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Quality Study Physical Characteristics of Dug Well Water in the Suwung Landfill Area , South Denpasar

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ABSTRACT

Well dig as one of the alternative means abundant and public water supply used by the community . The existence of well dig in the Suwung Landfill Area , until moment This utilized as water sources for bathing, washing , and other needs business livestock farming . Poor sanitation , business industry and nearby locations disposal rubbish can result in decline well water quality dig . Research objectives is For know quality well water physical digging in the Suwung Landfill Area reviewed from variables temperature , color , odor , turbidity and TDS. Research descriptive with do inspection quality water physics in 11 wells dig . Inspection results from variables temperature all over well dig fulfil requirements, 27.3% conditions colored, 9.1% odorless , 54.4% turbidity excessive and 36.4 % TDS excessive, in accordance with Minister of Health Regulation No. 2 of 2023. Inspection results health environment, as much as 54.6% of wells dig including category risk contamination high and very high . Condition and construction well dig varies and exists a number of well dig in the landfill area Suwung quality physique the water No fulfil requirements . To public recommended For do repair construction with make closing wells and regularly maintain them cleanliness surrounding environment well dig .

Keywords : well dig , quality water physics

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INTRODUCTION

Provision of clean water for public Keep going face a number of challenge Good quantity and quality . Improvement amount population and activities economy result in improvement need will water (WHO, 2018)availability . Limited availability of raw water from surface water sources , resulting groundwater use in a way excessive happened in several area (Kementrian PUPR, 2020)

In some area the existence and availability of clean water Still difficult obtained . Condition This happen influenced by factors geography and demographics in a region. Until moment this , Indonesia only capable serving 29% of clean water (Mulyawati & Biantoro, 2024)

Water sources used public For produce clean water among others originating from from rainwater reservoir , well water pump hands , well water dig , and water sources from network piping . The majority resident village using water from well dig and well drill , rainwater tank and some type other (Rolia et al., 2023)sources .

Making well dig must notice influence environment around . Distance of the well dig from source polluter must fulfil condition (Basri , KS. Sudiadnyana, 2023). Recommended safe distance in manufacturing well dig is 10 meters from from pollution microbes from well feces or septic tank and 95 meters from source waste contaminated waste material chemistry .(Baktiar et al., 2022)

In a way general water pollution can happen in a way directly and or No directly . Cause direct happen consequence source polluter from waste industry and home ladder . Water pollution No direct involving track water intermediary through natural media like rain and surface water movement .(Apriliani, 2020)

The existence of well water dig in the Suwung TPA area utilized for bathing, washing , drinking water as well as give Eat livestock and others . Poor sanitation , seepage from water activity House stairs , laundry , industrial and location disposal rubbish can result in decline groundwater quality (Wahyutriani, 2018)

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Research conducted by Putri found that facility clean water sources that are not fulfil criteria by 31.3%, located around the area where disposal end rubbish Suwung (Putri, 2021)

If somebody No implementing personal hygiene by good and use polluted water can give impact health , such as disease skin . S age dig own greater risk tall caught disease skin namely Dermatitis (Jesika & Hilal, 2017). There is a significant relationship between quality well dig and personal hygiene with complaint disturbance skin in various communities regions in Indonesia(Sugiester et al., 2021)

This study implemented with objective know quality well water physical dig in the Suwung Landfill Area . Through study this , it is hoped can detected existence pollution of water sources , so can anticipate possibility occurrence adverse impacts for health public .

METHODS

Study descriptive with objective For characterize , clarify , and validate the phenomenon being studied . (Ramdhan, 2021). Population in study This is well excavations located at a distance of 0 – 1 km from the Suwung TPA , using GPS (global positioning system) application .

. Amount well observed excavation in a way physique as many as 11 wells dig . based on variables temperature , color , odor , turbidity and TDS (total suspended solid).

RESULTS AND DISCUSSIONS

Amount observed wells is 11 wells with distance ranges from 50 – 250 meters from Suwung Landfill , Characteristics distance well dig read more like seen in diagram 1.

