Jurnal Pendidikan MIPA
Volume 13. Nomor 2, Juni 2023 | ISSN: 2088-0294 | e-ISSN: 2621-9166
https://doi.org/10.37630/jpm.v13i2.935

Analysis of Drinking Water Quality in Qirbah Made of Rabbit Skin (an Effort to Promote the Use of Qirbah)

Agus Mulyono[1),*], Muthmainnah[1)]

[1)]Department of Physics, State Islamic University of Maulana Malik Ibrahim Malang, Indonesia

*Coresponding Author: gusmul@fis.uin-malang.ac.id

Abstrak: The Prophet Muhammad whereas going to a house having a place to the companions of Ansor with a companion, he told the proprietor of the house "On the off chance that you've got water in a calfskin holder (Qirbah) put away from final night, allow it to us to drink, something else we are going drink from the water specifically (Sahih Bukhari Muslim) From the hadith appears that there are extraordinary drinks put away in qirbah. For this reason, it is fundamental to conduct investigate on the quality of drinking water put away in qirbah made of rabbit skin. This study aims to determine the effect of water storage containers (buffalo skin qirbah, plastic and ceramic) on the physical properties of water (pH, conductivity, temperature, oxygen content and TDS) and on the growth of E Coli bacteria. The water utilized was crude well water and bubbled water which were put away in rabbit skin, plastic, and ceramic qirbah holders for three days and the information were watched each day. The information watched were pH, conductivity, temperature, oxygen substance, TDS and bacterial growth. The comes about of information examination appeared that the holder had an impact on PH, Temperature, Conductivity, TDS, Oxygen Levels and the development of E. Coli microscopic organisms in crude well water and bubbled well water. The comes about appeared that the rabbit skin qirbah was attainable and sterile as a holder for drinking water.

Kata Kunci: Qirbah, Rabbit Skin, Plastic, Ceramic, Water Quality.

1. INTRODUCTION

Water is an important need for every living thing. Every living thing, be it humans, animals and plants, needs water to survive, either by drinking it to consume it or being absorbed through the roots. Therefore, sufficient and abundant water sources are needed to sustain the life of living things. Water quality is also an important parameter for humans and animals and plants because the water will enter the body and become a source of nutrition. Water can come from soil, rain, mountains, rivers or from other sources. Groundwater is water that comes from layers of soil or rocks that are below the ground surface (Sriyono, 2015).

80% of the human body is water, so the role of water is very important for human health. Therefore we need water that has good quality so that it can be healthy for the body. Quality water depends on the fulfillment of physical requirements which include acidity, aroma, color, level of clarity, temperature and the number of particles or dissolved substances based on predetermined standards (Gusril Henny, 2010). Water that is fit for drinking and good for health has a certain standard value.

According to khotimah et al. The value of the conductivity of pure water is 0.0055 µohm/cm (Khotimah et al., 2018), this depends on the presence of ions contained in the water. The high conductivity value of water causes the water to taste brackish and salty. The pH value of drinking water is 6.5-8.5 (Karangploso & Malang, 2015) where water below 6.5 is called acid, while water above 8.5 is called alkaline. If the pH value or acidity of the water is too high then the water will feel thick. Many health experts state that the human body that contains a lot of alkali can be efficacious in reducing the risk of degenerative diseases, and cancer that can develop properly in the body that contains a lot of acid.

The temperature of drinking water that is good for health is ±3°C, while the dissolved oxygen level in drinking water according to the standard is <2 ppm, (Arindita et al., 2019) and the dissolved metal content contained in drinking water is metalobesi (Fe) 0.3 mg/L up to 10 mg/L, manganese content (mn) is 0.1 mg up

ISSN: 2088-0294 | e-ISSN: 2621-9166
https://doi.org/10.37630/jpm.v13i2.935

to 10 mg/L, copper metal content (Cu) is 0.2 mg/L up to 10mg/L, zinc metal content (Zn) is 0.05 mg/L up to 2.0 mg/L L, while the metal content of lead(Pb) is 1.0 mg/L up to 20 mg/ (Afifah Ismayanti et al., 2019).

In physics, it has been known that water always follows the shape of its place or container. However, the changing physical appearance is only one property of water. More importantly, the molecular shape of water also changes along with changes in the vibrational energy of the environment.

