Belmont Valley

In Belmont Valley the eastern side of the valley (see Figure 5) is comprised entirely of Dwyka Group diamictite and products of its breakdown. This was confirmed during the site visit, though it was found that the contact with underlying Witteberg strata was somewhat to the west of the position shown on the map.

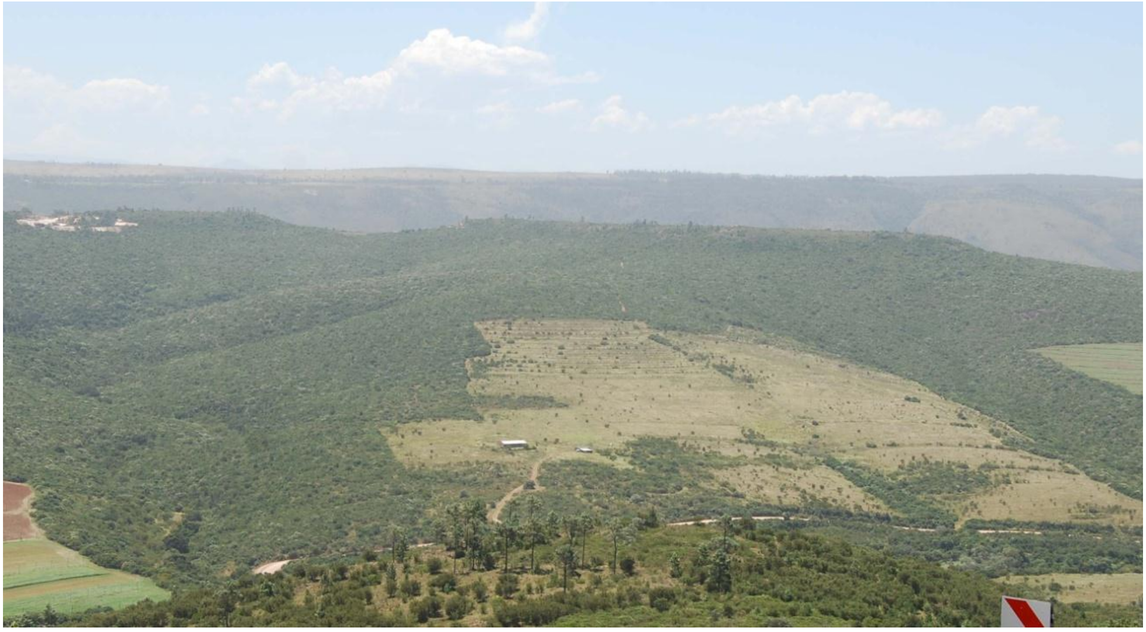

Figure 5. Eastern side of the Belmont Valley development area taken from above the western side of the study area. Note kaolin quarry to the east of the study area (top left of photo).

In the extreme east of the study area (ie. between Fig.3. pt.1 and pt.3) remnants of the silcrete that caps the ridge are encountered. Immediately to the east of the study area this silcrete overlies kaolin clay derived from leached Dwyka diamictite, (see Fig.5). An old kaolin prospecting pit (Fig.3 pt.2, Fig. 7) however reveals that within the study area the Dwyka diamictite, even immediately below the silcrete, is not leached to the grade of kaolin but exists as a crumbly yellowish sub clay.

