

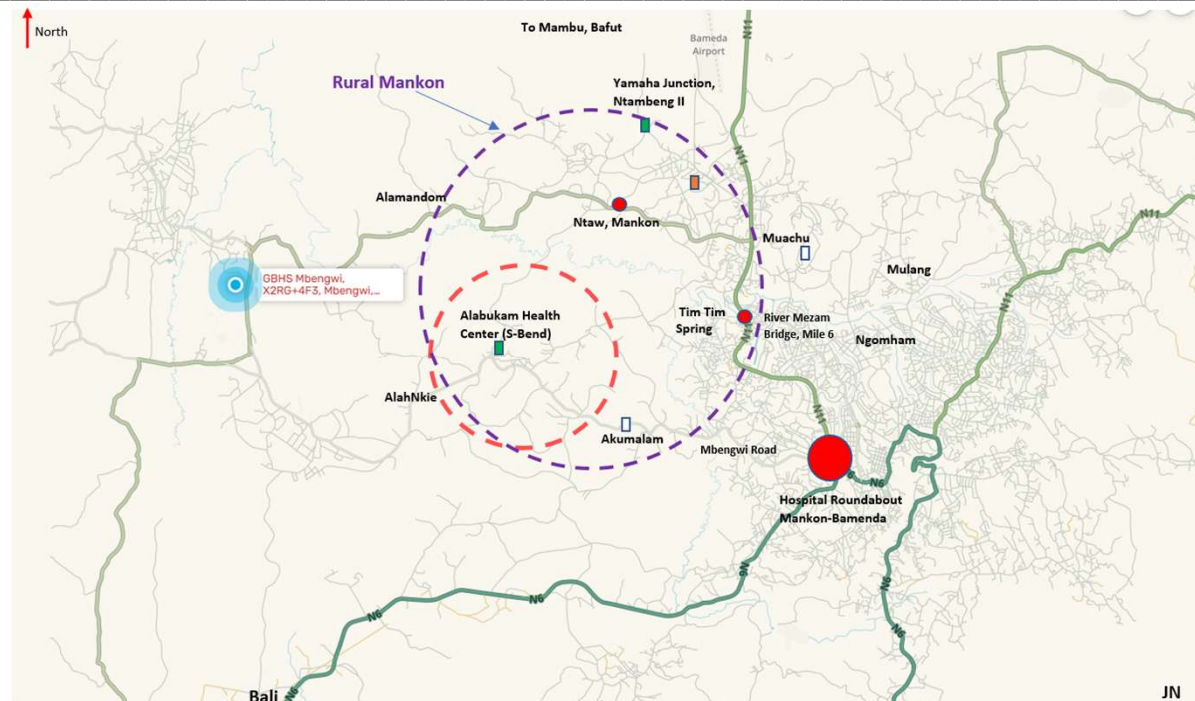
MACUDA AMERICA PROJECT COMMITTEE

WATER SYSTEM PROJECT SURVEY – 2025

Prepared by Jones Nji Nkimbeng

Engineering Supervisor and Project Committee Chair

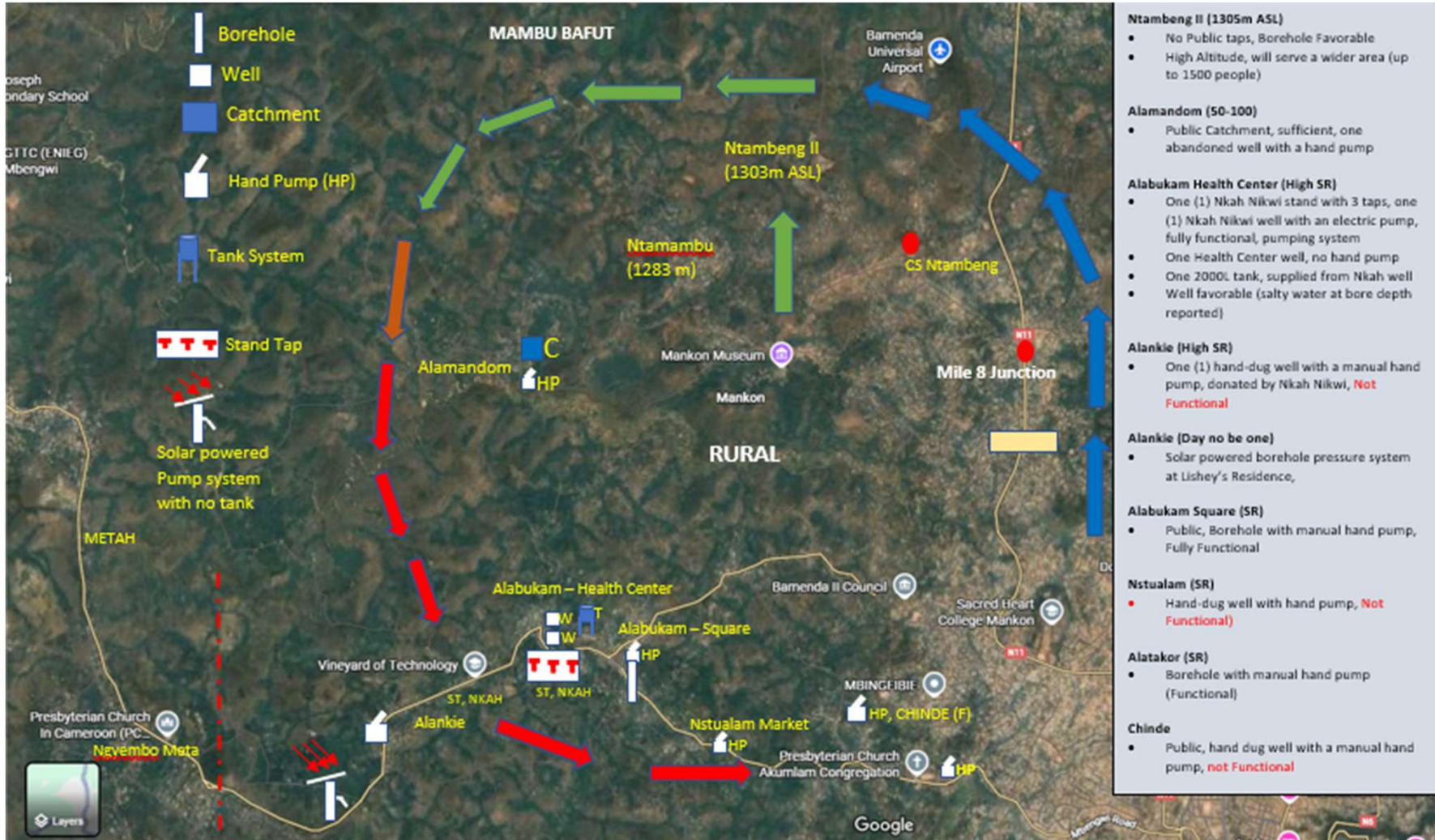
Project Committee Members: Sammy Bujang -DL, Gabila Frankline -DL, Felix Leshey -CH, Cletus Ndisang-OH, Amina Ngum-DL, Roland Cheyson-DE, Ernest Nsoh-MN, Edwin Cho-CA, Christopher Che Chi-DMV, Festus Fru Nde-GA



MAP OF MANKON AND SURVEY STRATEGY (SCOPE)



MAP OF MANKON AND SURVEY STRATEGY (SCOPE)



SURVEY RESULTS OF PUBLIC WATER SYSTEMS - CHINDE



Type of System

Hand-dug well with a manual hand pump.

State

Not functional

Possible Problem (s)

Faulty center rod - Faulty Pipes

Recommendation

Replacement of faulty parts; - Possible increase of depth if necessary; - Cleaning and treatment; - Enclosure of fetching area

Estimated cost of maintenance = 300,000 - 800,000 cfa

Future Expansion Considerations: Construction of a tower to carry a 5m³ tank, with 2 stand taps and powered by a hybrid solar pumping system.

SURVEY RESULTS OF PUBLIC WATER SYSTEMS - **NTSUALAM**



Type of System

Hand-dug well with a manual hand pump. Does not require a borehole machine.

State

Not functional for at least 5 years

Possible Problem (s)

Faulty center rod - Faulty Pipes - Faulty manual pump

Recommendation

Replacement of faulty parts; - Possible increment of depth if necessary; - Cleaning and treatment; - Reconstruction of enclosure of fetching area

Estimated Maintenance :400,000 - 900,000 CFA

Future Expansion Considerations: Construction of a complete water system (like that of Ngulung) with 6 stand taps to cater for Akumalam, Ntsualam and Ala'atah.

