

# WELBEDACHT DAM

COORDINATES (degrees, minutes, seconds)

LATITUDE	LONGITUDE
29° 54' 32" S	26° 51' 38" E

## LOCATION

This dam is situated on the Caledon River near Wepener in the Free State in quaternary D23J, South Africa.

## DESCRIPTION

The Welbedacht Dam is a concrete barrage-type dam. The dam has a full supply level of 1,402.9 m, with a dead storage level of 1,385.2 m and reservoir bottom at 1,383.2 m.

## PURPOSE

Welbedacht Dam was constructed as the main storage element of the Caledon–Modder River Government Water Scheme (CMRGWS) and water is abstracted from this dam for transfer to Bloemfontein and various smaller users along the way. Its purpose was to supply water to the city of Bloemfontein via the 115-km-long Caledon–Bloemfontein pipeline which has a capacity of approximately 1.157 m<sup>3</sup>/s. Due to the high sediment concentration in the water, the transfer from Welbedacht Dam is first purified at the Welbedacht Purification Plant which is located just downstream of the dam. The purification plant has a capacity of 1.68 m<sup>3</sup>/s (145 Mℓ/day).

The storage capacity of the dam reduced from 115 million m<sup>3</sup> to approximately 16 million m<sup>3</sup> in only 20 years due to siltation. This impacted the assurance of supply to Bloemfontein and so Knellpoort Dam was constructed to augment the supply.



Welbedacht Dam (source: [www.ewisa.co.za](http://www.ewisa.co.za))



## WELBEDACHT DAM

### PHYSICAL INFORMATION

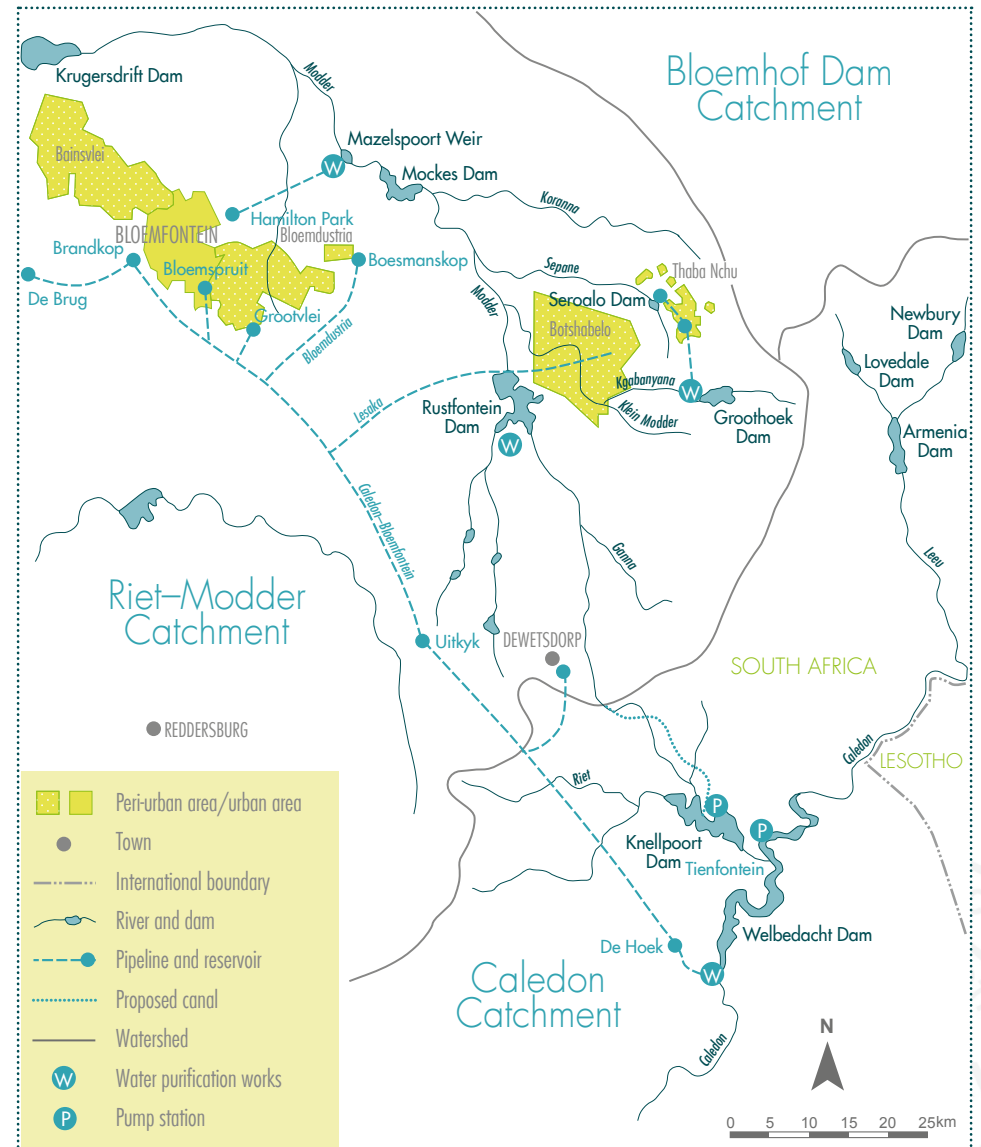
Dam name	River	Quaternary catchment	FSC* (million m <sup>3</sup> )	FSA (km <sup>2</sup> )	Owner	DWA code	Wall height (m)	Wall length (m)
Welbedacht	Caledon	D23J	15.47	11.75	DWA	D2R004	32	192

