

WATER PURIFICATION IN THE RESCUE CENTER

Providing drinking water from the own well

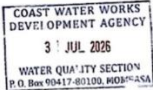
Project overview

The water quality of the well at the rescue center is currently not safe for cooking, drinking, or brushing teeth. Because the well is located close to the shore, salty seawater penetrates the groundwater. Furthermore, the surrounding community lacks a proper sewage drainage system, which leads to fecal contamination and introduces bacteria into the groundwater.

Therefore, a proper purification system must be provided for the chemical and biological treatment of the well water. The chemical cleaning is performed using multi-stage sediment filters and a reverse osmosis membrane system. Coliform and *Escherichia coli* bacteria are eliminated by an integrated ultraviolet (UV) radiation lamp.

Before (raw water)

The well water was analyzed in the laboratory of the Coast Water Works Development Agency (CWWDA) in Mombasa. The assessment comprised both chemical and biological analyses, the results of which are provided in the enclosed reports. Both the chemical and biological values exceeded the maximum acceptable limits.

 CHEMICAL ANALYSIS REPORT	 BACTERIOLOGICAL WATER ANALYSIS REPORT																																																																	
SAMPLE No: 429/2026 DATE SAMPLED: 30/07/2026 DATE SUBMITTED: 30/07/2026	SAMPLE REGISTRATION No: 84/2026																																																																	
SOURCE: Borehole - Likoni Timbani	DATE AND TIME OF SAMPLING: 30/07/2026, 10:00 am																																																																	
SUBMITTED: Erncast Ombeva	DATE AND TIME SAMPLE EXAMINED: 30/07/2026, 11:30 am																																																																	
PURPOSE OF SAMPLING: Check Quality	SAMPLE SUBMITTED BY: Erncast Ombeva																																																																	
<table border="1"><thead><tr><th>No.</th><th>PARAMETERS</th><th>UNITS</th><th>RESULTS</th><th>KS EAS 12:2014 STANDARDS</th></tr></thead><tbody><tr><td>1.</td><td>pH</td><td>pH Scale</td><td>7.3</td><td>6.5 - 8.5</td></tr><tr><td>2.</td><td>Turbidity</td><td>NTU</td><td>0.0</td><td>Max 5</td></tr><tr><td>3.</td><td>Conductivity</td><td>µs/cm</td><td>2970</td><td>Max 1500</td></tr><tr><td>4.</td><td>Total Hardness</td><td>mg/l</td><td>476</td><td>Max 300</td></tr><tr><td>5.</td><td>Chloride</td><td>mg/l</td><td>993.94</td><td>Max 250</td></tr><tr><td>6.</td><td>Total Alkalinity</td><td>mg/l</td><td>180</td><td>Max 300</td></tr><tr><td>7.</td><td>Magnesium</td><td>mg/l</td><td>61.49</td><td>Max 100</td></tr><tr><td>8.</td><td>Calcium</td><td>mg/l</td><td>90.72</td><td>Max 150</td></tr><tr><td>9.</td><td>Total Dissolved Solids</td><td>mg/l</td><td>1485</td><td>Max 700</td></tr><tr><td>10.</td><td>Salinity</td><td>mg/l</td><td>1640</td><td>Max 250</td></tr><tr><td>11.</td><td>Colour</td><td>Hazen</td><td>2.5</td><td>Max 15</td></tr><tr><td>12.</td><td>Others</td><td>Smell</td><td>-</td><td>Non-Objectionable</td></tr></tbody></table>	No.	PARAMETERS	UNITS	RESULTS	KS EAS 12:2014 STANDARDS	1.	pH	pH Scale	7.3	6.5 - 8.5	2.	Turbidity	NTU	0.0	Max 5	3.	Conductivity	µs/cm	2970	Max 1500	4.	Total Hardness	mg/l	476	Max 300	5.	Chloride	mg/l	993.94	Max 250	6.	Total Alkalinity	mg/l	180	Max 300	7.	Magnesium	mg/l	61.49	Max 100	8.	Calcium	mg/l	90.72	Max 150	9.	Total Dissolved Solids	mg/l	1485	Max 700	10.	Salinity	mg/l	1640	Max 250	11.	Colour	Hazen	2.5	Max 15	12.	Others	Smell	-	Non-Objectionable	REASON FOR SAMPLING: Check Quality SOURCE OF SAMPLE: Borehole - Likoni Timbani IS IT PROTECTED? Yes IF SO, HOW? Covered EXACT SITE SAMPLE TAKEN: From the Borehole ARE THERE ANY LATRINES OR OTHER SOURCES OF POLLUTION? No IS IT A CHLORINATED SUPPLY? No RESIDUAL CHLORINE: N/A
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COMMENTS As per the analysed parameters, the water is not chemically suitable for drinking purpose due to its high mineral content. However, a well equipped reverse osmosis machine /water purifier is recommended to help eliminate the high minerals thus, enhancing the suitability of the water for drinking and other domestic usage.	REPORT TOTAL COLIFORM COUNT: 31 MPN/100ML <i>Escherichia Coli</i> COUNT: 7 MPN/100ML																																																																	
 Fer Joyce Kwamboka SENIOR LAB TECHNOLOGIST	 Fer Joyce Kwamboka SENIOR LAB TECHNOLOGIST																																																																	
 COAST WATER WORKS DEVELOPMENT AGENCY 31 JUL 2026 WATER QUALITY SECTION P.O. Box 90417-80100, MOMBASA	 COAST WATER WORKS DEVELOPMENT AGENCY 02 AUG 2026 WATER QUALITY SECTION P.O. Box 90417-80100, MOMBASA																																																																	
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The raw water from the well was also tested using our own instrument for conductivity and TDS (total dissolved solids). The results were nearly identical to the values provided by the

