

**WEEKEND ARGUS – CAPE TOWN  
SUNDAY 7 DECEMBER 2008**

In a nondescript piece of West Coast scrubland just by the Langebaan Weg Airforce Base, Louise Saltou of the CSIR is crouched over a windswept borehole entering water level data into her laptop computer.

Saltou, a hydrogeologist, has repeated this exercise almost every hour for several months and has now gathered enough data to validate an important experiment aimed at boosting water supplies all round the country.

Like so many areas in the Cape, the West Coast District Municipality has far more water than it needs flowing along the lower reaches of the Berg River during the winter downpours but cannot store enough of it to meet the sky-rocketing demands during the dry summer season. Building more dams and reservoirs is the traditional solution but water stored at surface is subject to serious evaporation and potential contamination, and such projects are massively expensive and carry high environmental trade-offs. The Berg River Dam, opened last year near Franschoek after more than a decade of controversy, approval processes and construction, cost over R1.5bn and may well be one of the last of its kind built anywhere in the country.

So the West Coast District Municipality is trying to establish whether they can use the aquifer (or water-bearing sands) fifty metres below the ground as a natural dam in which to store their excess winter water. This particular aquifer, like so many, is already tapped by boreholes which can drain and seriously lower the water table but the plan is to reverse this process and use the boreholes to pump water back into the underground sands and raise the water table to full levels prior to the summer season.

The technique is known as artificial recharge and it is centuries old - the first recorded use was by nomads in Turkmenistan when they diverted infrequent surface run-off from clay-rich areas via long trenches to pits dug in more porous sandy areas - and its been applied widely in other parts of the world including Las Vegas, South Australia and Namibia. In Windhoek the local authorities implemented an extensive artificial recharge scheme at a cost of R216m to provide far greater security of supply in drought years instead of building a R1.6bn pipeline from the Kavango River. The Indian government is also excited by the idea and has just committed R3.3bn over the next ten years to expand its artificial recharge programme.

The Department of Water Affairs and Forestry is keen for South African municipalities to follow suit and has put in place the procedural framework that allows artificial recharge schemes to be developed. Such bureaucratic matters might seem trivial but issues around water rights are inevitably complex, involving various layers of government, different municipalities (often one authority is piping in its supply from another one) and the farmers under whose land the aquifer lies, and proper environmental impact processes are essential to ensure the integrity of the aquifers and the ecosystems that depend on them are properly maintained.

Atlantis, 50km north of Cape Town, has used a form of artificial recharge involving natural infiltration ponds for twenty years but the Langebaan project is the first in the country to actively inject water on a large scale into the aquifer. It's a delicate scientific exercise involving careful monitoring of water levels and also ensuring that the water being pumped underground is chemically compatible with the liquid that's already there which, quite incredibly, has taken an estimated 20,000 years to slowly migrate from its natural inflow points up to fifteen kilometres away.

The borehole injection tests started in early September and the results look very promising. The prospect of ultimately having several injection boreholes, each contributing 15 litres per second to the underground reservoir, seems high.

At that level the aquifer would only provide a relatively small percentage of the high season demand that West Coast District Municipality has to meet in the booming region where every year the growth knocks five years off their 25 year supply masterplan, but it will give them the best and cheapest type of reservoir they can get and what they describe as "an extra tool in the box" as an absolutely secure supply source to meet emergencies or peak demand at Christmas.

The municipality officials also understand that they are helping to provide a case study which, if it works, could open the way to much more significant developments right across the country.

Not every region has the particular kind of geology that allows for successful storage underground but an extensive survey conducted by DWAF has identified many suitable aquifers especially in the Limpopo, Crocodile West Marico, Lower Vaal and Lower Orange Water Management Areas and the department's experts are convinced artificial recharge could be used effectively for smaller communities where a multi-million rand investment in dams or pipelines is not economic. Plettenberg Bay and Prince Albert are two areas already actively researching schemes.

For some there are even bigger dreams around artificial recharge. Theoretically large swathes of the Kalahari could be used as a sand infiltration system into a massive reservoir that could irrigate previously arid land, similar to schemes developed so successfully by the Israelis, or the water-bearing nooks and crannies of the entire Table Mountain Group aquifer could become the reservoir for the Cape Metropole.

Interfering so radically and on such a huge scale in environmentally sensitive areas is obviously, at best, a very distant prospect and requires considerable research and great care, but it now seems certain that the more immediate water priorities of towns like Langebaan, Saldanha and Vredenburg can be met quickly with artificial recharge at a serious saving to both ratepayers and the environment.