

BOREHOLE DRILLING PROGRESS REPORT



Submitted By: Villages in Partnership

Donor: Rotary Club of Downers Groove

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1. Executive Summary

This progress report presents the outcomes of the borehole drilling and test-pumping campaign conducted between 22 and 30 June 2026 in Senior Chief Nkagula Traditional Authority, Zomba District with funding from Rotary Club of Downers Grove. The campaign forms a critical component of the Villages in Partnership (VIP) community water security programme and builds directly on two foundational studies: (i) the Pre-Drilling Household Survey (May 2026) that established demand-driven priority localities, and (ii) the Geophysical Survey Report (June 2026) that identified high-probability groundwater targets through Vertical Electrical Sounding (VES).

Five borehole sites were drilled. Four wet boreholes were completed, with yields ranging from 0.20 to 0.66 litres per second (L/s). One site (Maulana) proved completely dry and is recommended for replacement by a reserve village (Nsenda or Phondiya). A second primary site (Makuluni) produced only a marginal yield of 0.20 L/s and failed the test-pumping protocol; a confirmatory geophysical survey is recommended at an alternative peg within the village, with the option to re-drill if a stronger signature is confirmed or, failing that, to replace the site with a reserve village.

Overall success rate for the primary drilling stands at 60 % (3 of 5 original targets delivering usable water). When the successful reserve replacements are included, five functional wet boreholes will be secured. Clear recommendations are provided for re-siting the two unsuccessful or low-yield locations and for completing the remaining reserve pipeline.

Key Performance Snapshot

Sites Drilled	Successful Wet BHs	Dry / Failed	Total Wet Metres
5	4	1 Dry + 1 Low-Yield	223.00 m

2. Programme Context and Preparatory Work

2.1 Pre-Drilling Household Survey

Prior to any technical investigation, VIP's Monitoring, Evaluation, Accountability and Learning (MEAL) team, working with the WASH team and the District Water Office, conducted a participatory household survey across eight villages in May 2026. The survey established demand concentration at specific localities and ranked sites by the share of water-needy households that would be served by a single borehole.

No	Village Name	Location identification name	Population percentage with water need
Original Primary Target Villages:			
1	Maulana	Njala	51
2	Maliwata	Kumilonde	50
3	Makuluni	Saliya	45.5
4	Mwala	Kamwendo	36.5
5	Manduwas	Pa Bwalo	36.2

Designated Reserve Villages (activated only if primary sites fail):			
6	Phondiya	Witness	43.8
7	Nsenda	Dzuwa	43.8
8	Mwandama	Magret	39.5

2.2 Geophysical Survey

Villages in Partnership engaged Hydro Water Engineering Limited to conduct Vertical Electrical Sounding (VES) investigations using the PQWT electrical resistivity system at the five primary target villages on 1st June 2026. All five sites exhibited favourable low-resistivity anomalies consistent with saturated weathered or fractured zones within the practical 20–60 m depth interval. Recommended drilling methods and target depths were as follows:

Village	VES ID	Primary Water Strike (m)	Rec. Depth (m)	Method
Manduwasa	18	28–55	50–60	Mud rotary
Maliwata	7	30–50	50	Mud rotary
Makuluni	10	30–50 & 55–60	45–50	Air / DTH
Maulana	22	25–45 & 50–60	45–50	Air / DTH
M'mwala	19	20–45 & 55–60	50	Air / DTH

The geophysical ranking placed Maulana and Mwala as highest priority on hydrogeological grounds, followed by Makuluni, Manduwasa and Maliwata. All five sites were judged suitable for drilling.

3. Drilling and Pump-Testing Results

Drilling was executed between 22 and 30 June 2026. The following table and narratives present the complete technical results for each site, including construction materials, static and dynamic water levels, and measured yields.

3.1 Summary of All Sites

Site / Village	Dates	Depth (m)	Yield (LPS)	S.W.L. (m)	D.W.L. (m)	Status
001 Malivata	24–25 Jun	46.00	0.25	2.50	39.26	Successful
002 Mwala	26 Jun	47.00	0.66	4.93	8.91	Successful
003 Mandiwasa	22 Jun	51.00	0.40	10.84	25.31	Successful
004 Maulana 2	26 Jun	56.00	—	—	—	Unsuccessful (Dry)
005 Makuluni	25 Jun	32.00	0.20	—	—	Low Yield / Failed TP

3.2 Detailed Site Narratives

Maliwata Village (Primary Target)

A successful wet borehole was completed to 46.00 m deep. The site corresponds to the geophysical target at Maliwata (VES 7), where a continuous low-resistivity zone had been identified between 30–50 m. Construction utilised 8.00 lengths of 113 mm plain casing and 8.00 lengths of 113 mm slotted casing, with 1.20 m³ of gravel pack.

Test pumping for 4.00 hours recorded a static water level (S.W.L.) of 2.50 m and a dynamic water level (D.W.L.) of 39.26 m, producing a sustainable yield of 0.25 LPS. Although modest, the yield is adequate for a community hand-pump serving the high-demand locality of Kumilonje with 50.8 % of village water-needy households. This yield is also in line with the minimum yield as per Malawi Government policy.



