Club: *VSA*	Name of Area: ***Drik Drik.***	Author: ***K.G. Grimes.***	Date of trip: *19 August 2006*
Caves visited: ***3DD-4 & 3DD-25R.***			
Title of report (if any): *Hydrology & geology of DD-4 & DD-25R, Drik Drik.*			
Names in party (indicate Author, Leader) *Ken Grimes, Miles Pierce, Peter Robertson, Janeen Samuel, Daryl Carr, Rhonwen Pierce.*			

Report:

Summary:

Saturday 19-8-2006: The *A Team* (Glenn B, Peter F, Darryl P) went to end of cave (siphoning the sump). *B Team* dumped salt into the DD-4 stream where it enters the rockpile and a resistivity detector was installed in the DD-25R spring to attempt to detect the salinity spike. We explored the area about the spring.

DD-4 Hydrology

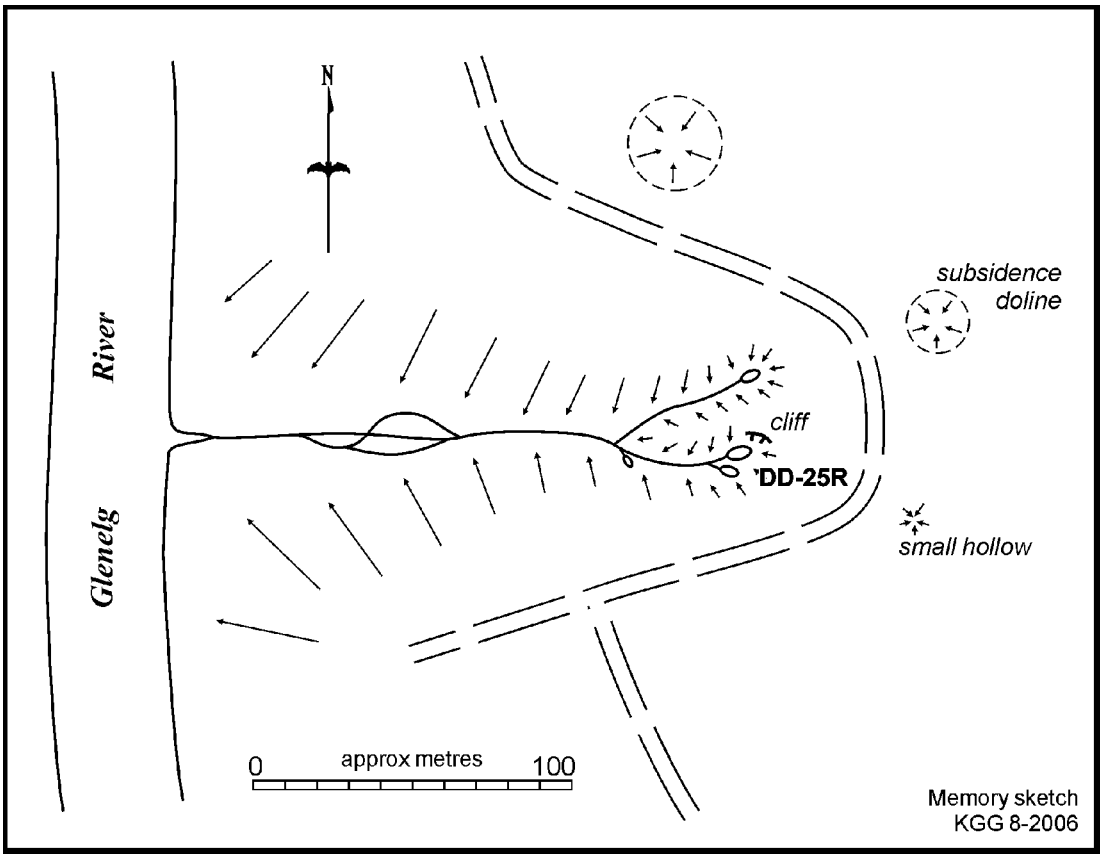
In the entrance area the side stream was flowing at 0.04 L/sec (timed into 500 ml container) and had a temperature of 15.3˚C and EC of 985 µS (approx 640 ppm TDS). This side stream has always shown a lower EC than the main stream.

60m upstream we used pooh sticks over a 3m run to measure the discharge at 2.9 L/sec. Temperature was 15.2˚C and EC was 2,080 µS (~1350 ppm).

We (Miles & KGG) mixed up three10 L buckets of NaCl salt (to approximately saturation) and dumped it in the DD-4 stream where it enters the rockpile. This was at 11:42 am.

DD-25R geology & hydrology

This spring is at about 523.95 km E, 5790.50 km N (AMG1966, from map) on the east bank of the Glenelg River. It feeds via a 150 m stream into the river. There are two main springs, each rising beneath a steephead, and several smaller inflows along the channel sides (see sketch map). DD-25R (photos D061415-18) has the main flow (4-6 L/sec? see below) and a second branch joining from the north had a smaller flow - maybe 1 L/sec (guesstimate).



The steephead behind DD-25R includes a 3m high cliff of Gambier Limestone (coarse-grained, moderately-cemented calcarenite), but on the steep track coming down from the lookout there is outcrop of cross-bedded dune limestone which would be overlying the Gambier Limestone. Up-slope to the east of the spring there are several small subsidence dolines (see sketch map). Downstream, the stream channel can be followed to the river, but is choked with bracken, raspberry and fallen trunks for much of the way, so travel is slow and painful. The valley is initially steep-sided but opens up downstream and the stream channel splits and rejoins several times. The water is actively precipitating tufa, and the stream bed has many tufa dams 10-30cm high (Photos D061419-24).

The spring water at the main rising (DD-25R) had a temperature of 15.3˚C and an EC of 1583 µS (measured at 12:30 pm, and rising to 1585-86 µS between 1:54 & 3:30pm – but those variations lie within the accuracy of the instrument so are not significant). The discharge could not be accurately measured as the water was running in multiple channels amongst rocks etc. I visually estimated it as being between 1.5 and two times the discharge seen in the DD-4 stream that morning - which would make it between 4 and 6 L/sec. It might be possible to measure it better (with a small bucket) further downstream where it is running over the tufa dams. Measuring downstream would also include the extra streams that enter from the sides.

After putting the salt into the DD-4 stream, a resistivity detector (built by Peter Robertson) was installed in the DD-25R spring to attempt to detect the salinity spike. Peter & Miles will report on this experiment. On the Saturday there was one trigger of the monitor about 1.5 hours after the salt was placed in DD-4. This was of uncertain reliability as we were still testing the system, and was not repeated in a second salt test later in the day. See report by Peter & Miles for what was done on late Saturday afternoon and Sunday (NB that report had not appeared by Nov 2006).

Compared with the DD-4 cave stream, the flow from the DD-25R spring is greater and has a lower salinity (but still reasonably high). This would be expected if the postulated underground pathway from DD-4 was picking up additional seepage water, of lower salinity, from surface infiltration. The tufa dams indicate that the water is saturated (or has been in the past) which is compatible with it coming from a cave stream rather than nearby surface seepages.

3DD-25R looking northeast.