Water from the dam is distributed by means of an extensive canal system which was constructed in the 1940s.

Dam Project Could Improve Aquatic Environment

The aquatic environment is proving to be an important stakeholder in the proposed raising of the Clanwilliam Dam, in the Western Cape, which could bring much needed additional water resources to the area. Lani Holtzhausen reports.

Originally completed in 1935, the Clanwilliam Dam is situated on the Olifants River upstream of Bulshoek Barrage. It is the major dam in the Olifants/Doring Basin, and provides water to a number of towns, the Clanwilliam canal scheme, to irrigation farmers who draw water from the river, and especially to the Olifants River Government Water Scheme around Vredendal.

Water is released from the Clanwilliam Dam to the Bulshoek Barrage, from where it is distributed by means of an extensive canal system to downstream towns and irrigation farmers. While about 85% of the total river flow occurs during winter months, more than 60% of the annual urban demand and 90% of the irrigation demand occurs in summer.

The concrete gravity dam was raised between 1962 and 1964 by adding 13 crest gates and through the use of pre-stressed cables, giving the wall a present height of 43 m. The dam has a current net storage capacity of 122 million cubic metres.

It is reported that water resources in the Olifants River catchment are over-allocated at present, with a deficit of some 55 million cubic metres being experienced every year on average. This places tremendous pressure on farmers' crops from water

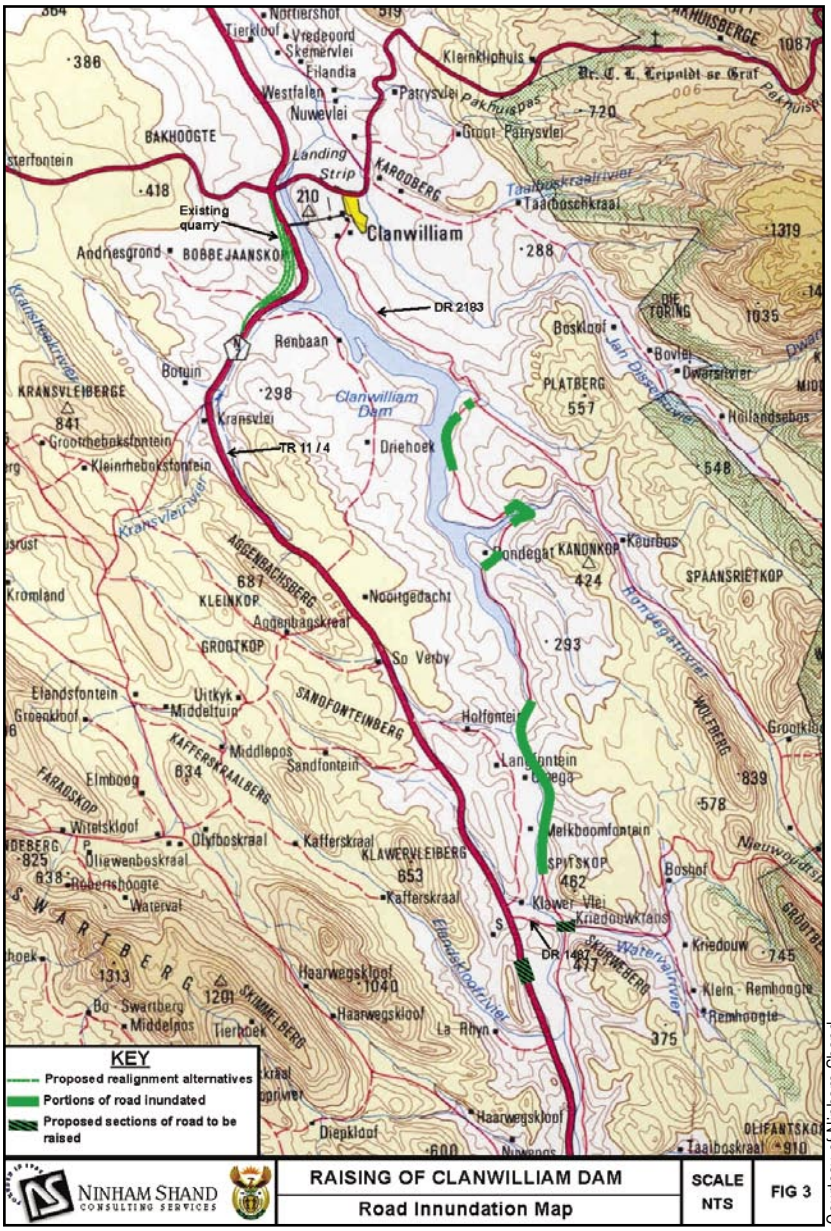
deprivation, while it leaves very little additional water resources for emerging farmers.

