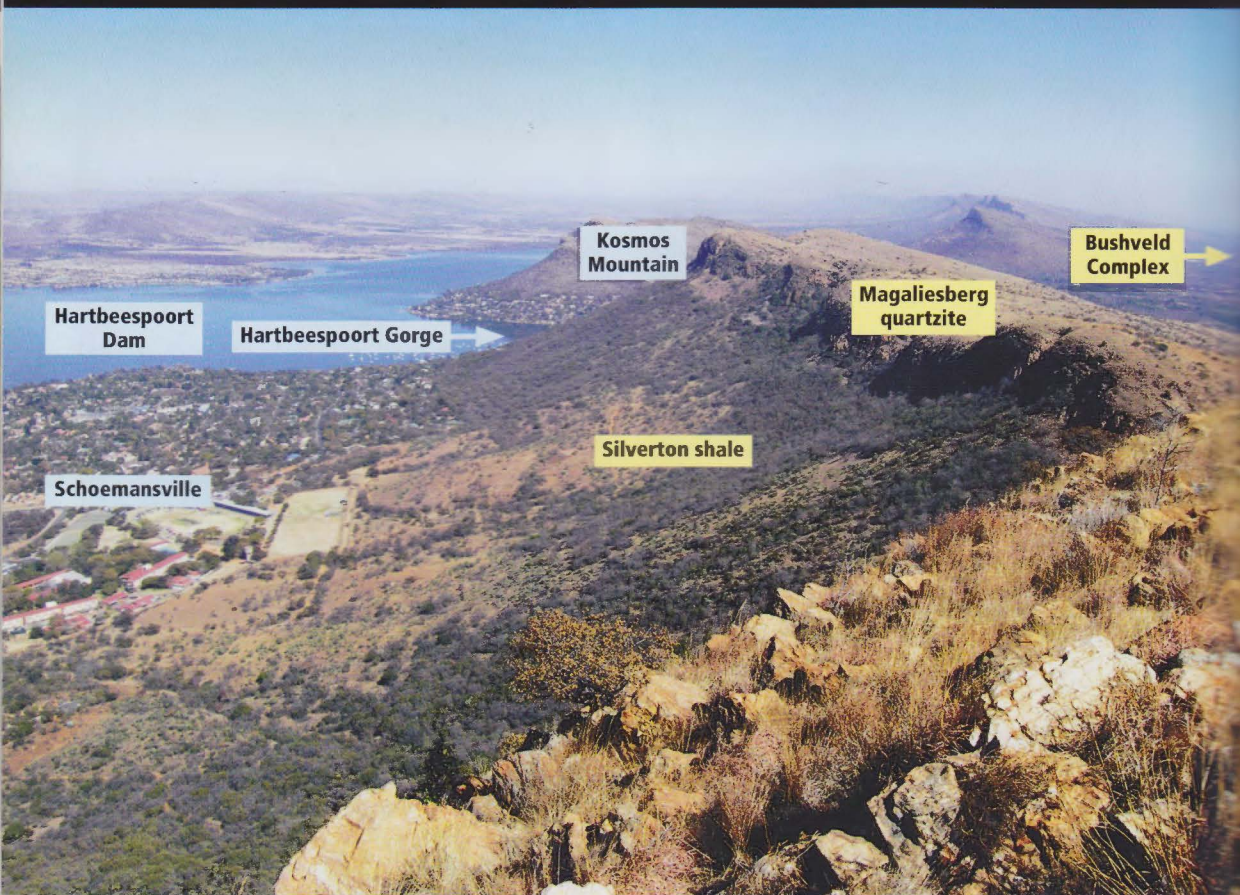


Hartbeespoort Dam

PART OF PROPOSED BIOSPHERE RESERVE

Ancient mountains of hard quartzite, a 'cuesta' landscape and a fault-made river gorge



