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ASSESSMENT OF LEACHATE ANALYSIS

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ABSTRACT

Landfill leachates are potential threats for environmental degradation. This study was conducted to determine the leachate quality, to identify the dominant pollutants and to evaluate the leachate pollution potential of an active and closed dumping ground of an uncontrolled municipal solid waste (MSW) landfill, India using leachate pollution index. One of the biggest problems associated with the dumping of solid waste is managing leachate that is formed when water passes through the deposited waste. It contains products of decomposition of organic matter and soluble ions which present a potential pollution threat for the surrounding soil, surface and ground waters. The monitoring that was carried out at the landfill specialized in leachate, groundwater and surface water. Sanitary landfills have been the most popular methods of municipal solid waste disposal for the last decades, all over the world, but waste management policy has been greatly turned toward waste minimizing and reuse. Incineration and energy recovery play an important role in waste reduction and energy conversion.

KEYWORDS – *Landfill Leachates, Leachate Quality, Municipal Solid Waste(MSW), Ground Water, Incineration and energy recovery.*

INTRODUCTION

Municipal solid waste landfills are major contamination threats to water body's resources throughout the world. Increased population growth particularly in the cities due to various reasons and development and growth of industries in the manufacturing hubs of the country significantly contributed to the increased solid waste generation per capita per day. The daily solid waste per capita has been documented by various investigators though their estimates vary. Also, due to improper waste disposal and collection systems

dwellers are facing negative environmental impacts in Indian cities. The major problems facing in the municipal solid waste management is related to the production and treatment of the landfill leachate (B. P. Naveen et. al, 2014).

From the landfill sites, the leachate, a contaminated liquid, varying in composition and characteristics seeps out and percolate through the underlying soils contaminating the groundwater resources. This leachate consists of inorganic and organic compounds as well as suspended particles. Based on the climatic conditions the leachate flow drastically increases (during rainy season) or reduce (during dry season).

The municipal solid waste landfill leachate discharge may cause environmental degradation of soil and water resources especially when the landfill are not scientifically design mainly the design and specification of liners used in this landfill. The organic matter present in the MSW undergoes degradation mainly due to the physical, chemical and biological processes contribute to the damage to the liners leading to leakage of the leachate to the soil and ultimately to the water bodies (A.Idris et ai, 2004). As the solid wastes of different composition are dumped daily over an area, the solid waste composition varies from location to location within the landfill and also it varies with respect to time at the same locations within the landfill sites. Which leads to leachate discharge of the different composition and characteristics with respect to space and time. Also, the rainfall amounts occurring over the landfill sites also contribute to variation in the leachate composition. The leachate characteristics mainly depends of MSW penetration such as segregation of dry waste like metals, plastic, batteries, paper, cardboard, glass, rubber, leather, etc.

- **Problem Statement**

Problem of this particular study is to find answers to the research questions which are, a) It is useful for farming or plant growth? b) it is safe for environment or not?

- **OBEJECTIVES**

The objectives of the study as follows,

- a) Selection of site
- b) To collect the sample
- c) To analyse the sample or taking test on sample
- d) Interpretation of results
- e) To suggest possible solution

- **METHODOLOGY**

The methodology of the project work is classified into three major steps.

The first one is the sample collection, the second one is the sample analysis and last step is to recommend whether it is useful or not

1. Sample collection from Nashik Waste Management, Nashik Muncipal Corporation, Nashik (Sample collection from onsite visit)

