

## INTISARI

### **ANALISIS POTENSI LIKUEFAKSI AKIBAT GEMPA BUMI MENGUNAKAN DATA MIKROTREMOR DI KABUPATEN BANTUL, DAERAH ISTIMEWA YOGYAKARTA**

Oleh

Finda Anggraini

19/439135/PA/18958

Kabupaten Bantul memiliki kerentanan terhadap bahaya gempa bumi yang ditimbulkan oleh aktivitas sesar aktif. Kejadian gempa bumi Yogyakarta tahun 2006 yang disebabkan oleh pergerakan Sesar Opak menyebabkan kerusakan parah dan berdampak likuefaksi. Kondisi tersebut membuat Kabupaten Bantul disinyalir memiliki potensi likuefaksi apabila terjadi gempa bumi dengan magnitudo lebih tinggi. Pada penelitian ini, potensi likuefaksi di Kabupaten Bantul bagian selatan dianalisis dengan data mikrotremor pada 34 titik yang diolah menggunakan metode HVSR. Parameter seismik yang diperoleh berupa frekuensi dominan, nilai amplifikasi, indeks kerentanan seismik, dan nilai *Ground Shear Strain* (GSS). Nilai kecepatan gelombang geser pada kedalaman 30 m ( $V_{s30}$ ) dihitung dari hasil inversi HVSR. Analisis potensi likuefaksi diperoleh dari dua pendekatan yaitu pembobotan metode *Simple Additive Weighting* dengan parameter nilai GSS,  $V_{s30}$ , dan muka air tanah serta pendekatan berdasarkan nilai *Factor of Safety* terhadap kedalaman dan ketebalan lapisan yang mampu terlikuefaksi. Hasil penelitian menunjukkan area yang berpotensi tinggi berada di bagian barat daya, tengah, hingga timur daerah penelitian dengan ketebalan lapisan yang mampu terlikuefaksi cukup tebal, sedangkan area berpotensi likuefaksi rendah berada di bagian tenggara dan barat laut daerah penelitian.

**Kata Kunci:** Likuefaksi, Mikrotremor, *Simple Additive Weighting*, *Factor of Safety*

## ABSTRACT

### ***ANALYSIS OF LIQUEFACTION POTENTIAL DUE TO EARTHQUAKES USING MICROTREMOR DATA IN BANTUL REGENCY, SPECIAL REGION OF YOGYAKARTA***

By

Finda Anggraini

19/439135/PA/18958

Bantul Regency has a vulnerability to earthquake hazards caused by active fault activities. The Yogyakarta earthquake in 2006 caused severe damage and caused liquefaction. These conditions make Bantul Regency estimated to have the potential for liquefaction if an earthquake with a higher magnitude occurs. In this study, the potential for liquefaction in the southern part of Bantul Regency was analyzed using microtremor data at 34 points which were processed using the HVSR method. The seismic parameters obtained are dominant frequency, amplification value, seismic susceptibility index, and Ground Shear Strain value. The value of the shear wave velocity at a depth of 30 m ( $V_{s30}$ ) is calculated from the results of the HVSR inversion. Analysis of liquefaction potential was obtained from two approaches, namely the Simple Additive Weighting method with GSS,  $V_{s30}$ , and groundwater table parameters and an approach based on the Factor of Safety value for the depth and thickness of layers that are capable of liquefaction. The results showed that areas with high potential are located in the southwestern, central, and eastern parts of the study area with a thick layer capable of liquefaction, while areas with low potential are located in the southeast and northwest of the study area.

**Keyword:** Liquefaction, Microtremor, *Simple Additive Weighting*, *Factor of Safety*