The water container used to store water can affect the quality of the water in the container. The water storage containers used by the community are plastic bottles, containers made of ceramics, or composites. At this time the world can produce an average of 300 million tons of plastic per year, while plastic recycling in a country like the US – according to the OWorldwatch Institute – only recycles about 0.6% of the plastics used, the rest becomes waste. This plastic waste lasts a long time on earth because it is not able to decompose naturally (Soegoto et al., 2021). Currently, bottled water drinks are commonly used. Some consumers even reuse bottled drinking water over and over again. In fact, this has a bad impact on health, because the plastic bottles used are often the cause of disease (Proshad et al., 2017).

It is recorded in history that at the time of the Prophet, the container for storing water was called qirbah made of animal skin (camel, cow or sheep skin). In modern times, qirbaho is very rare in Indonesia. Even people in general are not familiar with qirbah.

Narrated O from Jabir Radhiallahhu 'Anhu, Rasulullah SAW visited a house belonging to the oansor with a friend of his O and said to the housekeeper "If you have water in a container of skin left over from last night give it to us to drink otherwise let us drink from its direct stream" (Sahih Bukhari Muslims) (*Kitab Hadits Pegangan: 642 Hadits Sahih Pilihan Beserta Tafsir Untuk Pedoman ... - Maulana Muhammad Ali - Google Buku*, n.d.)

From the hadith it is explained that Rasulullah SAW drank the water stored in the qirbah for one night. This shows that there is a privilege to drink water stored in qirbah. For this reason, it is necessary to conduct research related to the quality of drinking water stored in the qirbah.

In Malang and surrounding areas, rabbit farming is increasingly mushrooming. In some places, rabbits whose meat is taken for consumption, it turns out that the rabbit skin has not been used, so it becomes waste. Therefore, in this study will be developed qirbah from rabbit skin. For comparison, in this study the quality of drinking water stored in rabbit skin qirbahs will be compared with drinking water stored in plastic and ceramic containers.

2. METHODS

This research is experimental in nature to determine the quality of drinking water stored for a certain time and in a certain container. The quality of drinking water is determined by looking at physical, chemical and biological parameters. The treatment used was three variants with six repetitions. The first variant is water stored in the qirbah. The second treatment was water containers stored in plastic and third treatment was water stored in ceramic containers. The data obtained were analyzed using the Anova test.

Qirbah Making

Qirbah is made using vegetable tanned rabbit skin. The first step in making a qirbah is to choose a rabbit skin, then form a pattern as needed. After that, the two leather patterns are united by applying glue to the edges of the leather. Since rabbit skin is thin, it must be stacked, then sewn using nylon thread. After the qirbah is sewn, soaked in warm water and rubbed gently, the qirbah is filled with grains until it dries and swells to form a container. The final process of making qirbah by coating beeswax on the inside.

Bacterial colony calculation

Before the bacterial colony calculation process is carried out, first the tools to be used must be sterilized using an autoclave at a temperature of 121 °C. Furthermore, by making the media using NA media, if the NA media is 10 grams, the distilled water is 500 ml (Wati, 2018). After that the media is sterilized so as not to be contaminated and stored in the refrigerator. After that, the dilution was carried out by preparing 9 test tubes filled with 9 ml of distilled water each. Samples taken using a micropipette are poured into the first dilution test tube as much as 1 ml from the first dilution test tube, 1 ml is taken to be poured into the second dilution test tube and so on until the tenth dilution. After the dilution was carried out, the sample was poured into a petri

ISSN: 2088-0294 | e-ISSN: 2621-9166
https://doi.org/10.37630/jpm.v13i2.935

dish of 200 microliters at the same time as the medium was poured over the sample and homogenized. After that it was incubated in an incubator for 24 hours and the last process was counting the number of bacterial colonies in the petri dish (M. F. Ledoh et al., 2013)(Kumala et al., 2009).

Water Physical Properties Testing Process (pH, conductivity, temperature, oxygen content and TDS as well as bacterial test)

Water samples were taken from the well after which it was put in a container (rabbit skin qirbah, plastic and ceramic). Then stored for three days and observed and measured every day. Each treatment with 5 repetitions.

3. RESULT AND DISCUSSION

The following is the measurement data for PH, Temperature, Conductivity, TDS, Oxygen Level and the growth of E. Coli bacteria in boiled well water and raw source water from Qirbah, plastic and ceramic containers.