Furthermore, no releases for the ecological water requirements are currently made from the Clanwilliam Dam, although considerable releases are made via the river channel to supply Bulshoek Barrage. This means that if the dam were not to be raised current water users may have to forego a portion of their allocation to satisfy the ecological water requirements.

The raising of Clanwilliam Dam is likely to have negative impacts in the Olifants River upstream of the dam, by replacing the natural riverine environment with an artifical lake environment.

The possibility of raising the Clanwilliam Dam wall to relieve some of these pressures was first studied by the Department of Water Affairs & Forestry in 2003. It has since been found that, in order for the dam to comply with present dam safety legislation, the dam wall will have to be strengthened, offering an opportunity to raise the fully supply level at the same time.

Improving the safety of the existing dam as well as the raising thereof would require the replacing of the spillway gates with a fixed concrete spillway and the possible raising of this spillway by between 5 m and 15 m. This would be achieved by adding concrete on the downstream face of the existing overspill. No specific costs are being mentioned at this stage, but such a project is expected to cost hundreds of millions of Rands.



Courtesy of Ninham Shand

Possible road inundation and realignment during raising of the Clanwilliam Dam in the Western Cape.

In January 2004, the Clanwilliam Dam Raising Association (CDRA), comprising Ninham Shand, ASCH Consulting Engineers and Jakoet & Associates was appointed to undertake a feasibility study for the possible raising of the dam. The environmental impact assessment is nearing completion and several meetings have already been held with interested and affected parties to date.

ENVIRONMENTAL CONSIDERATIONS

According to Erik van der Berg of the CDRA, there are several possible socio-economic and environmental impacts, which are currently being investigated in depth as part of the assessment process. One potential environmental concern is the effect of the project on the ecology of the Olifants River and its tributaries,

Plans are afoot to raise the Clanwilliam Dam to bring welcome additional resources to the area. While a final decision is yet to be made, it is speculated that the dam wall is likely to be raised by about 10 m.

Wine grapes are the main crops irrigated in the area.

which contain several endemic fish species, the highest number of endemic fish south of the Zambezi.

The raising of Clanwilliam Dam is likely to have negative impacts in the Olifants River upstream of the dam, by replacing the natural riverine environment with an artifical lake environment, thereby increasing the habitat for exotic fish, such as smallmouth bass, banded tilapia and brown trout that already pose a threat to endemic fish.

On the positive side, however, the raising of the dam would facilitate meeting the ecological water requirements downstream. At present, the water released from the dam is colder than the water entering the reservoir, retarding the onset of spawning in the Clanwilliam yellowfish, listed internationally as vulnerable. Van der Berg reports that the installation of a multi-level outlet is being suggested which could reduce some of the existing impacts on the riverine and estuarine environment downstream of the dam wall.

SOCIO-ECONOMIC IMPACTS

The raising of the Clanwilliam Dam could see the flooding of up to 150 hectares of land as well as some 20 farmhouses. In addition, between 1 600 m and 3 200 of the N7 national road that links Cape Town with the Northern Cape and Namibia as well as several secondary roads could be inundated.

An unanticipated problem is the potential greater-than-anticipated flooding of sections of secondary road DR2183, which is used by commercial farmers in the area to take their product to market. Alternative access to the affected farms via Clanwilliam is undesirable due to the increased haulage costs associated with the greater distance. “This is a bigger challenge than we anticipated, and will certainly require some attention,” Van der Berg tells *the Water Wheel.*

To investigate the social implications of the project, including loss of land and infrastructure, impacts on livelihoods, and the potential benefits of additional water in the area, a social impact assessment is also being undertaken at present.

Despite these potential impacts, the overall reaction to the project has been surprisingly positive, notes Van der Berg. Further public meetings are planned in February to launch the environmental impact assessment report. If all goes according to plan, construction could start as early as 2007.