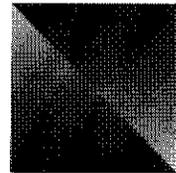
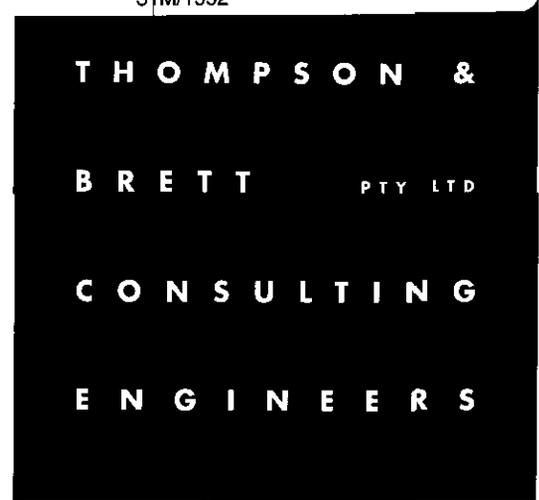


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Merrywood Open Cut, Report on Landslide Activity
and Fine Reject Pond Safety
Merrywood Coal Company Proprietary Limited*; Thom
Anon 31M/1992



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MERRYWOOD COAL CO. PTY. LTD.
MERRYWOOD OPEN CUT
REPORT ON LANDSLIDE ACTIVITY AND
FINE REJECT POND SAFETY

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1. INTRODUCTION

This report has been prepared to discuss two issues at the Merrywood Coal Co's mine at Royal George, as inspected by Mr David Brett on 20th March 1996. These are:

- a) the reactivation and extension of a significant landslide on the eastern side of the central overburden dump, and
- b) the safety of fine reject ponds located on the top of the dump.

2. LANDSLIP

The landslip is located on the western bank of the Merrywood Creek as shown in Figure 1 and Plates 1 and 2. The slide appears to be a reactivation and extension of an historical slide which predates the current mining activity and shows up as a scar on the mapping for Figure 1.

The slide appears to have developed in dolerite talus material on the banks of the creek, which sloped at approximately 25° at the site.

The slide had been recognised some years ago and, with recent haul road construction and overburden dumping, efforts made to ensure the stability of the area by installation of a deep subsoil drain across the mid section of the slip. However, following very heavy rain in February, the slip reactivated over an extended area with displacement in excess of 3m being measured.

This has caused exposure of a significant head scarp and heaving of the toe. Significant tension cracks are evident across the mid-section of the slide.

Anecdotal evidence suggests that the slip has redeveloped due to exceptionally heavy rain, perhaps generating inflow of water along a fault zone through the foundations mid-way along the slip zone. Possibly the

existence of a waste dump above the slide may have contributed but this is unclear at this stage. Contribution to groundwater from reject ponds above the slide is a possible contributory factor but this is considered unlikely.

I considered that the slip will continue moving. The subsoil drain has been destroyed and tension cracks could lead to further water infiltration. Stabilisation by conventional means of drainage and head load removal would involve major earthworks and are considered essentially impractical. The only practical method of stabilisation believed feasible and compatible with mine development is to buttress the slip by specific extension of the overburden dump to fill the Merrywood Creek over the slip zone.

This would involve construction of a "flow through" dump base in the creek utilising selected durable sandstone from overburden removal operations. This material would be dumped over a high face of at least 10 metres, commencing to the north of the slip and proceeding down creek to the southern extremity of the slip. With the inherent coarse nature of this rock, aided by segregation from the high face tipping, a permeable drain would develop in the creek bed, sufficient to allow drainage of the normal creek flow.

The dump design would allow the formation of a pond upstream of this "flow through" structure. This pond would fill during storm flows and drain during dry periods.

Advice from site suggests that the initial hard rock base could be placed within weeks, providing the base to further lifts using general mudstone and tallus fill.

The final dump surface profile would be designed to a stable face slope of a conservative 3 horizontal to 1 vertical and feature benches at 5 metre levels to allow drainage and rehabilitation. The final surface will include a surface

expression of the creek in the event of long term blocking of the drain. A conceptual plan of the dump is presented in Figure 1.

