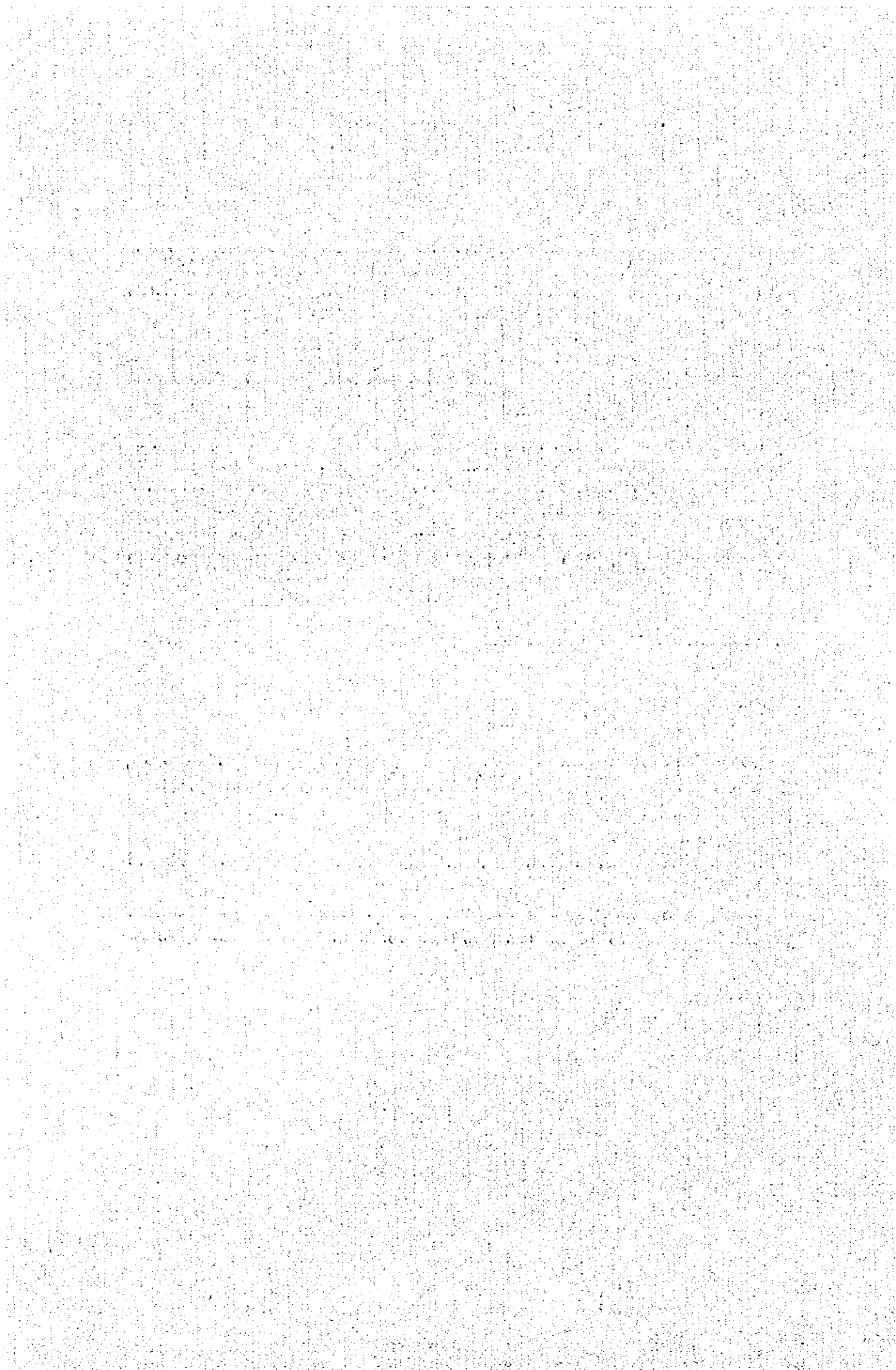


**APPENDIX 5 SUMMARY OF CASH FLOW
ANALYSIS (I=18%)**



Appendix 5 Summary of Cash Flow Analysis (i=18%)

1. Study Area

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	60.018	60.413	46.891	157.322	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0	% of Capital Cost	
Overhead Cost:	0.04 R/kl		15.0	% of Production Cost	

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	403.7	102.6	256.6	
	Stage 2	284.9	49.8	181.1	
	Stage 3	259.3	36.2	164.8	
	Total	947.9	188.6	602.5	
Retail Supply	Stage 1	410.5	230.1	260.8	
	Stage 2	274.8	173.5	174.6	
	Stage 3	176.7	151.1	112.3	
	Total	862.0	554.7	547.7	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(1,968.8)	(1,545.8)	(1,264.9)	(4,779.5)	
Retail	(1,216.1)	(777.1)	59.6	(1,933.7)	
Total	(3,185.0)	(2,322.9)	(1,205.3)	(6,713.2)	

Note: Figures in parentheses are negative.

Interest Rate:	18.00 %/year	Recovery R:	100 %
----------------	--------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

2. Western Zone Total

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	19.060	12.191	12.189	43.440	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0	% of Capital Cost	
Overhead Cost:	0.04 R/kl		15.0	% of Production Cost	

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	244.6	23.1	155.4	
	Stage 2	169.2	14.2	107.5	
	Stage 3	169.1	14.2	107.5	
	Total	582.9	51.5	370.4	
Retail Supply	Stage 1	101.8	56.1	64.6	
	Stage 2	64.0	36.7	40.6	
	Stage 3	64.0	36.7	40.6	
	Total	229.8	129.5	145.8	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(1,489.4)	(1,212.3)	(1,131.7)	(3,833.4)	
Retail	(160.1)	(165.0)	(131.8)	(456.9)	
Total	(1,649.5)	(1,377.3)	(1,263.5)	(4,290.3)	

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (I=18%) (cont'd)

2.1 Vaalkop North

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	5.294	4.343	4.343	13.980	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0 % of Capital Cost		
Overhead Cost:	0.04 R/kl		15.0 % of Production Cost		

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	131.3	7.2	83.4	
	Stage 2	107.7	5.9	68.5	
	Stage 3	107.7	5.9	68.5	
	Total	346.7	19.0	220.4	
Retail Supply	Stage 1	39.8	19.6	25.3	
	Stage 2	32.7	16.1	20.8	
	Stage 3	32.7	16.1	20.8	
	Total	105.2	51.8	66.9	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(884.1)	(828.4)	(777.9)	(2,490.4)	
Retail	(134.8)	(145.5)	(129.1)	(409.4)	
Total	(1,018.9)	(973.9)	(907.0)	(2,899.8)	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

2.2 Vaalkop South

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	8.021	4.387	4.386	16.794	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0		% of Capital Cost
Overhead Cost:	0.04 R/kl		15.0		% of Production Cost

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	107.9	14.7	68.6	
	Stage 2	59.0	8.0	37.5	
	Stage 3	59.0	8.0	37.5	
	Total	225.9	30.7	143.6	
Retail Supply	Stage 1	52.5	20.5	33.3	
	Stage 2	28.7	11.2	18.2	
	Stage 3	28.7	11.2	18.2	
	Total	109.9	42.9	69.7	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(663.7)	(420.5)	(392.6)	(1,476.8)	
Retail	(141.1)	(107.9)	(93.3)	(342.2)	
Total	(804.8)	(528.3)	(485.9)	(1,819.1)	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

2.3 Barnardsvlei

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	5.422	3.461	3.460	12.343	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0		% of Capital Cost
Overhead Cost:	0.04 R/kl		15.0		% of Production Cost

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	3.8	0.4	2.4	
	Stage 2	2.4	0.3	1.5	
	Stage 3	2.4	0.3	1.5	
	Total	8.6	1.0	5.4	
Retail Supply	Stage 1	4.1	14.7	2.6	
	Stage 2	2.6	9.4	1.6	
	Stage 3	2.6	9.4	1.6	
	Total	9.3	33.5	5.8	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	64.7	37.3	38.8	140.9	
Retail	147.0	88.3	90.6	325.9	
Total	211.8	125.7	129.4	466.8	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

2.4 Koster

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	0.323	-	-	0.323	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0		% of Capital Cost
Overhead Cost:	0.04 R/kl		15.0		% of Production Cost

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	1.6	0.8	1.0	
	Stage 2	-	-	-	
	Stage 3	-	-	-	
	Total	1.6	0.8	1.0	
Retail Supply	Stage 1	5.3	1.2	3.4	
	Stage 2	-	-	-	
	Stage 3	-	-	-	
	Total	5.3	1.2	3.4	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(6.3)	-	-	(6.3)	
Retail	(30.5)	-	-	(30.5)	
Total	(36.8)	-	-	(36.8)	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

3. Central Zone Total

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	32.680	32.957	32.956	98.593	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0 % of Capital Cost		
Overhead Cost:	0.04 R/kl		15.0 % of Production Cost		

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	101.7	50.5	64.7	
	Stage 2	81.2	19.5	51.7	
	Stage 3	81.2	19.5	51.7	
	Total	264.1	89.5	168.1	
Retail Supply	Stage 1	86.9	122.3	55.3	
	Stage 2	76.2	104.6	48.5	
	Stage 3	76.2	104.6	48.5	
	Total	239.3	331.5	152.3	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(195.1)	(132.5)	(91.3)	(418.9)	
Retail	395.0	390.4	435.8	1,221.1	
Total	199.9	258.0	344.4	802.3	

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

3.1 Brits

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	4.822	4.187	4.186	13.195	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0	% of Capital Cost	
Overhead Cost:	0.04 R/kl		15.0	% of Production Cost	

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	21.6	2.3	13.7	
	Stage 2	18.8	2.0	11.9	
	Stage 3	18.8	2.0	11.9	
	Total	59.2	6.3	37.5	
Retail Supply	Stage 1	16.0	6.5	10.2	
	Stage 2	13.9	5.6	8.8	
	Stage 3	13.9	5.6	8.8	
	Total	43.8	17.7	27.8	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(77.7)	(87.7)	(78.5)	(243.9)	
Retail	37.2	15.4	23.1	75.8	
Total	(40.5)	(72.3)	(55.4)	(168.2)	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

3.2 Klipvoor

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	0.900	-	-	0.900	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0		% of Capital Cost
Overhead Cost:	0.04 R/kl		15.0		% of Production Cost

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	21.6	31.8	13.8	
	Stage 2	-	-	-	
	Stage 3	-	-	-	
	Total	21.6	31.8	13.8	
Retail Supply	Stage 1	12.5	23.2	8.0	
	Stage 2	-	-	-	
	Stage 3	-	-	-	
	Total	12.5	23.2	8.0	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(145.0)	-	-	(145.0)	
Retail	(73.4)	-	-	(73.4)	
Total	(218.4)	-	-	(218.4)	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (I=18%) (cont'd)

3.3 Temba

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	7.907	8.470	8.470	24.847	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0 % of Capital Cost		
Overhead Cost:	0.04 R/kl		15.0 % of Production Cost		

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	24.9	11.9	15.8	
	Stage 2	26.7	12.8	17.0	
	Stage 3	26.7	12.8	17.0	
	Total	78.3	37.5	49.8	
Retail Supply	Stage 1	8.7	29.6	5.5	
	Stage 2	9.4	31.7	6.0	
	Stage 3	9.4	31.7	6.0	
	Total	27.5	93.0	17.5	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(49.3)	(82.8)	(69.5)	(201.7)	
Retail	190.9	187.1	194.0	572.0	
Total	141.6	104.3	124.5	370.4	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (I=18%) (cont'd)

3.4 Rand Water

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	19.051	20.300	20.300	59.651	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0 % of Capital Cost		
Overhead Cost:	0.04 R/kl		15.0 % of Production Cost		

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	33.6	4.5	21.4	
	Stage 2	35.8	4.8	22.8	
	Stage 3	35.8	4.8	22.8	
	Total	105.2	14.1	67.0	
Retail Supply	Stage 1	49.7	63.1	31.6	
	Stage 2	52.9	67.2	33.7	
	Stage 3	52.9	67.2	33.7	
	Total	155.5	197.5	99.0	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	77.0	37.3	56.0	170.2	
Retail	240.2	188.0	218.6	646.8	
Total	317.2	225.2	274.6	817.0	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

4. Eastern Zone Total

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	8.278	5.265	1.746	15.289	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0 % of Capital Cost		
Overhead Cost:	0.04 R/kl		15.0 % of Production Cost		

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	57.4	29.0	36.5	
	Stage 2	34.5	16.1	21.9	
	Stage 3	8.9	2.4	5.6	
	Total	100.8	47.5	64.0	
Retail Supply	Stage 1	221.8	51.7	140.9	
	Stage 2	134.6	32.2	85.5	
	Stage 3	36.5	9.8	23.2	
	Total	392.9	93.7	249.6	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(284.3)	(201.1)	(41.1)	(526.5)	
Retail	(1,451.1)	(1,002.5)	(244.4)	(2,697.9)	
Total	(1,735.4)	(1,203.5)	(285.5)	(3,224.4)	

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

4.1 Wellervreden

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	7.001	3.518	-	10.519	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0 % of Capital Cost		
Overhead Cost:	0.04 R/kl		15.0 % of Production Cost		

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	50.9	27.2	32.3	
	Stage 2	25.6	13.7	16.3	
	Stage 3	-	-	-	
	Total	76.5	40.9	48.6	
Retail Supply	Stage 1	195.1	44.5	124.0	
	Stage 2	98.0	22.3	62.3	
	Stage 3	-	-	-	
	Total	293.1	66.8	186.3	

3. Result

Overall Cash Balance

(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(257.9)	(155.7)	-	(413.6)	
Retail	(1,285.6)	(739.9)	-	(2,025.5)	
Total	(1,543.5)	(895.6)	-	(2,439.1)	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

Appendix 5 Summary of Cash Flow Analysis (i=18%) (cont'd)

4.2 Bronkhorstspuit

1. Basis of Calculation

Water Demand: (mcm/year)	Stage 1	Stage 2	Stage 3	Total	Remarks
	1.277	1.747	1.746	4.770	
	Bulk Supply		Retail Supply		
Water Tariff	1.20 R/kl		1.30 R/kl		
Prod. Cost:	0.49 R/kl		1.0		% of Capital Cost
Overhead Cost:	0.04 R/kl		15.0		% of Production Cost

2. Required Capital Cost

(Unit: R Million)

		Loan Portion	Grant Portion	Direct Cost	Remarks
Bulk Supply	Stage 1	6.5	1.8	4.2	
	Stage 2	8.9	2.4	5.6	
	Stage 3	8.9	2.4	5.6	
	Total	24.3	6.6	15.4	
Retail Supply	Stage 1	26.7	7.2	16.9	
	Stage 2	36.5	9.8	23.2	
	Stage 3	36.5	9.8	23.2	
	Total	99.7	26.8	63.3	

