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Evaluate of Lindi Processing Technology in TPA Pojok Kota Kediri

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ABSTRACT

One of the problems in the final processing site (TPA) is the presence of leachate. Leachate often collects at the midpoint of the landfill. Leachate contains various chemical derivatives from the dissolving of waste in the landfill and the results of chemical and biochemical reactions that occur in the landfill. The purpose of this study was to determine the technology used in the TPA Pojok Kota Kediri in processing existing leachate.

This type of research is qualitative research. This study uses a qualitative approach because the researcher wants to explore, review, and describe a technology directly. In this study, the researchers wanted to explore directly and review how the existing technology in the Pojok TPA in processing the existing leachate. There are seven informants in this study consisting of six special workers who handle leachate and triangulation. Other tools used are friends, cellphones, then documented in the form of a transcript. Data processing was carried out by means of content descriptive. Subsequently reported and presented in a descriptive description.

The results of the study indicate that the technology used by the TPA Pojok Kota Kediri in processing its leachate is the Wetland method. To determine the level of success of this technology is to use aquatic plants such as water spinach and water hyacinth which have been proven to survive so far.

The technology used by TPA Pojok Kota Kediri is in accordance with existing government regulations, but it must continue to make improvements to the wetland pond which is still not maximally used.

Keywords: TPA, Lindi and Wetland

BACKGROUND

TPA management in Indonesia, which is mostly operated by open dumping, is generally due to limited facilities and infrastructure, one of which is the malfunctioning of the Leachate Treatment Plant (IPL) properly. The Leachate Treatment Plant plays an important role in protecting the environment around the TPA from leachate (leachate). Leachate is a very dangerous pollutant because of its characteristics which contain high organic levels, and sometimes even heavy metals.

Leachate (*leachate*) namely the liquid released from the waste due to the biological degradation process. Leachate can also be defined as water or other liquids that have been

contaminated as a result of contact with garbage (Rustiawan*et al* (1993 in Dadang Irmanto 2012). Leachate can be classified as a compound that is difficult to degrade, which contains polymeric materials (macro molecules) and synthetic organic matter (Suprehin 2002*in* Sulinda 2004 *in* Dadang 2012). In general, leachate has a very low BOD5 / COD ratio (<0.4). This very low ratio value indicates that the organic material contained in leachate is difficult to be degraded biologically. The lower number of comparisons indicates that the organic material that is difficult to decompose is high (Alerts and Santika, 1984 in Dadang 2012).

Tchobanoglous (1993, in Wahyu Purwanta 2007) states that leachate is a liquid that permeates through waste containing dissolved and suspended elements or fluids that pass through *landfill* and mix and are suspended with substances or materials that are in the stockpile (*landfill*) the. Liquids in landfills are the result of the decomposition of waste and liquids that enter landfills such as flow or surface drainage, rainwater and groundwater.

Municipal waste management in Indonesia has become an actual problem in line with the increasing rate of population growth which has an impact on the increasing amount of waste produced. Several studies have analyzed the causes of problems that occur in waste management in Indonesia. Chaerul et al. (2007 in Rizqi 2017) analyzes the problems faced in waste management in Indonesia, including the lack of a firm legal basis, inadequate landfills, lack of effort in composting, and lack of landfill management with a proper system. Kardono (2007 in Rizqi 2017) said that the waste management problems in Indonesia are seen from the following indicators, namely the high amount of waste generated, the level of waste management services is still low,

It should be noted that the TPA must be equipped with a buffer zone and the final disposal method is carried out by means of a sanitary landfill (large / metropolitan city) and controlled landfill (medium / small city). It is necessary to monitor the quality of leachate processing results regularly. Regulation based on Law no. 18/2008 implies that the provisions for the closure of an open dumping landfill into a sanitary landfill within 5 years, so that various efforts are needed to revitalize the TPA.

In Kota Kediri, the disposal method ended up using a controlled landfill system. But on the other hand, the manager of TPA Pojok wants to use the sanitary landfill system because ideally according to Law no. 18/2008 is using a sanitary landfill. In addition, because the existing garbage must be immediately covered with soil with a period of less than 1x24 hours, so that the odor generated from the garbage is not so strong, because in a day Kediri City produces 110 tons of waste / day and in 110 tons / day it is able to produce leachate as much as 15-16 liters / day.

If the handling and processing of waste leachate is not carried out optimally, this waste leachate will enter the groundwater or be carried in the surface runoff. Efforts to overcome this problem start from the location selection stage, and continue until the TPA facility is closed. At TPA Pojok, biofilter and wetland methods are used. However, the wetland method in TPA Pojok has not been functioning properly because it has not been able to neutralize the pH in the leachate so that it cannot be released into the environment. The purpose of this study was to explore the rate of leachate generation, explore the leachate processing process, and explore leachate processing technology at TPA Pojok Kota Kediri.

OBJECTIVES

The purpose of this study was to determine the technology used in the TPA Pojok Kota Kediri in processing existing leachate.