This arrangement will not only stabilise the current slip but allow rationalisation of the dumps at the mine and resolve the current need to construct steep dumps due to insufficient space.

Proper design will also allow better control of water discharge from the site with provision of a major silt trap.

At present only out of date survey information is available. It is suggested that a detailed survey, possibly photogrammetric, is undertaken and dump planning carried out to determine an accurate target land surface.

In the meantime the "flow through" dump base should be constructed as a matter of urgency.

3. FINE REJECT PONDS

A series of fine reject ponds has been developed on the top of an old overburden dump to the west of the Merrywood Creek slip area, as shown in Plate 3. This comprises an arrangement of four main ponds which can be used independently and which overflow to a series of smaller settling ponds.

The arrangement allows settling of fine reject from the washery and clarification of the return water.

The main ponds are clay lined and the smaller ponds are lined with geomembrane.

As the main ponds fill they have, in the past, been raised. However, current practice is to excavate fines and restore the pond.

Water is critical to the plant operation and the ponds appear to have been carefully constructed to prevent water loss. It is thus considered unlikely that water is saturating the underlying foundation and contributing to instability. However this has not been proven and could be possible.

The main pond construction is not ideal with steep batters as shown in Plate 4. Freeboard is limited. However in view of the small quantity of water stored, any failure of the ponds would not cause significant impact below the mining lease.

Once again, as with overburden dumps in general, the current situation seems caused by the limited space available on the site. This could be overcome by the proposed changes to the dumps around Merrywood Creek.

It is recommended that the fine reject dams concept should be reconsidered in line with the proposed overburden dump planning to allow the dams to be relocated away from steep dump batters and designed such that dredging of settled reject is not required.

Time for this redevelopment should be allowed as it is not considered that the ponds are dangerous in the short term.

4. DATE

This report is dated 19 April 1996.