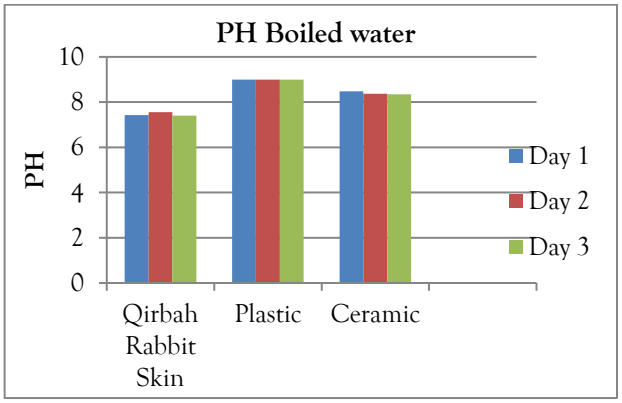

Fig. 1 Average PH Graph of Boiled Water

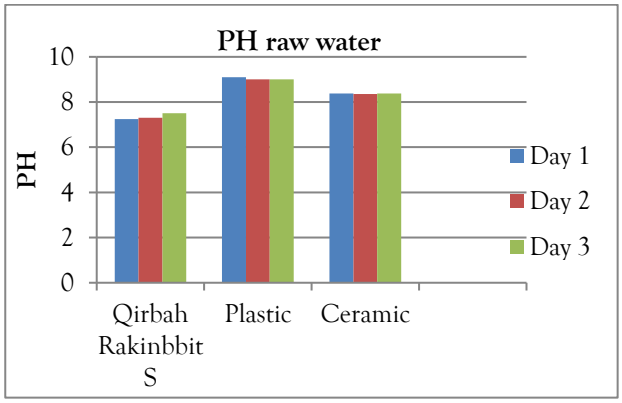

Fig.2 Average PH Graph of Raw Water

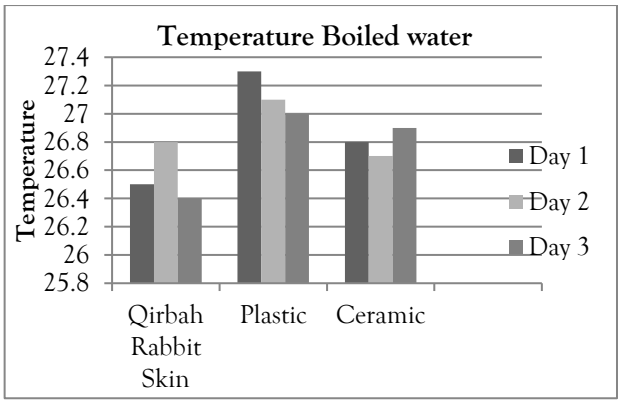

Fig.3 Average Temperature Graph of Boiled Water

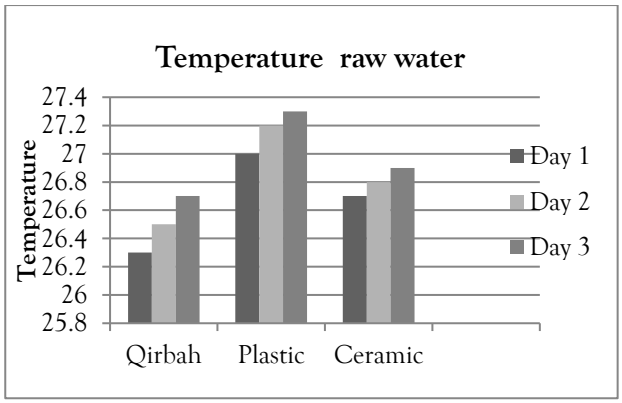

Fig.4 Average Temperature Graph of Raw Water

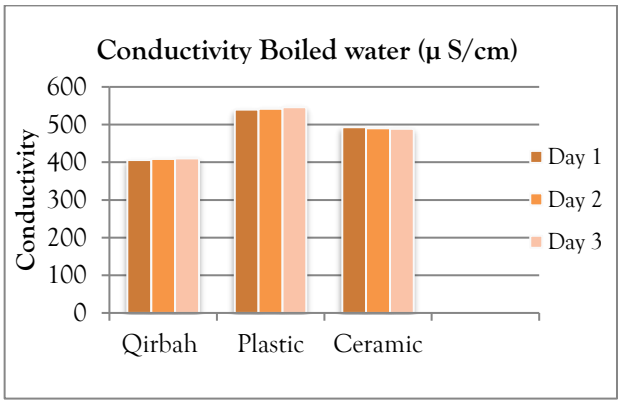

Fig.5 Average Conductivity Graph of Boiled Water

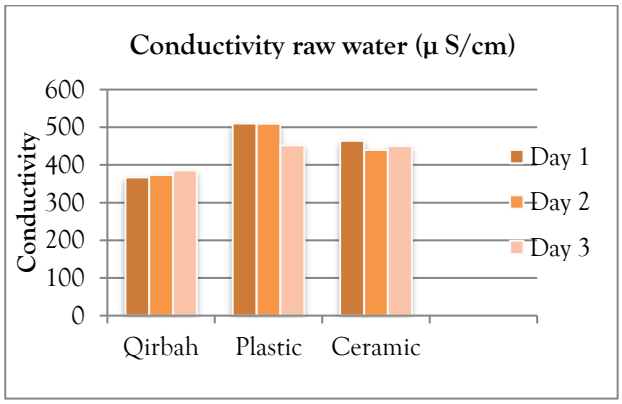

Fig.6 Average Conductivity Graph of Raw Water

ISSN: 2088-0294 | e-ISSN: 2621-9166
https://doi.org/10.37630/jpm.v13i2.935

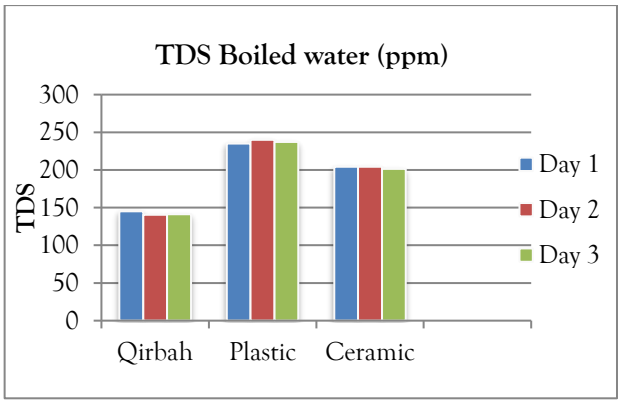

Fig.7 Average TDS Graph of Boiled Water

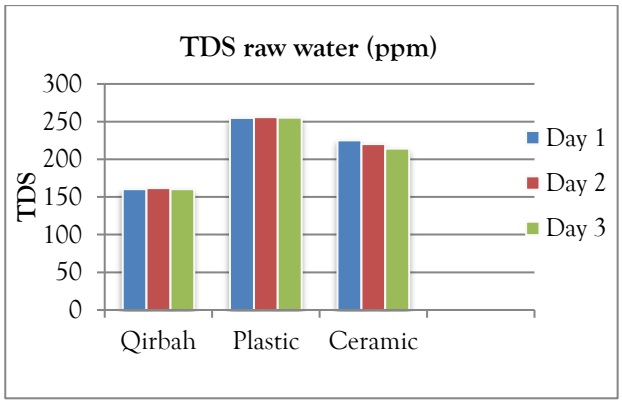

Fig.8 Average TDS Graph of Raw Water

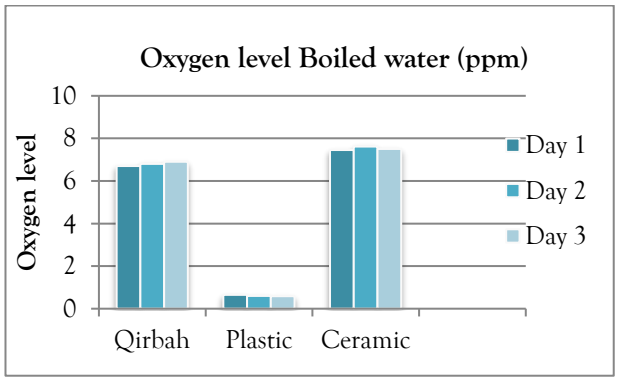

Fig. 9 Average Oxygen Level Graph of Boiled Water

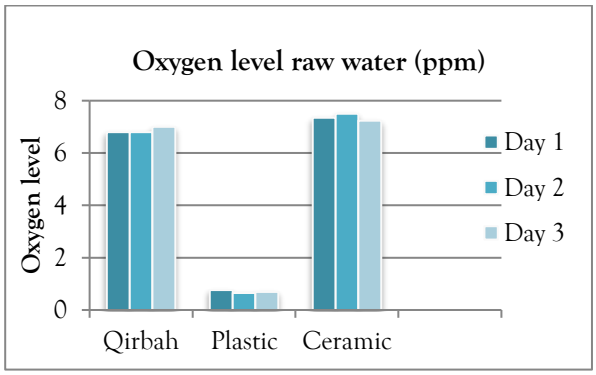

Fig.10 Average Oxygen Level Graph of Raw Water

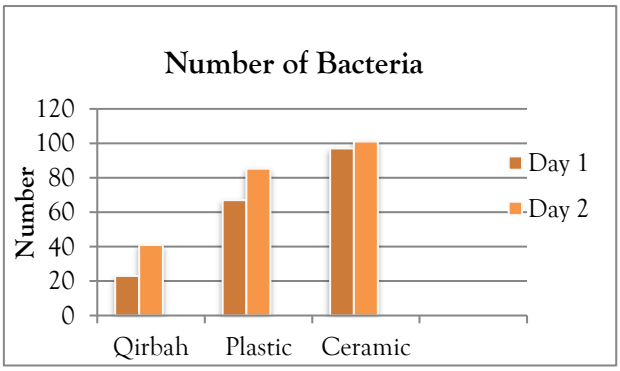

Fig.11 Graph of the Number of Bacteria E.Coli in Raw Water

Fig.1 is the average PH test on boiled water. Fig.2 is the average PH test on raw water. The lowest PH is water in qirbah, then ceramics and the highest is plastic. Fig.3 is the average temperature test on boiled water. Fig.4 is the