Borroloola Alluvial Diamond Project – Geological Mapping

Geological mapping was undertaken over part of the project area to compile a 1:50,000 scale map of surface geology. The aim of the mapping was to broadly define the nature and extent of the ancient alluvium associated with the former course of the McArthur River. This will provide a base map for further detailed mapping prior to collection of bulk samples for diamond recovery.

Seven geological units were defined that are described below and indicated on Figure 1. Ferricrete occurs throughout but is not included on the map face.

Proterozoic Shale

Highly weathered flat-lying siltstone is exposed in modern drainages. It is not known to which Group this belongs; however, surrounding rocks mapped by the NTGS suggest it is possibly of the Roper Group. Plate 1 shows alluvium overlying the siltstone.

Cretaceous Sandstone

The sandstone is described as a bioturbated, fractured sandstone of the Walker River Formation. The sandstone crops out in modern drainages where the bank has been cut away. Plate 2 shows the sandstone cropping out in a modern drainage with younger alluvium in the foreground.

Gravel Unit (Lower) G1

This unit is described as an unconsolidated clast supported conglomerate. Particles include soil and sand through to rounded cobbles up to approximately 0.10m diameter comprised of white sandstone, quartzite, chert, siltstone, occasional conglomerates and breccias. The origin of the clasts has not been determined and minor variations observed in the field have not been included on the map face. It attains a thickness of greater than 4m (Plate 3) and has a surface area of 4.5 square kilometres.

Gravel Unit (Higher) G2

This unit is also an unconsolidated clast supported conglomerate. It has a clast size <0.05m and comprises red-brown sub-rounded clasts. It overlies G1 and does not contain the larger white cobbles typical of G1. It is restricted

to the eastern side of G1 before probably disappearing beneath the blacksoil further east.

Ferricrete

Ferricrete is observed throughout the area although is typically exposed in outcrop with G1. It is also observed as cobbles and boulders in current drainages. Plate 4 and Plate 5 show the relationship between ferricrete and G1. The ferricrete occurs as probably detrital well sorted cemented pisoliths and also as cemented G1 gravels. It attains a thickness of up to 3m over G1 in parts of the area. Ferricrete and an in-situ laterite profile are also observed in outcrop with Cretaceous sandstone. The type of ferricrete (detrital, in-situ, composition etc) has not been mapped.

Sand and Blacksoil

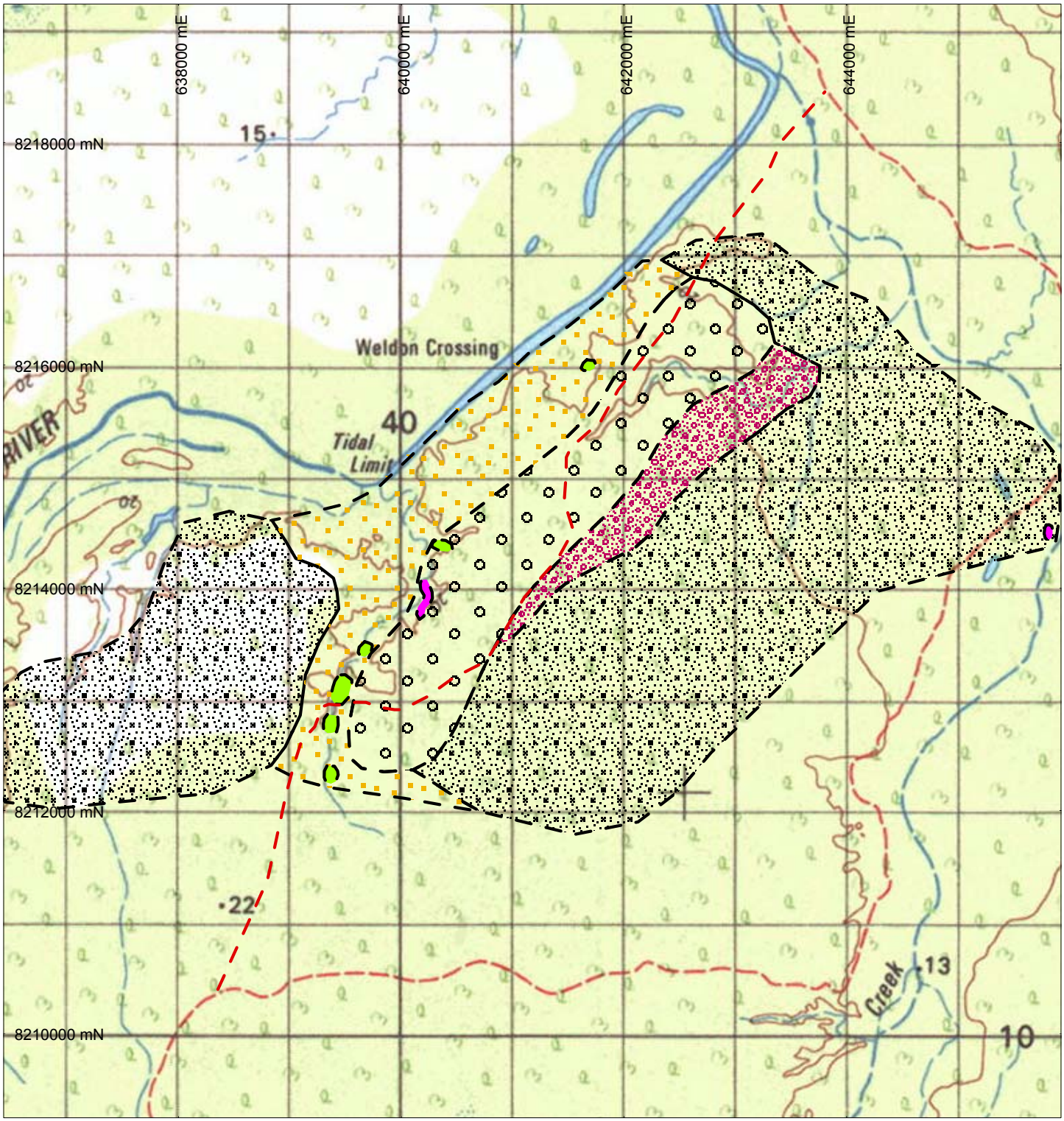
Yellow sand occurs between the G1 gravels and the current McArthur River channel. It attains a thickness of >5m where exposed in erosional gullies that drain toward the McArthur River. Often associated with the sand are abundant iron pisoliths and less abundant flat sub-rounded gravels of various lithology. The gravels also overly the Cretaceous sandstone. Blacksoil is well developed in the east and far west, and is less developed over the central sands. Plate 6 shows sand (and blacksoil) overlying the western boundary of G1.