3. Result

Overall Cash Balance

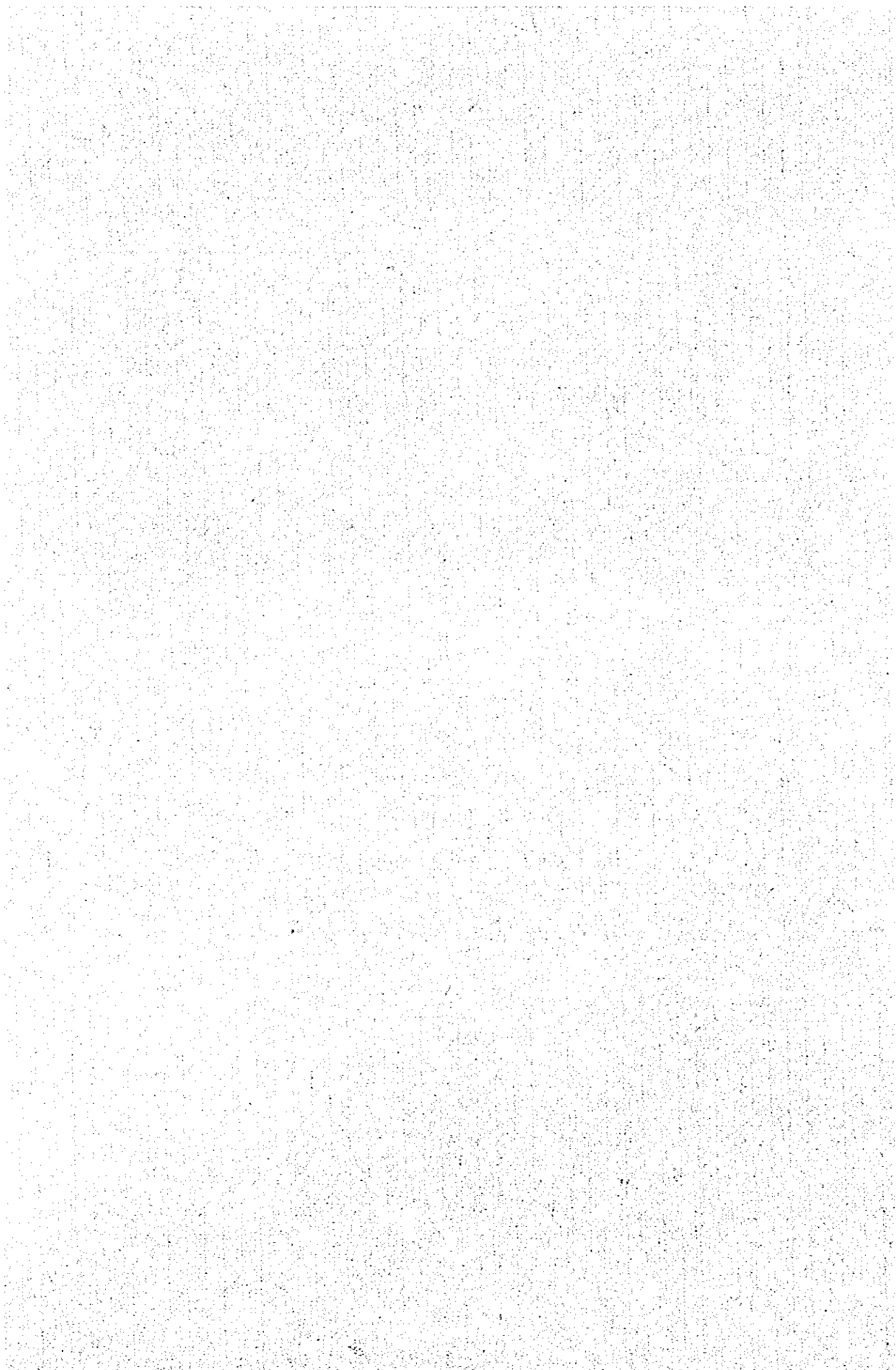
(Unit: R. Million)

	Stage 1	Stage 2	Stage 3	Total	Remarks
Bulk	(26.4)	(45.4)	(41.1)	(112.9)	
Retail	(165.4)	(261.7)	(244.4)	(671.5)	
Total	(191.9)	(307.1)	(285.5)	(784.4)	

Note: Figures in parentheses are negative.

Interest Rate:	18.0 %/year	Recovery R:	100 %
----------------	-------------	-------------	-------

**APPENDIX 6 CALCULATION OF FINANCIAL
INTERNAL RATE OF RETURN**



Appendix 6 Calculation of Financial Internal Rate of Return

1. Study Area Total

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	157.322	60.018	50.413	46.891	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	947.900	403.700	284.900	259.300	million R
(Retail):	861.800	410.400	274.700	176.700	million R
Direct Cost (Bulk)	602.500	256.600	181.100	164.800	million R
(Retail):	547.700	260.800	174.600	112.300	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	81.410	-	-	81.410	-	(81.410)
2	122.115	-	-	122.115	-	(122.115)
3	244.230	3.592	-	247.822	-	(247.822)
4	244.230	12.570	-	256.800	45.014	(211.786)
5	122.115	28.731	-	150.846	105.032	(45.814)
6	55.960	35.913	-	91.873	150.045	58.172
7	55.960	35.913	-	91.873	150.045	58.172
8	83.940	38.860	-	122.800	150.045	27.245
9	111.920	44.753	-	156.673	175.253	18.580
10	111.920	50.646	-	162.566	213.061	50.495
11	83.940	58.013	-	141.953	238.268	96.315
12	55.960	62.433	-	118.393	257.173	138.780
13	43.600	65.380	-	108.980	276.079	167.099
14	65.400	65.380	-	130.780	276.079	145.299
15	87.200	68.041	-	155.241	276.079	120.838
16	87.200	74.696	-	161.896	306.908	145.012
17	87.200	81.351	-	168.551	337.739	169.188
18	65.400	89.336	-	154.736	368.569	213.833
19	-	91.998	-	91.998	399.401	307.403
20	-	91.998	117.967	209.965	399.401	189.436
21	-	91.998	-	91.998	399.401	307.403
22	-	91.998	-	91.998	399.401	307.403
23	-	91.998	-	91.998	399.401	307.403
24	-	91.998	-	91.998	399.401	307.403
25	-	91.998	-	91.998	399.401	307.403
26	-	91.998	81.100	173.098	399.401	226.303
27	-	91.998	-	91.998	399.401	307.403
28	-	91.998	-	91.998	399.401	307.403
29	-	91.998	-	91.998	399.401	307.403
30	-	91.998	-	91.998	399.401	307.403
31	-	91.998	-	91.998	399.401	307.403
32	-	91.998	62.472	154.470	399.401	244.931
33	-	91.998	-	91.998	399.401	307.403
34	-	91.998	-	91.998	399.401	307.403
35	-	91.998	117.967	209.965	399.401	189.436
36	-	91.998	-	91.998	399.401	307.403
37	-	91.998	-	91.998	399.401	307.403
38	-	91.998	-	91.998	399.401	307.403
39	-	91.998	-	91.998	399.401	307.403
40	-	91.998	-	91.998	399.401	307.403
Total	1,809.700	2,839.564	379.506	5,028.770	12,112.211	7,083.441
					FIRR=	13.3%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation of Financial Internal Rate of Return (cont'd)

2. Western Zone Total

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	43.440	19.060	12.191	12.189	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	582.800	244.600	169.100	169.100	million R
(Retail):	229.700	101.700	64.000	64.000	million R
Direct Cost (Bulk)	370.400	155.400	107.500	107.500	million R
(Retail):	145.800	64.600	40.600	40.600	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	34.630	-	-	34.630	-	(34.630)
2	51.945	-	-	51.945	-	(51.945)
3	103.890	1.112	-	105.002	-	(105.002)
4	103.890	3.892	-	107.782	14.295	(93.487)
5	51.945	8.895	-	60.840	33.355	(27.485)
6	23.310	11.119	-	34.429	47.650	13.221
7	23.310	11.119	-	34.429	47.650	13.221
8	34.965	11.829	-	46.794	47.650	0.856
9	46.620	13.249	-	59.869	53.746	(6.124)
10	46.620	14.669	-	61.289	62.889	1.599
11	34.965	16.445	-	51.410	68.984	17.575
12	23.310	17.510	-	40.820	73.556	32.736
13	23.310	18.220	-	41.530	78.128	36.597
14	34.965	18.220	-	53.185	78.128	24.942
15	46.620	18.930	-	65.550	78.128	12.577
16	46.620	20.705	-	67.325	87.269	19.944
17	46.620	22.480	-	69.100	96.411	27.311
18	34.965	24.610	-	59.575	105.553	45.978
19	-	25.320	-	25.320	114.695	89.374
20	-	25.320	50.160	75.480	114.695	39.214
21	-	25.320	-	25.320	114.695	89.374
22	-	25.320	-	25.320	114.695	89.374
23	-	25.320	-	25.320	114.695	89.374
24	-	25.320	-	25.320	114.695	89.374
25	-	25.320	-	25.320	114.695	89.374
26	-	25.320	33.767	59.087	114.695	55.608
27	-	25.320	-	25.320	114.695	89.374
28	-	25.320	-	25.320	114.695	89.374
29	-	25.320	-	25.320	114.695	89.374
30	-	25.320	-	25.320	114.695	89.374
31	-	25.320	-	25.320	114.695	89.374
32	-	25.320	33.060	58.380	114.695	56.314
33	-	25.320	-	25.320	114.695	89.374
34	-	25.320	-	25.320	114.695	89.374
35	-	25.320	50.160	75.480	114.695	39.214
36	-	25.320	-	25.320	114.695	89.374
37	-	25.320	-	25.320	114.695	89.374
38	-	25.320	-	25.320	114.695	89.374
39	-	25.320	-	25.320	114.695	89.374
40	-	25.320	-	25.320	114.695	89.374
Total	812.500	790.048	167.147	1,769.695	3,496.669	1,726.974
					FIRR=	8.9%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation of Financial Internal Rate of Return (cont'd)

2.1 Vaalkop North

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	13.980	5.294	4.343	4.343	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	346.700	131.300	107.700	107.700	million R
(Retail):	105.200	39.800	32.700	32.700	million R
Direct Cost (Bulk)	220.400	83.400	68.500	68.500	million R
(Retail):	66.900	25.300	20.800	20.800	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	17.110	-	-	17.110	-	(17.110)
2	25.665	-	-	25.665	-	(25.665)
3	51.330	0.320	-	51.650	-	(51.650)
4	51.330	1.121	-	52.451	3.971	(48.481)
5	25.665	2.563	-	28.228	9.265	(18.964)
6	14.040	3.204	-	17.244	13.235	(4.009)
7	14.040	3.204	-	17.244	13.235	(4.009)
8	21.060	3.467	-	24.527	13.235	(11.292)
9	28.080	3.992	-	32.072	15.407	(16.666)
10	28.080	4.518	-	32.598	18.664	(13.934)
11	21.060	5.175	-	26.235	20.835	(5.400)
12	14.040	5.570	-	19.610	22.464	2.854
13	14.040	5.833	-	19.873	24.093	4.220
14	21.060	5.833	-	26.893	24.093	(2.800)
15	28.080	6.095	-	34.175	24.093	(10.083)
16	28.080	6.763	-	34.833	26.807	(8.026)
17	28.080	7.410	-	35.490	29.521	(5.969)
18	21.060	8.199	-	29.259	32.236	2.977
19	-	8.461	-	8.461	34.950	26.489
20	-	8.461	24.784	33.245	34.950	1.705
21	-	8.461	-	8.461	34.950	26.489
22	-	8.461	-	8.461	34.950	26.489
23	-	8.461	-	8.461	34.950	26.489
24	-	8.461	-	8.461	34.950	26.489
25	-	8.461	-	8.461	34.950	26.489
26	-	8.461	20.360	28.822	34.950	6.128
27	-	8.461	-	8.461	34.950	26.489
28	-	8.461	-	8.461	34.950	26.489
29	-	8.461	-	8.461	34.950	26.489
30	-	8.461	-	8.461	34.950	26.489
31	-	8.461	-	8.461	34.950	26.489
32	-	8.461	20.360	28.822	34.950	6.128
33	-	8.461	-	8.461	34.950	26.489
34	-	8.461	-	8.461	34.950	26.489
35	-	8.461	24.784	33.245	34.950	1.705
36	-	8.461	-	8.461	34.950	26.489
37	-	8.461	-	8.461	34.950	26.489
38	-	8.461	-	8.461	34.950	26.489
39	-	8.461	-	8.461	34.950	26.489
40	-	8.461	-	8.461	34.950	26.489
Total	451.900	259.408	90.288	801.596	1,060.051	258.455
					FIRR=	3.2%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation of Financial Internal Rate of Return (cont'd)

2.2 Vaalkop South

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	16.794	8.021	4.387	4.386	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	225.900	107.900	59.000	59.000	million R
(Retail):	109.900	52.500	28.700	28.700	million R
Direct Cost (Bulk):	143.600	68.600	37.500	37.500	million R
(Retail):	69.700	33.300	18.200	18.200	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	16.040	-	-	16.040	-	(16.040)
2	24.060	-	-	24.060	-	(24.060)
3	48.120	0.478	-	48.598	-	(48.598)
4	48.120	1.672	-	49.792	6.016	(43.776)
5	24.060	3.821	-	27.881	14.037	(13.844)
6	8.770	4.776	-	13.546	20.053	6.506
7	8.770	4.776	-	13.546	20.053	6.506
8	13.155	5.037	-	18.192	20.053	1.860
9	17.540	5.560	-	23.100	22.246	(0.854)
10	17.540	6.082	-	23.622	25.536	1.914
11	13.155	6.735	-	19.890	27.730	7.840
12	8.770	7.127	-	15.897	29.375	13.478
13	8.770	7.388	-	16.158	31.020	14.862
14	13.155	7.388	-	20.543	31.020	10.477
15	17.540	7.649	-	25.189	31.020	5.831
16	17.540	8.302	-	25.842	33.761	7.919
17	17.540	8.955	-	26.495	36.503	10.007
18	13.155	9.739	-	22.894	39.244	16.350
19	-	10.000	-	10.000	41.985	31.985
20	-	10.000	23.233	33.233	41.985	8.752
21	-	10.000	-	10.000	41.985	31.985
22	-	10.000	-	10.000	41.985	31.985
23	-	10.000	-	10.000	41.985	31.985
24	-	10.000	-	10.000	41.985	31.985
25	-	10.000	-	10.000	41.985	31.985
26	-	10.000	12.700	22.699	41.985	19.286
27	-	10.000	-	10.000	41.985	31.985
28	-	10.000	-	10.000	41.985	31.985
29	-	10.000	-	10.000	41.985	31.985
30	-	10.000	-	10.000	41.985	31.985
31	-	10.000	-	10.000	41.985	31.985
32	-	10.000	12.700	22.699	41.985	19.286
33	-	10.000	-	10.000	41.985	31.985
34	-	10.000	-	10.000	41.985	31.985
35	-	10.000	23.233	33.233	41.985	8.752
36	-	10.000	-	10.000	41.985	31.985
37	-	10.000	-	10.000	41.985	31.985
38	-	10.000	-	10.000	41.985	31.985
39	-	10.000	-	10.000	41.985	31.985
40	-	10.000	-	10.000	41.985	31.985
Total	335.800	315.482	71.866	723.148	1,311.334	588.187
					FIRR=	7.7%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation of Financial Internal Rate of Return (cont'd)