average temperature test on raw water. The lowest temperature is water in the qirbah, then ceramic and the highest is plastic. Fig.5 is the average conductivity test on boiled water. Fig.6 is the average conductivity test on raw water. The lowest conductivity is water in qirbah, then ceramic and the highest is plastic. Fig.7 is the average TDS test on boiled water. Fig.8 is the average TDS test on raw water. The lowest TDS is water in qirbah then ceramic and highest is plastic. Fig.9 is the average DO test on boiled water. Fig.10 is the average DO test on raw water. The lowest DO value is water in qirbah then ceramics and highest is plastic. Fig.11 is the average number of ecoli bacteria colonies in row water. In the fig it can be seen that the number of bacterial colonies on the qirbah is small and relatively undeveloped compared to ceramic and plasic.

Electrical conductivity or conductivity and total dissolved solids (TDS) are commonly used water quality parameters (Han et al., 2011). Electrical conductivity is a measure of a liquid's ability to conduct an electrical charge (Krishna kumar et al., 2015). Its capacity depends on the concentration of dissolved ions, ionic strength and temperature (Hem, 1985). The concentration of dissolved ions is usually measured in TDS.

Water quality includes physical, chemical and microbiological parameters that meet sanitary requirements. According to Regulation of the Minister of Health of the Republic of Indonesia No.

ISSN: 2088-0294 | e-ISSN: 2621-9166
https://doi.org/10.37630/jpm.v13i2.935

416/Menkes/per/IX/1990 on Water Quality Requirements and Supervision. In terms of physical parameters, good water is water that has no taste, odor, color and is not harmful to health, including pH, odor, taste, color, turbidity, temperature and amount of dissolved solids (Marpaung & Marsono, 2013). The pH of the water must not be acidic or alkaline to prevent the dissolution of heavy metals and corrosion of the water distribution network. The recommended pH for clean water is 6.5-8.5. For clean water standards, the dye should be 50 TCU and for drinking water standards, the maximum dye content is 15 TCU. By turbidity, water is called cloudy if it contains so many particles of suspended material that it gives it a muddy, dirty color or appearance.

Table 1 through 10 are the results of the Anova test in each test. From this data, the Anova test was then carried out to see the effect of using the container on the measurement results of PH, Temperature, Conductivity, TDS and Oxygen Level.