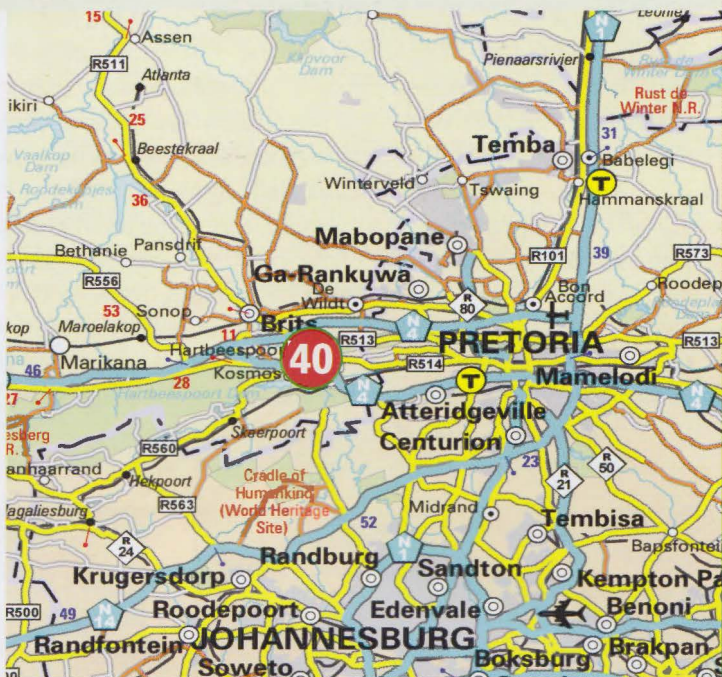
The Magaliesberg range, as seen looking west from the upper cableway station, with part of Hartbeespoort Dam in the distance. Gently north-dipping Magaliesberg quartzite, overlying Silverton shale, forms a 'cuesta' landscape. This prominent range effectively separates the Highveld Plateau in the south (left) from the Bushveld Basin to the north (right).

The Hartbeespoort is a narrow gorge where the Crocodile River has cut its way through the imposing Magaliesberg with the help of a geological fault – one of the few rivers that has succeeded in doing this. It is in this gorge that, in the 1920s, a major dam was built for irrigation purposes. The gorge is also the gateway to the Bushveld Complex and the semi-tropical bushveld environs.

■ Location and getting there

■ Hartbeespoort Dam is located in the east-west-trending Magaliesberg range, about 35km west of Pretoria and some 65km northwest of Johannesburg. Various routes get you to the dam wall: the easiest takes you via Schoemansville on the R511, then follow the winding road to the dam wall and tunnel.

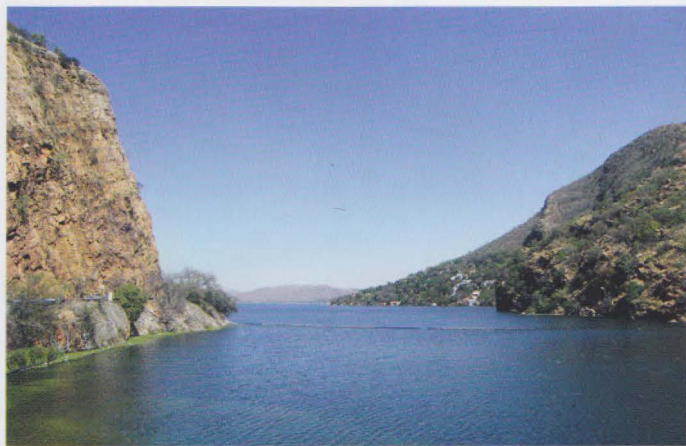
■ GPS (parking area west of dam wall):
25°43'32"S; 27°50'49"E



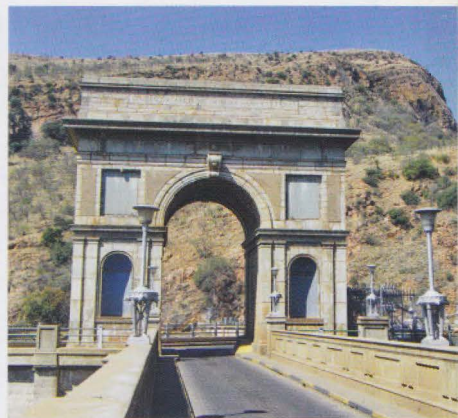
Setting the scene

The Magaliesberg forms a mountainous ridge running from northwest of Rustenburg to east of Pretoria, more than 200km long, and is a major feature of the Highveld landscape.

