GROUNDWATER POLLUTION AND LEACHATE CHARACTERIZATION FROM SELECTED WASTE DISPOSAL FACILITIES IN REGION 1

INTRODUCTION

Waste management is everybody's concern. Mismanaged wastes usually results to health risks and pose environmental consequences which may include groundwater and surface water contamination, local flooding, air pollution, exposure to toxicants and spread of diseases.

Landfills are point sources of pollution .In the landfill, anything happens. The wastes are dumped, then covered with soil, and if wastes dumped are not segregated, these would produce l eachate of varying amounts and concentrations. Out of 125 waste disposal facilities in Region I, only 16 are functional sanitary landfills.

The minimum criteria for the establishment of sanitary landfill should include a clay liner, leachate collection and leachate systems, gas control recovery systems, ground monitoring well, cover, closure procedure and post closure procedure (RA 9003).

OBJECTIVES

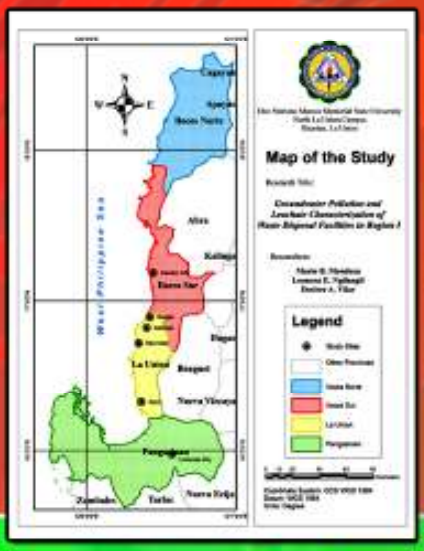
General Objective: To determine the concentration of primary pollutants in groundwater and to characterize leachate quality from waste disposal facilities in Region I.

Specific Objectives:

To determine the groundwater quality of tube wells adjacent or near the landfill in terms of physic-chemical and biological quality parameters;

To characterize leachate quality in terms of pH, chemical oxygen demand, total nitrogen, and toxic metals such as Cadmium, chromium, copper, lead, and mercury;

To find out whether the physic-chemical and biological parameters conform to environmental quality standards.



METHODOLOGY

Leachate Sampling

Groundwater Sampling

RESULTS

Groundwater Quality

1.Temperature of the Groundwater (GW) samples ranged from 26.2 degrees centigrade to 32.2 degrees centigrade which were found normal.

2.Urdaneta groundwater monitoring wells during the 2nd sampling were found turbid due to conditions made during the sampling period. Except for one well each from Bangar and Bacnotan, turbidity values conformed to the standard of 5 NTU.

3. Conductivity values for GW samples were found high though no limit for this parameter.

4. There were slight deviations from standard values of the ground water samples obtained from Bacnotan, Bangar and Balaoan which make them slightly acidic. pH values should range between 6.5 to 8.5.

5. High values for total dissolved solids were d etermined from GW samples of Candon and Bangar.
Both stations exceeded the PNSDW limit of 500 mg/L.

6. Nitrate value and total phosphorous in GW well in Agoo was found above the standard value of 50 mg/L.

7. Only four stations of the study sites conformed to PNSDW standards in terms of total coliforms while seven stations conformed in terms of fecal coliforms.

Leachate Quality

The Chemical quality parameters and metal concentration (cadmium, chromium, copper, lead and mercury) of the leachate water conformed to the quality standards set by DAO 35, Class C waters.

Leachate soil from Bacnotan SLF did not conform to Dutch Reference target values in terms of cadmium and copper.

CONCLUSIONS

Ground water quality in areas adjacent or near waste disposal facilities is no longer fit for drinking purposes due to the presence of pathogenic microorganisms.

Leachate samples contain organics, and trace amounts of toxic metals which could potentially contaminate the groundwater .

RECOMMENDATION

Constant monitoring of the ground water and leachate quality is highly recommended to reduce health risks .

Researchers: MARIO B.MENDOZA, LEONORA E. NGILANGIL & DESIREE A. VILAR

Korea Environment Corporation