Table 1. Anova boiled water PH data

	Sum of Square	df	Mean Square	F	Sig.
Between Groups	6.648	2	3.324	980.411	0.000
Within Groups	.047	14	.003		
Total	6.696	16			

Table 2. Anova raw water PH data

	Sum of Square	df	Mean Square	F	Sig.
Between Groups	8.778	2	4,389	1.062E3	0.000
Within Groups	.062	15	.004		
Total	8.840	17			

Table 3. Anova data Temperature boiled water

	Sum of Square	df	Mean Square	F	Sig.
Between Groups	.973	3	0.487	23.804	0.000
Within Groups	.307	15	.020		
Total	1.280	17			

Table 4. Anova data Temperature raw water

	Sum of Square	df	Mean Square	F	Sig.
Between Groups	1.351	2	0.676	38.000	0.000
Within Groups	.267	15	.018		
Total	1.618	17			

Table 5. Anova data Conductivity boiled water

	Sum of Square	df	Mean Square	F	Sig.
Between Groups	54977.33	2	27488.667	4.548E3	0.000
Within Groups	90.667	15	6.044		
Total	55068.00	17			

Table 6. Anova data Conductivity raw water

	Sum of Square	df	Mean Square	F	Sig.
Between Groups	41299.111	2	20649.556	58.150	0.000
Within Groups	5326.667	15	355.111		
Total	46625.778	17			

Table 7. Anova data TDS boiled water

	Sum of Square	Df	Mean Square	F	Sig.
Between Groups	27871.161	2	13935.580	3.398E4	0.000
Within Groups	61.519	15	4.101		
Total	27932.679	17			

ISSN: 2088-0294 | e-ISSN: 2621-9166
https://doi.org/10.37630/jpm.v13i2.935

Table 8. Anova TDS raw water data

	Sum of Square	Df	Mean Square	F	Sig.
Between Groups	27416.390	2	13708.195	1.648E3	0.000
Within Groups	124.745	15	8.316		
Total	27541.135	17			

Table 9. Anova data Oxygen Level boiled water

	Sum of Square	df	Mean Square	F	Sig.
Between Groups	173.092	2	86.546	1.739E4	0.000
Within Groups	0.075	15	0.005		
Total	173.167	17			

Table 10. Anova data Oxygen Level raw water

	Sum of Square	df	Mean Square	F	Sig.
Between Groups	165.349	2	82.674	9.264E3	0.000
Within Groups	0.134	15	0.009		
Total	165.483	17			

From the results of the analysis with Anova, it is clear that the drinking water tank affects the pH, temperature, conductivity, TDS and oxygen content of boiled well water and raw well water. The data also shows that the qirbah container is very well used as a container for drinking water. Bacterial growth data shows that the qirbah container has the lowest bacterial growth compared to other containers. This shows that the qirbah is more hygienic.

The turbidity of the water can be determined by laboratory tests using the turbidimeter method. For clean water standards, the maximum allowable turbidity is 25 NTU and 5 NTU for drinking water standards. Temperature, the water temperature should be 10-250 ° C (cold) so that no chemicals dissolve in the channel or pipe that can endanger your health. The quantity of dissolved solids (TDS) usually consists of organic substances, inorganic salts and dissolved gases. As the TDS increases, the hardness also increases. Also, the effect of TDS or harshness on health depends on the chemical that is causing the problem (Gusril Henny, 2010; Muthmainnah & Agus Mulyono, 2022).

Qirbah containers are very suitable as containers for drinking water. This phenomenon could be an additional explanation of the Hadith of the Prophet Muhammad. It was narrated by Jabir Radliallahu 'Anhu that the Messenger of Allah visited an Ansar house with a friend and said to the owner of the house: "If you have water in a water container from the skin left over from last night - give it to us to drink; otherwise let's drink to its direct current." (Sahih Bukhari)

Qirbah is not only an object for permanent drinks, but is part of a water resource management system that can have a large impact. The use of Qirbah will slightly reduce the use of plastic. Plastic waste is becoming more and more a world problem that must be immediately found a solution (Chow et al., 2017)(Gross, 2015). So we can use Qirbah as a place to keep drinking water.

4. CONCLUSION

Drinking water tanks affect pH, temperature, conductivity, TDS, oxygen levels, and the growth of E. coli bacteria in raw well water and boiled well water. The results showed that the rabbit skin qirbah is practical and hygienic as a drinking water reservoir.

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