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Gravity Fed Water System

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Sharpening Intellect | Deepening Christian Faith | Inspiring Action

Messiah University is a Christian university of the liberal and applied arts and sciences. Our mission is to educate men and women toward maturity of intellect, character and Christian faith in preparation for lives of service, leadership and reconciliation in church and society.

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Project Background

In Sipacapa, Guatemala, a village of approximately 150 people lack direct access to safe and potable water. We are working with Mennonite Central Committee to design a gravity fed water system to solve this

problem. The system captures water from a spring and pipes it by gravity (without pumps) to the village. It is a sustainable zero energy water system. By providing access to water, the local people will no longer have to walk or horseback ride miles to retrieve water from the river.

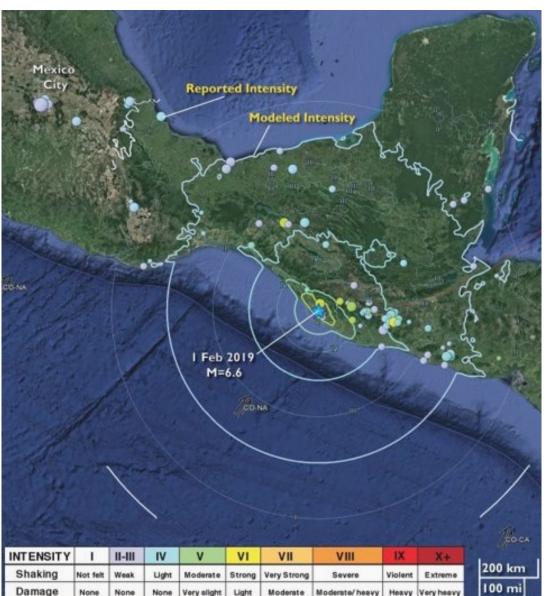


Our Partner

The Gravity Fed Water project team collaborates with Mennonite Central Committee to serve our brothers and sisters in Sipacapa, Guatemala.

Environmental Impact

•Earthquakes occur frequently in Guatemala so the intake structure and tanks will be reinforced with rebar • Installation of a fence around the intake structures will help prevent source contamination and



Source: temblor.net





Relief, development and peace in the name of Christ

waterborne diseases

Gravity Fed Water System

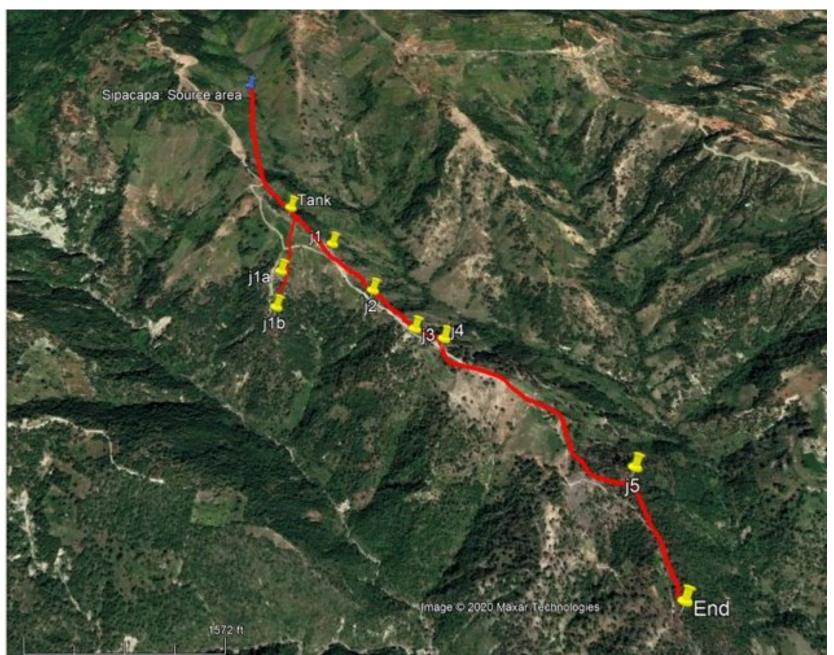
Sarah Aldrich and Joseph Grant

The Water System

Water Source

- Multiple groundwater seeps
- ~7 GPM flow rate
- Highest elevation point in the system
- Reduce potential contaminants





IPELINE TO THE COLLECTION

MULTIPLE SOURCES & COLLECTION TANK

Source: Dr. Thomas Jordan Jnr

Cost Estimate

Intake Structures

Piping Network • 1.25" PVC piping

- pressure calculations along system
- Water tanks will store at least a days worth of water for the village

COVER SLOPED TO DEPLECT RAIN NAT OVERFLOW PIPE, SCREENED 3 INCHES DIAMETER ARGE AND SMALL STONES STACKED TO FORM HALL ALLONING HATER TO FLOH THROUGH

Source: EMI

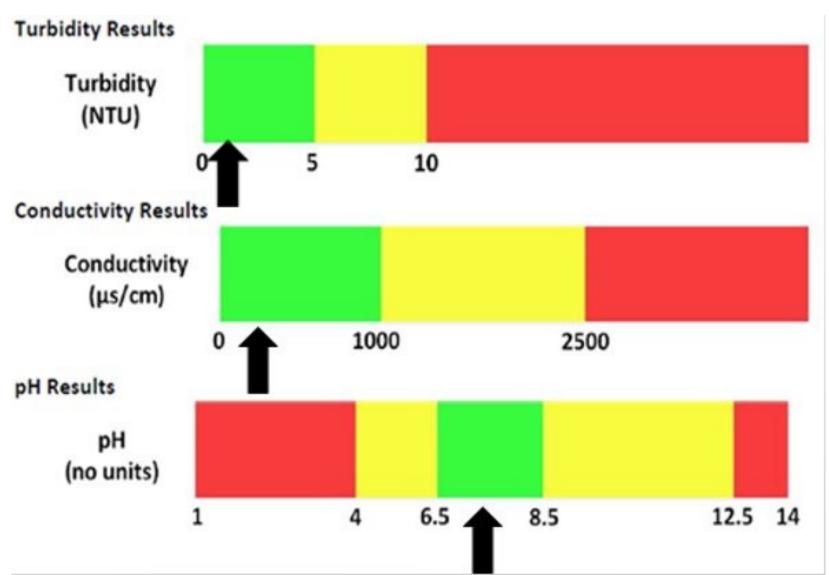
Concrete Work	\$ 1,663.89
Watermain Work- Intake to Community Building Storage Tank	\$ 2,011.40
Watermain Work- Community Building Storage Tank to Village	\$ 4,591.08
Water main Work- First Main Lateral	\$ 805.62
Storage Tank Work	\$ 1,200.00
Subtotal	\$10,271.99
20% Contingency	\$ 2,054.40
Total Project Cost	\$22,598.38



• EPANET and Microsoft Excel models for • 3 concrete water tanks throughout system

Water Treatment

•Tested Water Alkalinity, Hardness, Turbidity, pH •Onsite water testing for indicator coliforms will be performed after intake structures are built •Will chlorinate water if needed



Project Impacts

Some of the potential impacts of installing the gravity fed water system in Sipacapa include:

- Access to safe, potable water
- Reduced disease
- More people brought to Christ
- Reduced time spent getting water to allow more time spent on education, working, and further development

Acknowledgements

We would like to acknowledge our mentor, Thomas Soerens, and our other team members: Ella Sobek (Student Project Manager) and Jordan Higley.





•3 concrete intake structures feeding into one larger concrete intake structure