CWWDA laboratory. This allows us to monitor the chemical properties of the clean water in the future and replace filters and membranes in a timely manner.

After (clean water)

A 5-stage filter and reverse osmosis system with an integrated UV filter has been installed in the kitchen area. The system has an hourly capacity of 150 liters. A 40-liter pressurized tank is included to cover peak consumption when necessary.

The conductivity values dropped from approximately **3.000 micro-Siemens/cm** to **236 micro-Siemens/cm**, and the **Total Dissolved Solids (TDS)** fell from approximately **1.500 ppm** to **130 ppm**. The bacteria content has been reduced from a total coliform count of **31 MPN/100 ml** to **0 MPN/100 ml**.





CHEMICAL ANALYSIS REPORT

SAMPLE No: 453/2026 DATE SAMPLED: 13/08/2026 DATE SUBMITTED: 13/08/2026

SOURCE: Purified Water Timbani-Likoni

SUBMITTED: Ernest Ombeva

PURPOSE OF SAMPLING: Check Quality

No.	PARAMETERS	UNITS	RESULTS	KS EAS 12:2014 STANDARDS
1.	pH	pH Scale	6.4	6.5 - 8.5
2.	Turbidity	NTU	0.0	Max 5
3.	Conductivity	µs/cm	255	Max 1500
4.	Total Hardness	mg/l	44	Max 300
5.	Chloride	mg/l	72.72	Max 250
6.	Total Alkalinity	mg/l	36	Max 300
7.	Magnesium	mg/l	5.36	Max 100
8.	Calcium	mg/l	8.9	Max 150
9.	Total Dissolved Solids	mg/l	127.5	Max 700
10.	Salinity	mg/l	120	Max 250
11.	Colour	Hazen	2.5	Max 15
12.	Others	Smell	-	Non-Objectionable

COMMENTS

Based on the tested parameters, the water is not chemically suitable for drinking purpose due to the low pH unless it raised.

Joyce Kwamboka

SENIOR LAB TECHNOLOGIST



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BACTERIOLOGICAL WATER ANALYSIS REPORT

SAMPLE REGISTRATION No: 127/2026

DATE AND TIME OF SAMPLING: 13/08/2026, 12:10 pm

DATE AND TIME SAMPLE EXAMINED: 13/08/2026, 14:40 pm

SAMPLE SUBMITTED BY: Ernest Ombeva

REASON FOR SAMPLING: Check Quality

SOURCE OF SAMPLE: Purified Water Timbani-Likoni

IS IT PROTECTED? Yes

IF SO, HOW? Purified

EXACT SITE SAMPLE TAKEN: From the Purifier

ARE THERE ANY LATRINES OR OTHER SOURCES OF POLLUTION? No

IS IT A CHLORINATED SUPPLY? No

RESIDUAL CHLORINE: N/A

REPORT

TOTAL COLIFORM COUNT: 0 MPN/100ML

Escherichia Coli COUNT: 0 MPN/100ML

COMMENTS:

The water is bacteriologically safe for human consumption. However, monitoring should continue.