2.3 Barnardsvlei

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	12.343	5.422	3.461	3.460	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	8.600	3.800	2.400	2.400	million R
(Retail):	9.300	4.100	2.600	2.600	million R
Direct Cost (Bulk):	5.400	2.400	1.500	1.500	million R
(Retail):	5.800	2.600	1.600	1.600	million R

(Unit: R million)

Project Year	Project Cost			Total	Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement			
1	0.790	-	-	0.790	-	(0.790)
2	1.185	-	-	1.185	-	(1.185)
3	2.370	0.291	-	2.661	-	(2.661)
4	2.370	1.020	-	3.390	4.067	0.676
5	1.185	2.332	-	3.517	9.489	5.972
6	0.500	2.915	-	3.415	13.555	10.140
7	0.500	2.915	-	3.415	13.555	10.140
8	0.750	3.101	-	3.851	13.555	9.704
9	1.000	3.473	-	4.473	15.286	10.813
10	1.000	3.845	-	4.845	17.881	13.036
11	0.750	4.310	-	5.060	19.612	14.552
12	0.500	4.589	-	5.089	20.910	15.821
13	0.500	4.775	-	5.275	22.208	16.933
14	0.750	4.775	-	5.525	22.208	16.683
15	1.000	4.961	-	5.961	22.208	16.247
16	1.000	5.426	-	6.426	24.370	17.944
17	1.000	5.891	-	6.891	26.533	19.642
18	0.750	6.449	-	7.199	28.695	21.496
19	-	6.635	-	6.635	30.858	24.223
20	-	6.635	1.140	7.775	30.858	23.083
21	-	6.635	-	6.635	30.858	24.223
22	-	6.635	-	6.635	30.858	24.223
23	-	6.635	-	6.635	30.858	24.223
24	-	6.635	-	6.635	30.858	24.223
25	-	6.635	-	6.635	30.858	24.223
26	-	6.635	0.707	7.342	30.858	23.516
27	-	6.635	-	6.635	30.858	24.223
28	-	6.635	-	6.635	30.858	24.223
29	-	6.635	-	6.635	30.858	24.223
30	-	6.635	-	6.635	30.858	24.223
31	-	6.635	-	6.635	30.858	24.223
32	-	6.635	0.707	7.342	30.858	23.516
33	-	6.635	-	6.635	30.858	24.223
34	-	6.635	-	6.635	30.858	24.223
35	-	6.635	1.140	7.775	30.858	23.083
36	-	6.635	-	6.635	30.858	24.223
37	-	6.635	-	6.635	30.858	24.223
38	-	6.635	-	6.635	30.858	24.223
39	-	6.635	-	6.635	30.858	24.223
40	-	6.635	-	6.635	30.858	24.223
Total	17.900	207.032	3.694	228.626	952.993	724.368
					FIRR=	73.9%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation of Financial Internal Rate of Return (cont'd)

2.4 Koster

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	0.323	0.323	-	-	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	1.600	1.600	-	-	million R
(Retail):	5.300	5.300	-	-	million R
Direct Cost (Bulk)	1.000	1.000	-	-	million R
(Retail):	3.400	3.400	-	-	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	0.690	-	-	0.690	-	(0.690)
2	1.035	-	-	1.035	-	(1.035)
3	2.070	0.022	-	2.092	-	(2.092)
4	2.070	0.078	-	2.148	0.242	(1.906)
5	1.035	0.179	-	1.214	0.565	(0.649)
6	-	0.224	-	0.224	0.808	0.583
7	-	0.224	-	0.224	0.808	0.583
8	-	0.224	-	0.224	0.808	0.583
9	-	0.224	-	0.224	0.808	0.583
10	-	0.224	-	0.224	0.808	0.583
11	-	0.224	-	0.224	0.808	0.583
12	-	0.224	-	0.224	0.808	0.583
13	-	0.224	-	0.224	0.808	0.583
14	-	0.224	-	0.224	0.808	0.583
15	-	0.224	-	0.224	0.808	0.583
16	-	0.224	-	0.224	0.808	0.583
17	-	0.224	-	0.224	0.808	0.583
18	-	0.224	-	0.224	0.808	0.583
19	-	0.224	-	0.224	0.808	0.583
20	-	0.224	1.003	1.227	0.808	(0.420)
21	-	0.224	-	0.224	0.808	0.583
22	-	0.224	-	0.224	0.808	0.583
23	-	0.224	-	0.224	0.808	0.583
24	-	0.224	-	0.224	0.808	0.583
25	-	0.224	-	0.224	0.808	0.583
26	-	0.224	-	0.224	0.808	0.583
27	-	0.224	-	0.224	0.808	0.583
28	-	0.224	-	0.224	0.808	0.583
29	-	0.224	-	0.224	0.808	0.583
30	-	0.224	-	0.224	0.808	0.583
31	-	0.224	-	0.224	0.808	0.583
32	-	0.224	-	0.224	0.808	0.583
33	-	0.224	-	0.224	0.808	0.583
34	-	0.224	-	0.224	0.808	0.583
35	-	0.224	1.003	1.227	0.808	(0.420)
36	-	0.224	-	0.224	0.808	0.583
37	-	0.224	-	0.224	0.808	0.583
38	-	0.224	-	0.224	0.808	0.583
39	-	0.224	-	0.224	0.808	0.583
40	-	0.224	-	0.224	0.808	0.583
Total	6.900	8.127	2.006	17.033	29.070	12.037
					FIRR=	6.8%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation Financial Internal Rate of Return (cont'd)

3. Central Zone Total

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	98.593	32.680	32.957	32.956	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	264.300	101.700	81.300	81.300	million R
(Retail):	239.300	86.900	76.200	76.200	million R
Direct Cost (Bulk)	168.100	64.700	51.700	51.700	million R
(Retail):	152.300	55.300	48.500	48.500	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	18.860	-	-	18.860	-	(18.860)
2	28.290	-	-	28.290	-	(28.290)
3	56.580	1.819	-	58.399	-	(58.399)
4	56.580	6.366	-	62.946	24.510	(38.436)
5	28.290	14.552	-	42.842	57.190	14.348
6	15.750	18.189	-	33.939	81.700	47.761
7	15.750	18.189	-	33.939	81.700	47.761
8	23.625	20.012	-	43.637	81.700	38.063
9	31.500	23.658	-	55.158	98.179	43.020
10	31.500	27.304	-	58.804	122.896	64.092
11	23.625	31.861	-	55.486	139.375	83.888
12	15.750	34.596	-	50.346	151.734	101.388
13	15.750	36.419	-	52.169	164.093	111.924
14	23.625	36.419	-	60.044	164.093	104.049
15	31.500	38.241	-	69.741	164.093	94.351
16	31.500	42.799	-	74.299	184.690	110.391
17	31.500	47.356	-	78.856	205.288	126.432
18	23.625	52.824	-	76.449	225.885	149.436
19	-	54.647	-	54.647	246.483	191.835
20	-	54.647	27.360	82.007	246.483	164.475
21	-	54.647	-	54.647	246.483	191.835
22	-	54.647	-	54.647	246.483	191.835
23	-	54.647	-	54.647	246.483	191.835
24	-	54.647	-	54.647	246.483	191.835
25	-	54.647	-	54.647	246.483	191.835
26	-	54.647	22.846	77.493	246.483	168.990
27	-	54.647	-	54.647	246.483	191.835
28	-	54.647	-	54.647	246.483	191.835
29	-	54.647	-	54.647	246.483	191.835
30	-	54.647	-	54.647	246.483	191.835
31	-	54.647	-	54.647	246.483	191.835
32	-	54.647	22.846	77.493	246.483	168.990
33	-	54.647	-	54.647	246.483	191.835
34	-	54.647	-	54.647	246.483	191.835
35	-	54.647	27.360	82.007	246.483	164.475
36	-	54.647	-	54.647	246.483	191.835
37	-	54.647	-	54.647	246.483	191.835
38	-	54.647	-	54.647	246.483	191.835
39	-	54.647	-	54.647	246.483	191.835
40	-	54.647	-	54.647	246.483	191.835
Total	503.600	1,652.845	100.411	2,256.856	7,369.738	5,112.882
					FIRR=	27.8%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation Financial Internal Rate of Return (cont'd)

3.1 Brits

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	13.195	4.822	4.187	4.186	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	59.200	21.600	18.800	18.800	million R
(Retail):	43.800	16.000	13.900	13.900	million R
Direct Cost (Bulk)	37.500	13.700	11.900	11.900	million R
(Retail):	27.800	10.200	8.800	8.800	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	3.760	-	-	3.760	-	(3.760)
2	5.640	-	-	5.640	-	(5.640)
3	11.280	0.272	-	11.552	-	(11.552)
4	11.280	0.950	-	12.230	3.617	(8.614)
5	5.640	2.173	-	7.813	8.439	0.626
6	3.270	2.716	-	5.986	12.055	6.069
7	3.270	2.716	-	5.986	12.055	6.069
8	4.905	2.951	-	7.856	12.055	4.199
9	6.540	3.423	-	9.963	14.149	4.185
10	6.540	3.895	-	10.435	17.289	6.854
11	4.905	4.484	-	9.389	19.382	9.993
12	3.270	4.838	-	8.108	20.952	12.844
13	3.270	5.074	-	8.344	22.523	14.179
14	4.905	5.074	-	9.979	22.523	12.544
15	6.540	5.310	-	11.850	22.523	10.673
16	6.540	5.899	-	12.439	25.139	12.700
17	6.540	6.488	-	13.028	27.755	14.727
18	4.905	7.196	-	12.101	30.371	18.271
19	-	7.431	-	7.431	32.988	25.556
20	-	7.431	5.449	12.881	32.988	20.107
21	-	7.431	-	7.431	32.988	25.556
22	-	7.431	-	7.431	32.988	25.556
23	-	7.431	-	7.431	32.988	25.556
24	-	7.431	-	7.431	32.988	25.556
25	-	7.431	-	7.431	32.988	25.556
26	-	7.431	4.720	12.151	32.988	20.837
27	-	7.431	-	7.431	32.988	25.556
28	-	7.431	-	7.431	32.988	25.556
29	-	7.431	-	7.431	32.988	25.556
30	-	7.431	-	7.431	32.988	25.556
31	-	7.431	-	7.431	32.988	25.556
32	-	7.431	4.720	12.151	32.988	20.837
33	-	7.431	-	7.431	32.988	25.556
34	-	7.431	-	7.431	32.988	25.556
35	-	7.431	5.449	12.881	32.988	20.107
36	-	7.431	-	7.431	32.988	25.556
37	-	7.431	-	7.431	32.988	25.556
38	-	7.431	-	7.431	32.988	25.556
39	-	7.431	-	7.431	32.988	25.556
40	-	7.431	-	7.431	32.988	25.556
Total	103.000	226.947	20.338	350.285	996.549	646.265
					FIRR=	20.8%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation Financial Internal Rate of Return (cont'd)

3.2 Klipvoor

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	0.900	0.900	-	-	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	21.600	21.600	-	-	million R
(Retail):	12.500	12.500	-	-	million R
Direct Cost (Bulk)	13.800	13.800	-	-	million R
(Retail):	8.000	8.000	-	-	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	3.410	-	-	3.410	-	(3.410)
2	5.115	-	-	5.115	-	(5.115)
3	10.230	0.060	-	10.290	-	(10.290)
4	10.230	0.211	-	10.441	0.675	(9.766)
5	5.115	0.482	-	5.597	1.575	(4.022)
6	-	0.602	-	0.602	2.250	1.648
7	-	0.602	-	0.602	2.250	1.648
8	-	0.602	-	0.602	2.250	1.648
9	-	0.602	-	0.602	2.250	1.648
10	-	0.602	-	0.602	2.250	1.648
11	-	0.602	-	0.602	2.250	1.648
12	-	0.602	-	0.602	2.250	1.648
13	-	0.602	-	0.602	2.250	1.648
14	-	0.602	-	0.602	2.250	1.648
15	-	0.602	-	0.602	2.250	1.648
16	-	0.602	-	0.602	2.250	1.648
17	-	0.602	-	0.602	2.250	1.648
18	-	0.602	-	0.602	2.250	1.648
19	-	0.602	-	0.602	2.250	1.648
20	-	0.602	4.970	5.572	2.250	(3.322)
21	-	0.602	-	0.602	2.250	1.648
22	-	0.602	-	0.602	2.250	1.648
23	-	0.602	-	0.602	2.250	1.648
24	-	0.602	-	0.602	2.250	1.648
25	-	0.602	-	0.602	2.250	1.648
26	-	0.602	-	0.602	2.250	1.648
27	-	0.602	-	0.602	2.250	1.648
28	-	0.602	-	0.602	2.250	1.648
29	-	0.602	-	0.602	2.250	1.648
30	-	0.602	-	0.602	2.250	1.648
31	-	0.602	-	0.602	2.250	1.648
32	-	0.602	-	0.602	2.250	1.648
33	-	0.602	-	0.602	2.250	1.648
34	-	0.602	-	0.602	2.250	1.648
35	-	0.602	4.970	5.572	2.250	(3.322)
36	-	0.602	-	0.602	2.250	1.648
37	-	0.602	-	0.602	2.250	1.648
38	-	0.602	-	0.602	2.250	1.648
39	-	0.602	-	0.602	2.250	1.648
40	-	0.602	-	0.602	2.250	1.648
Total	34.100	21.823	9.941	65.863	81.000	15.137
FIRR=						2.2%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation Financial Internal Rate of Return (cont'd)

