Club:	Name of Area:	Author:	Date of trip:
VSA	*Drik Drik, 3DD-4.*	***K.G. Grimes.***	*9-6-2001*

Caves visited:
3DD-4.

Title of report (if any):
Drik Drik, DD-4 area. (report compiled 31-1-2004)

Names in party (indicate Author, Leader)
Ken Grimes, Susan White, Lynne Lacota, and others.

PART 1: Hydrological observations

Site 1: about 50 m in from entrance.

Stream flow. Discharge 2.8 L/sec. EC (Elect Conductivity) was 1590 µS, which implies a TDS (derived as 'EC x 0.6') of about 950 ppm.

Site 2: about 200m? past second rockfall, near start of long stream way ("Bowling Alley"?)

EC (Elect Conductivity) was 1570 µS (implies TDS of abt 940 ppm) - little difference from site 2. The stream flow near start of a long streamway ("Bowling Alley"?) was 1.4 L/sec, which is half that measured at the entrance.

Site 3: Junction and U-turn.

There was a small flow entering from the passage straight ahead (south), and likewise from the main muddy passage to right (NW). The flow rates were hard to estimate but the combined flow would be significantly less than site 2.

Site 4: Pool below waterfall

EC = 1700 µS (implies TDS abt 1020 ppm). The flow over the falls was just a trickle.

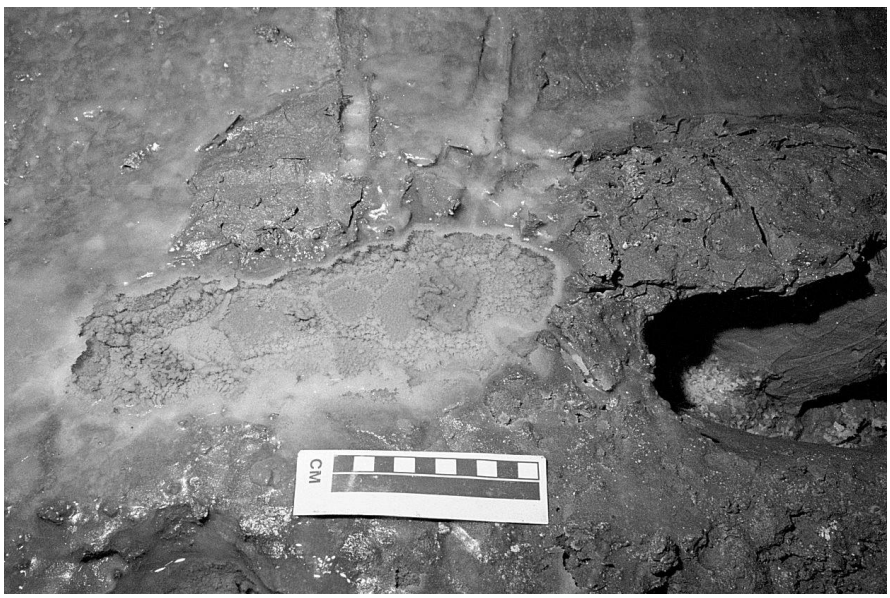
Comments:

Comments from others (Reto & Glenn) suggest that the stream flow was lower than usual (lowest ever seen by them?).

The stream flow doubled from the "Bowling Alley" (half way along the cave) to the entrance. Thus a significant part of the flow is fed by the seepages entering down the east wall. That applies at this time of low flows, the seepage component may be less significant at times of strong flow.

The EC (and TDS) was highest at the falls, and a bit less further out, but the difference was not great.

All TDS values are fairly high for a karst water, suggesting that it is saturated or nearly so. This could be taken as conflicting with the small pockets and hollows on the bedrock parts of the stream floor, which suggest active solution (unless those are abrasive 'swirl holes'). The seepage waters from the east wall are certainly saturated as they are actively precipitating speleothems (including crystal growth in old footprints near entrance, photo C991214). These high values also suggest that the water was coming from seepage from the plateau above, rather than fast conduit flow from (e.g.) the sink-point in the uvala. However, the story may well change at times of strong flow (when the uvala is running).



C991214: Calcite crystals in an old footprint.