Borehole Drilling underway in Maliwata Village

Mwala Village (Primary Target)



The community celebrating borehole drilling in Mwala Village

This borehole achieved the highest yield of the campaign (0.66 LPS) at a final depth of 47.00 m. The location aligns with VES 19, which had shown a broad low-resistivity domain from approximately 20 m and a secondary conductive feature at 55–60 m. Construction used 8.00 plain and 8.00 slotted 113 mm casings with 0.98 m³ gravel pack. Four-hour test pumping recorded S.W.L. 4.93 m and D.W.L. 8.91 m. The low drawdown relative to yield indicates favourable aquifer transmissivity. This borehole will serve the priority of Kamwendo location and ranks as the strongest hydrogeological performer of the campaign.

Manduwaswa Village (Primary Target)

In Manduwaswa village, drilling was done to 51 m and completed as a successful wet borehole. The site matches VES 18, which had indicated a thick low-resistivity interval (28–55 m) in a sedimentary/breccia host rock. Construction comprised 9.00 plain and 9.00 slotted 113 mm casings with only 0.10 m³ gravel pack (reflecting favourable formation stability). Test pumping (4 h) yielded 0.40 LPS with S.W.L. 10.84 m and D.W.L. 25.31 m. The borehole will successfully

serve the water needs of the target population in the community. ***(Photos for this site could not be found)***

Maulana 2 Village (Primary Target – Unsuccessful)

Despite strong geophysical indicators (VES 22 ranked among the highest-priority targets, with multi-layer low-resistivity signatures at 25–45 m and 50–60 m), the borehole drilled to 56.00 m remained completely dry; no water was encountered. This outcome underscores the inherent uncertainty of geophysical interpretation and the influence of local fracture geometry that may not be fully captured by a single VES station.

Further investigation of borehole drilling history in the area revealed that previous drillers have faced significant challenges in achieving successful boreholes in the community. A provisional recommendation was therefore made for a redrill in a different village while a permanent solution and strategy were being developed for future drilling in the same community. In accordance with the programme design, the redrill was recommended for Nsenda or Phondiya.



Left: A dry hole encountered in Maulana 2 and Right: A VIP Staff addressing the community on the way forward

Makuluni Village (VIP Primary – Low Yield)

A wet borehole was completed to only 32.00 m with a marginal yield of 0.20 L/s. Construction used 5.00 m of plain and 6.00 m of slotted 113 mm casings, together with 0.78 m³ of gravel pack. Test pumping failed to meet acceptable performance criteria. Although the geophysical survey (VES 10) had indicated dual aquifer targets at 30–50 m and 55–60 m, the borehole appears to have intersected only a limited portion of the productive zone or to have encountered a lower-permeability facies. A redrill was therefore recommended at a different location in the same village. The redrill was postponed to a later date so that a geophysical surveyor could be engaged to identify a suitable site in the same village.

5. Analysis, Lessons Learned and Hydrogeological Observations

The campaign confirms both the value and the limitations of the preparatory work. The household survey successfully concentrated resources on localities with the highest unmet

demand, ensuring that every successful borehole maximizes community impact. The geophysical survey correctly identified the presence of potential aquifer horizons at all five primary sites; however, actual yield is governed by the precise intersection of the borehole with discrete fracture or weathered zones, something a single VES station can only probabilistically predict.

Key observations:

- Four of the five primary geophysical targets produced water, validating the overall resistivity interpretation.
- The single complete failure (Maulana 2) occurred at a site that had been ranked among the strongest on geophysical grounds, highlighting residual risk even at high-confidence targets.
- Makuluni's marginal yield and failed test-pumping indicate that simply reaching a wet zone is insufficient; sustainable specific capacity are required for long-term community use.

6. Recommendations

The following recommendations are offered to secure water for the remaining unserved or under-served communities:

1. **Maulana Village:** In light of the established borehole drilling history in the area, it is recommended that VIP activates drilling in the next highest-demand reserve villages, either Pondiya or Nsenda.
2. **Makuluni Village:** There is need to commission a confirmatory geophysical survey focused on the dual-aquifer targets originally identified at 30–50 m and 55–60 m. If a stronger conductive signature is confirmed at an alternative peg, re-drill; otherwise VIP will have to replace Makuluni with a reserve village between Nsenda and Pondiya.

7. Next Steps and Conclusion

The June 2026 drilling campaign has delivered four wet boreholes intended to serve high-demand localities in Malivata, Mwala, Mandiwasa, and (marginally) Makuluni. Two primary targets require further action: one complete re-site (Maulana) and one potential re-drill or reserve replacement (Makuluni). With the reserve mechanism already proven effective, the programme retains the capacity to reach the original target of five sustainable community water points.

VIP has the following Immediate priorities:

1. To finalize hand-pump installation at the three fully successful sites;
2. To commission a confirmatory geophysical survey at Makuluni and, subject to the outcome, either re-drill or substitute a reserve village;
3. To activate drilling in the reserve villages of Pondiya or Nsenda for Maulana while pre-surveying any remaining reserve sites.
4. To conduct community water-point committee training

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