2. Sample Testing at Water Quality Laboratory Level 2, Jalvinyan Bhavan, Dindori, Nashik.

3. Conclusion - whether it is useful or not?



• RESULTS

Sr No	Parameters	Results	Acceptable limits (IS 10500,2012)	Permissible limit in the absence of alternate source	Units
Physiochemical Analysis					
1	Ph	4.43	6.5- 8.5	No relaxation	---
2	Turbidity	960	1	5	N.T.U
3	Suspended solids	57500	---	---	Mg/lit
4	Total dissolved solids	94000	500	2000	Mg/lit
5	Chloride (as Cl)	4266	250	1000	Mg/lit
6	Alkalinity (as CaCO ₃)	26100	200	600	Mg/lit
7	Total hardness (as CaCO ₃)	69222	200	600	Mg/lit
8	Calcium (as Ca)	20758	75	200	Mg/lit
9	Iron (as Fe)	3.20	0.3	No relaxation	Mg/lit
10	Boron (as B)	5.91	0.5	1.0	Mg/lit
11	Sulphate (as SO ₄)	1114	200	400	Mg/lit
12	Fluoride (as F)	3.50	1.0	1.5	Mg/lit
13	Nitrate (as NO ₃)	82.7	45	No relaxation	Mg/lit
Bacteriological Analysis					
14	Total coliforms	1.600 X 10 ⁶	*	*	MPN Index/100 ml
15	Faecal coliforms	5.40 X 10 ⁵	*	*	MPN Index/100 ml
<ul style="list-style-type: none"> • Standards for bacteriological examination as per IS 10500: 2012 Shall not be detected in any 100 ml sample. • ND = Not Detectable. 					

• CONCLUSION

1. From above results, we can conclude following points. Treatment to Leachate at treatment plant is not enough to treat the water.
2. Another source of water supply shall be provided to nearby area around disposal site.
3. Leachate after treatment is not able to clean naturally.
4. People using this water for irrigation purpose, is very dangerous for human health and can cause severe disease.
5. Monitoring well shall be established around disposal site for daily monitoring of ground water as well as surface water at prominent places.

● REFERANCE

1. Aghazadeh, N. & Mogaddam, A. A. (2010). Assessment of groundwater quality and its suitability for drinking and agricultural uses in the Oshnevieh Area, northwest of Iran. *Journal of Environmental Protection*, 1, 30-40.
2. Amra Serdarevic. *Landfill Leachate Management – Control and Treatment*.
3. Aderemi Adeolu O.1, Oriaku Ada V.2 , Adewumi Gbenga A.2 and Otitoloju Adebayo A.1. Assessment of groundwater contamination by leachate near a municipal solid waste landfill. *African Journal of Environmental Science and Technology Vol. 5(11), pp. 933-940, November 2011*.
4. Albert C. Ibezute, And Osarumwense Erhunmwunse. Assessment of Leachate Characteristics and Pollution Index of Ikhueniro Dumpsite in Benin City, Edo State, Nigeria. *IOSR Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT) e-ISSN: 2319-2402,p- ISSN: 2319-2399. Volume 12, Issue 6 Ver. I (June. 2018)*,
5. Barjinder Bhalla¹, M.S. Saini, M.K. Jha Scientist C, Pushpa Gujral Science City, Kapurthala-144601, Punjab, India Director, Guru Nanak Dev Engineering College, Ludhiana-141006, Punjab, India Professor, Department of Chemical Engineering, Dr.B.R. Ambedkar National Institute of Technology, Jalandhar144011, Punjab, India .Assessment of Municipal Solid Waste Landfill Leachate Treatment Efficiency by Leachate Pollution Index.(An ISO 3297: 2007 Certified Organization) *Vol. 3, Issue 1, January 2014*
6. Barjinder Bhalla, M.S. Saini, M.K. Jha Scientist C, Pushpa Gujral Science City, Jalandhar-Kapurthala Highway, Kapurthala-144601, Punjab, India. Director, Guru Nanak Dev Engineering College, Ludhiana- 141006, Punjab, India. Professor, Department of Chemical Engineering, Dr.B.R.Ambedkar National Institute of Technology, Jalandhar144011, Punjab, India.Characterization of Leachate from Municipal Solid Waste (MSW) Landfilling Sites of Ludhiana, India: A Comparative Study. *Vol. 2, Issue 6, November- December 2012*.
7. Bidhendi, M. E., Karbassi, A. R., Baghvand, A., Saeedi, M. & Pejman, A. H. (2010). Potential of natural bed soil in adsorption of heavy metals in industrial waste landfill. *International Journal of Science and Technology*, 7(3), 545-552.