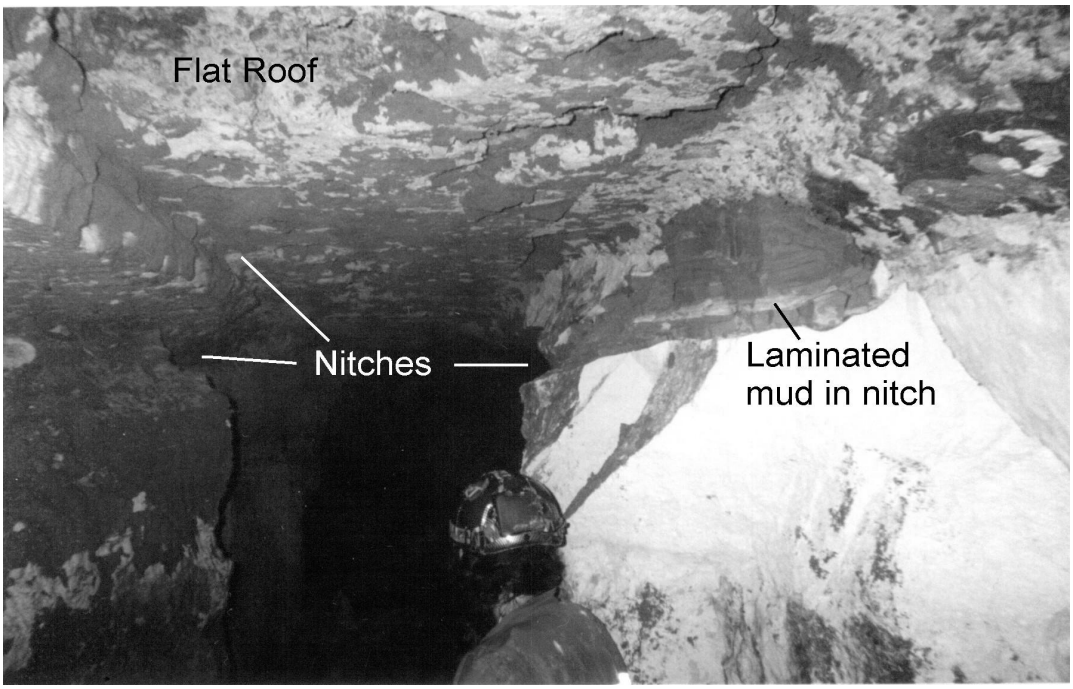
PART 2: Geological/geomorphological observations.

(see also report from Sue White, who took separate notes)

The wall rock is a soft white limestone with sub-horizontal bedding. Beds are 0.5 to 1.0 m thick.

The long straight passage is typically a 'vadose canyon' style (with 'straight meanders'!). Typically 1-2m wide (wider where modified by rock-fall) and 6-8m high (? check Reto's survey notes). It is modified by rockfall in many places - this comes mainly from spalling of the walls rather than roof collapse.

The roof is flat, sometimes with notch extending beyond the walls below (photo C012213). Where we got close to the roof (climbing over rockpiles), it often had horizontal notches, but no sign of any passages going off. The flat roof has a thin dry mud coating that is cracking off in a tessellated pattern (photo C011216). In places the roof has lines of dark mud which seem to be filling joint slots (photo C011222p). These slots run parallel to the passage and suggest joint control of passage direction. Well-formed bell-holes were seen in the flat roof at the southern end of the cave (photo C011208), but NOT further north. Some spongework pockets were seen in the flat roof (and walls) in a number of places, but are not common.



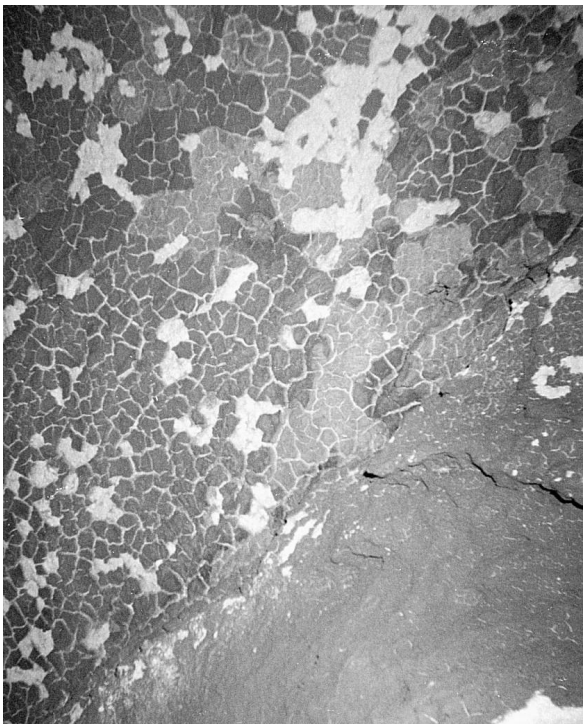
C011213:
Ceiling of stream passage.