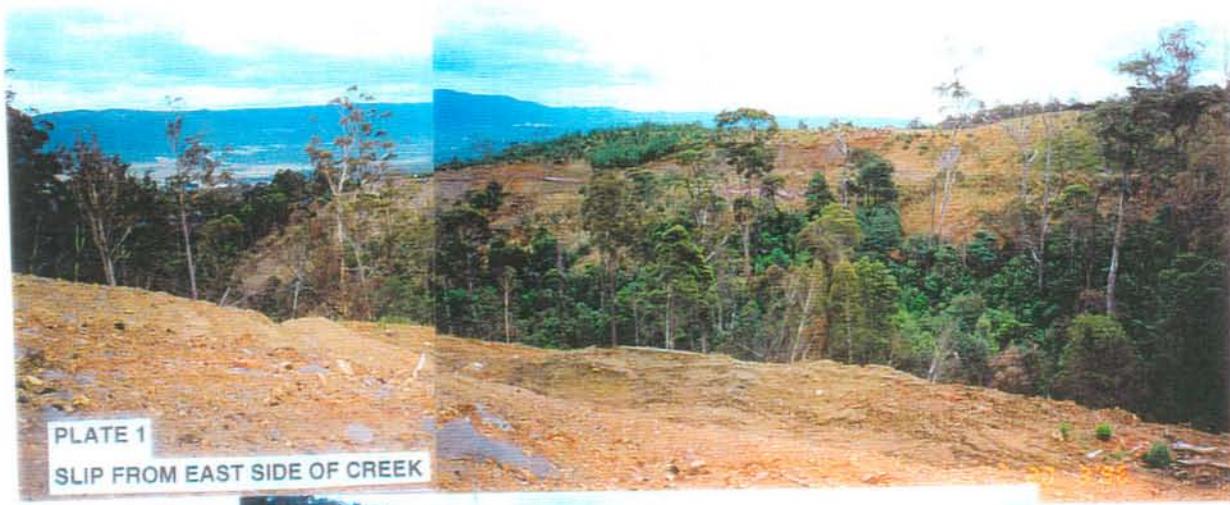


PLATE 1
SLIP FROM EAST SIDE OF CREEK



PLATE 2
SLIP FROM SOUTH

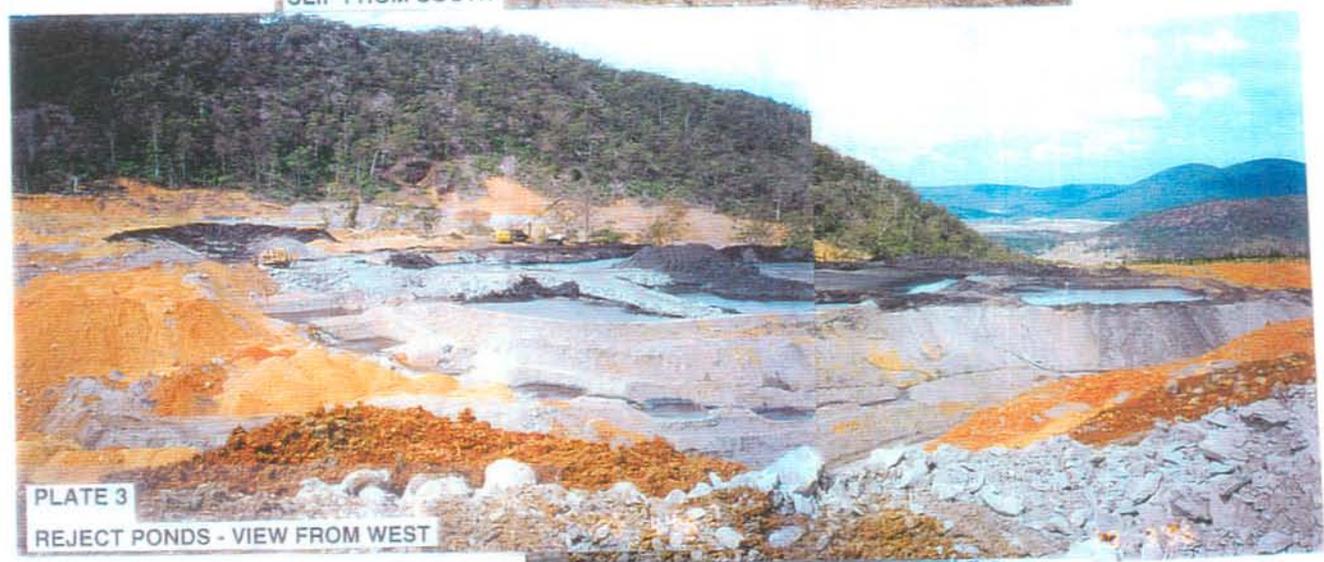


PLATE 3
REJECT PONDS - VIEW FROM WEST