SURVEY RESULTS OF PUBLIC WATER SYSTEMS - ALATAKOR



Type of System

Borehole with a manual hand pump

State

Fully Functional

Possible Problem (s)

Stressful to operate hand pump

Recommendation

Installation of a foot valve for water retention and mounting of water pressure for easy and less stressful use

Estimated Maintenance: 100,000 - 200,000 CFA

Future Expansion Considerations

Construction of a tower to carry 5m³ tank, with 2 stand taps and powered by a hybrid solar pumping system.

SURVEY RESULTS OF PUBLIC WATER SYSTEMS - ALABUKAM



Type of System

Borehole with a manual hand pump

State

Fully Functional

Possible Problem (s)

No Problem

Recommendation

The water system needs little or no maintenance. Possible maintenance of the concrete slab needed.

Estimated Maintenance: 5,000 - 25, 000 CFA

Future Expansion Considerations

Construction of a tower to carry 10m³ of water(two 5m³ tanks), with about 3 stand taps and powered by a hybrid solar pumping system.

SURVEY RESULTS OF PUBLIC WATER SYSTEMS – **ASONGKA – ALABUKAM HEALTH CENTER**



Type of System

Hand-dug well without a manual hand pump. Does not require a borehole machine.

State

Not functional but water can be fetched from the well by means of a rope and bucket

Possible Problem (s)

Lack of pumping system

Recommendation

Installation of complete manual hand pump; - Possible increase of depth if necessary; - Cleaning and treatment; - Construction of an enclosure around the fetching area

Estimated Maintenance: 600,000 - 1, 200, 000 CFA

Future Expansion Considerations

Construction of a tower to carry 5m³ tank, with 2 stand taps and powered by a hybrid solar pumping system

SURVEY RESULTS OF PUBLIC WATER SYSTEMS – **ASONGKA – ALABUKAM HEALTH CENTER**



Type of System

Hand-dug well with one stand tap and a constructed tower carrying a 2m³ tank and system operated by an electric pump. This was donated by NKAH NIKWI NI MANKON. Borehole machine not required.

State

Functional

Possible Problem (s)

Water shortage always experienced ; Unstable electrical supply

Recommendation

Possible increase of depth if necessary; - Cleaning and treatment
(Need approval/collaboration with Nkah Nikwi of Mankon)

Estimated Maintenance: 100,000 - 300, 000 CFA

SURVEY RESULTS OF PUBLIC WATER SYSTEMS – ALAHNKIE



Type of System

Hand-dug well with a manual hand pump donated by NKAH NIKWI NI MANKON. Does not require a borehole machine.

State

Not Functional

Possible Problem (s)

Faulty center rod

Recommendation

Replacement of broken center rod (***Need to approval/collaboration with Nkah Nikwi***)

Estimated Maintenance: 50,000 - 100,000 CFA

Future Considerations

Construction of a tower to carry 5m³ tank, with 2 stand taps and powered by a hybrid solar pumping system

SURVEY RESULTS OF PUBLIC WATER SYSTEMS – ALAHNKIE – DAY NO BE ONE AT LISHEY'S RESIDENCE



Type of System

Borehole powered by a solar system but with no storage

State

Partially Functional, one failed tap, two taps total

Possible Problem (s)

One Failed tap

RecommendationNeed

Replacement of failed tap head (**Approval/Agreement**)

Estimated Maintenance: 5,000- 25, 000 CFA

Future Considerations

Construction of a tower to carry 10m³ tank, with 3 stand taps
(**Need to seek approval/agreement**)

CRITERIA

A - Existing Public Water Systems

- Public wells/Borehole systems, etc.

B - Soil Condition and Water Availability Below the Surface

- Ease of digging wells (up to 40 m deep) to access water
- Available interconnected Aquifers between 50 – 150 meters. Borehole systems deeper than 150 m are expensive to construct and maintain

B - Population – (Cost to Population Ratio)

D - S – Factor (SAR,, IR, AR)

REVIEW OF SURVEYED LOCATIONS

NTAMBENG II

A – Are there any Existing Public Water Systems?

- No public wells or borehole systems.

B – How is the soil condition?

- Significant difficulty to access water with wells due rocks/altitude
- Interconnected aquifers between 100-150 m
- Ntambeng II sits at an Altitude of 1305m ASL. This will facilitate water distribution to neighboring quarters

C- Population

- 500-600. Potentially 1500

D- S – Factor (SAR)

ALABUKAM –ASONKA, ALABUKAM, ALAHNKIE

A – Are there any Existing Public Water Systems?

- Yes – several. Repairs/Upgrades needed

B – How is the soil condition?

