Appendix 3.1A

Summary of geological and lithological description, including a grid reference on the Penrith 1:100,000 of each site is given below

Site 1: Mulgoa (GR851569)

The site is operated by Mulgoa Quarries Pty Ltd. It is located within the region where Bringelly shale outcrops with a topography that is dominated by an escarpment to the east of Mulgoa creek which rises to about 25m above the creek bank. At the base of the slope, Bringelly shale is vanishing, and Minchinbury sandstone which is outcropping. At the sampling site, the rocks are 20-22m above the top of the Minchinbury sandstone, a slight regional dip to the east was observed, primarily due to the Lapstone monocline to the west.

At this site, Bringelly shale reaches a maximum thickness of 20m with almost 70% of its lithology comprising claystone. The main lithological units at the site are:

(i) Weathered shale that comprises clays and claystone is of the order of 6m in thickness characterised by red / brown mottled clays with inconsistent occurrences of clays with various shades of grey;
(ii) sandstones are dominant in the central section of the site and sporadic towards the outer part of the site which is mainly composed of laminite and siltstones;
(iii) claystone with minor laminite and sandstone lenses dominates the unit.

Site 2: Horsley Park (GR985542)

The site is operated by Austral Bricks and Pavers Co. Pty Ltd. The rocks present in the site are 35-42m above the top of the Minchinbury sandstone, the bedding at the site is essentially horizontal. The exposed units of interbedded claystone and siltstone are dominant while thin laminite horizons occur throughout with a maximum thickness of 400mm. The detected units are listed in a descending order as follow:

(i) clay, light brown to light grey, mottled throughout, minor ironstone bands throughout with spotted pyrite towards base. Thickness varies from 1to 1.6m;
(ii) claystone varying in thickness between 10m to 12m, the colour changes from light grey at the top to dark grey at the bottom. Generally uniform with minor carbonaceous root traces throughout;
(iii) siltstones generally light grey in colour, regularly alternate with medium grained thin layers of sandstone; and
Site 3: Badgerys Creek (GR926471),

The site is an active quarry pit operated by Boral Bricks (NSW) Pty Ltd. It has its base 15-20m below the existing ground. The topography of the host area is gently to moderately undulating countryside. The site is located within the Bringelly shale where 25-30m of Bringelly shale lie above the Minchinbury sandstone. No investigation was undertaken below the base of the quarry. A typical sequence of Bringelly shale was investigated visually and the unit lithology of the quarry wall was described from the top to the base as follow:

(i) clay, mid orange to red colour with a maximum of 800mm thick. Minor ironstone pigmentation is observed;
(ii) claystone 12m to 15m thick, interbeded by thin sandstone layers with light grey colour and coarse grains; and
(iii) laminites varies in thickness from 0.6 to 1.5m, light to mid grey with minor spotted siderite nodules at the base.

Site 4: Kemps Creek (GR951491)

The site is operated by Brandown Pty Ltd. Based on the geological logs of the site, the shale above the top of the Minchinbury sandstone is available to a depth of 30 to 40m. The depth of the open pit was approximately 12 to 14m below the existing ground. The units comprising Bringelly shale were described as follow:

(i) clay, brown colour with sporadic black spots that are occasionally associated with fine roots throughout, maximum thickness measured at the site was 0.7m;
(ii) claystone, dark grey colour impregnated with black spots, carbonaceous bands occur within claystone. No indication of siderite nodules was detected. Light grey claystone was observed at the base of the lower 5m of the exposed sequence;
(iii) sandstone laminae of 0.15 to 0.25m thick were observed interbeded with dark grey siltstone layers; and
(iv) siltstone, light to medium grey, underlain by claystone with maximum 1m thickness and no evidence of continuity.

These observations were verified from the driller records archived at the administration office at some of the investigated sites. The outcrop sequences have shown that in most cases, fresh shale is dominant after 5m from the ground surface and is best at 8 - 10m depth (Corkery, 1984)
Figure 3.1A location map showing the investigated sites
(1:250,000)

Appendix - 3A