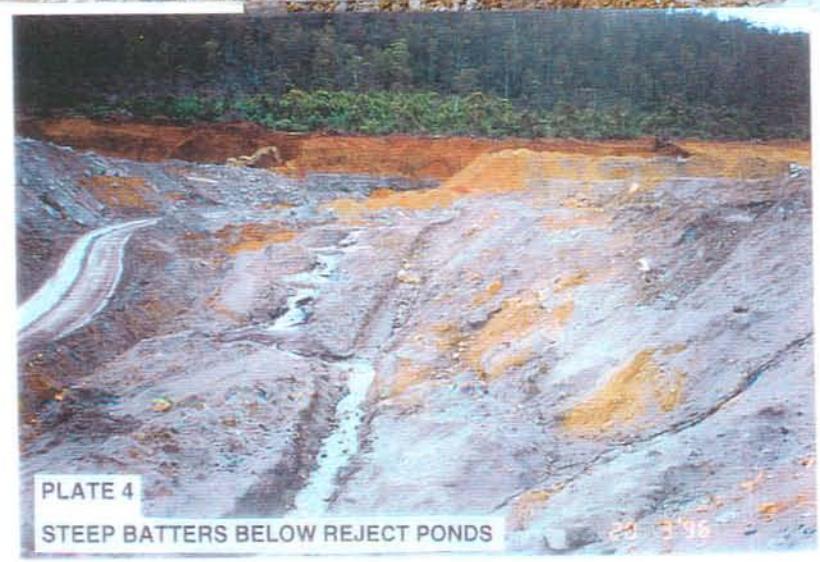


PLATE 4
STEEP BATTERS BELOW REJECT PONDS

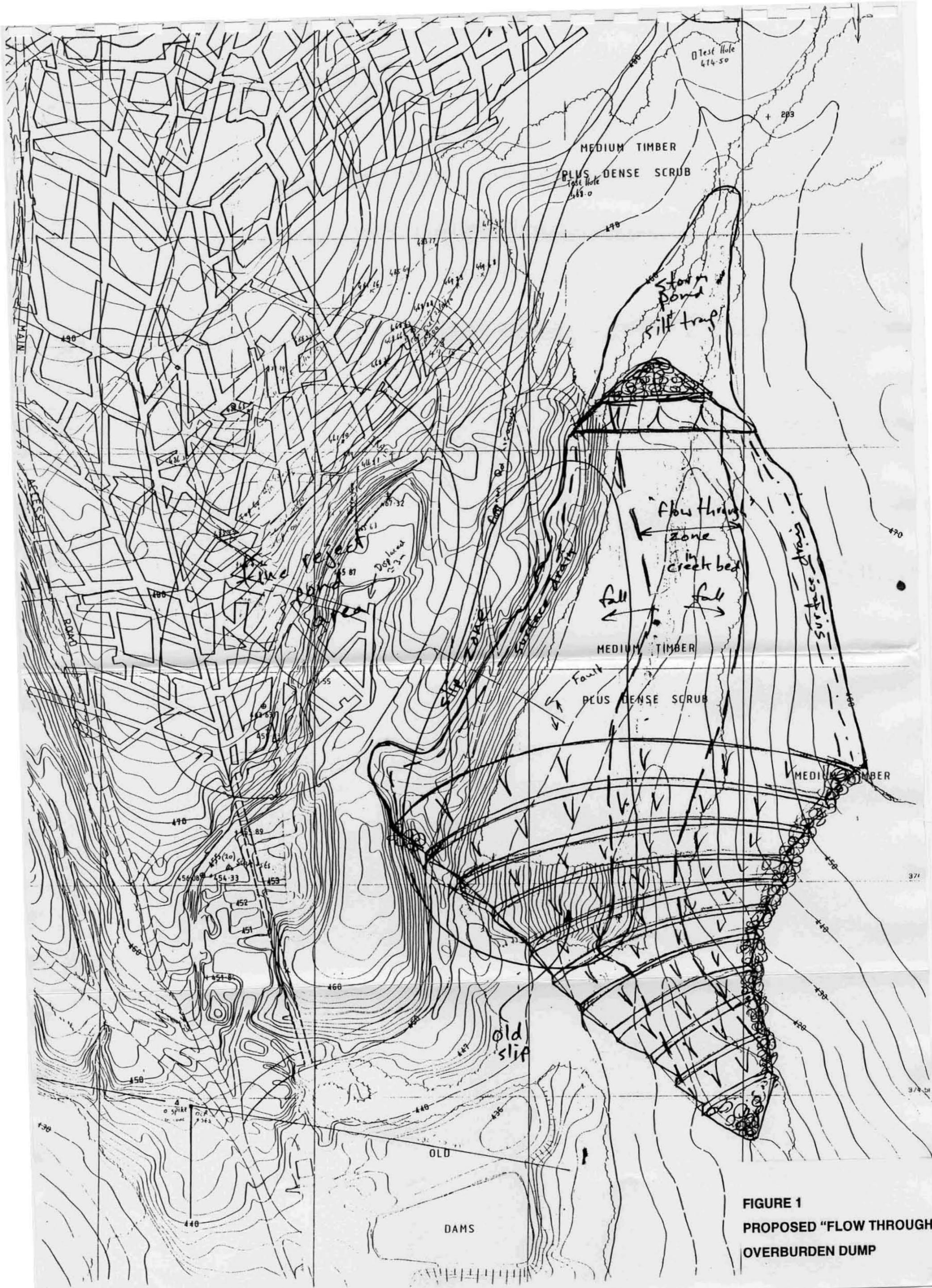


FIGURE 1
PROPOSED "FLOW THROUGH"
OVERBURDEN DUMP