Joyce Kwamboka

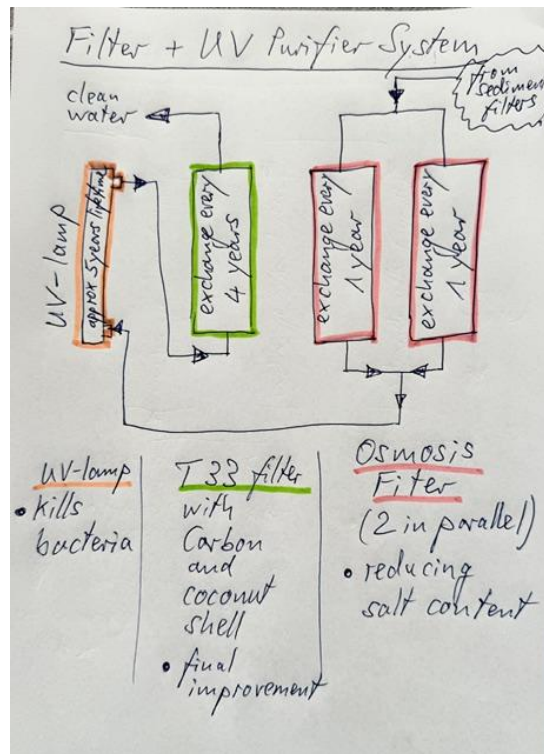
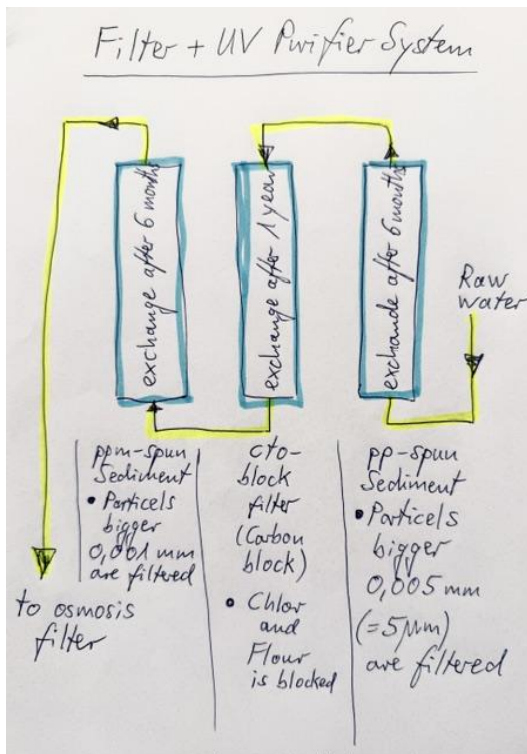
SENIOR LAB TECHNOLOGIST



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The flow scheme of the purifying system also shows the exchange periods of the different filter stages recommended by the supplier. Our own measurements and function checks will monitor the values closely.

Measurement of Water Quality Likoni Aid for Children Centre

Test Date	Type of water	Conductivity (microS/cm)	TDS (ppm) (Total dissolved solids)	Temperatur (°C)	ph - value	Value of flow meter (m3) 1 m3 = 1.000 liter	Measured by
Maximum value	Purified water	1.500	700		6,5 – 8,5		KS EAS 12:2014 Standards
30.07.2026	Raw water	2.970	1.485	-	7,3	not applicable	Coast Water Works Development Agency
08.08.2026	Raw water	2.976	1.488	28,5	-	not applicable	Ruth and Dinnah
09.08.2026	Purified water	236	130	29,6	-	0,717	Ruth and Dinnah
14.08.2026	Purified water	255	127,5	-	6,4		Coast Water Works Development Agency
18.08.2026	Raw water	3.390	1.695	27,4	-	3,889	Ruth
18.08.2026	Purified water	216	115	28,2	-	3,889	Ruth
25.08.2026	Purified water	-	-	-	6,48	-	Mastek
07.09.2026	Purified water	152	76	29,6	6,26	9,575	Ruth
01.10.2026	Purified water						

A responsible staff member of the orphanage will regularly monitor the chemical water quality and document the findings in the form above.

A water dispenser was installed to make it easier for the children to get purified water on their own. The orphanage staff fills the 10-liter container with clean water and places it on top of the dispenser.

Project data

- **Location:** Likoni AID for Children Centre
- **Project budget:** 158.000 KeS
- **Approximate value:** 1.050 Euro / 1.200 USD
- **Execution:** August 2026

Impact

The provision of clean water for food, drinking, and hygiene will significantly improve the health conditions of the children, who previously suffered frequently from intestinal diseases.