Diagram 1. Characteristics of the Distance of Dug Wells from the Suwung Landfill

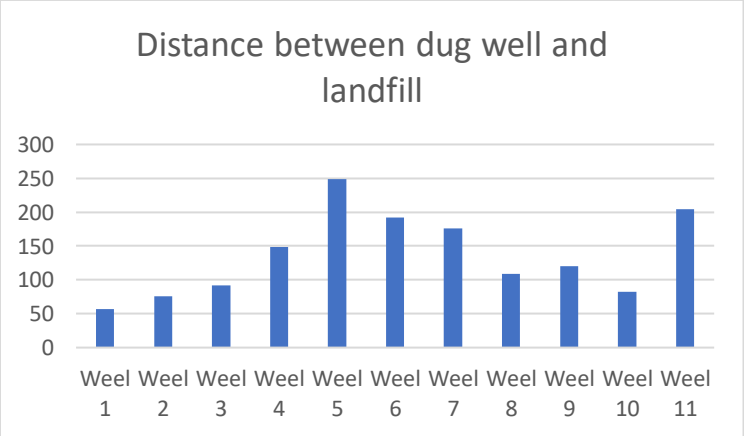

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Table 1. Distribution Frequency Well Water Temperature

Category	Frequency (N)	Percentage (%)
Meet the requirements	11	100%
Doesn't meet the requirements	0	-
Total	11	100%

Based on the data in table 1, the distribution frequency quality physique temperature of well water dig all of it fulfil condition with temperature range between 30-33 ℃ , thing This caused by Because reactions chemicals formed from the decomposition process rubbish Because well dig the location near with TPA Suwung . But if associated with temperature air , water temperature fulfil standard standard quality .

According to Sackey et al who researched impact landfill operations against well water quality drill , where the groundwater temperature around the landfill is generally Still within normal limits even though there is activity decomposition intensive organic , showing that the temperature parameters tend stable Because characteristic isolation good soil and depth adequate wells (Sackey et al., 2024).

Table 2. Distribution Well Water Color Frequency

Category	Frequency (N)	Percentage (%)
Color	8	72.7%
No color	3	27.3%
Total	11	100%

Based on table 2 distribution quality physique well water color dig as many as 3 wells (27.3%) were colored and 8 wells (72.7%) were not colored colored . According to well water

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writer dig own color yellow young like murky water . Color parameters can contaminated through material organic , metal heavy , or other particles resulting from activity waste House stairs , as well as damage physical on the well .

In research comprehensive in Morocco confirms that change the color of the groundwater around the municipal landfill is indicator beginning leachate (El Fadili et al., 2022)contamination . Research the identify that color yellowish color in groundwater correlated with height concentration of dissolved organic matter (DOM) originating from from the decomposition process organic waste .

Table 3. Distribution Frequency of Well Water Odor

Category	Frequency (N)	Percentage (%)
Odor	10	90.9%
No odor	1	9.1%
Total	11	100%

The data in table 3 shows that distribution frequency quality well water physical dig that has smell as many as 1 well (9.1%) and well water dig that is not No smelly 10 wells (90.9%). Odor can caused by existence wastewater puddles House stairs around well dig so that there is possibility well dig the polluted .

Table 4. Distribution Frequency Turbidity of Dug Well Water

Category	Frequency (N)	Percentage (%)
Meet the requirements	5	45.5%
Doesn't meet the requirements	6	54.5%
Total	11	100%

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Standard standard quality physical turbidity parameters according to Minister of Health Regulation No. 2 of 2023 is No more of 3 NTU/FNU. A total of 6 wells digging in the Suwung Landfill Area No fulfil condition turbidity . Reviewed from condition physique environment , well dig This located tend near with TPA Suwung , distance well dig with a landfill of 50 – 250 meters so that substance organic matter produced by microorganisms can influence well water quality dig in a way physique .

This result consistent with research by Sackey et al. (2024) which reported that although turbidity and color values are within the limits that can be accepted according to WHO and the Ghana Standard Authority, however there is variation significant based on distance from landfills (Sackey et al., 2024). Research the emphasize that well with distance not enough from 200 meters from the landfill shows trend increased turbidity, although Still within tolerance limits .