3.3 Temba

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	24.847	7.907	8.470	8.470	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	78.300	24.900	26.700	26.700	million R
(Retail):	27.500	8.700	9.400	9.400	million R
Direct Cost (Bulk)	49.800	15.800	17.000	17.000	million R
(Retail):	17.500	5.500	6.000	6.000	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	3.360	-	-	3.360	-	(3.360)
2	5.040	-	-	5.040	-	(5.040)
3	10.080	0.428	-	10.508	-	(10.508)
4	10.080	1.497	-	11.577	5.930	(5.647)
5	5.040	3.422	-	8.462	13.837	5.375
6	3.610	4.278	-	7.888	19.768	11.880
7	3.610	4.278	-	7.888	19.768	11.880
8	5.415	4.736	-	10.151	19.768	9.616
9	7.220	6.653	-	12.873	24.003	11.130
10	7.220	6.569	-	13.789	30.355	16.566
11	5.415	7.715	-	13.130	34.590	21.460
12	3.610	8.403	-	12.013	37.766	25.754
13	3.610	8.861	-	12.471	40.943	28.472
14	5.415	8.861	-	14.276	40.943	26.667
15	7.220	9.319	-	16.539	40.943	24.403
16	7.220	10.465	-	17.685	46.236	28.551
17	7.220	11.611	-	18.831	51.530	32.699
18	5.415	12.986	-	18.401	56.824	38.423
19	-	13.444	-	13.444	62.118	48.674
20	-	13.444	4.856	18.300	62.118	43.817
21	-	13.444	-	13.444	62.118	48.674
22	-	13.444	-	13.444	62.118	48.674
23	-	13.444	-	13.444	62.118	48.674
24	-	13.444	-	13.444	62.118	48.674
25	-	13.444	-	13.444	62.118	48.674
26	-	13.444	5.244	18.688	62.118	43.430
27	-	13.444	-	13.444	62.118	48.674
28	-	13.444	-	13.444	62.118	48.674
29	-	13.444	-	13.444	62.118	48.674
30	-	13.444	-	13.444	62.118	48.674
31	-	13.444	-	13.444	62.118	48.674
32	-	13.444	5.244	18.688	62.118	43.430
33	-	13.444	-	13.444	62.118	48.674
34	-	13.444	-	13.444	62.118	48.674
35	-	13.444	4.856	18.300	62.118	43.817
36	-	13.444	-	13.444	62.118	48.674
37	-	13.444	-	13.444	62.118	48.674
38	-	13.444	-	13.444	62.118	48.674
39	-	13.444	-	13.444	62.118	48.674
40	-	13.444	-	13.444	62.118	48.674
Total	105.800	404.846	20.201	530.847	1,849.786	1,318.940
					FIRR=	34.7%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation Financial Internal Rate of Return (cont'd)

3.4 Rand Water Rand Water

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	59.651	19.051	20.300	20.300	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	105.200	33.600	35.800	35.800	million R
(Retail):	155.500	49.700	52.900	52.900	million R
Direct Cost (Bulk):	67.000	21.400	22.800	22.800	million R
(Retail):	99.000	31.600	33.700	33.700	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	8.330	-	-	8.330	-	(8.330)
2	12.495	-	-	12.495	-	(12.495)
3	24.990	1.059	-	26.049	-	(26.049)
4	24.990	3.708	-	28.698	14.288	(14.410)
5	12.495	8.475	-	20.970	33.339	12.369
6	8.870	10.594	-	19.464	47.628	28.163
7	8.870	10.594	-	19.464	47.628	28.163
8	13.305	11.723	-	25.028	47.628	22.600
9	17.740	13.980	-	31.720	57.778	26.057
10	17.740	16.238	-	33.978	73.003	39.024
11	13.305	19.060	-	32.365	83.153	50.787
12	8.870	20.753	-	29.623	90.765	61.142
13	8.870	21.882	-	30.752	98.378	67.625
14	13.305	21.882	-	35.187	98.378	63.190
15	17.740	23.011	-	40.751	98.378	57.627
16	17.740	25.833	-	43.573	111.065	67.492
17	17.740	28.655	-	46.395	123.753	77.358
18	13.305	32.041	-	45.346	136.440	91.094
19	-	33.170	-	33.170	149.128	115.957
20	-	33.170	12.084	45.254	149.128	103.873
21	-	33.170	-	33.170	149.128	115.957
22	-	33.170	-	33.170	149.128	115.957
23	-	33.170	-	33.170	149.128	115.957
24	-	33.170	-	33.170	149.128	115.957
25	-	33.170	-	33.170	149.128	115.957
26	-	33.170	12.882	46.052	149.128	103.075
27	-	33.170	-	33.170	149.128	115.957
28	-	33.170	-	33.170	149.128	115.957
29	-	33.170	-	33.170	149.128	115.957
30	-	33.170	-	33.170	149.128	115.957
31	-	33.170	-	33.170	149.128	115.957
32	-	33.170	12.882	46.052	149.128	103.075
33	-	33.170	-	33.170	149.128	115.957
34	-	33.170	-	33.170	149.128	115.957
35	-	33.170	12.084	45.254	149.128	103.873
36	-	33.170	-	33.170	149.128	115.957
37	-	33.170	-	33.170	149.128	115.957
38	-	33.170	-	33.170	149.128	115.957
39	-	33.170	-	33.170	149.128	115.957
40	-	33.170	-	33.170	149.128	115.957
Total	260.700	999.230	49.932	1,309.862	4,442.403	3,132.541
					FIRR=	33.7%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation of Financial Internal Rate of Return (cont'd)

4. Eastern Zone Total

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	15 289	8.278	5.265	1.746	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	100.800	57.400	34.500	8.900	million R
(Retail):	392.800	221.800	134.500	36.500	million R
Direct Cost (Bulk)	64.000	36.500	21.900	5.600	million R
(Retail):	249.600	140.900	85.500	23.200	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	27.920	-	-	27.920	-	(27.920)
2	41.880	-	-	41.880	-	(41.880)
3	83.760	0.661	-	84.421	-	(84.421)
4	83.760	2.312	-	86.072	6.209	(79.863)
5	41.880	5.284	-	47.164	14.487	(32.678)
6	16.900	6.605	-	23.505	20.695	(2.810)
7	16.900	6.605	-	23.505	20.695	(2.810)
8	25.350	7.019	-	32.369	20.695	(11.674)
9	33.800	7.846	-	41.646	23.328	(18.318)
10	33.800	8.673	-	42.473	27.276	(15.197)
11	25.350	9.707	-	35.057	29.909	(5.148)
12	16.900	10.327	-	27.227	31.883	4.656
13	4.540	10.741	-	15.281	33.858	18.577
14	6.810	10.741	-	17.551	33.858	16.307
15	9.080	10.870	-	19.950	33.858	13.908
16	9.080	11.192	-	20.272	34.949	14.676
17	9.080	11.515	-	20.595	36.040	15.445
18	6.810	11.902	-	18.712	37.131	18.419
19	-	12.031	-	12.031	38.223	26.191
20	-	12.031	40.447	52.478	38.223	(14.256)
21	-	12.031	-	12.031	38.223	26.191
22	-	12.031	-	12.031	38.223	26.191
23	-	12.031	-	12.031	38.223	26.191
24	-	12.031	-	12.031	38.223	26.191
25	-	12.031	-	12.031	38.223	26.191
26	-	12.031	24.487	36.518	38.223	1.704
27	-	12.031	-	12.031	38.223	26.191
28	-	12.031	-	12.031	38.223	26.191
29	-	12.031	-	12.031	38.223	26.191
30	-	12.031	-	12.031	38.223	26.191
31	-	12.031	-	12.031	38.223	26.191
32	-	12.031	6.566	18.598	38.223	19.625
33	-	12.031	-	12.031	38.223	26.191
34	-	12.031	-	12.031	38.223	26.191
35	-	12.031	40.447	52.478	38.223	(14.256)
36	-	12.031	-	12.031	38.223	26.191
37	-	12.031	-	12.031	38.223	26.191
38	-	12.031	-	12.031	38.223	26.191
39	-	12.031	-	12.031	38.223	26.191
40	-	12.031	-	12.031	38.223	26.191
Total	493.600	396.686	111.948	1,002.234	1,245.763	243.529
					FIRR=	2.5%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation of Financial Internal Rate of Return (cont'd)

4.1 Wellervreden

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	10.519	7.001	3.518	-	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	76.500	50.900	25.600	-	million R
(Retail):	293.100	195.100	98.000	-	million R
Direct Cost (Bulk)	48.600	32.300	16.300	-	million R
(Retail):	186.300	124.000	62.300	-	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	24.600	-	-	24.600	-	(24.600)
2	36.900	-	-	36.900	-	(36.900)
3	73.800	0.586	-	74.366	-	(74.366)
4	73.800	1.982	-	75.782	5.251	(70.531)
5	36.900	4.529	-	41.429	12.252	(29.177)
6	12.360	5.662	-	18.022	17.503	(0.519)
7	12.360	5.662	-	18.022	17.503	(0.519)
8	18.540	5.946	-	24.486	17.503	(6.983)
9	24.720	6.515	-	31.235	19.262	(11.973)
10	24.720	7.084	-	31.804	21.900	(9.904)
11	18.540	7.795	-	26.335	23.659	(2.676)
12	12.360	8.222	-	20.582	24.978	4.397
13	-	8.506	-	8.506	26.298	17.791
14	-	8.506	-	8.506	26.298	17.791
15	-	8.506	-	8.506	26.298	17.791
16	-	8.506	-	8.506	26.298	17.791
17	-	8.506	-	8.506	26.298	17.791
18	-	8.506	-	8.506	26.298	17.791
19	-	8.506	-	8.506	26.298	17.791
20	-	8.506	35.636	44.142	26.298	(17.845)
21	-	8.506	-	8.506	26.298	17.791
22	-	8.506	-	8.506	26.298	17.791
23	-	8.506	-	8.506	26.298	17.791
24	-	8.506	-	8.506	26.298	17.791
25	-	8.506	-	8.506	26.298	17.791
26	-	8.506	17.921	26.427	26.298	(0.129)
27	-	8.506	-	8.506	26.298	17.791
28	-	8.506	-	8.506	26.298	17.791
29	-	8.506	-	8.506	26.298	17.791
30	-	8.506	-	8.506	26.298	17.791
31	-	8.506	-	8.506	26.298	17.791
32	-	8.506	-	8.506	26.298	17.791
33	-	8.506	-	8.506	26.298	17.791
34	-	8.506	-	8.506	26.298	17.791
35	-	8.506	35.636	44.142	26.298	(17.845)
36	-	8.506	-	8.506	26.298	17.791
37	-	8.506	-	8.506	26.298	17.791
38	-	8.506	-	8.506	26.298	17.791
39	-	8.506	-	8.506	26.298	17.791
40	-	8.506	-	8.506	26.298	17.791
Total	369.600	292.131	89.194	750.925	896.139	145.214
					FIRR=	2.0%

Note: Figures in parentheses mean negative.

Appendix 6 Calculation of Financial Internal Rate of Return (cont'd)

4.2 Bronkhorstspuit

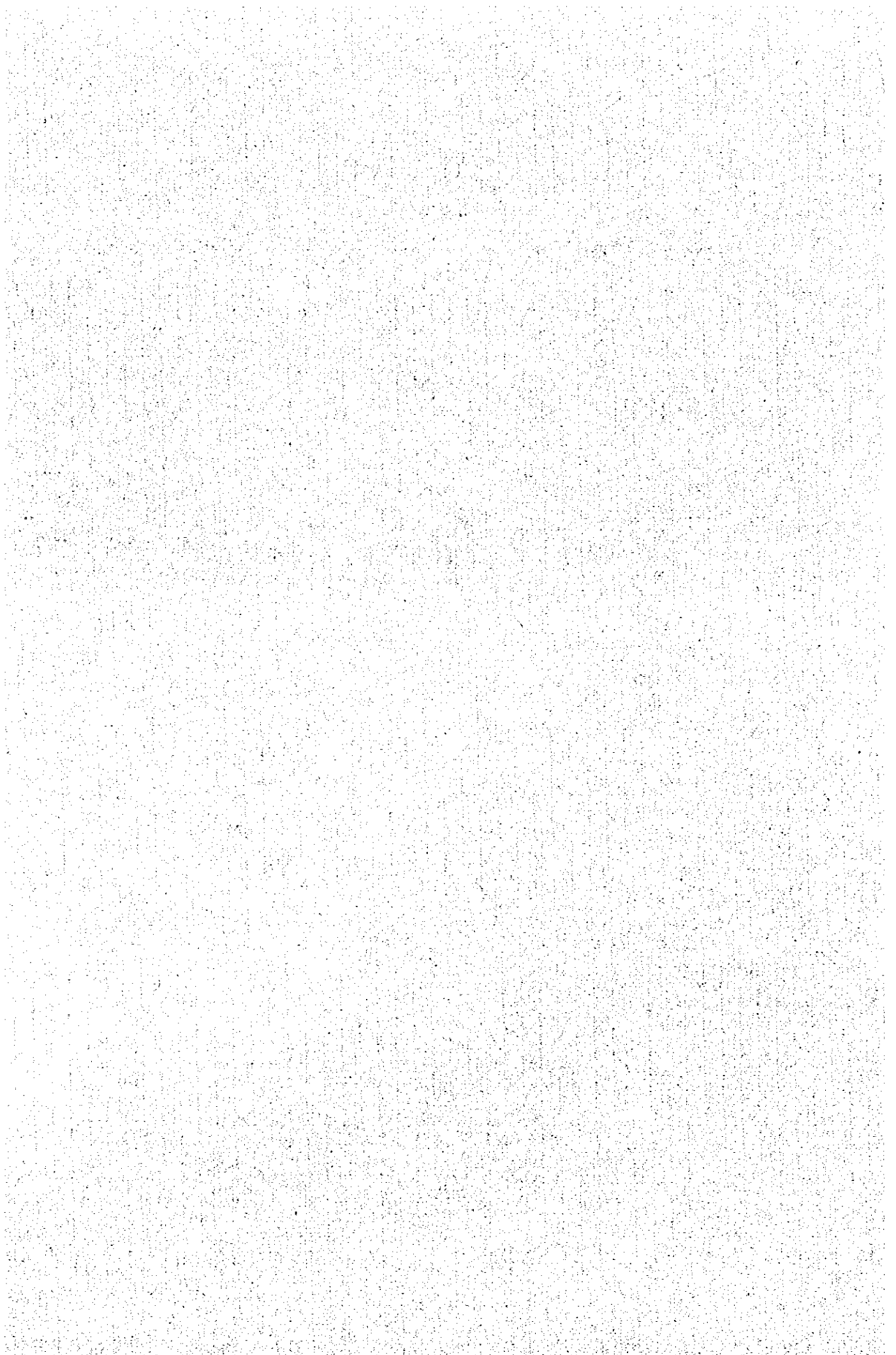
	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	4.770	1.277	1.747	1.746	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	24.300	6.500	8.900	8.900	million R
(Retail):	99.700	26.700	36.500	36.500	million R
Direct Cost (Bulk)	15.400	4.200	5.600	5.600	million R
(Retail):	63.300	16.900	23.200	23.200	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	3.320	-	-	3.320	-	(3.320)
2	4.980	-	-	4.980	-	(4.980)
3	9.960	0.094	-	10.054	-	(10.054)
4	9.960	0.330	-	10.290	0.958	(9.333)
5	4.980	0.755	-	5.735	2.235	(3.500)
6	4.540	0.944	-	5.484	3.193	(2.291)
7	4.540	0.944	-	5.484	3.193	(2.291)
8	6.810	1.073	-	7.883	3.193	(4.690)
9	9.080	1.331	-	10.411	4.066	(6.345)
10	9.080	1.589	-	10.669	5.376	(5.293)
11	6.810	1.912	-	8.722	6.250	(2.472)
12	4.540	2.106	-	6.646	6.905	0.259
13	4.540	2.235	-	6.775	7.560	0.785
14	6.810	2.235	-	9.045	7.560	(1.485)
15	9.080	2.364	-	11.444	7.560	(3.884)
16	9.080	2.686	-	11.766	8.651	(3.115)
17	9.080	3.009	-	12.089	9.743	(2.346)
18	6.810	3.396	-	10.206	10.834	0.628
19	-	3.525	-	3.525	11.925	8.400
20	-	3.525	4.811	8.336	11.925	3.589
21	-	3.525	-	3.525	11.925	8.400
22	-	3.525	-	3.525	11.925	8.400
23	-	3.525	-	3.525	11.925	8.400
24	-	3.525	-	3.525	11.925	8.400
25	-	3.525	-	3.525	11.925	8.400
26	-	3.525	6.566	10.092	11.925	1.834
27	-	3.525	-	3.525	11.925	8.400
28	-	3.525	-	3.525	11.925	8.400
29	-	3.525	-	3.525	11.925	8.400
30	-	3.525	-	3.525	11.925	8.400
31	-	3.525	-	3.525	11.925	8.400
32	-	3.525	6.566	10.092	11.925	1.834
33	-	3.525	-	3.525	11.925	8.400
34	-	3.525	-	3.525	11.925	8.400
35	-	3.525	4.811	8.336	11.925	3.589
36	-	3.525	-	3.525	11.925	8.400
37	-	3.525	-	3.525	11.925	8.400
38	-	3.525	-	3.525	11.925	8.400
39	-	3.525	-	3.525	11.925	8.400
40	-	3.525	-	3.525	11.925	8.400
Total	124.000	104.555	22.754	251.309	349.624	98.315
					FIRR=	4.3%

Note: Figures in parentheses mean negative.