Palaeostratigraphy

The top of the G1 gravels occurs at approximately 21mRL, which is coincidentally 21m higher than the current base-level of 0mRL (ie upper tidal limit of the McArthur River as indicated on Figure 1). The gravels probably represent stream terrace deposits, which are a relict feature such as a flood plain from a period when the McArthur River flowed at a higher level and has down-cut to the current lower level. They indicate the former course of the McArthur River, which is currently located approximately one kilometre to the west. Plate 7 also shows how in recent times the McArthur River has down-cut and wandered in a north-westerly direction.

In 2006 an east-west line of large diameter drill holes were completed approximately 10km south of where the surface mapping was undertaken. Here the drill holes intersected gravels up to 6m thick beneath thick sand cover at a depth corresponding to approximately 13mRL to 19mRL. It is probable that these gravels continue northward to crop out at the surface as the G1 gravels.

The age of the G1 gravels has not been determined, other than to say that overlying detrital ferricrete indicates a maximum age of the Tertiary lateritisation event(s).



Track

Sand

Blacksoil

Gravel unit (higher)

Gravel Unit (lower) 4.5 sqkm

Cretaceous sandstone

Proterozoic shale

Figure 1 - Local Geology

Borroloola Alluvial Project

Date:26/8/2007	
Author:	
Office:	
Drawing:	
Scale: 1:50000	Projection: AMG Zone 53 (AGD 66)

