Downer's approach into mine haul roads treatment

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ABSTRACT

Mine haul roads play a key and vital role in the mine operation and the production process. Downer has recently been commissioned to maintain the mine haul roads of an iron ore mining company. This paper will discuss the details of the approach taken to tackle the technical challenges including stabilising the wearing course, dust suppressing and surface maintenance. In the first part of the paper the lab investigations will be explored. In order to provide a tailored solution for each site in the mine, the mining site was split into four sections and each one was investigated separately. The soil properties including particle size distribution, plasticity, dry density/moisture content relationships and pH were measured. A Downer proprietary emulsion product was nominated to treat and maintain the haul roads. The optimum amount of the product in the soil was determined by using indirect tensile modulus testing and moisture susceptibility assessment. The application rates for stabilising the top section of the haul roads were calculated based on this approach. In order to sufficiently cap the treated surface, a methodology was developed and the amount of emulsion product was optimised to be economically viable. The capping layer was considered as a thin protective layer for the treated underneath pavement against moisture. It also could provide a better surface for a smoother drive. The two treatments were followed by a daily surface maintenance spraying to provide the quality ride with minimum dust. In the second part of this paper the operational challenges in applying the recommended treatments will be discussed. Also the performance of the haul roads prior and after the treatment will be discussed.

KEYWORDS

Haul road, emulsion, modulus, iron ore, stabilisation, dust suppressing