**APPENDIX 7 SENSITIVITY ANALYSIS OF
FINANCIAL INTERNAL RATE OF RETURN**



Appendix 7 Sensitivity Analysis of Financial Internal Rate of Return

(1) Study Area Total (Cost Recovery 60%)

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	157.322	60.018	50.413	46.891	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	947.900	403.700	284.900	259.300	million R
(Retail):	861.800	410.400	274.700	176.700	million R
Direct Cost (Bulk)	602.500	256.600	181.100	164.800	million R
(Retail):	547.700	260.800	174.600	112.300	million R

(Unit: R million)

Project Year	Project Cost			Total	Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement			
1	81.410	-	-	81.410	-	(81.410)
2	122.115	-	-	122.115	-	(122.115)
3	244.230	3.592	-	247.822	-	(247.822)
4	244.230	12.570	-	256.800	27.008	(229.792)
5	122.115	28.731	-	150.846	63.019	(87.827)
6	55.960	35.913	-	91.873	90.027	(1.846)
7	55.960	35.913	-	91.873	90.027	(1.846)
8	83.940	38.860	-	122.800	90.027	(32.773)
9	111.920	44.753	-	156.673	105.151	(51.522)
10	111.920	50.646	-	162.566	127.837	(34.729)
11	83.940	58.013	-	141.953	142.961	1.008
12	55.960	62.433	-	118.393	154.304	35.911
13	43.600	65.380	-	108.980	165.648	56.668
14	65.400	65.380	-	130.780	165.648	34.868
15	87.200	68.041	-	155.241	165.648	10.407
16	87.200	74.696	-	161.896	187.801	25.905
17	87.200	81.351	-	168.551	209.957	41.406
18	65.400	89.336	-	154.736	232.112	77.376
19	-	91.998	-	91.998	254.268	162.270
20	-	91.998	117.967	209.965	254.268	44.303
21	-	91.998	-	91.998	254.268	162.270
22	-	91.998	-	91.998	254.268	162.270
23	-	91.998	-	91.998	254.268	162.270
24	-	91.998	-	91.998	254.268	162.270
25	-	91.998	-	91.998	254.268	162.270
26	-	91.998	81.100	173.098	254.268	81.170
27	-	91.998	-	91.998	254.268	162.270
28	-	91.998	-	91.998	254.268	162.270
29	-	91.998	-	91.998	254.268	162.270
30	-	91.998	-	91.998	254.268	162.270
31	-	91.998	-	91.998	254.268	162.270
32	-	91.998	62.472	154.470	254.268	99.798
33	-	91.998	-	91.998	254.268	162.270
34	-	91.998	-	91.998	254.268	162.270
35	-	91.998	117.967	209.965	254.268	44.303
36	-	91.998	-	91.998	254.268	162.270
37	-	91.998	-	91.998	254.268	162.270
38	-	91.998	-	91.998	254.268	162.270
39	-	91.998	-	91.998	254.268	162.270
40	-	91.998	-	91.998	254.268	162.270
Total	1,809.700	2,839.564	379.506	5,028.770	7,611.071	2,582.301

FIRR= 6.1%

Note: Figures in parentheses mean negative.

Appendix 7 Sensitivity Analysis of Financial Internal Rate of Return (cont'd)

(2) Study Area Total (Cost Recovery 30%)

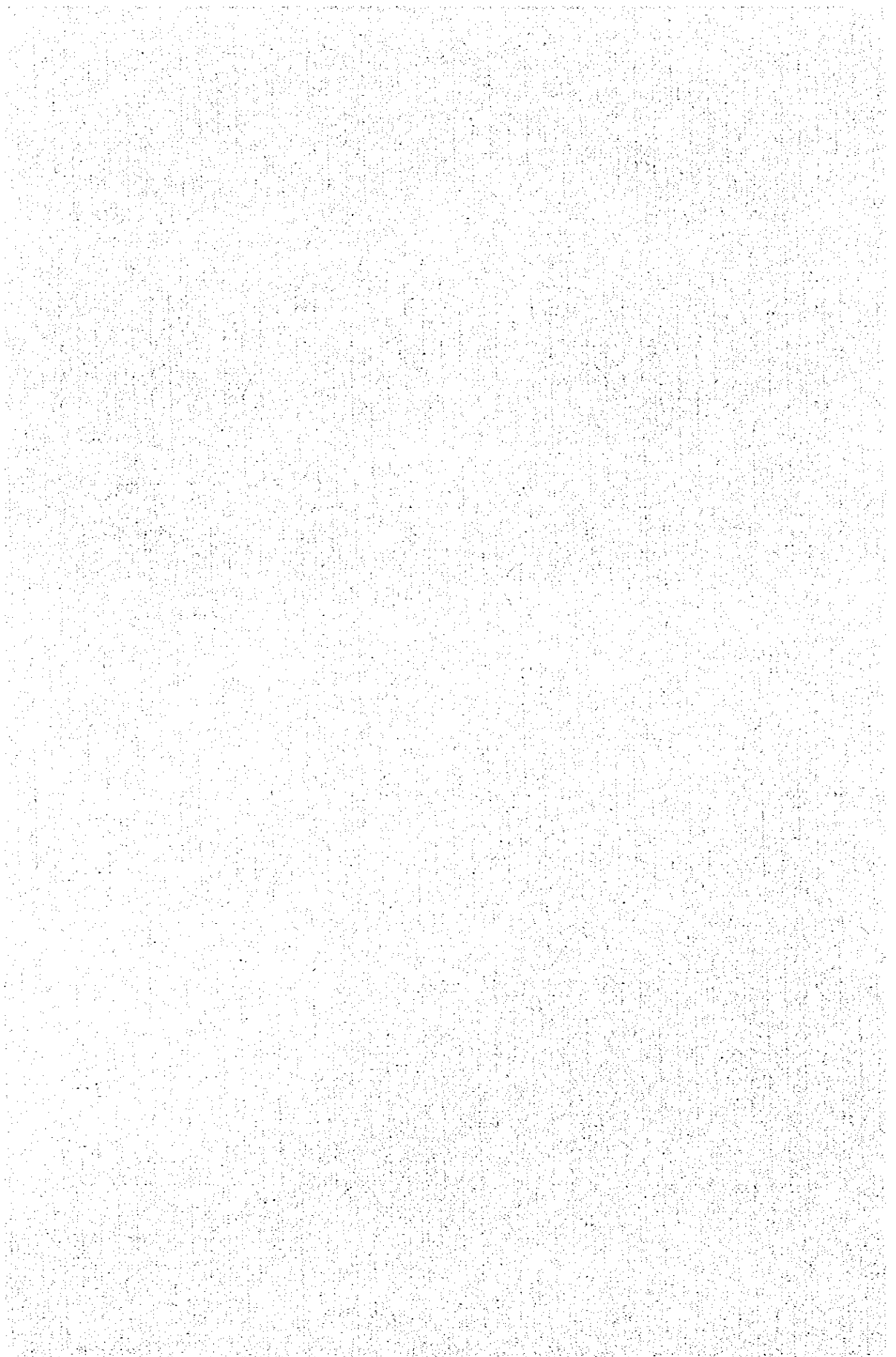
	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	157.322	60.018	50.413	46.891	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	947.900	403.700	284.900	259.300	million R
(Retail):	861.800	410.400	274.700	176.700	million R
Direct Cost (Bulk)	602.500	256.600	181.100	164.800	million R
(Retail):	547.700	260.800	174.600	112.300	million R

(Unit: R million)

Project Year	Project Cost			Total	Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement			
1	81.410	-	-	81.410	-	(81.410)
2	122.115	-	-	122.115	-	(122.115)
3	244.230	3.592	-	247.822	-	(247.822)
4	244.230	12.570	-	256.800	13.505	(243.295)
5	122.115	28.731	-	150.846	31.510	(119.336)
6	55.960	35.913	-	91.873	45.014	(46.859)
7	55.960	35.913	-	91.873	45.014	(46.859)
8	83.940	38.860	-	122.800	45.014	(77.786)
9	111.920	44.753	-	156.673	52.576	(104.097)
10	111.920	50.646	-	162.566	63.919	(98.647)
11	83.940	58.013	-	141.953	71.480	(70.473)
12	55.960	62.433	-	118.393	77.152	(41.241)
13	43.600	65.380	-	108.980	82.823	(26.157)
14	65.400	65.380	-	130.780	82.823	(47.957)
15	87.200	68.041	-	155.241	82.823	(72.418)
16	87.200	74.696	-	161.896	98.472	(63.424)
17	87.200	81.351	-	168.551	114.120	(54.431)
18	65.400	89.336	-	154.736	129.769	(24.967)
19	-	91.998	-	91.998	145.417	53.419
20	-	91.998	117.967	209.965	145.417	(64.548)
21	-	91.998	-	91.998	145.417	53.419
22	-	91.998	-	91.998	145.417	53.419
23	-	91.998	-	91.998	145.417	53.419
24	-	91.998	-	91.998	145.417	53.419
25	-	91.998	-	91.998	145.417	53.419
26	-	91.998	81.100	173.098	145.417	(27.681)
27	-	91.998	-	91.998	145.417	53.419
28	-	91.998	-	91.998	145.417	53.419
29	-	91.998	-	91.998	145.417	53.419
30	-	91.998	-	91.998	145.417	53.419
31	-	91.998	-	91.998	145.417	53.419
32	-	91.998	62.472	154.470	145.417	(9.053)
33	-	91.998	-	91.998	145.417	53.419
34	-	91.998	-	91.998	145.417	53.419
35	-	91.998	117.967	209.965	145.417	(64.548)
36	-	91.998	-	91.998	145.417	53.419
37	-	91.998	-	91.998	145.417	53.419
38	-	91.998	-	91.998	145.417	53.419
39	-	91.998	-	91.998	145.417	53.419
40	-	91.998	-	91.998	145.417	53.419
Total	1,809.700	2,839.564	379.506	5,028.770	4,235.188	(793.582)
					FIRR=	-2.9%

Note: Figures in parentheses mean negative.

**APPENDIX 8 CALCULATION TABLE FOR
ECONOMIC COST**



Appendix 8 Calculation Table for Economic Cost

(1) Stage 1

(Unit: R million)

		Financial Cost			Economic Cost		
		Direct	Indirect	Total	Direct	Indirect	Total
Vaalkop North	Bulk	88.000	50.442	138.442	88.000	33.440	121.440
	Retail	37.800	21.667	59.467	37.800	14.364	52.164
	Total	125.800	72.109	197.909	125.800	47.804	173.604
Vaalkop South	Bulk	77.900	44.652	122.552	77.900	29.602	107.502
	Retail	46.400	26.596	72.996	46.400	17.632	64.032
	Total	124.300	71.249	195.549	124.300	47.234	171.534
Barnardsvlei	Bulk	2.700	1.548	4.248	2.700	1.026	3.726
	Retail	12.000	6.878	18.878	12.000	4.560	16.560
	Total	14.700	8.426	23.126	14.700	5.586	20.286
Koster	Bulk	1.500	0.860	2.360	1.500	0.570	2.070
	Retail	4.200	2.407	6.607	4.200	1.596	5.796
	Total	5.700	3.267	8.967	5.700	2.166	7.866
Western Z. Total	Bulk	170.100	97.501	267.601	170.100	64.638	234.738
	Retail	100.400	57.549	157.949	100.400	38.152	138.552
	Total	270.500	155.051	425.551	270.500	102.790	373.290
Brits	Bulk	15.200	8.713	23.913	15.200	5.776	20.976
	Retail	14.300	8.197	22.497	14.300	5.434	19.734
	Total	29.500	16.909	46.409	29.500	11.210	40.710
Klipvoor	Bulk	33.960	19.466	53.426	33.960	12.905	46.865
	Retail	22.655	12.986	35.641	22.655	8.609	31.264
	Total	56.615	32.452	89.067	56.615	21.514	78.129
Temba	Bulk	23.400	13.413	36.813	23.400	8.892	32.292
	Retail	24.400	13.986	38.386	24.400	9.272	33.672
	Total	47.800	27.399	75.199	47.800	18.164	65.964
Rand Water	Bulk	24.200	13.871	38.071	24.200	9.196	33.396
	Retail	71.700	41.098	112.798	71.700	27.246	98.946
	Total	95.900	54.970	150.870	95.900	36.442	132.342
Central Z. Total	Bulk	96.760	55.463	152.223	96.760	36.769	133.529
	Retail	133.055	76.267	209.322	133.055	50.561	183.616
	Total	229.815	131.730	361.545	229.815	87.330	317.145
Wettersvreden	Bulk	49.700	28.488	78.188	49.700	18.886	68.586
	Retail	152.300	87.298	239.598	152.300	57.874	210.174
	Total	202.000	115.786	317.786	202.000	76.760	278.760
Bronkhorst-spruit	Bulk	5.300	3.038	8.338	5.300	2.014	7.314
	Retail	21.500	12.324	33.824	21.500	8.170	29.670
	Total	26.800	15.362	42.162	26.800	10.184	36.984
Eastern Z. Total	Bulk	55.000	31.526	86.526	55.000	20.900	75.900
	Retail	173.800	99.622	273.422	173.800	66.044	239.844
	Total	228.800	131.148	359.948	228.800	86.944	315.744
Grand Total	Bulk	321.860	184.490	506.350	321.860	122.307	444.167
	Retail	407.255	233.439	640.694	407.255	154.757	562.012
	Total	729.115	417.929	1,147.044	729.115	277.064	1,006.179