In 1913 an ambitious plan was developed to dam the narrow gorge on the Crocodile River south of Brits, to provide for downstream irrigation, but it was only in 1923 that the dam was completed. Buttressed on each side by massive outcrops of hard quartzite, the curved



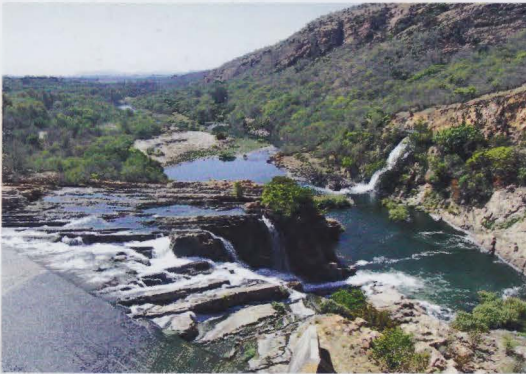
The fault-created gorge (the original Hartbeespoort) on the Crocodile River is now part of Hartbeespoort Dam, here seen from the dam wall, looking south.



The dam wall, completed in 1923, is straddled by a decorative arch; built in the classical 'triumphal' style, it is adorned with Latin inscriptions.

The Bushveld Complex

North of the Magaliesberg is the Western Limb of the Bushveld Complex, part of the world's largest layered intrusion, and one of the choicest bits of geological real estate in the world – here lie the world's richest deposits of platinum metals, chromium and vanadium. After the sedimentary deposits of the Transvaal Basin had become sandstone and shale, an underlying, deep-seated mantle hot-spot developed, and the overlying part of the Earth's crust began to weaken. Around 2,060 million years ago, a period of unprecedented igneous activity started as thin intrusions of mafic magma penetrated the sedimentary layers forming the diabase sills we see today. This was soon followed by the injection of enormous volumes of magma, deep into the central portion of the Transvaal Basin, forming the mafic phase Bushveld Complex. Slightly later, Bushveld granite was also intruded. The weakened crust and the vast mass and heat of these intrusions resulted in structural sagging of the entire Transvaal Basin, forming a consistent inward dip. The great heat caused the neighbouring sedimentary rocks to become thermally metamorphosed to quartzite and hornfels.



When viewed facing northwards down the Crocodile River from the dam wall, the river can be seen to follow the fault that created the gorge.

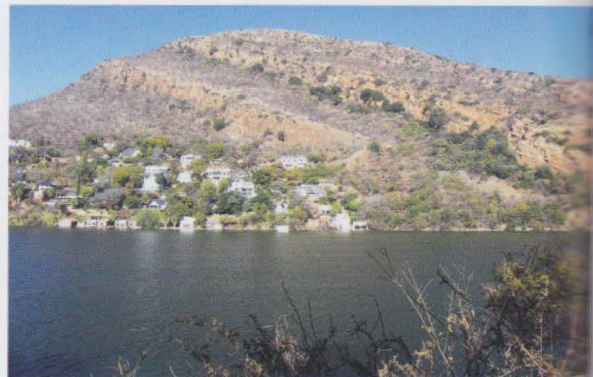


The Crocodile River downstream below the dam wall, which can be seen in the far distance. Kosmos Mountain is on the right.

dam wall is 101m long and 60m high. With a shoreline of around 56km, Hartbeespoort Dam is the largest body of water in the Gauteng region. Desirable urban settlements have developed in the surrounding areas and the dam has become a favourite recreation venue for the land-locked population. It is locally known as the Bushveld Riviera.

Regional geology

The Magaliesberg is made of the upper formations of the mainly sedimentary Pretoria Group, part of the Transvaal Supergroup.



On the western side of the original Hartbeespoort is Kosmos Mountain, which shows a more easily weathered diabase sill in between beds of Magaliesberg quartzite dipping north at 25°.

At Hartbeespoort Dam these formations dip consistently at around 25° to the north. The thick quartzite unit that forms the top of the mountain ridge is the **Magaliesberg Formation**, and beneath this, poorly outcropping shale of the **Silverton Formation** forms the lower southern slopes and the broad Moot Valley. The original 200m-wide Crocodile River gorge follows a north-northwest-trending fault, which is part of a regional down-faulted structure called the Brits Graben. The other parallel fault of the graben lies some 3km to the west at Commando Nek. Between these two faults the upper crust was depressed by several hundred metres, thus displacing to the south a short section of the Magaliesberg ridge. Over millennia, considerable erosion followed and what remains of the graben is now prominently exposed as Kosmos Mountain with the Hartbeespoort fault on its eastern side.

