

# RETENTION OF FREE LIQUIDS IN LANDFILLS UNDERGOING VERTICAL EXPANSION

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**Abstract:** This paper presents the results of an evaluation of the potential release of liquids stored within a waste mass undergoing compression due to a landfill vertical expansion. The mechanism of free liquid generation is initially evaluated and data interpretation methods are developed to estimate the maximum allowable waste thickness that a landfill could reach without releasing liquids stored within the waste. The proposed conceptual framework of free liquid generation is used to evaluate the environmental implications of the vertical expansion of an unlined case history landfill located in southern California. The moisture content of waste in southern California landfills is generally below field capacity. However, if the waste is compressed, its available moisture holding capacity will decrease and its moisture content may eventually reach field capacity. Additional compression beyond this point will squeeze liquid from the waste. Laboratory testing and field characterization programs were undertaken to evaluate the field capacity, the in-situ moisture distribution, and the unit weight profiles of the waste in the case history landfill. These experimental data were used to evaluate the ability of the landfill to continue to retain moisture after continued waste placement. The evaluation indicated that the moisture content of the waste will not reach its field capacity for the proposed final grading of the case history landfill and, therefore, that the liquids should remain within the waste mass after the vertical expansion.

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Full reference:

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