

## ABSTRAK

### PENENTUAN LOKASI LAYAK *LANDFILL* DAN RUTE OPTIMAL PENGANGKUTAN LIMBAH INDUSTRI NON-B3 BERBASIS SIG DI KABUPATEN KARAWANG

Oleh

**NURHIDAYAH**

Pengelolaan limbah industri non-B3 di Kabupaten Karawang masih menghadapi berbagai kendala, terutama keterbatasan fasilitas pengolahan dan penimbunan akhir (*landfill*). Hingga saat ini, belum terdapat informasi resmi mengenai keberadaan fasilitas *landfill* khusus limbah non-B3 di wilayah ini. Serta belum adanya perencanaan rute pengangkutan limbah yang efisien. Tujuan penelitian adalah menghasilkan peta lokasi layak *landfill* untuk limbah industri non-B3 dan rute yang optimal dengan mempertimbangkan berbagai kriteria spasial dan lingkungan untuk mendukung perencanaan tata ruang yang berkelanjutan.

Data yang digunakan meliputi lima kriteria utama yaitu penggunaan lahan, kemiringan lereng, jarak dari permukiman, jarak dari badan air, dan jarak dari jalan. Bobot kriteria diperoleh melalui metode pembobotan AHP berdasarkan evaluasi para ahli atau responden. Metode yang digunakan adalah *Weighted Overlay* dengan pembobotan *Analytical Hierarchy Process* (AHP) dan *Network Analysis* dalam Sistem Informasi Geografis (SIG).

Hasil penelitian berdasarkan analisis spasial menggunakan metode *weighted overlay* dengan pembobotan *Analytical Hierarchy Process* (AHP), lokasi layak *landfill* limbah industri non-B3 di Kabupaten Karawang terbagi ke dalam tiga kelas, yaitu Layak seluas 2.618,75 ha, Cukup Layak 99.239,09 ha, dan Tidak Layak 89.681,25 ha. Kelas Layak hanya tersebar pada beberapa kecamatan, yaitu Ciampel (1.390,62 ha), Pangkalan (800,97 ha), Tegalwaru (208,39 ha), Telukjambe Barat (129,02 ha), Klari (53,12 ha), dan Telukjambe Timur (36,63 ha). Selanjutnya, rute optimal pengangkutan limbah industri non-B3 ditentukan menggunakan metode *Network Analysis* dengan pendekatan *shortest path*, dengan rute terpendek berasal dari Kawasan Industri KJIE menuju Kecamatan Telukjambe Barat sejauh 6,2 km (12 menit), sedangkan dari KIIC dan Surya Cipta masing-masing sejauh 13,6 km (27 menit) dan 16,5 km (33 menit).

**Kata kunci:** *Landfill* non-B3, Sistem Informasi Geografis (SIG), *Weighted Overlay*, *Analytical Hierarchy Process* (AHP), *Network Analysis*.

## ABSTRACT

### DETERMINATION OF SUITABLE LANDFILL LOCATION AND OPTIMAL TRANSPORTATION ROUTE FOR NON-HAZARDOUS INDUSTRIAL WASTE BASED ON GIS IN KARAWANG REGENCY

By

**NURHIDAYAH**

The management of non-B3 industrial waste in Karawang Regency still faces various challenges, particularly the limited availability of processing facilities and final disposal sites (landfills). To date, there is no official information regarding the existence of landfills specifically for non-B3 waste in this area. Additionally, there is no efficient waste transportation route planning. The aim of this study is to produce a map of suitable landfill locations for non-B3 industrial waste and the optimal routes, taking into account various spatial and environmental criteria to support sustainable spatial planning. The methods used are Weighted Overlay with Analytical Hierarchy Process (AHP) weighting and Network Analysis within Geographic Information Systems (GIS). The data used include five main criteria: land use, slope, distance from settlements, distance from water bodies, and distance from roads. The criteria weights were obtained through the AHP weighting method based on expert evaluations or respondent input. The results of the study based on spatial analysis using the weighted overlay method with Analytical Hierarchy Process (AHP) weighting indicate that suitable landfill locations for non-hazardous industrial waste (non-B3) in Karawang Regency are classified into three suitability classes, namely Suitable covering 2,618.75 ha, Moderately Suitable 99,239.09 ha, and Unsuitable 89,681.25 ha. Suitable areas are only distributed in several districts, namely Ciampel (1,390.62 ha), Pangkalan (800.97 ha), Tegalwaru (208.39 ha), Telukjambe Barat (129.02 ha), Klari (53.12 ha), and Telukjambe Timur (36.63 ha). Furthermore, the optimal transportation routes for non-B3 industrial waste were determined using Network Analysis with a shortest path approach, where the shortest route originates from the KJIE Industrial Area to Telukjambe Barat District with a distance of 6.2 km (12 minutes), while routes from the KIIC and Surya Cipta Industrial Areas measure 13.6 km (27 minutes) and 16.5 km (33 minutes), respectively.

**Keywords:** Non-B3 landfill, Geographic Information System (GIS), Weighted Overlay, Analytical Hierarchy Process (AHP), Network Analysis.