\* Live full supply capacity (ORASECOM, 2007a, WRYM datasets and DWA, 1990)

Year of completion	Demands/abstractions (million m <sup>3</sup> /a)			1:50 yield (million m <sup>3</sup> /a)	Maximum spillway capacity (m <sup>3</sup> /s)
	Domestic	Irrigation	Other		
1973	48.27 †	Unknown	1166 ‡	Unknown	5,310

† WRC, 2008

‡ Total outflow from the dam (WRC, 2008)



Caledon-Bloemfontein Government Water Scheme (adapted from ORASECOM, 2007a)

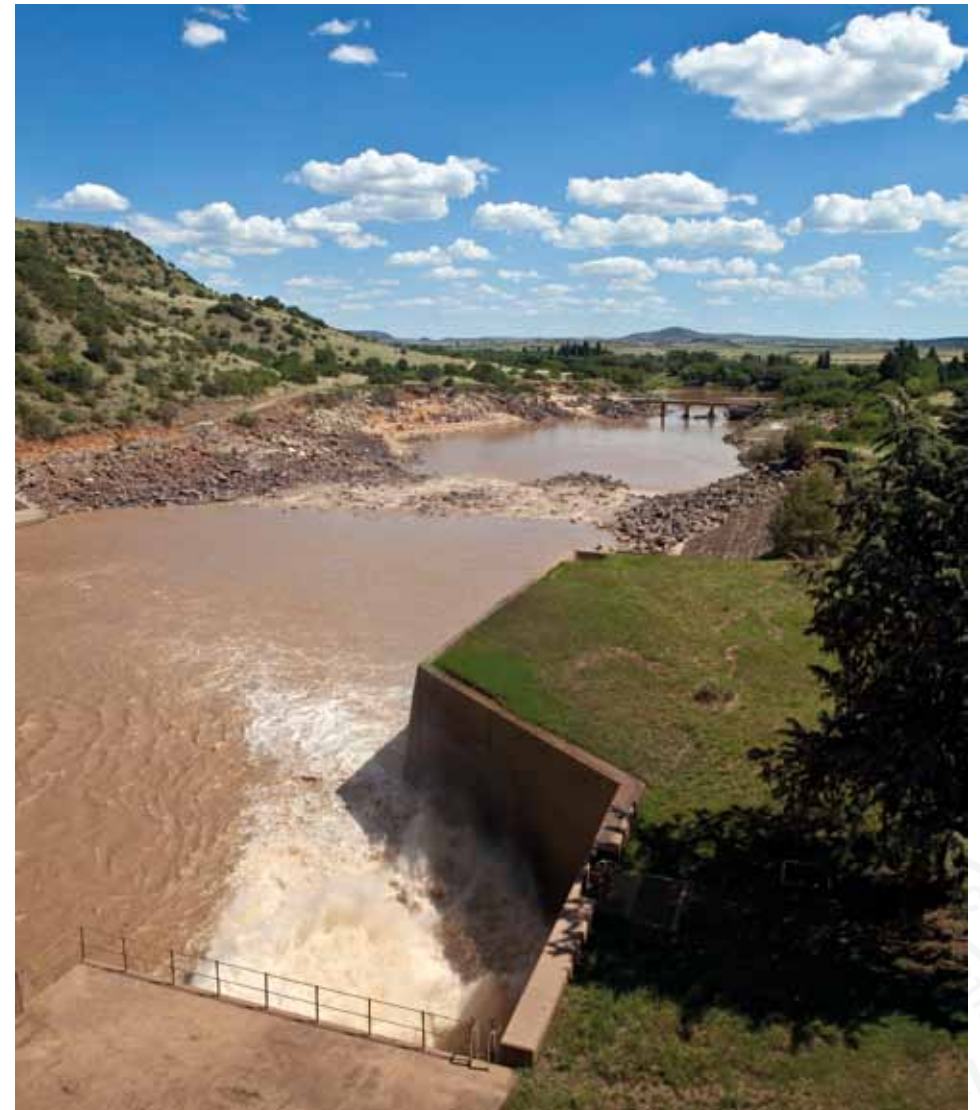
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### AREA–CAPACITY RELATIONSHIP

Elevation (m)	Storage (million m <sup>3</sup> )	Surface area (km <sup>2</sup> )
1,403.4	22.25	14.20
1,403.1	18.18	12.88
1,402.9	15.47	11.75
1,402.5	11.45	9.29
1,402.3	9.74	7.85
1,401.7	6.21	4.30
1,401.3	4.78	2.90
1,400.5	3.19	0.44
1,385.6	0.01	0.01
1,383.2	0.00	0.00

### OPERATING RULE

Welbedacht Dam (along with Knellpoort Dam) supports the Modder system when there is insufficient water in the system, via the Caledon–Modder Transfer.



Welbedacht Dam is heavily silted (© UNOPS/Leonie Marinovich)