

# A Study on The SWM of Karsingsa Solid Waste Dumping Site of Arunachal Pradesh

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**Abstract:** Leachate from landfills is known to contain contaminants unsafe for the environment. Consequently, leachate should be treated before it is released to the earth. Harmful materials from chaotic dumping site filtered out as leachate and dirty the groundwater that outcomes in adverse effects on the human wellbeing and condition. The board of this profoundly contaminant leachate is fundamental for evaluating the effect of municipal solid waste (MSW) landfills to guarantee least ecological effect. The point of this investigation is to survey the leachate qualities & leachate treatment methods for Karsingsa solid waste dumping site. The various types of characteristics of leachate were characterized as pH, colour and odour, turbidity, biochemical oxygen demand, dissolved oxygen, chemical oxygen demand, total dissolved solids, electrical conductivity etc. The adsorption method by activated charcoal and sand filter collectively was studied. It reduced the values of the contaminants of leachate.

**Key Words:** —Municipal solid waste, landfill leachate, ground water contamination, solid waste management, leachate characteristics.

## I. INTRODUCTION

Leachate is characterized as any tainted fluid that is created from water permeating through a solid waste disposal site, aggregating contaminants, and moving into subsurface regions. A second wellspring of leachate emerges from the high dampness substance of certain disposed waste. As these wastes are compacted or synthetically respond, bound water is discharged as "leachate". Leachate contains an assortment of synthetic constituents got from the solubilisation of the materials kept in the landfill and from the results of the chemical and biochemical responses happening inside the landfill. Leachate is usually dark brown in colour indicating the level of its toxicity. Leachate requires proper management before disposing it off otherwise it will cause a lot of environmental pollution and will mainly affect the water, soil and air. The characteristics of leachate will mainly depend on the symphony of waste, the existence of biodegradable substance in them, moisture content, weather circumstances, waste holding time and other operational procedures.

Landfill if not managed properly then leachate can seep into the groundwater and contaminate the entire aquifer (source of ground water).

## II. OBJECTIVES

- To study the physical & chemical characteristic of leachate from Kharsingsa solid waste dumping site.
- To propose a treatment method for the leachate of Kharsingsa solid waste dumping site.

## III. MATERIALS AND METHODS

### 3.1 Overview of the landfill site

Karsingsa dumping site is sited at a distance of about 7 km from NERIST, Nirjuli of Arunachal Pradesh. A barren land between two cliffs is used as a dumping site; and at a distance of merely 3 m away from the highway. It is exactly located at 27°07'17" N latitude and 93°47'06" E longitude and it has an elevation of 119 m. The landfill site has been used since last 10 years (approx). It causes unaesthetic visuals to the people and also since it lies near the Dikrong river it has 100 percent chance of polluting the river beside the fear of contamination of underground sources of water.

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Fig.1. Karsingsa solid waste dumping site

### 3.2 Characterization of leachate

The leachate characteristics of Karsingsa solid waste dumping site were found to be as follows:

- Colour and smell: The leachate sample was blackish in colour showing presence of organic matter and it had a malodorous smell. It was done by mere observation.
- pH: The pH value of leachate was found to be 7.98 describing it to be alkaline fluid and showing that the landfill is old since it has pH higher than 7.5. It was determined using the pH meter rod. The pH measuring device rod was dipped into the test and the reading was taken when it gave a stable value.
- Biochemical oxygen demand: To calculate the BOD value, the DO value of the sample was first calculated; after that the sample was kept in the incubator at 20° C for 5 days. After 5 days the DO value was taken and it was found to be 97.67 mg/l.
- Total dissolved solid: The TDS value was brought into being to be 32066.67 parts per million. The TDS probe was inserted in the instrument and the reading was taken.
- Turbidity: The turbidity of the sample was found to be 73 NTU.
- The COD value of the leachate was 116.33 mg/L.

- The Arsenic and fluoride values were nil.
- Chloride value was 360 mg/L
- Total hardness was noted to be 1.63 mg/L.
- Copper was of 0.39 mg/L and also iron value was 0.38 mg/L.

## IV. RESULTS AND DISCUSSION

As per the work done, it is observed that most of the parameters of the effluent discharge from the Karsingsa solid waste dumping site are within the permissible limits and are discussed as under:

- Turbidity of 73 NTU shows the presence of suspended matters in the leachate sample.
- pH and total hardness were found to be within the permissible limits.
- Value of COD and BOD of leachate indicates the presence of organic matters.
- High value of TDS indicates the presence of dissolved solids.
- Heavy metals such as Arsenic and fluoride were found to be absent indicating absence of mine waste etc.
- Presence of chloride indicates the presence of domestic waste and sewage.
- High value of iron would have caused incrustation on the pipe lines but it was found to be within permissible limits.
- The value of copper was also found to be within permissible limit.

## V. CONCLUSION

At the first place we can notice that most of the characteristics of the leachate were within the permissible limits which indicate that the Karsinga dumping site is not yet fully contaminated. But with the increase in the rate of dumping of waste material, eventually the contamination will become more hazardous and will continue to participate in soil pollution & ground water contamination like it is already contributing to the air pollution by spreading bad odour. So, it is high time to take necessary actions regarding the dumping of waste at Karsingsa dumping site. And the next would be to construct a proper sanitary landfill site with all the precautions

using liners at bottom and cover on top.

Any location for dumping site should be kept away from livelihood area. In case of Karsinga dumping site it not only pollutes the environment but also creates an unaesthetic view to people and destroys the landscape of that particular place.

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