THE DEBRIS FLOW ORIGIN OF THE MISSION DIAMICTON AND ASSOCIATED GEOHAZARDS TO THE CITY OF SANTA BARBARA, CALIFORNIA

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A large debris flow fan, comprised of deposits of the Mission diamicton, associated with the failure of a landslide dam, is recognized in the residential development of the foothills of the City of Santa Barbara, California. The Skofield landslide dam and associated slope failures contributed to the genesis of the Mission diamicton. The Mission diamicton represents multiple episodes of debris flow history and is approximately 8.7 x 10^6 m^3 in volume. Geophysical investigations identified the 8.7-meter average thickness of Mission diamicton piedmont deposits and potential More Ranch – Mission Ridge fault locations. The Skofield landslide failure occurred in bedrock of the Sespe Formation and mobilized overlying fanglomerate. Radiocarbon dating of Mission diamicton deposits indicates the deposits are younger than 1000 ± 40 ka in age. Quantitative geohazard evaluation and spatial analysis of Rattlesnake Canyon were used to identify critical slope orientations for present day slope instability, which allows for the recognition that slope failure, landslide dam formation, and associated debris flows from landslide dam failure pose threats to the City of Santa Barbara and perhaps the Santa Barbara coastal region.