Phenomenon This can explained through mechanism transportation particle suspended through groundwater flow . The study of Ramirez-Hernandez et al. (2021) in PMC shows that sanitary landfill is one of the source main contamination source water power because leachate generation with content high dissolved organic matter (DOM), inorganic material , and elements toxic (Davalos Pena et al., 2021).

Table 5. Distribution TDS Frequency of Dug Well Water

Category	Frequency (N)	Percentage (%)
Meet the requirements	7	63.6%
Doesn't meet the requirements	4	36.4%
Total	11	100%

TDS or total dissolved solids are solid materials that undergo a dissolution process . in water, and characteristics size the particles is at more low compared to with solid material that is not dissolved . Based on The results obtained in Table 5 show that 4 wells (36.4%) did not

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fulfil standard conditions standard from TDS is not enough of 300 mg/l or 300 ppm. Water that has taste saline indicates level high salinity and has higher TDS levels from standard quality .

high TDS content in water can gives a salty taste to the water, because TDS measures solids dissolved in water like mineral and salt content . Reviewed from the environment well digging in the Suwung Landfill Area close together with beaches that can become reason TDS content in well water high and there is a salty taste in the well water dig the .

Findings This in line with United States EPA standards that establish secondary limits for TDS of 500 mg/L for drinking water . There is study using the Water Quality Index (WQI) with range 27.47–214.58 and Nemerow index (0.72–6.17) for evaluate groundwater quality around municipal landfills . The study show that increased TDS correlated strong with Leachate Pollution Index (LPI = 29.14) which exceeds the permitted limit For leachate (El Fadili et al., 2022)disposal .

Geographical factors the location of the adjacent Suwung TPA with beach confirm about influence seawater intrusion to increased TDS. Combination Leachate contamination and saline intrusion create condition groundwater quality is complex and requires handling special .

Table 6. Risk Score Categories Dug Well Water Contamination

Category	Frequency (N)	Percentage (%)
Currently	5	45.5%
Tall	4	36.4%
Very High	2	18.1%
Total	11	100%

Special data evaluation risk on the form inspection means well dig with see distance toilet with well , source pollution like dirt animal or garbage , channels water disposal facilities well dig as well as construction means well in the form of wall well and floor well .

Results with risk contamination currently until with very tall located relatively near with source polluter garbage (Suwung Landfill), besides That there is the well is located near with pen chicken and pork . Apart from influence environment around well dig , there is

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construction well dig that is not fulfil condition like well open pit , there is wall well dig the cracked and too low , around well dig there is puddles , as well as place ropes and buckets are placed in possible places dirty .

Classification risk contamination This in harmony with methodology evaluation risk comprehensive health Where also applied in study (El Fadili et al., 2022). The study use index quality irrigation (SAR, MHR, %Na, KI, and PI) as well analysis spatial For identify risk zones high around the municipal landfill.

Condition construction well as well as method well water can also be taken potential contamination , especially in construction well dig open and collecting water using a bucket. If clean water facilities This planned in accordance with standards that meet condition health , then potential contamination or pollution can minimized , so that the quality of the water obtained become more safe (Asri et al., 2019)

Besides that construction adequate wells become part important in prevent contamination cross . The study by Ramirez-Hernandez et al. (2021) shows that the hydrogeochemical processes in the area near the municipal landfill are greatly influenced by the conditions construction wells and systems drainage around (Davalos Pena et al., 2021).

CONCLUSIONS

Quality physique well water temperature dig fulfil condition compared to with temperature air quality color , odor , turbidity and total dissolved solids are not fulfil conditions on some well as well as condition sanitation means well dig show level risk contamination currently until very tall .

Based on comparison with studies international latest , well water conditions digging in the Suwung Landfill Area show pattern consistent contamination with study similar in various countries. Combination leachate contamination factors , construction wells that are not adequate , and the proximity effect of the landfill contributes to degradation groundwater quality .

Recommended to public For do repair means sanitation and management construction well for prevent risk contamination . Recommendations addition based on international best practices includes : implementation system closing adequate wells , installations system

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effective drainage , and the establishment of a buffer zone of at least 200 meters from source contamination .

CONFLICT OF INTEREST

There is no conflict of interest regarding the publication of this paper.

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