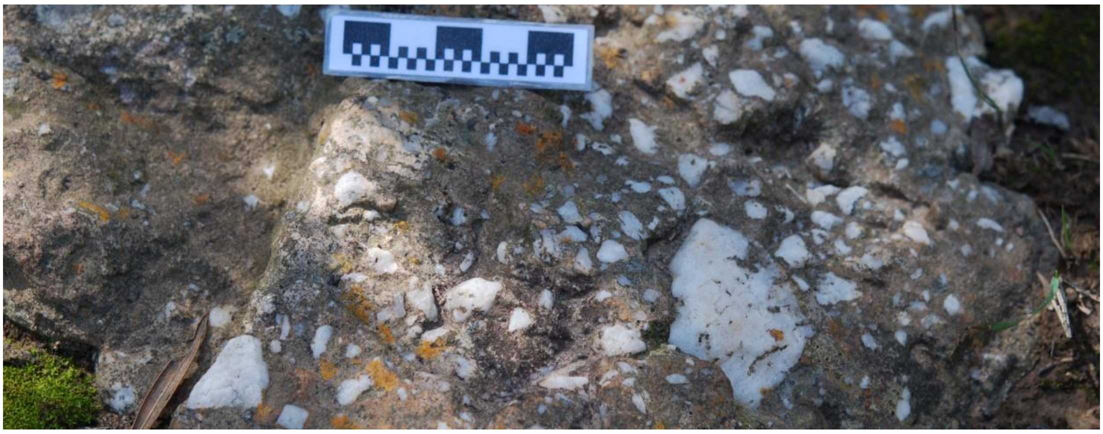

Figure 6. Grahamstown formation silcrete in east of Belmont Valley study area (Fig. 3 pt. 1)

Figure. 7. Crumbly yellow weathered diamictite exposed in a prospecting pit in the extreme east of the study area (Fig. 3 pt.1)

Small outcrops of diamictite are found throughout the western side of the study area, extending to the west of the mapped area. These are well exposed in the roadside sloot at, for example Fig. 3 pt. 4. (Figure 8)

Figure 8. Dwyka diamictite exposed to the west of its mapped outcrop area at Fig.3. pt.4.

The western side of Belmont Valley exposes overturned strata representing the locally stratigraphically uppermost strata of the Witteberg Group and the stratigraphically lowermost deposits of the Dwyka Group (Karroo Supergroup). The contact (red line) between these strata is well exposed in a small quarry (Fig. 3. Pt. 5.).

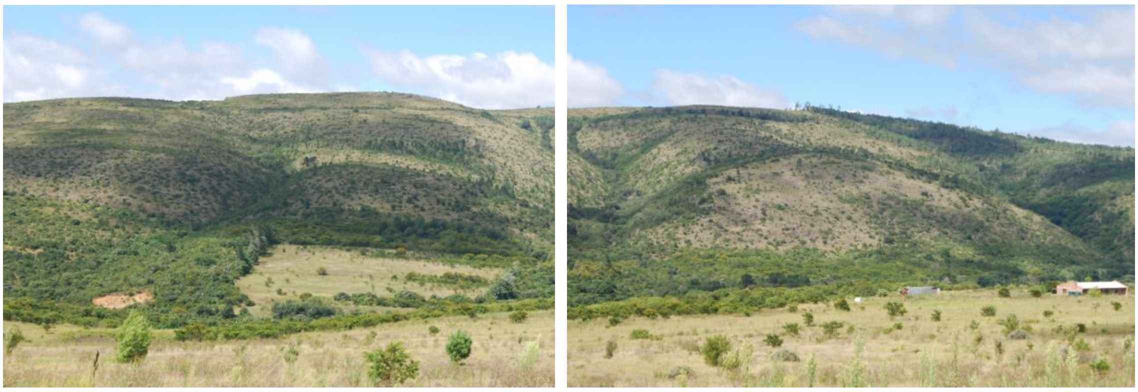

Figure 9 Western side of Belmont Valley area from the eastern side. Development area extends approximately half way up the valley side. Note small quarry at bottom left.

Within this quarry (Fig. 3. Pt. 5.) the strata are near vertical and overturned such that the stratigraphically overlying Dwyka Group deposits physically underlie Witteberg group strata. The adjacent uppermost Witteberg Group strata exhibit overturned ripple cross beds highlighted by iron concentrated in palaeoripple troughs (Fig. 10). Other, more clay rich strata preserve fossilised plant fragments (Fig. 11).

Figure 10: Overturned ripple cross beds preserved in Witteberg Group strata immediately stratigraphically underlying Dwyka Group (at pt.5. Fig. 3) . Scale in centimetres.

Figure 11: Plant fragments preserved in locally uppermost Witteberg Group strata at pt.5 (Fig. 3). Scale bars = 1cm.

Quartzitic strata that define the valley side and that have been mapped as belonging to the upper Lake Mentz subgroup are (eg. Fig. 3 pts. 6 and 7) are also near vertical to overturned (see fig. 12).