- Relative ease to access water with hand-dug wells at 20-25m (Health Center, Alankie). It is reported that two (2) 150m boreholes at the health center were abandoned due to salty water. (*Need further investigation*).

C- Population

300-500

D- S – Factor (SAR, IR, AR)

NSTUALAM, CHINE, ALATAKOR, AKUMALAM

A – Are there any Existing Public Water Systems?

- Yes – several. Repairs/Upgrades needed

B – How is the soil condition?

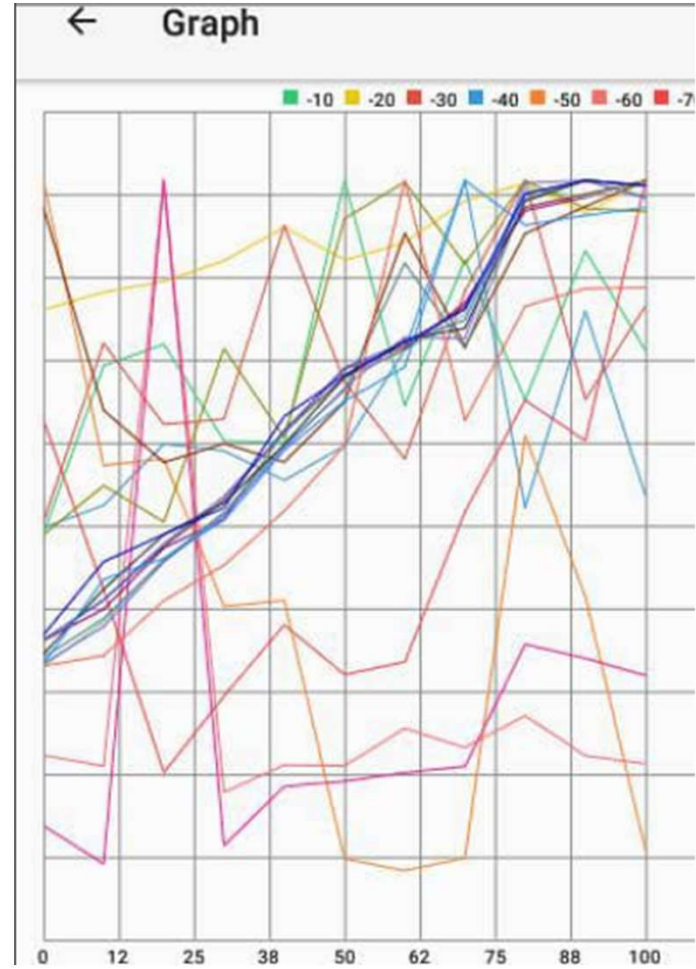
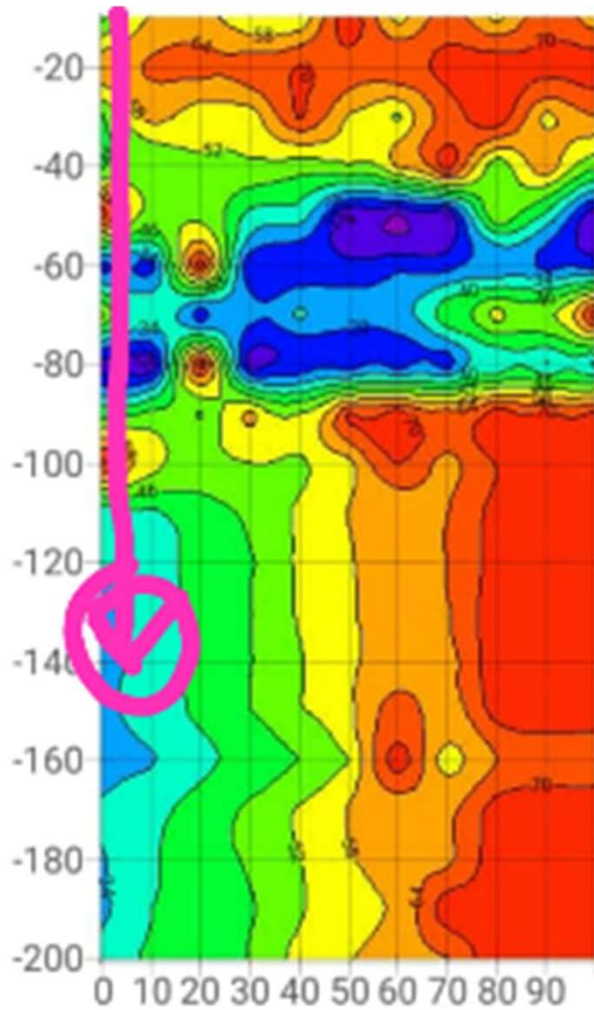
- Relative ease to access water with wells or boreholes at 30-100m. A borehole system will serve a wider area by gravity