METHODS

This study uses a qualitative approach because the researcher wants to explore, review, and describe a technology directly. In this study, the researchers wanted to explore directly and review how the existing technology in the Pojok TPA in processing existing leachate. Researchers act as instruments as well as data collection. Other supporting instruments use an instrument in the form of a questionnaire containing semi-structured and in-depth questions. The presence of researchers describes explicitly in the research report. The role of the researcher as a full participant. The presence of the researcher is known as a researcher by the subject or informant.

This research was conducted at TPA Pojok, Mojoroto Sub-district, Kediri City. In this study the data sources were from informants. The informants in this study were officers who specifically supervised and examined the leachate processing process in TPA Pojok in the form of primary data

and secondary data. Triangulation is essentially a multimethodal approach that researchers take when collecting and analyzing data. The basic idea is that the phenomenon under study can be well understood in order to obtain a high level of truth if approached from various points of view. The triangulation here is the Head of UPT Waste Management DLHKP Kota Kediri.

Sources of data from interviews and results from observations. The sampling technique in this study used purposive sampling to determine informants with certain considerations, namely by asking questions at least 3 times in a row to produce a saturation point of the same and consistent answers from each informant.

RESULTS AND DISCUSSION

The results showed the following themes:

1. The system used by TPA Kediri in Hoarding Garbage

   For the use of the landfill system, there are still workers at TPA Pojok Kota Kediri who do not know what the system actually is. They only know that the garbage is well covered and does not cause a strong odor. But the process before hoarding is known and has been carried out properly in accordance with good and correct hoarding procedures. As one informant put it: "Yes, it is made worse so it doesn't smell". In addition, there are informants who know what systems are used in the TPA to landfills, namely using a controlled landfill system.

2. The advantages of using the sanitary landfill system

   According to the law, the use of the sanitary landfill system should be more recommended. However, all returned to support the local regional budget and also the existing budget politics. But here the researchers found that the Kediri TPA utilizes existing methane gas as an energy source for the stove, this is in accordance with what was conveyed by one of the informants.

   "The advantage is that it doesn't smell, miss, it reduces the smell".

   The use of the sanitary landfill system does have more advantages, including within 1x24 hours the garbage must be covered and the odor generated by the garbage does not evaporate, especially when the methane gas in garbage can damage the ozone layer. But on the other hand, if you want to use this system you have to prepare a lot of money, of course. This is what happened to the TPA Pojok Kota Kediri. If the local government provides large APBD support for waste problems, it will be easy if the TPA Pojok Kota Kediri uses a sanitary landfill system. However, currently the use of the controlled landfill system at TPA Pojok Kota Kediri is better than the open dumping system.

3. Landfill development must meet Government Regulation Standards

   TPA Pojok Kota Kediri is in accordance with applicable government regulations, such as the base layer of the TPA must be waterproof so that leachate is blocked from seeping into the ground. Kediri is a medium-sized city that at least uses a controlled landfill system and already has an IPL.

   "Yes, it is just the procedure, every time a TPA is made, there must be what is the leach water reservoir, the procedure is like that".

   The suitability of the existing TPA and IPL development is in accordance with existing Government Regulations. For example, the construction of a landfill where the land area is suitable, the base layer is a TPA that is watertight, but it seems that there is no disease vector control in this TPA. Likewise with the existing IPL, its construction is in accordance with the existence of anaerobic ponds, facultative ponds, maturase ponds and wetland ponds.

4. The process of dealing with leachate

   TPA Pojok Kota Kediri is trying to get rid of the smell in the anaerobic pool. The leachate management at TPA Pojok Kota Kediri uses the EM4 bio-activator to reduce the smell before entering the next process which will eventually be released back into the environment.

   "We eee in the meantime we are using that thing, using a cultivator. Which is the leachate, which used to be, what is bad microbes? When we enter the bioactivator, the bioactivator is a good microbe, it's urgent, not to kill but urgent, to breed the good microbes to get rid of the bad microbes ".

The smell generated from the landfill is not actually the smell of garbage like the people complain about, but the smell of leachate that is pungent like the smell of ammonia. The first action of the TPA is to remove odors by providing an activator. Because if it rains, the smell will be even more pungent, especially at night which contains acid. But the TPA will routinely continue to control the leachate pool and the odor it causes.

5. Leachate treatment technology

In order to be discharged back into the environment, from the interview, the TPA Pojok Kota Kediri uses Wetland technology as the final process for treating leachate water. Supported by laboratory tests to determine the quality standards of leachate water whether it is safe to release into the environment.

"When it's clean. Hooh when it's clean. The problem here is that there is a pool
Anaerobic is optional, there is a wetland when it enters the wetland then it will come out a bit clean already. We will test whether it is not polluting the environment we throw away ".