Figure 12: Overturned Witteberg Group quartzites exposed at point 7 (Fig. 3)

The most westerly (stratigraphically lowest) quartzites within the study area were considered by the Geological Survey to belong to the Witpoort Formation (lower Lake Mentz Subgroup, Witteberg Group). A reassessment of the local boundary between these units is, however, in great need of revue.

Figure 13: Witteberg quartzite strata in the far west of the study area at point 8 (Fig. 3)

The presence of impressions of mud chip lag deposits in Witteberg strata at point 9 (Fig. 3) suggests probable proximity to a river mouth. No plant stem or bone impressions were, however, observed.

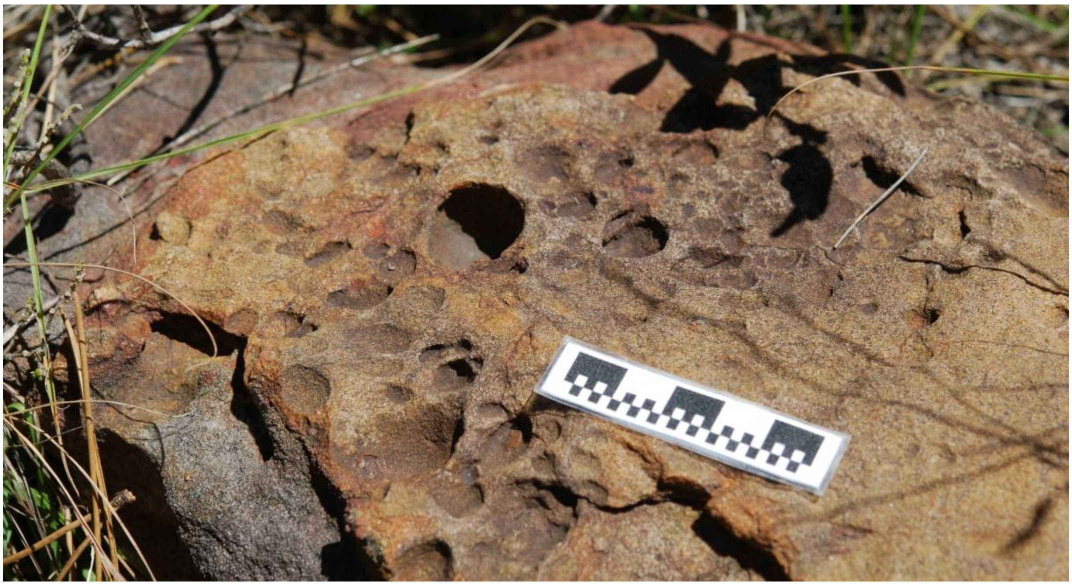

Figure 14: Casts of mud chips, possibly deposited as a lag deposit within shoreline sands near a river mouth.

Conclusions and Recommendations

North of Grahamstown

In the area north of Grahamstown where the current golf course is situated it is extremely unlikely that any significant palaeontological resources will be disturbed at any stage during the project. **Should any suspected fossils be uncovered during construction a palaeontologist should immediately be notified**.

Belmont Valley

It can be said with confidence that within the Belmont Valley study area, all land to the east of the Blaaukrantz River, (chiefly underlain as it is by weathered Dwyka diamictite) has an almost zero likelihood of containing any palaeontological material.

To the **west of the Blaaukrantz River**, however, where Witteberg Group strata underlie the study site, particularly where mudstones and shales are likely to be exposed, (such as between the river and the foot of the hills it is *probable* that plant (and possibly fish) fossils will be disturbed by earth moving activities such as road construction and the landscaping of the proposed golf course. Though the disturbance of such fossils is likely to be *localised*, a particularly significant find could be of *international* importance. Destruction of material would be of a *severe permanent* nature though *long term benefit* could be gained from the discovery of significant new material.

Although it is difficult to numerically quantify potential palaeontological impacts according to standard models it can be said that potential palaeontological impacts to the east of the Blaaukrantz River in Belmont Valley are of *Moderate Significance*. Any negative impact resultant from disturbance of fossiliferous bedrock could be mitigated to a benefit to science if the disturbed material was sampled and studied.

It is therefore recommended that within this restricted area all large scale earthworks including road construction, pond excavation, levelling etc. should be monitored by a palaeontologist.

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