C- Population

Over 600 people

D- S Factor *SAR, IR, AR)

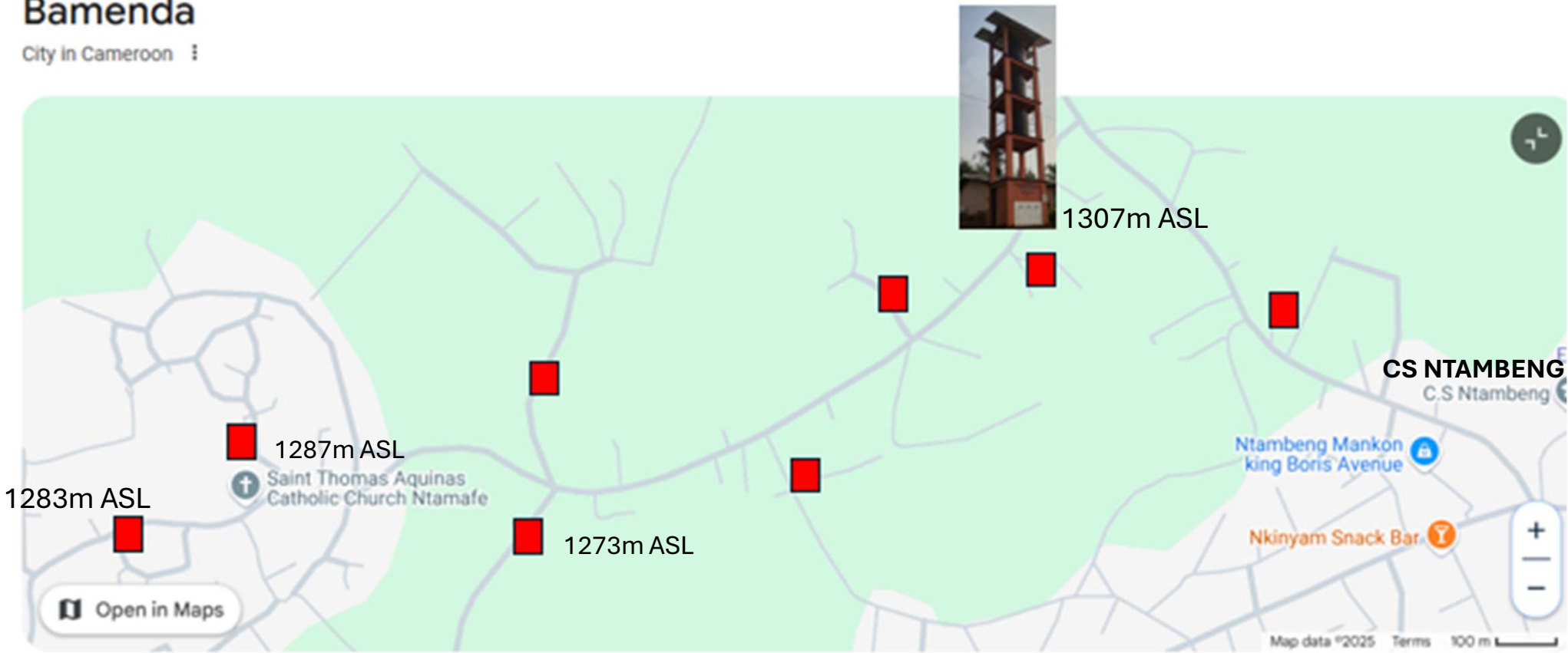
BOREHOLE WATER SYSTEM PROPOSAL – NTAMBENG II – SURVEY RESULTS



BOREHOLE WATER SYSTEM PROPOSAL – NTAMBENG II – DISTRIBUTION

Bamenda

City in Cameroon



NTAMBENG II – BOREHOLE WATER SYSTEM – ESTIMATE (20,000 LITERS, FOUR TANKS)

1. Preliminary Work – **0.5M**
2. Drilling of Borehole -**3.35 M**
3. Construction of Tower (Material & Labor) – **6M**
4. Water Storage and Distribution at the Tower (Tanks, Pipes, Accessories) - **2M**
5. Installation of Solar Pumping System - **4.8M**
6. Distribution within Ntambeng II (Pipes, faucets, etc.) - **3.6 M**
7. Extension to Ntamambu – Two Stands – **2.5M**
8. Extension Toward Ntumbong – **0.7M**
9. Engineering Supervision and Control on the Ground (Supervision, Training of Community, Transportation, etc.) - **0.9M**