Due to the leakage in the wetland pond, the performance for processing this leachate must experience problems. This is because the TPA uses the wetland method for final processing before being released into the environment. But even so, the Kediri City Environment will take samples and laboratory tests to determine the quality standards in leachate so that it is safe when it will be released into the environment.

6. Trials to Measure the Success Rate of Technology

Water spinach and water hyacinth were used as trials to determine the success rate of theetland technology. The results obtained were that these plants managed to survive when planted in wetland water that had gone through several processes. In fact, besides water spinach and water hyacinth, other aquatic plants can be used for this experiment, such as the lompong plant that can also grow when planted in wetland water.

"Plants can be kale, it can be water hyacinth ".

So far, what TPA uses are water plants such as water spinach, water hyacinth and lompong. It is proven that the three plants can live. But it does require adaptation for these plants to survive. In fact, TPA workers do not yet know why they should use water spinach or water hyacinth, here the most important thing is how leachate is considered safe and can be released into the environment.

7. The Effect of Rain on the Leachate Generation Rate

The high intensity of rain actually affects the rate of leachate generation in the TPA Pojok Kota Kediri. The higher / heavier the rain that falls, the rate of leachate entering the leachate pool is also heavy so that it can affect the volume of leachate in the pond.

"Yes, if it rains a lot, the volume can be high sis, if it is, I don't think so much water goes into the leachate. If it rains heavily, the river water is high, usually partly I bypass the river directly. But for the time being, it rains rarely, you don't dare, sis ".

When entering the rainy season, it becomes a challenge for the TPA to be able to process leachate. Because when it rains, the falling water will cause the leach rate to be higher than usual. In addition, rainwater and leachate automatically mix together, but it still depends on the intensity of the rain.

8. Volume of Waste in TPA Pojok Kota Kediri Per Day

Most of the informants do not know how much waste the TPA generates per day. The volume of waste in this TPA was also brought up by the informant when the researcher conducted the interview, namely that 130 tons of waste in this TPA per day is already in a solid state, which means that if it is not or not compacted, the amount or volume can exceed 130 tons.

"The average was 130 tons. But it's already that solid".

The problem of the volume of waste in the TPA is that some workers do not know the volume produced per day. In fact, the actual volume of waste can also be used as a reference for leachate out of the TPA. Moreover, the existing leachate pool accommodates leachate from 2 landfills, therefore it is important to know the workers at the TPA to find out the volume of waste before assessing the volume of leachate that comes out.

9. Difference between Sanitary and Controlled Landfill

Most of the informants did not know what the difference was from a sanitary landfill, controlled landfill.

"I don't understand it, miss me ".

For the differences between the sanitary system and controlled landfill, some of the workers at the TPA do not even know the difference. However, they have been doing hoarding in accordance with existing procedures.

10. Rain Affects Surface Flow and Leachate Volume

It can be seen that rainfall affects runoff and leachate. The volume in the leachate pool. Because it is mixed from rainwater and protect it causes the volume to increase.

"Yes, for rain, sis, if the intensity of the rain is high, it definitely affects the volume of leachate, maybe it can go up maybe from the top surface a little bit down. So if the volume maybe yes, if you add it is around 40%, depending on the intensity of the rain. If the rain intensity is high, there is a possibility that a lot of water will enter ".

The rain that falls also affects the surface flow and volume of leachate in the TPA and this makes the TPA inconvenient in handling it. Especially if the rain intensity is high. In fact, the TPA has experienced annual floods 5 times in 1 year, causing the leachate pond to sink and the volume automatically increases because it is mixed with rainwater.

CONCLUSION

The garbage dumping system carried out by the TPA Pojok Kota Kediri uses a Controlled Landfill. This is better and it is recommended to use it because the garbage is relatively closed so that the smell caused by the methane gas in the waste does not evaporate and the garbage does not spread because of the wind. Because methane gas in waste, if allowed to evaporate, will cause damage to ozone. The construction of TPA Pojok Kota Kediri is in accordance with the Regulation of the Minister of Public Works of the Republic of Indonesia Number 03 / PRT / M / 2013 Attachment 3 concerning the Technical Requirements for the Provision of Operation, Closure or Rehabilitation of TPA. Because the existing leachate ponds or IPL have met, namely anaerobic ponds, facultative ponds, maturase ponds and finally there is a wetland pool. The process of dealing with leachate is the provision of bioactivators with the type EM4. The technology in handling leachate carried out by the TPA Pojok Kota Kediri is by using the wetland method as the final process for cleaning and using laboratory tests to make it safe when released into the environment. Water spinach and water hyacinth are used to help absorb cadmium (Cd), COD, BOD and TSS levels in leachate. The intensity of rain or rainfall that falls can affect the rate of generation, surface flow and the volume of existing leachate. Head of Section for Utilization of Waste and Handling of Hazardous and Toxic Waste (B3) of the Kediri City Environment, Hygiene and Gardening Service (DLHKP) Ridwan said that currently the volume of waste in Kediri City that is accommodated at the Klotok TPA is above average, namely 145 tons. per day.

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