0 0.75 1.5 3

kilometres

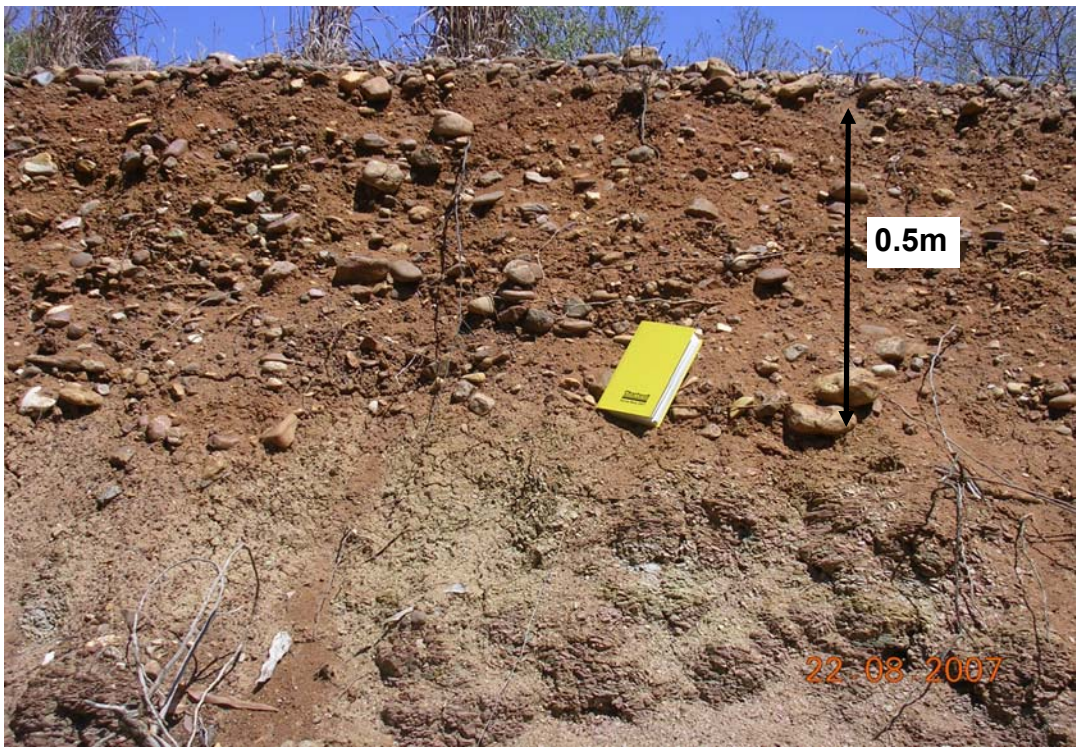


Plate 1. Alluvium overlying Proterozoic shale.

Plate 2. Exposed Cretaceous sandstone in drainage.

Plate 3. Gravel unit G1 exposed in hillside.

Plate 4. Ferricrete and gravel unit G1.

Plate 5. Ferricrete overlying gravel unit G1 (ruler = 0.15m)

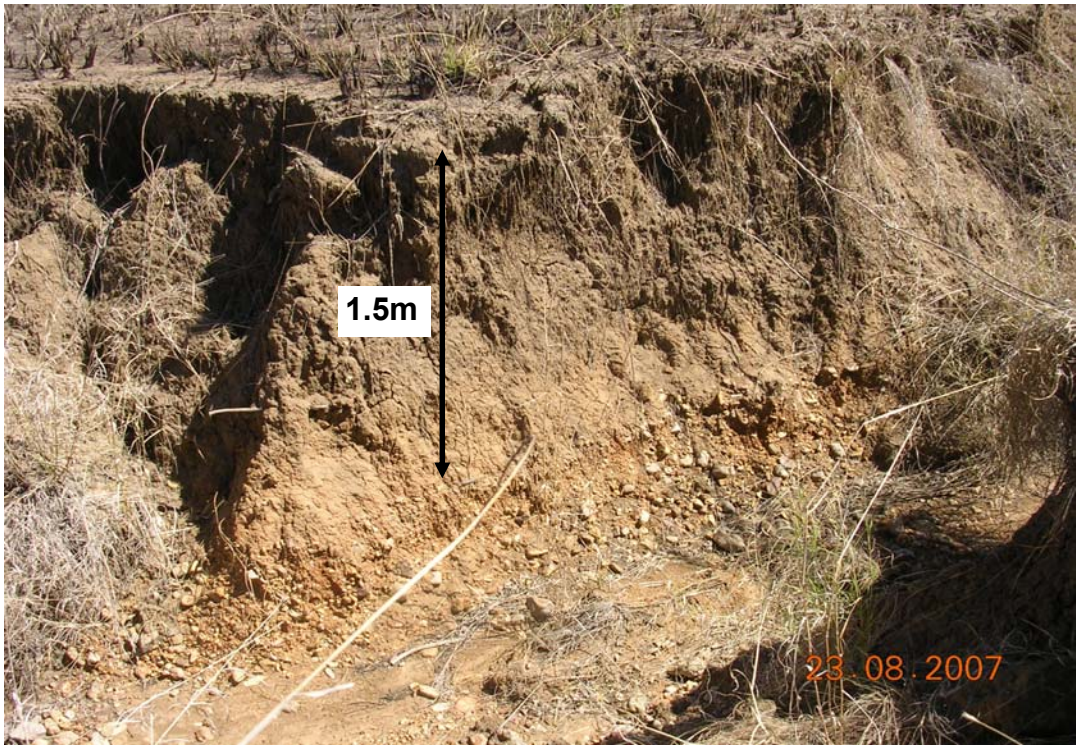


Plate 6. Sand and blacksoil overlying gravel unit G1.

Plate 7. Aerial view showing down-cutting and wandering of McArthur River to northwest during recent times.