

# RISK ANALYSIS OF H<sub>2</sub>S AND NH<sub>3</sub> EXPOSURE TO LOCAL COMMUNITY AROUND BENOWO LANDFILL IN 2023

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## ABSTRACT

The final waste processing in Indonesia utilizes a landfill system, with 65% of waste management implementing this method. Benowo landfill adopts this system, which has drawbacks such as the production of H<sub>2</sub>S and NH<sub>3</sub> gases. The objective of this research is to determine the level of health risks faced by the community residing in the vicinity of Benowo landfill

A quantitative descriptive was used in this study as design approach, cross sectional was conducted at one time and the method of Risk Analysis Environmental Health (ARKL) samples were taken to 93 housewives ladder with Simple random sampling technique. H<sub>2</sub>S air sampling and NH<sub>3</sub> was carried out at 2 points of places. The independent variables of this research were the concentration of H<sub>2</sub>S and NH<sub>3</sub> gas in the Benowo landfill environment, body weight, age, exposure time, duration of exposure, frequency of exposure, intake, average time period, Rfc value, temperature, humidity, wind direction, wind speed. The dependent variable was the RQ value H<sub>2</sub>S and NH<sub>3</sub>. The data analysis method used was univariate analysis and ARKL. If the value of RQ > 1 then the health was not safe while RQ ≤ 1, it was still said to be safe.

The results of this study showed that the concentration of H<sub>2</sub>S gas was 0.02 ppm and NH<sub>3</sub> 0.006 ppm. It was still below the quality standard in East Java Governor Regulation No. 10 year 2009 concerning ambient air quality standards and emissions from immovable sources in East Java which is 0.03 ppm for H<sub>2</sub>S and 2.00 ppm for NH<sub>3</sub>. Value of RfC were 0.002 mg/m<sup>3</sup> for H<sub>2</sub>S and 0.5 mg/m<sup>3</sup> for NH<sub>3</sub>. RQ H<sub>2</sub>S value > 1 was not safe meanwhile RQ NH<sub>3</sub> value ≤ 1 was still safe for the people lived around Benowo landfill.

The conclusion of this study showed that people lived near Benowo landfill were at risk of H<sub>2</sub>S gas while NH<sub>3</sub> was not risk for the people health. The suggestion for the people who lived in community was better and safer to wear a mask in Benowo landfill environment, and local government should be able to carry out the risk management through related agencies to the people lived near Benowo landfill area.

**Keywords** : Risk analysis, Exposure H<sub>2</sub>S and NH<sub>3</sub>, Community, TPA Benowo  
**Reading list** : 58 Books and Journal (1999-2022)

# ANALISIS RISIKO PAJANAN H<sub>2</sub>S DAN NH<sub>3</sub> TERHADAP MASYARAKAT DI LINGKUNGAN TPA BENOWO TAHUN 2023

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## ABSTRAK

Pengolahan sampah akhir di Indonesia 65% menerapkan sistem *landfill*. TPA Benowo menggunakan sistem tersebut, dimana kelemahannya menghasilkan gas H<sub>2</sub>S dan NH<sub>3</sub>. Tujuan penelitian ini adalah menetapkan tingkat risiko kesehatan masyarakat yang menetap di lingkungan TPA Benowo.

Penelitian ini menggunakan desain deskriptif kuantitatif dengan pendekatan *cross sectional* yang dilakukan dalam satu waktu dan metode Analisis Risiko Kesehatan Lingkungan (ARKL) Sampel yang diambil sebanyak 93 ibu rumah tangga dengan teknik *Simple random sampling*. Pengambilan sampel udara H<sub>2</sub>S dan NH<sub>3</sub> dilakukan di 2 titik. Variabel bebas penelitian ini adalah Konsentrasi gas H<sub>2</sub>S dan NH<sub>3</sub> di lingkungan TPA Benowo, berat badan, umur, waktu pajanan, durasi pajanan, frekuensi pajanan, intake, periode waktu rata-rata, nilai R<sub>fc</sub>, suhu, kelembaban, arah angin, kecepatan angin, dan variabel terikatnya adalah nilai RQ H<sub>2</sub>S dan NH<sub>3</sub>. Metode analisis data yang digunakan adalah analisis univariat dan ARKL jika nilai RQ > 1 maka tidak aman sedangkan RQ ≤ 1 masih dikatakan aman.

Hasil penelitian menunjukkan konsentrasi gas H<sub>2</sub>S 0,02 ppm dan NH<sub>3</sub> 0,006 ppm masih dibawah baku mutu Peraturan Gubernur Jawa Timur No 10 Tahun 2009 tentang baku mutu udara ambien dan emisi sumber tidak bergerak di Jawa Timur H<sub>2</sub>S 0,03 ppm dan NH<sub>3</sub> 2,00 ppm. Nilai R<sub>fc</sub> H<sub>2</sub>S 0,002 mg/m<sup>3</sup> dan NH<sub>3</sub> 0,5 mg/m<sup>3</sup>. Nilai RQ H<sub>2</sub>S > 1 tidak aman dan nilai RQ NH<sub>3</sub> ≤ 1 masih aman bagi masyarakat.

Kesimpulan penelitian ini adalah gas H<sub>2</sub>S berisiko dan NH<sub>3</sub> tidak berisiko terhadap masyarakat di lingkungan TPA Benowo. Saran pada masyarakat sebaiknya menggunakan masker di lingkungan TPA Benowo dan bagi instansi terkait agar dapat melakukan pengelolaan risiko di lingkungan TPA Benowo.

**Kata Kunci** : Analisis risiko, pajanan H<sub>2</sub>S dan NH<sub>3</sub>, Masyarakat, TPA Benowo  
**Daftar Bacaan**: 58 buku dan jurnal (1999-2022)