

**metago** Environmental Engineers

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## MEMORANDUM

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**TO:** Katina de Sousa  
**FROM:** Gordon McPhail  
**DATE:** 11 February 2010  
**PROJ NO:** 343-002  
**SUBJECT: NORTHERN WASTE ROCK DUMP – TOE INFRASTRUCTURE**

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Dear Katina,

As requested I attach a schematic indicating the slope profile and toe infrastructure details for the new northern waste rock dump. The details indicated are based on the following:

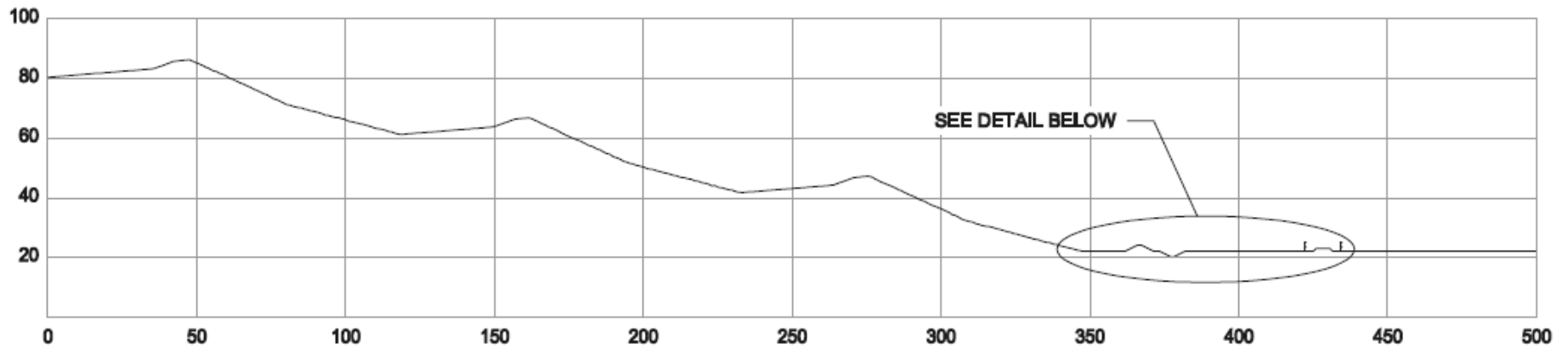
1. A requirement by the Regulator that the infrastructure be located no closer than 40m from the road reserve.
2. A requirement by the Regulator that a storm runoff control trench be provided around the toe of the dump. To this end we have indicated a trench with 1:2 side slopes to reduce maintenance. We have allowed a depth of 2m so as to provide scope for grading the trench so that water will flow around the dump towards the pit area.
3. Concerns expressed during the Regulator workshops about containment and management of erosion from the slopes of the dump. In this respect we have allowed for a 15m wide paddock and toe bund to be provided so as to retain material eroded from the lower-most slope of the dump. This bund and paddock will operate in the same manner as the crest bunds and step-backs on the upper parts of the dump which will retain all runoff and eroded material. The toe bund is formed using material excavated from the toe trench and can be constructed in a single operation.

I trust the above is sufficient for your present purposes and look forward to elaborating on any aspects as necessary.

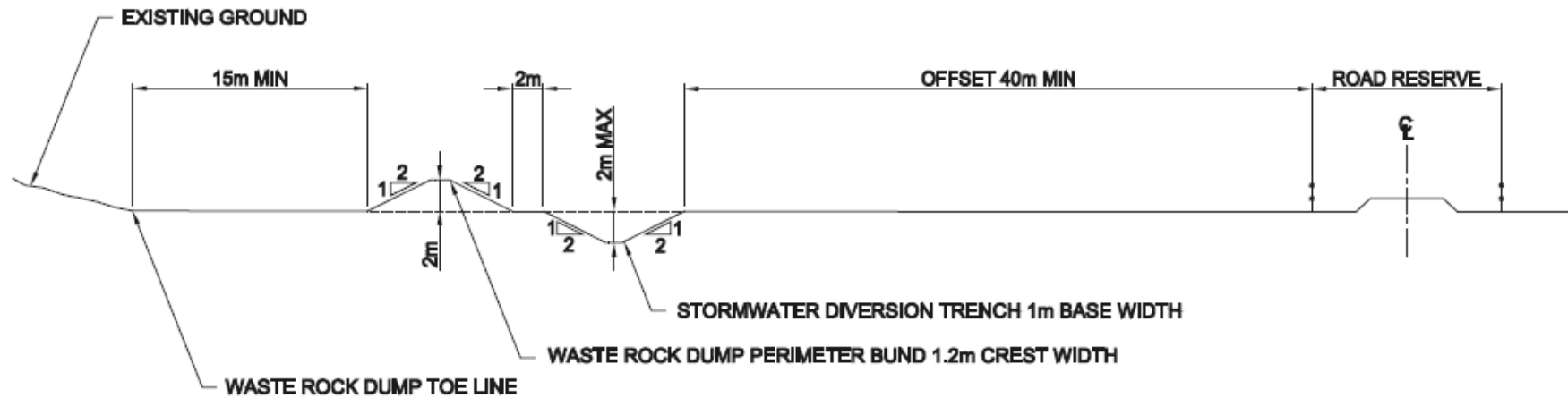
**Dr G I McPhail** MIEAust CPEng

For and on behalf of

*Metago Environmental Engineers (Australia) Pty Ltd*



**TYPICAL SECTION THROUGH NORTH DUMP SLOPE**



**DETAIL AT ROCK DUMP TOE**