Appendix 8 Calculation Table for Economic Cost (cont'd)

(2) Stage 2

(Unit: R million)

		Financial Cost			Economic Cost		
		Direct	Indirect	Total	Direct	Indirect	Total
Vaalkop North	Bulk	72.200	41.385	113.585	72.200	27.436	99.636
	Retail	31.000	17.769	48.769	31.000	11.780	42.780
	Total	103.200	59.154	162.354	103.200	39.216	142.416
Vaalkop South	Bulk	42.600	24.418	67.018	42.600	16.188	58.788
	Retail	25.400	14.559	39.959	25.400	9.652	35.052
	Total	68.000	38.978	106.978	68.000	25.840	93.840
Barnardsvlei	Bulk	1.700	0.974	2.674	1.700	0.646	2.346
	Retail	7.600	4.356	11.956	7.600	2.888	10.488
	Total	9.300	5.331	14.631	9.300	3.534	12.834
Koster	Bulk	-	-	-	-	-	-
	Retail	-	-	-	-	-	-
	Total	-	-	-	-	-	-
Western Z. Total	Bulk	116.500	66.778	183.278	116.500	44.270	160.770
	Retail	64.000	36.685	100.685	64.000	24.320	88.320
	Total	180.500	103.463	283.963	180.500	68.590	249.090
Brits	Bulk	13.200	7.566	20.766	13.200	5.016	18.216
	Retail	12.400	7.108	19.508	12.400	4.712	17.112
	Total	25.600	14.674	40.274	25.600	9.728	35.328
Klipvoor	Bulk	-	-	-	-	-	-
	Retail	-	-	-	-	-	-
	Total	-	-	-	-	-	-
Temba	Bulk	25.100	14.387	39.487	25.100	9.538	34.638
	Retail	26.100	14.961	41.061	26.100	9.918	36.018
	Total	51.200	29.348	80.548	51.200	19.456	70.656
Rand Water	Bulk	25.800	14.789	40.589	25.800	9.804	35.604
	Retail	76.400	43.792	120.192	76.400	29.032	105.432
	Total	102.200	58.581	160.781	102.200	38.836	141.036
Central Z. Total	Bulk	64.100	36.742	100.842	64.100	24.358	88.458
	Retail	114.900	65.861	180.761	114.900	43.662	158.562
	Total	179.000	102.603	281.603	179.000	68.020	247.020
Wellervreden	Bulk	25.000	14.330	39.330	25.000	9.500	34.500
	Retail	76.500	43.850	120.350	76.500	29.070	105.570
	Total	101.500	58.180	159.680	101.500	38.570	140.070
Bronkhorst-spruit	Bulk	7.200	4.127	11.327	7.200	2.736	9.936
	Retail	29.500	16.909	46.409	29.500	11.210	40.710
	Total	36.700	21.036	57.736	36.700	13.946	50.646
Eastern Z. Total	Bulk	32.200	18.457	50.657	32.200	12.236	44.436
	Retail	106.000	60.759	166.759	106.000	40.280	146.280
	Total	138.200	79.216	217.416	138.200	52.516	190.716
Grand Total	Bulk	212.800	121.977	334.777	212.800	80.864	293.664
	Retail	284.900	163.305	448.205	284.900	108.262	393.162
	Total	497.700	285.282	782.982	497.700	189.126	686.826

Appendix 8 Calculation Table for Economic Cost (cont'd)

(3) Stage 3

(Unit: R million)

		Financial Cost			Economic Cost		
		Direct	Indirect	Total	Direct	Indirect	Total
Vaalkop North	Bulk	72.200	41.385	113.585	72.200	27.436	99.636
	Retail	31.000	17.769	48.769	31.000	11.780	42.780
	Total	103.200	59.154	162.354	103.200	39.216	142.416
Vaalkop South	Bulk	42.600	24.418	67.018	42.600	16.188	58.788
	Retail	25.400	14.559	39.959	25.400	9.652	35.052
	Total	68.000	38.978	106.978	68.000	25.840	93.840
Barnardsvlei	Bulk	1.700	0.974	2.674	1.700	0.646	2.346
	Retail	7.600	4.356	11.956	7.600	2.888	10.488
	Total	9.300	5.331	14.631	9.300	3.534	12.834
Koster	Bulk	-	-	-	-	-	-
	Retail	-	-	-	-	-	-
	Total	-	-	-	-	-	-
Western Z. Total	Bulk	116.500	66.778	183.278	116.500	44.270	160.770
	Retail	64.000	36.685	100.685	64.000	24.320	88.320
	Total	180.500	103.463	283.963	180.500	68.590	249.090
Brits	Bulk	13.200	7.566	20.766	13.200	5.016	18.216
	Retail	12.400	7.108	19.508	12.400	4.712	17.112
	Total	25.600	14.674	40.274	25.600	9.728	35.328
Klipvoor	Bulk	-	-	-	-	-	-
	Retail	-	-	-	-	-	-
	Total	-	-	-	-	-	-
Temba	Bulk	25.100	14.387	39.487	25.100	9.538	34.638
	Retail	26.100	14.961	41.061	26.100	9.918	36.018
	Total	51.200	29.348	80.548	51.200	19.456	70.656
Rand Water	Bulk	25.800	14.789	40.589	25.800	9.804	35.604
	Retail	76.400	43.792	120.192	76.400	29.032	105.432
	Total	102.200	58.581	160.781	102.200	38.836	141.036
Central Z. Total	Bulk	64.100	36.742	100.842	64.100	24.358	88.458
	Retail	114.900	65.861	180.761	114.900	43.662	158.562
	Total	179.000	102.603	281.603	179.000	68.020	247.020
Weltevreden	Bulk	-	-	-	-	-	-
	Retail	-	-	-	-	-	-
	Total	-	-	-	-	-	-
Bronkhorstspruit	Bulk	7.200	4.127	11.327	7.200	2.736	9.936
	Retail	29.500	16.909	46.409	29.500	11.210	40.710
	Total	36.700	21.036	57.736	36.700	13.946	50.646
Eastern Z. Total	Bulk	7.200	4.127	11.327	7.200	2.736	9.936
	Retail	29.500	16.909	46.409	29.500	11.210	40.710
	Total	36.700	21.036	57.736	36.700	13.946	50.646
Grand Total	Bulk	187.800	107.647	295.447	187.800	71.364	259.164
	Retail	208.400	119.455	327.855	208.400	79.192	287.592
	Total	396.200	227.102	623.302	396.200	150.556	546.756

**APPENDIX 9 CALCULATION OF ECONOMIC
INTERNAL RATE OF RETURN**

Appendix 9 Calculation of Economic Internal Rate of Return

1. Study Area Total

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	157.322	60.018	50.413	46.891	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	997.661	445.401	293.348	258.912	million R
(Retail):	1,242.855	564.773	391.841	286.241	million R
Direct Cost (Bulk)	722.537	322.363	212.571	187.603	million R
(Retail):	900.530	409.166	283.943	207.421	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	101.017	-	-	101.017	-	(101.017)
2	151.526	-	-	151.526	-	(151.526)
3	303.052	3.352	-	306.404	-	(306.404)
4	303.052	11.732	-	314.784	54.016	(260.768)
5	151.526	26.816	-	178.342	126.038	(52.304)
6	68.519	33.521	-	102.040	180.054	78.014
7	68.519	33.521	-	102.040	180.054	78.014
8	102.778	36.253	-	139.031	180.054	41.023
9	137.037	41.719	-	178.756	210.302	31.546
10	137.037	47.186	-	184.223	255.675	71.452
11	102.778	54.018	-	156.796	285.922	129.126
12	68.519	58.117	-	126.636	308.607	181.971
13	54.516	60.850	-	115.366	331.293	215.927
14	81.773	60.850	-	142.623	331.293	188.670
15	109.030	63.314	-	172.344	331.293	158.949
16	109.030	69.474	-	178.504	366.452	187.958
17	109.030	75.634	-	184.664	401.630	216.966
18	81.773	83.026	-	164.799	436.798	271.999
19	-	85.489	-	85.489	471.966	386.477
20	-	85.489	147.440	232.929	471.966	239.037
21	-	85.489	-	85.489	471.966	386.477
22	-	85.489	-	85.489	471.966	386.477
23	-	85.489	-	85.489	471.966	386.477
24	-	85.489	-	85.489	471.966	386.477
25	-	85.489	-	85.489	471.966	386.477
26	-	85.489	99.303	184.792	471.966	287.174
27	-	85.489	-	85.489	471.966	386.477
28	-	85.489	-	85.489	471.966	386.477
29	-	85.489	-	85.489	471.966	386.477
30	-	85.489	-	85.489	471.966	386.477
31	-	85.489	-	85.489	471.966	386.477
32	-	85.489	79.005	164.494	471.966	307.472
33	-	85.489	-	85.489	471.966	386.477
34	-	85.489	-	85.489	471.966	386.477
35	-	85.489	146.305	231.794	471.966	240.172
36	-	85.489	-	85.489	471.966	386.477
37	-	85.489	-	85.489	471.966	386.477
38	-	85.489	-	85.489	471.966	386.477
39	-	85.489	-	85.489	471.966	386.477
40	-	85.489	-	85.489	471.966	386.477
Total	2,240.512	2,640.141	472.053	5,352.706	14,362.743	9,010.037
					EIRR=	13.7%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

2. Western Zone Total

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	43.440	19.060	12.191	12.189	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	556.450	234.798	160.816	160.836	million R
(Retail):	315.343	138.533	88.405	88.405	million R
Direct Cost (Bulk):	403.210	170.144	116.533	116.533	million R
(Retail):	228.510	100.386	64.062	64.062	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	37.333	-	-	37.333	-	(37.333)
2	56.000	-	-	56.000	-	(56.000)
3	111.999	1.024	-	113.023	-	(113.023)
4	111.999	3.583	-	115.582	17.154	(98.428)
5	56.000	8.189	-	64.189	40.026	(24.163)
6	24.922	10.237	-	35.159	57.180	22.021
7	24.922	10.237	-	35.159	57.180	22.021
8	37.383	10.891	-	48.274	57.180	8.906
9	49.844	12.200	-	62.045	64.495	2.450
10	49.844	13.510	-	63.354	75.467	12.113
11	37.383	15.146	-	52.529	82.781	30.252
12	24.922	16.128	-	41.050	88.267	47.217
13	24.924	16.782	-	41.706	93.753	52.047
14	37.386	16.782	-	54.168	93.753	39.585
15	49.848	17.437	-	67.285	93.753	26.468
16	49.848	19.073	-	68.921	102.895	33.974
17	49.848	20.709	-	70.557	112.037	41.479
18	37.386	22.673	-	60.059	121.178	61.120
19	-	23.327	-	23.327	130.320	106.993
20	-	23.327	55.241	78.568	130.320	51.752
21	-	23.327	-	23.327	130.320	106.993
22	-	23.327	-	23.327	130.320	106.993
23	-	23.327	-	23.327	130.320	106.993
24	-	23.327	-	23.327	130.320	106.993
25	-	23.327	-	23.327	130.320	106.993
26	-	23.327	36.119	59.446	130.320	70.874
27	-	23.327	-	23.327	130.320	106.993
28	-	23.327	-	23.327	130.320	106.993
29	-	23.327	-	23.327	130.320	106.993
30	-	23.327	-	23.327	130.320	106.993
31	-	23.327	-	23.327	130.320	106.993
32	-	23.327	36.119	59.446	130.320	70.874
33	-	23.327	-	23.327	130.320	106.993
34	-	23.327	-	23.327	130.320	106.993
35	-	23.327	54.106	77.433	130.320	52.887
36	-	23.327	-	23.327	130.320	106.993
37	-	23.327	-	23.327	130.320	106.993
38	-	23.327	-	23.327	130.320	106.993
39	-	23.327	-	23.327	130.320	106.993
40	-	23.327	-	23.327	130.320	106.993
Total	871.793	727.794	181.585	1,781.172	4,024.138	2,242.966
					IRR=	10.6%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

2.1 Vaalkop North

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	13.980	5.294	4.343	4.343	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	320.771	121.463	99.644	99.664	million R
(Retail):	137.805	52.185	42.810	42.810	million R
Direct Cost (Bulk)	232.429	88.017	72.206	72.206	million R
(Retail):	99.859	37.815	31.022	31.022	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	17.365	-	-	17.365	-	(17.365)
2	26.047	-	-	26.047	-	(26.047)
3	52.094	0.298	-	52.392	-	(52.392)
4	52.094	1.043	-	53.138	4.765	(48.373)
5	26.047	2.384	-	28.432	11.117	(17.314)
6	14.245	2.980	-	17.226	15.882	(1.344)
7	14.245	2.980	-	17.226	15.882	(1.344)
8	21.368	3.225	-	24.593	15.882	(8.711)
9	28.491	3.714	-	32.205	18.488	(13.717)
10	28.491	4.203	-	32.694	22.397	(10.297)
11	21.368	4.814	-	26.182	25.002	(1.180)
12	14.245	5.181	-	19.426	26.957	7.530
13	14.247	5.425	-	19.673	28.911	9.238
14	21.371	5.425	-	26.796	28.911	2.115
15	28.495	5.670	-	34.165	28.911	(5.254)
16	28.495	6.281	-	34.776	32.168	(2.608)
17	28.495	6.892	-	35.387	35.426	0.038
18	21.371	7.626	-	28.997	38.683	9.686
19	-	7.870	-	7.870	41.940	34.070
20	-	7.870	25.166	33.037	41.940	8.903
21	-	7.870	-	7.870	41.940	34.070
22	-	7.870	-	7.870	41.940	34.070
23	-	7.870	-	7.870	41.940	34.070
24	-	7.870	-	7.870	41.940	34.070
25	-	7.870	-	7.870	41.940	34.070
26	-	7.870	20.646	28.516	41.940	13.424
27	-	7.870	-	7.870	41.940	34.070
28	-	7.870	-	7.870	41.940	34.070
29	-	7.870	-	7.870	41.940	34.070
30	-	7.870	-	7.870	41.940	34.070
31	-	7.870	-	7.870	41.940	34.070
32	-	7.870	20.646	28.516	41.940	13.424
33	-	7.870	-	7.870	41.940	34.070
34	-	7.870	-	7.870	41.940	34.070
35	-	7.870	25.166	33.037	41.940	8.903
36	-	7.870	-	7.870	41.940	34.070
37	-	7.870	-	7.870	41.940	34.070
38	-	7.870	-	7.870	41.940	34.070
39	-	7.870	-	7.870	41.940	34.070
40	-	7.870	-	7.870	41.940	34.070
Total	458.576	241.291	91.624	791.491	1,272.061	480.570
					IRR=	5.3%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