Estimated Cost of Project – 24.3 – 26.7 Million CFA (Includes 10% Contingency)

Notes:

1. The Project Manager did not charge for Engineering hours
2. The Project Manager did not charge for this report

ADDITIONAL COMMENTS

Existing Wells

- Existing wells should be improved and sealed of the prevent contamination (Intentional or Inadvertent). This applies to existing wells at Alabukam and Alankie
- Access should be by authorized and competent Persons ONLY

Priority

Based on this year's survey and how much is raised during the Fundraiser, work priority is recommended as follows using the estimate from Ntambeng II as a guide :

1. If the amount of money raised in 2025 can sponsor one Borehole Water System project - Construct a Borehole Supply System in Ntambeng II to serve Ntambeng II and Neighboring Quarters
2. If the amount of money raised can sponsor two Borehole Water System project– Construct a Borehole in Ntambeng II as above **AND ALSO** Construct a second Borehole Water Supply System in Nstualam to supply Nstualam and Neighboring quarters (*Additional planning needed)
3. If the amount of money raised can sponsor both projects above as outlined under item #2, AND another project – it is recommended to repair and UPGRADE existing water systems in Alabukam and Alankie (Ala Mankon) as outlined in the presentation above (Addition of Above ground storage tanks, hybrids electric pumps, Solar systems, stands, etc.)

ADDITIONAL PICTURES – A WIDER VIEW OF THE PUBLIC HAND PUMP AT CHINDE



ADDITIONAL PICTURES – AKUMALAM PRESBYTERIAN CHURCH – A BOREHOLE SYSTEM AT NSTUALAM WOULD SUPPLY AKUMALAM AND NEIGHBORING QUARTERS



ADDITIONAL PICTURES – NKAH NIKWI HAND-DUG WELL AT ALAHNKIE – A BOREHOLE MACHINE WAS NOT NEEDED



ADDITIONAL PICTURES – 2000-L TANK TOWER AT ALABUKAM HEALTH CENTER (S-BEND)

AN ELECTRIC PUMP INSIDE THE NKAH NIKWI WELL NEARBY PUMPS WATER INTO THIS TANK. THE TANK SUPPLIES WATER BY GRAVITY TO THE HOSPITAL AND COMMUNITY. THIS SYSTEM CAN BE UPGRADED AS EXPLAINED ABOVE

2000 L Tank at Alabukam Health Center



S-Bend Alabukam showing the road to the Health Center



Nkwa Nikwi Well at S-Bend



ADDITIONAL PICTURES – 2000L TANK TOWER AT ALABUKAM HEALTH CENTER (S-BEND)

AN ELECTRIC PUMP INSIDE THE NKAH NIKWI WELL NEARBY PUMPS WATER INTO THIS TANK. THE TANK SUPPLIES WATER BY GRAVITY TO THE HOSPITAL AND COMMUNITY. THIS SYSTEM CAN BE UPGRADED AS EXPLAINED ABOVE

The Tank needs to be centered



The Tank needs to be centered



The tank was original supported by a metal structure



ADDITIONAL PICTURES – ALABUKAM HEALTH CENTER (S-BEND)

IT IS REPORTED THAT TWO BOREHOLES WERE DUG BUT ABANDONED DUE TO THE SALTY NATURE OF THE WATER. FURTHER INVESTIGATION IS NEEDED

Alabukam Health Center



Alabukam Health Center



Location of an abandoned Borehole
infront of the Health Center



ADDITIONAL PICTURES – ALABUKAM HEALTH CENTER (S-BEND)

IT IS REPORTED THAT TWO BOREHOLES WERE DUG BUT ABANDONED DUE TO THE SALTY NATURE OF THE WATER. FURTHER INVESTIGATION IS NEEDED

Alabukam Health Center – Location of the second borehole that was abandoned



Alabukam Health Center – A public tap in front of the building (Needs repairs)



ADDITIONAL PICTURES – NTAMBENG II – NO PUBLIC TAPS

PROPOSED LOCATION OF THE BOREHOLE SYSTEM AT NTAMBENG II



**Let us Continue to Improve the Quality of Life
in Mankon – One or Several Quarters at a
Time!**

Thank You!