Landscapes and landforms

The Magaliesberg is an eroded remnant of the surface that existed before the African land surface was formed. Today, Hartbeespoort Dam is overlooked by the Magaliesberg ridge, which reaches 1,600m. Part of the landscape can be traced back to the time of Dwyka glaciation around 300 million years ago, when ice sheets partly planed down the mountains and carved wide glacial valleys. The range is a fine example of 'cuesta' landscape (also called 'bankenveld'), an asymmetric landscape with a steep scarp-slope and a gentle dip-slope.

Rock formations

- Coarse-grained Magaliesberg quartzite originates from sandstone that was deposited less than 2,200 million years ago as clean



North-dipping beds of Magaliesberg quartzite at the upper cableway station. Inset: Showing that the quartzite was coarsely recrystallised (thermally metamorphosed) by the enormous heat generated from the Bushveld Complex which lies nearby, to the north.

quartz sand along a shallow shoreline, with occasional sandy flats on which ripple marks formed and, in places, are now preserved.

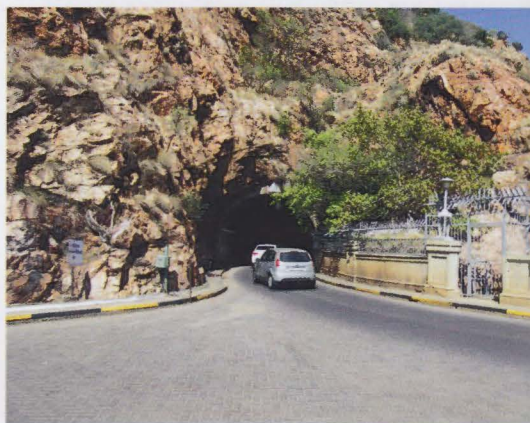
- Thermal metamorphism from the nearby Bushveld Complex resulted in the original sandstone being completely



Ripple marks indicate that this sandstone was deposited in very shallow water, and has been reformed into hard, recrystallised quartzite with ripples still preserved.

recrystallised to form large interlocking quartz grains and coarse-grained quartzite.

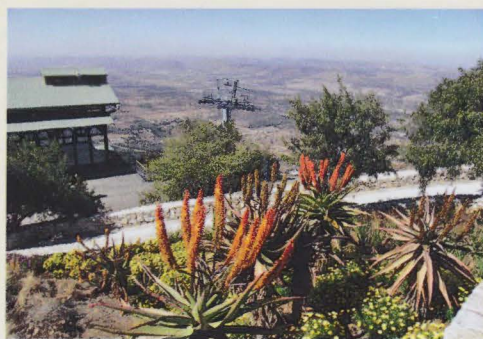
- The Silverton shales were deposited as mud in deeper water within the vast inland Transvaal Sea, and much later several sills of Bushveld-related diabase were intruded into the shale.



The entrance to the single-lane road tunnel that was blasted through very hard, recrystallised Magaliesberg quartzite, on the eastern side of the dam wall.

■ Things to see and do

- **Do the aerial cableway:** This is the highlight of any visit. In 2012 the new aerial cableway was opened and it takes you to the top of the Magaliesberg, at a height of about 1,600m. From there you will have a superb view across Hartbeespoort Dam, and a panoramic view of the entire region, from the Witwatersrand in the south to the Pilanesberg in the northwest.
- **Visit the dam wall and tunnel:** Walk across the dam wall and see the 57m-long single-lane road tunnel blasted through massive quartzite. Notice the north-dipping, very hard, coarse-grained quartzite, and look down the fault-created Crocodile River gorge (Hartbeespoort). Parking is available on the northwestern side.



An attractive landscaped indigenous garden has been established at the upper cableway station.



The new aerial cableway and the viewing deck, which provide superb views to the south of the Magaliesberg, including Hartbeespoort Dam and Schoemansville.