Freshly broken limestone walls expose: (a) horizontal bands of dark mud (which seems to be filling a complex of vert seams?, but all at one level - suggesting bedding control?), and, (b) horizontal belts of red-brown to orange quasi-"liesegang" banding - also developed in zone of vertical cracks? and suggesting bedding-plane control? (photo C011211)

Small scallops (1-5cm? check Sue White's notes for size) can be seen on some lower walls. There are incuts and some protruding horizontal ridges on the walls. The latter appear to be bedding-controlled as they could be traced for some distance.

The stream sometimes dissapears sideways into low horizotal notches at floor-level; these are undercutting the walls (and possibly contributing to the rock-falls?).

Mud coats everything, except where washed clean near the stream level, or high up where thin mud coatings are cracking off, or on fresh rockfall surfaces. Even the stalactites are mud-coated except on the actively-washed (and growing) tips. The low-level mud is moist to wet & sloppy. High-level mud is dryer and firmer, and tends to crack. Brown-grey laminated mud fills wall notches, and also small proto-conduits (2-10cm dia) in the walls. Locally the mud is sandy or silty, but is mainly pure clay.



C011216: Thin coating of mud on ceiling is cracking into a tessellated pattern.

C011222P: Flat roof, with lines of mud following joints (?).

The stream bed has mud banks, but the active channel commonly has sand and gravel, or is cut into the limestone. The pebbles are limestone, basalt and irregular fragments of dark (to black) ?calcite-cemented mud (?). This hard dark material is also seen as coatings on wall and mud-banks and veins in the mud. In places breakdown of the walls has exposed laminated mud, silt and fine sand that form old banks or fill pockets or niches in the walls of the passage. (Photos C011224, C991215, 16).

Mud stalactites

Mud stalactites were seen in several places (see earlier report). Near the junction at the south end of the cave, small carrot-shaped (complete with terminal 'root') mud stalactites are 10cm long and abt 1cm thick and consistently bent to point downstream (Reto Z photo). Hmmm... would stream flow (high stage) bend these without washing them away entirely? Someone thought they could feel a slight air-flow here, but I was dubious. (Do a smoke test ?)

50 m section below the Falls.

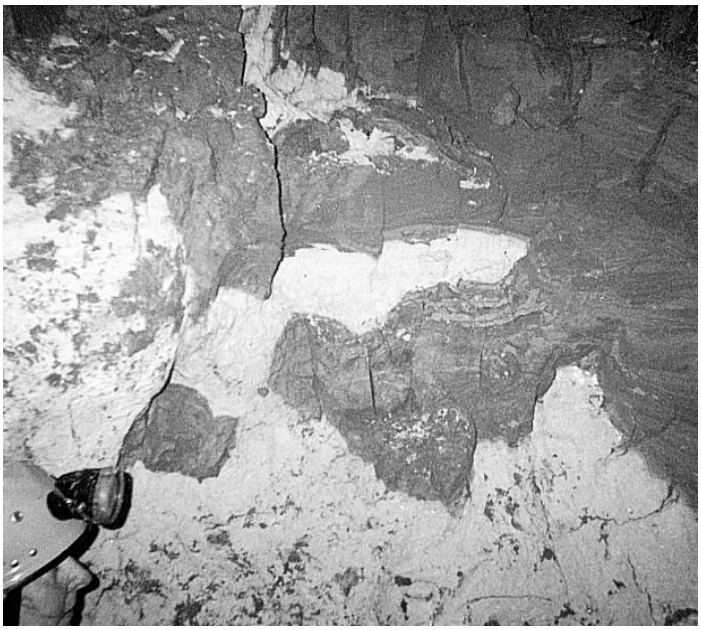
The gradient steepens with a set of alternating chutes and pools (photos C011205, 06). The pools vary from hand-basin up to bath-tub size, with a bigger pool right below the falls, and a large, wide, mud-floored pool at the start of this steep section. The passage is narrower here, and tends to meander. This section is relatively mud-free (strong flows wash it out)

Above the falls.

I ran on quickly for about 50m before turning back as we were behind time. The roof is lower (i.e. the floor is higher!) and the passage is narrower and meanders much more tightly (photos C011202, 03, 04). There is one muddy side-branch and a couple of small side holes. The floor has some small pools and chutes, but is more level than immediately below the falls.

C011208: Bell holes in roof. In section below the falls.

C011206: chutes and pools in the section below the falls.



C011224: Old, laminated, mud and silt filling niches and pockets in the cave wall.