2.2 Vaalkop South

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	16.794	8.021	4.387	4.386	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	225.206	107.560	58.823	58.823	million R
(Retail):	134.173	64.083	35.045	35.045	million R
Direct Cost (Bulk):	163.192	77.942	42.625	42.625	million R
(Retail):	97.227	46.437	25.395	25.395	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	17.164	-	-	17.164	-	(17.164)
2	25.746	-	-	25.746	-	(25.746)
3	51.493	0.437	-	51.929	-	(51.929)
4	51.493	1.528	-	53.021	7.219	(45.802)
5	25.746	3.493	-	29.239	16.844	(12.395)
6	9.387	4.366	-	13.753	24.063	10.310
7	9.387	4.366	-	13.753	24.063	10.310
8	14.080	4.605	-	18.685	24.063	5.378
9	18.774	5.082	-	23.856	26.695	2.839
10	18.774	5.560	-	24.333	30.644	6.310
11	14.080	6.157	-	20.237	33.276	13.039
12	9.387	6.515	-	15.902	35.250	19.348
13	9.387	6.754	-	16.140	37.224	21.084
14	14.080	6.754	-	20.834	37.224	16.390
15	18.774	6.992	-	25.766	37.224	11.458
16	18.774	7.589	-	26.363	40.514	14.151
17	18.774	8.186	-	26.960	43.803	16.843
18	14.080	8.902	-	22.982	47.093	24.110
19	-	9.141	-	9.141	50.382	41.241
20	-	9.141	24.876	34.017	50.382	16.365
21	-	9.141	-	9.141	50.382	41.241
22	-	9.141	-	9.141	50.382	41.241
23	-	9.141	-	9.141	50.382	41.241
24	-	9.141	-	9.141	50.382	41.241
25	-	9.141	-	9.141	50.382	41.241
26	-	9.141	13.604	22.745	50.382	27.637
27	-	9.141	-	9.141	50.382	41.241
28	-	9.141	-	9.141	50.382	41.241
29	-	9.141	-	9.141	50.382	41.241
30	-	9.141	-	9.141	50.382	41.241
31	-	9.141	-	9.141	50.382	41.241
32	-	9.141	13.604	22.745	50.382	27.637
33	-	9.141	-	9.141	50.382	41.241
34	-	9.141	-	9.141	50.382	41.241
35	-	9.141	24.876	34.017	50.382	16.365
36	-	9.141	-	9.141	50.382	41.241
37	-	9.141	-	9.141	50.382	41.241
38	-	9.141	-	9.141	50.382	41.241
39	-	9.141	-	9.141	50.382	41.241
40	-	9.141	-	9.141	50.382	41.241
Total	359.379	288.382	76.960	724.721	1,573.601	848.881
					IRR=	9.7%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

2.3 Barnardsvleri

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	12.343	5.422	3.461	3.460	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	8.378	3.680	2.349	2.349	million R
(Retail):	37.630	16.530	10.550	10.550	million R
Direct Cost (Bulk)	6.071	2.667	1.702	1.702	million R
(Retail):	27.268	11.978	7.645	7.645	million R

(Unit: R million)

Project Year	Project Cost			Total	Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement			
1	2.021	-	-	2.021	-	(2.021)
2	3.032	-	-	3.032	-	(3.032)
3	6.063	0.268	-	6.331	-	(6.331)
4	6.063	0.939	-	7.002	4.880	(2.122)
5	3.032	2.147	-	5.178	11.386	6.208
6	1.290	2.683	-	3.973	16.266	12.293
7	1.290	2.683	-	3.973	16.266	12.293
8	1.935	2.855	-	4.789	16.266	11.477
9	2.580	3.197	-	5.777	18.343	12.566
10	2.580	3.540	-	6.119	21.458	15.338
11	1.935	3.968	-	5.903	23.534	17.631
12	1.290	4.225	-	5.515	25.092	19.577
13	1.290	4.396	-	5.686	26.649	20.963
14	1.935	4.396	-	6.331	26.649	20.318
15	2.580	4.567	-	7.147	26.649	19.502
16	2.580	4.995	-	7.575	29.244	21.669
17	2.580	5.423	-	8.003	31.839	23.836
18	1.935	5.937	-	7.872	34.434	26.562
19	-	6.108	-	6.108	37.029	30.921
20	-	6.108	2.929	9.037	37.029	27.992
21	-	6.108	-	6.108	37.029	30.921
22	-	6.108	-	6.108	37.029	30.921
23	-	6.108	-	6.108	37.029	30.921
24	-	6.108	-	6.108	37.029	30.921
25	-	6.108	-	6.108	37.029	30.921
26	-	6.108	1.869	7.978	37.029	29.051
27	-	6.108	-	6.108	37.029	30.921
28	-	6.108	-	6.108	37.029	30.921
29	-	6.108	-	6.108	37.029	30.921
30	-	6.108	-	6.108	37.029	30.921
31	-	6.108	-	6.108	37.029	30.921
32	-	6.108	1.869	7.978	37.029	29.051
33	-	6.108	-	6.108	37.029	30.921
34	-	6.108	-	6.108	37.029	30.921
35	-	6.108	2.929	9.037	37.029	27.992
36	-	6.108	-	6.108	37.029	30.921
37	-	6.108	-	6.108	37.029	30.921
38	-	6.108	-	6.108	37.029	30.921
39	-	6.108	-	6.108	37.029	30.921
40	-	6.108	-	6.108	37.029	30.921
Total	46.008	190.605	9.597	246.209	1,143.592	897.382
					IRR=	46.4%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

2.4 Koster

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	0.323	0.323	-	-	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	2.095	2.095	-	-	million R
(Retail):	5.735	5.735	-	-	million R
Direct Cost (Bulk):	1.518	1.518	-	-	million R
(Retail):	4.156	4.156	-	-	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	0.783	-	-	0.783	-	(0.783)
2	1.175	-	-	1.175	-	(1.175)
3	2.349	0.021	-	2.370	-	(2.370)
4	2.349	0.073	-	2.422	0.291	(2.131)
5	1.175	0.166	-	1.340	0.678	(0.662)
6	-	0.207	-	0.207	0.969	0.762
7	-	0.207	-	0.207	0.969	0.762
8	-	0.207	-	0.207	0.969	0.762
9	-	0.207	-	0.207	0.969	0.762
10	-	0.207	-	0.207	0.969	0.762
11	-	0.207	-	0.207	0.969	0.762
12	-	0.207	-	0.207	0.969	0.762
13	-	0.207	-	0.207	0.969	0.762
14	-	0.207	-	0.207	0.969	0.762
15	-	0.207	-	0.207	0.969	0.762
16	-	0.207	-	0.207	0.969	0.762
17	-	0.207	-	0.207	0.969	0.762
18	-	0.207	-	0.207	0.969	0.762
19	-	0.207	-	0.207	0.969	0.762
20	-	0.207	2.270	2.477	0.969	(1.508)
21	-	0.207	-	0.207	0.969	0.762
22	-	0.207	-	0.207	0.969	0.762
23	-	0.207	-	0.207	0.969	0.762
24	-	0.207	-	0.207	0.969	0.762
25	-	0.207	-	0.207	0.969	0.762
26	-	0.207	-	0.207	0.969	0.762
27	-	0.207	-	0.207	0.969	0.762
28	-	0.207	-	0.207	0.969	0.762
29	-	0.207	-	0.207	0.969	0.762
30	-	0.207	-	0.207	0.969	0.762
31	-	0.207	-	0.207	0.969	0.762
32	-	0.207	-	0.207	0.969	0.762
33	-	0.207	-	0.207	0.969	0.762
34	-	0.207	-	0.207	0.969	0.762
35	-	0.207	1.135	1.342	0.969	(0.373)
36	-	0.207	-	0.207	0.969	0.762
37	-	0.207	-	0.207	0.969	0.762
38	-	0.207	-	0.207	0.969	0.762
39	-	0.207	-	0.207	0.969	0.762
40	-	0.207	-	0.207	0.969	0.762
Total	7.830	7.516	3.404	18.751	34.884	16.133
					IRR=	7.8%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

3. Central Zone Total

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	98.593	32.680	32.957	32.956	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	311.003	134.079	88.462	88.462	million R
(Retail):	500.725	183.595	158.565	158.565	million R
Direct Cost (Bulk)	224.973	96.767	64.103	64.103	million R
(Retail):	362.844	133.040	114.902	114.902	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	31.767	-	-	31.767	-	(31.767)
2	47.651	-	-	47.651	-	(47.651)
3	95.302	1.701	-	97.003	-	(97.003)
4	95.302	5.954	-	101.257	29.412	(71.845)
5	47.651	13.610	-	61.261	68.628	7.367
6	24.703	17.013	-	41.715	98.040	56.325
7	24.703	17.013	-	41.715	98.040	56.325
8	37.054	18.702	-	55.756	98.040	42.284
9	49.405	22.080	-	71.485	117.814	46.329
10	49.405	25.458	-	74.863	147.476	72.612
11	37.054	29.681	-	66.735	167.250	100.515
12	24.703	32.214	-	56.917	182.080	125.163
13	24.703	33.903	-	58.606	196.911	138.305
14	37.054	33.903	-	70.957	196.911	125.954
15	49.405	35.592	-	84.998	196.911	111.913
16	49.405	39.815	-	89.220	221.628	132.408
17	49.405	44.038	-	93.443	246.345	152.902
18	37.054	49.105	-	86.159	271.062	184.903
19	-	50.794	-	50.794	295.779	244.985
20	-	50.794	45.961	96.755	295.779	199.024
21	-	50.794	-	50.794	295.779	244.985
22	-	50.794	-	50.794	295.779	244.985
23	-	50.794	-	50.794	295.779	244.985
24	-	50.794	-	50.794	295.779	244.985
25	-	50.794	-	50.794	295.779	244.985
26	-	50.794	35.801	86.595	295.779	209.184
27	-	50.794	-	50.794	295.779	244.985
28	-	50.794	-	50.794	295.779	244.985
29	-	50.794	-	50.794	295.779	244.985
30	-	50.794	-	50.794	295.779	244.985
31	-	50.794	-	50.794	295.779	244.985
32	-	50.794	35.801	86.595	295.779	209.184
33	-	50.794	-	50.794	295.779	244.985
34	-	50.794	-	50.794	295.779	244.985
35	-	50.794	45.961	96.755	295.779	199.024
36	-	50.794	-	50.794	295.779	244.985
37	-	50.794	-	50.794	295.779	244.985
38	-	50.794	-	50.794	295.779	244.985
39	-	50.794	-	50.794	295.779	244.985
40	-	50.794	-	50.794	295.779	244.985
Total	811.728	1,537.247	163.525	2,512.499	8,843.686	6,331.186
					IRR=	22.7%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

3.1 Brits

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	13.195	4.822	4.187	4.186	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	57.426	20.986	18.220	18.220	million R
(Retail):	53.943	19.713	17.115	17.115	million R
Direct Cost (Bulk)	41.613	15.207	13.203	13.203	million R
(Retail):	39.089	14.285	12.402	12.402	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	4.070	-	-	4.070	-	(4.070)
2	6.105	-	-	6.105	-	(6.105)
3	12.210	0.244	-	12.453	-	(12.453)
4	12.210	0.853	-	13.062	4.340	(8.723)
5	6.105	1.949	-	8.054	10.126	2.072
6	3.534	2.436	-	5.970	14.466	8.496
7	3.534	2.436	-	5.970	14.466	8.496
8	5.300	2.648	-	7.948	14.466	6.518
9	7.067	3.071	-	10.138	16.978	6.840
10	7.067	3.494	-	10.561	20.747	10.185
11	5.300	4.023	-	9.323	23.259	13.935
12	3.534	4.341	-	7.874	25.143	17.269
13	3.534	4.552	-	8.086	27.027	18.941
14	5.300	4.552	-	9.852	27.027	17.175
15	7.067	4.764	-	11.831	27.027	15.196
16	7.067	5.292	-	12.359	30.167	17.807
17	7.067	5.821	-	12.888	33.306	20.418
18	5.300	6.456	-	11.756	36.446	24.690
19	-	6.667	-	6.667	39.585	32.918
20	-	6.667	5.898	12.566	39.585	27.019
21	-	6.667	-	6.667	39.585	32.918
22	-	6.667	-	6.667	39.585	32.918
23	-	6.667	-	6.667	39.585	32.918
24	-	6.667	-	6.667	39.585	32.918
25	-	6.667	-	6.667	39.585	32.918
26	-	6.667	5.121	11.788	39.585	27.797
27	-	6.667	-	6.667	39.585	32.918
28	-	6.667	-	6.667	39.585	32.918
29	-	6.667	-	6.667	39.585	32.918
30	-	6.667	-	6.667	39.585	32.918
31	-	6.667	-	6.667	39.585	32.918
32	-	6.667	5.121	11.788	39.585	27.797
33	-	6.667	-	6.667	39.585	32.918
34	-	6.667	-	6.667	39.585	32.918
35	-	6.667	5.898	12.566	39.585	27.019
36	-	6.667	-	6.667	39.585	32.918
37	-	6.667	-	6.667	39.585	32.918
38	-	6.667	-	6.667	39.585	32.918
39	-	6.667	-	6.667	39.585	32.918
40	-	6.667	-	6.667	39.585	32.918
Total	111.369	203.611	22.039	337.018	1,195.859	858.841
					IRR=	24.3%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

3.2 Klipvoor

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	0.900	0.900	-	-	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	46.865	46.865	-	-	million R
(Retail):	31.264	31.264	-	-	million R
Direct Cost (Bulk)	33.960	33.960	-	-	million R
(Retail):	22.655	22.655	-	-	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	7.813	-	-	7.813	-	(7.813)
2	11.719	-	-	11.719	-	(11.719)
3	23.439	0.073	-	23.512	-	(23.512)
4	23.439	0.256	-	23.694	0.810	(22.884)
5	11.719	0.584	-	12.304	1.890	(10.414)
6	-	0.731	-	0.731	2.700	1.969
7	-	0.731	-	0.731	2.700	1.969
8	-	0.731	-	0.731	2.700	1.969
9	-	0.731	-	0.731	2.700	1.969
10	-	0.731	-	0.731	2.700	1.969
11	-	0.731	-	0.731	2.700	1.969
12	-	0.731	-	0.731	2.700	1.969
13	-	0.731	-	0.731	2.700	1.969
14	-	0.731	-	0.731	2.700	1.969
15	-	0.731	-	0.731	2.700	1.969
16	-	0.731	-	0.731	2.700	1.969
17	-	0.731	-	0.731	2.700	1.969
18	-	0.731	-	0.731	2.700	1.969
19	-	0.731	-	0.731	2.700	1.969
20	-	0.731	11.323	12.054	2.700	(9.354)
21	-	0.731	-	0.731	2.700	1.969
22	-	0.731	-	0.731	2.700	1.969
23	-	0.731	-	0.731	2.700	1.969
24	-	0.731	-	0.731	2.700	1.969
25	-	0.731	-	0.731	2.700	1.969
26	-	0.731	-	0.731	2.700	1.969
27	-	0.731	-	0.731	2.700	1.969
28	-	0.731	-	0.731	2.700	1.969
29	-	0.731	-	0.731	2.700	1.969
30	-	0.731	-	0.731	2.700	1.969
31	-	0.731	-	0.731	2.700	1.969
32	-	0.731	-	0.731	2.700	1.969
33	-	0.731	-	0.731	2.700	1.969
34	-	0.731	-	0.731	2.700	1.969
35	-	0.731	11.323	12.054	2.700	(9.354)
36	-	0.731	-	0.731	2.700	1.969
37	-	0.731	-	0.731	2.700	1.969
38	-	0.731	-	0.731	2.700	1.969
39	-	0.731	-	0.731	2.700	1.969
40	-	0.731	-	0.731	2.700	1.969
Total	78.129	26.484	22.646	127.259	97.200	(30.059)
					IRR=	-2.6%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

