

OPTIMAL TRACE INTERVAL FOR GROUND PENETRATING
RADAR(GPR) MEASUREMENTS ON WASTEWATER
CONTAMINATION

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WASTEWATER CONTAMINATION**

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Ground penetrating radar (GPR) is a geophysical survey tool with many applications for underground detection. An optimal interval that can be used for GPR investigations and get the most reasonable with highly accurate data for different type of soil and frequency. As for now, the practitioners have been using variety trace interval measurement that suit the project or by using own preference as long as the data collected can be used to carry out the project. The issue is that, particularly when the size of the site and the scope of the job are diverse, there is no fixed solution or appropriate interval that can be used when the project is carried out. If trace interval is not practically carried out to grid survey projects, the interval will be inconsistent and scattered, hence resulting in low accuracy level of data. The aim of this research is to study the optimal trace interval for GPR measurements and the objectives are to identify leachate placement radargram images from different GPR measurement traces interval, to produce a c-scan by identifying leachate at different assessment trace intervals and to determine the optimal trace interval for GPR measurement. Methodology of this research used two different frequencies which are 250 MHz and 800 MHz was used to perform the research and to locate the leachate in wastewater contamination to test the optimal trace interval on different type of soil. Five different traces interval was used which are 0.1,0.2,0.3,0.4,0.5 (m) to test the variety of interval that gives different outcomes. Process each data set to get an average measurement to check the most optimal interval for every type of soil. Data processing using ReflexW and leachate migration interpretation was performed on B-Scan data. C-Scan was generated and accuracy was calculated using Root Mean Square Noise(RMSN). The results of this study shows that every type of soil need to has their own optimal trace because of their size in particles that need different interval to ensure that the waves penetrate thoroughly from GPR.

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