3.3 Temba

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	24.847	7.907	8.470	8.470	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	101.568	32.292	34.638	34.638	million R
(Retail):	105.708	33.672	36.018	36.018	million R
Direct Cost (Bulk):	73.600	23.400	25.100	25.100	million R
(Retail):	76.600	24.400	26.100	26.100	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	6.596	-	-	6.596	-	(6.596)
2	9.895	-	-	9.895	-	(9.895)
3	19.789	0.401	-	20.190	-	(20.190)
4	19.789	1.403	-	21.192	7.116	(14.076)
5	9.895	3.207	-	13.102	16.605	3.503
6	7.066	4.009	-	11.074	23.721	12.647
7	7.066	4.009	-	11.074	23.721	12.647
8	10.598	4.438	-	15.036	23.721	8.685
9	14.131	5.297	-	19.428	28.803	9.375
10	14.131	6.156	-	20.287	36.426	16.139
11	10.598	7.229	-	17.827	41.508	23.681
12	7.066	7.873	-	14.939	45.320	30.381
13	7.066	8.302	-	15.368	49.131	33.763
14	10.598	8.302	-	18.901	49.131	30.230
15	14.131	8.732	-	22.863	49.131	26.268
16	14.131	9.805	-	23.936	55.484	31.547
17	14.131	10.879	-	25.010	61.836	36.826
18	10.598	12.167	-	22.765	68.189	45.423
19	-	12.596	-	12.596	74.541	61.945
20	-	12.596	9.560	22.156	74.541	52.385
21	-	12.596	-	12.596	74.541	61.945
22	-	12.596	-	12.596	74.541	61.945
23	-	12.596	-	12.596	74.541	61.945
24	-	12.596	-	12.596	74.541	61.945
25	-	12.596	-	12.596	74.541	61.945
26	-	12.596	10.240	22.836	74.541	51.705
27	-	12.596	-	12.596	74.541	61.945
28	-	12.596	-	12.596	74.541	61.945
29	-	12.596	-	12.596	74.541	61.945
30	-	12.596	-	12.596	74.541	61.945
31	-	12.596	-	12.596	74.541	61.945
32	-	12.596	10.240	22.836	74.541	51.705
33	-	12.596	-	12.596	74.541	61.945
34	-	12.596	-	12.596	74.541	61.945
35	-	12.596	9.560	22.156	74.541	52.385
36	-	12.596	-	12.596	74.541	61.945
37	-	12.596	-	12.596	74.541	61.945
38	-	12.596	-	12.596	74.541	61.945
39	-	12.596	-	12.596	74.541	61.945
40	-	12.596	-	12.596	74.541	61.945
Total	207.276	379.320	39.600	626.196	2,219.744	1,593.547
					IRR=	24.5%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

3.4 Rand Water

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	59.651	19.051	20.300	20.300	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	105.144	33.936	35.604	35.604	million R
(Retail):	309.810	98.946	105.432	105.432	million R
Direct Cost (Bulk):	75.800	24.200	25.800	25.800	million R
(Retail):	224.500	71.700	76.400	76.400	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	13.288	-	-	13.288	-	(13.288)
2	19.932	-	-	19.932	-	(19.932)
3	39.865	0.984	-	40.848	-	(40.848)
4	39.865	3.443	-	43.307	17.146	(26.162)
5	19.932	7.869	-	27.802	40.007	12.205
6	14.104	9.837	-	23.940	57.153	33.213
7	14.104	9.837	-	23.940	57.153	33.213
8	21.155	10.885	-	32.040	57.153	25.113
9	28.207	12.981	-	41.188	69.333	28.145
10	28.207	15.078	-	43.285	87.603	44.318
11	21.155	17.698	-	38.853	99.783	60.930
12	14.104	19.270	-	33.374	108.918	75.544
13	14.104	20.318	-	34.422	118.053	83.631
14	21.155	20.318	-	41.474	118.053	76.579
15	28.207	21.367	-	49.574	118.053	68.479
16	28.207	23.987	-	52.194	133.278	81.084
17	28.207	26.607	-	54.815	148.503	93.688
18	21.155	29.752	-	50.907	163.728	112.821
19	-	30.800	-	30.800	178.953	148.153
20	-	30.800	19.180	49.980	178.953	128.973
21	-	30.800	-	30.800	178.953	148.153
22	-	30.800	-	30.800	178.953	148.153
23	-	30.800	-	30.800	178.953	148.153
24	-	30.800	-	30.800	178.953	148.153
25	-	30.800	-	30.800	178.953	148.153
26	-	30.800	20.440	51.240	178.953	127.713
27	-	30.800	-	30.800	178.953	148.153
28	-	30.800	-	30.800	178.953	148.153
29	-	30.800	-	30.800	178.953	148.153
30	-	30.800	-	30.800	178.953	148.153
31	-	30.800	-	30.800	178.953	148.153
32	-	30.800	20.440	51.240	178.953	127.713
33	-	30.800	-	30.800	178.953	148.153
34	-	30.800	-	30.800	178.953	148.153
35	-	30.800	19.180	49.980	178.953	128.973
36	-	30.800	-	30.800	178.953	148.153
37	-	30.800	-	30.800	178.953	148.153
38	-	30.800	-	30.800	178.953	148.153
39	-	30.800	-	30.800	178.953	148.153
40	-	30.800	-	30.800	178.953	148.153
Total	414.954	927.831	79.240	1,422.025	5,330.883	3,908.858
					IRR=	28.4%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

4. Eastern Zone Total

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	15.289	8.278	5.265	1.746	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	130.208	76.524	44.070	9.614	million R
(Retail):	426.787	242.645	144.871	39.271	million R
Direct Cost (Bulk)	94.354	55.452	31.935	6.967	million R
(Retail):	309.176	175.740	104.979	28.457	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	31.917	-	-	31.917	-	(31.917)
2	47.875	-	-	47.875	-	(47.875)
3	95.751	0.627	-	96.378	-	(96.378)
4	95.751	2.195	-	97.945	7.450	(90.495)
5	47.875	5.017	-	52.892	17.384	(35.508)
6	18.894	6.271	-	25.165	24.834	(0.331)
7	18.894	6.271	-	25.165	24.834	(0.331)
8	28.341	6.660	-	35.001	24.834	(10.167)
9	37.788	7.439	-	45.227	27.993	(17.234)
10	37.788	8.218	-	46.006	32.732	(13.274)
11	28.341	9.191	-	37.532	35.891	(1.642)
12	18.894	9.775	-	28.669	38.260	9.590
13	4.889	10.165	-	15.053	40.629	25.576
14	7.333	10.165	-	17.497	40.629	23.132
15	9.777	10.285	-	20.062	40.629	20.567
16	9.777	10.586	-	20.363	41.939	21.576
17	9.777	10.887	-	20.664	43.248	22.584
18	7.333	11.248	-	18.580	44.558	25.977
19	-	11.368	-	11.368	45.867	34.499
20	-	11.368	46.238	57.606	45.867	(11.739)
21	-	11.368	-	11.368	45.867	34.499
22	-	11.368	-	11.368	45.867	34.499
23	-	11.368	-	11.368	45.867	34.499
24	-	11.368	-	11.368	45.867	34.499
25	-	11.368	-	11.368	45.867	34.499
26	-	11.368	27.383	38.751	45.867	7.116
27	-	11.368	-	11.368	45.867	34.499
28	-	11.368	-	11.368	45.867	34.499
29	-	11.368	-	11.368	45.867	34.499
30	-	11.368	-	11.368	45.867	34.499
31	-	11.368	-	11.368	45.867	34.499
32	-	11.368	7.085	18.453	45.867	27.414
33	-	11.368	-	11.368	45.867	34.499
34	-	11.368	-	11.368	45.867	34.499
35	-	11.368	46.238	57.606	45.867	(11.739)
36	-	11.368	-	11.368	45.867	34.499
37	-	11.368	-	11.368	45.867	34.499
38	-	11.368	-	11.368	45.867	34.499
39	-	11.368	-	11.368	45.867	34.499
40	-	11.368	-	11.368	45.867	34.499
Total	556.995	375.095	126.944	1,059.034	1,494.916	435.882
					IRR=	3.8%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

4.1 Weltevreden

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	10.519	7.001	3.518	-	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	103.024	68.568	34.456	-	million R
(Retail):	315.749	210.149	105.600	-	million R
Direct Cost (Bulk)	74.655	49.687	24.968	-	million R
(Retail):	228.804	152.282	76.522	-	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	27.872	-	-	27.872	-	(27.872)
2	41.808	-	-	41.808	-	(41.808)
3	83.615	0.535	-	84.150	-	(84.150)
4	83.615	1.873	-	85.489	6.301	(79.188)
5	41.808	4.282	-	46.090	14.702	(31.388)
6	14.006	5.353	-	19.358	21.003	1.645
7	14.006	5.353	-	19.358	21.003	1.645
8	21.008	5.622	-	26.630	21.003	(5.627)
9	28.011	6.160	-	34.171	23.114	(11.057)
10	28.011	6.698	-	34.709	26.280	(8.429)
11	21.008	7.370	-	28.378	28.391	0.012
12	14.006	7.774	-	21.779	29.974	8.195
13	-	8.043	-	8.043	31.557	23.514
14	-	8.043	-	8.043	31.557	23.514
15	-	8.043	-	8.043	31.557	23.514
16	-	8.043	-	8.043	31.557	23.514
17	-	8.043	-	8.043	31.557	23.514
18	-	8.043	-	8.043	31.557	23.514
19	-	8.043	-	8.043	31.557	23.514
20	-	8.043	40.394	48.436	31.557	(16.879)
21	-	8.043	-	8.043	31.557	23.514
22	-	8.043	-	8.043	31.557	23.514
23	-	8.043	-	8.043	31.557	23.514
24	-	8.043	-	8.043	31.557	23.514
25	-	8.043	-	8.043	31.557	23.514
26	-	8.043	20.298	28.341	31.557	3.216
27	-	8.043	-	8.043	31.557	23.514
28	-	8.043	-	8.043	31.557	23.514
29	-	8.043	-	8.043	31.557	23.514
30	-	8.043	-	8.043	31.557	23.514
31	-	8.043	-	8.043	31.557	23.514
32	-	8.043	-	8.043	31.557	23.514
33	-	8.043	-	8.043	31.557	23.514
34	-	8.043	-	8.043	31.557	23.514
35	-	8.043	40.394	48.436	31.557	(16.879)
36	-	8.043	-	8.043	31.557	23.514
37	-	8.043	-	8.043	31.557	23.514
38	-	8.043	-	8.043	31.557	23.514
39	-	8.043	-	8.043	31.557	23.514
40	-	8.043	-	8.043	31.557	23.514
Total	418.773	276.209	101.086	796.068	1,075.367	279.298
					IRR=	3.2%

Note: Figures in parentheses mean negative.

Appendix 9 Calculation of Economic Internal Rate of Return (cont'd)

4.2 Bronkhorstspuit

	Total	Stage 1	Stage 2	Stage 3	
Annual Demand:	4.770	1.277	1.747	1.746	MCM
Construction Period:	18	5	7	6	Years
Initial Cost (Bulk):	27.184	7.956	9.614	9.614	million R
(Retail):	111.038	32.496	39.271	39.271	million R
Direct Cost (Bulk):	19.699	5.765	6.967	6.967	million R
(Retail):	80.372	23.458	28.457	28.457	million R

(Unit: R million)

Project Year	Project Cost				Project Benefit	Net Benefit
	Initial Cost	O & M Cost	Replacement	Total		
1	4.045	-	-	4.045	-	(4.045)
2	6.068	-	-	6.068	-	(6.068)
3	12.136	0.092	-	12.227	-	(12.227)
4	12.136	0.321	-	12.457	1.149	(11.308)
5	6.068	0.734	-	6.802	2.682	(4.120)
6	4.889	0.918	-	5.806	3.831	(1.975)
7	4.889	0.918	-	5.806	3.831	(1.975)
8	7.333	1.038	-	8.371	3.831	(4.540)
9	9.777	1.279	-	11.056	4.879	(6.177)
10	9.777	1.520	-	11.297	6.452	(4.846)
11	7.333	1.821	-	9.154	7.500	(1.654)
12	4.889	2.002	-	6.890	8.286	1.396
13	4.889	2.122	-	7.011	9.072	2.061
14	7.333	2.122	-	9.455	9.072	(0.383)
15	9.777	2.242	-	12.019	9.072	(2.947)
16	9.777	2.543	-	12.320	10.382	(1.939)
17	9.777	2.844	-	12.621	11.691	(0.930)
18	7.333	3.205	-	10.538	13.001	2.463
19	-	3.326	-	3.326	14.310	10.984
20	-	3.326	5.845	9.170	14.310	5.140
21	-	3.326	-	3.326	14.310	10.984
22	-	3.326	-	3.326	14.310	10.984
23	-	3.326	-	3.326	14.310	10.984
24	-	3.326	-	3.326	14.310	10.984
25	-	3.326	-	3.326	14.310	10.984
26	-	3.326	7.085	10.410	14.310	3.900
27	-	3.326	-	3.326	14.310	10.984
28	-	3.326	-	3.326	14.310	10.984
29	-	3.326	-	3.326	14.310	10.984
30	-	3.326	-	3.326	14.310	10.984
31	-	3.326	-	3.326	14.310	10.984
32	-	3.326	7.085	10.410	14.310	3.900
33	-	3.326	-	3.326	14.310	10.984
34	-	3.326	-	3.326	14.310	10.984
35	-	3.326	5.845	9.170	14.310	5.140
36	-	3.326	-	3.326	14.310	10.984
37	-	3.326	-	3.326	14.310	10.984
38	-	3.326	-	3.326	14.310	10.984
39	-	3.326	-	3.326	14.310	10.984
40	-	3.326	-	3.326	14.310	10.984
Total	138.222	98.885	25.859	262.966	419.549	156.583
					IRR=	5.7%

Note: Figures in parentheses mean negative.