

Engineers Without Borders (EWB) Research Triangle Professional (RTP) Chapter:



Chipozo Alta Verapaz Guatemala Water Supply Project

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Bruce Binney
President, EWB RTP
bruce.binney@gmail.com
<http://ewb-usa.org>
<http://rtpewb.com>
<https://support.ewb-usa.org/waterforchipozo>

Objectives of this brief

- Introduce Engineers Without Borders (EWB)
 - EWB Mission, Core Values and Impact
 - Our professional chapter in Raleigh NC
- Describe the EWB RTP water supply improvement project in the community of Chipozo Alta Verapaz, Guatemala
 - Help 95 families (615 people) without dependable clean water
- Solicit your support in participation and/or resources for this important effort



EWB RTP members meeting with Chipozo community leaders 04/25/2019

EWB USA

Building a Better World



Vision

EWB-USA's vision is a world in which every community has the capacity to sustainably meet their basic human needs.

Mission

EWB-USA builds a better world through engineering projects that empower communities to meet their basic human needs and equip leaders to solve the world's most pressing challenges.

Engineers Without Borders USA is a 501c(3) tax-exempt organization



Core Values

SERVICE FIRST

EWB-USA commits to harnessing the skills of its volunteers to fulfill communities' basic human needs. We provide the services that meet these needs without consideration of race, religion, gender or political affiliation.

TRUSTED PARTNERSHIPS

Trust forms the foundation of EWB-USA partnerships, which are achieved through transparency, integrity and respect for the contributions and capabilities of all parties.

SUSTAINABLE SOLUTIONS

Sustainability drives EWB-USA's programs. We commit to community-driven projects. We equip our partner communities to maintain each project so it remains functional long after our commitment is fulfilled.

GROWTH & LEARNING

EWB-USA fosters an environment of learning so our volunteers, community members and staff have the tools, training and passion to address the world's most pressing challenges. We strive for our work to inspire others to learn more, do more, and become more.

CONDUCT & PRACTICES

EWB-USA holds paramount safety, security and ethical conduct. The volunteers and staff of EWB-USA are bound by the Member Code of Conduct and the engineers' Code of Ethics.

STRONGER TOGETHER

The EWB-USA family is comprised of community members, students, professionals, universities, headquarters staff and a host of other supporters. We thrive off diversity and the collaborative pathways it provides. But most importantly, we pursue EWB-USA's mission as one, with aligned goals and purpose.

We are **Impactful**

651 Projects Underway



384

WATER PROJECTS



77

STRUCTURES PROJECTS



40

ENERGY PROJECTS



77

SANITATION PROJECTS



44

AGRICULTURE PROJECTS



25

CIVIL WORKS PROJECTS



3

INFORMATION SYSTEM PROJECTS



1

DISASTER RECOVERY PROJECT

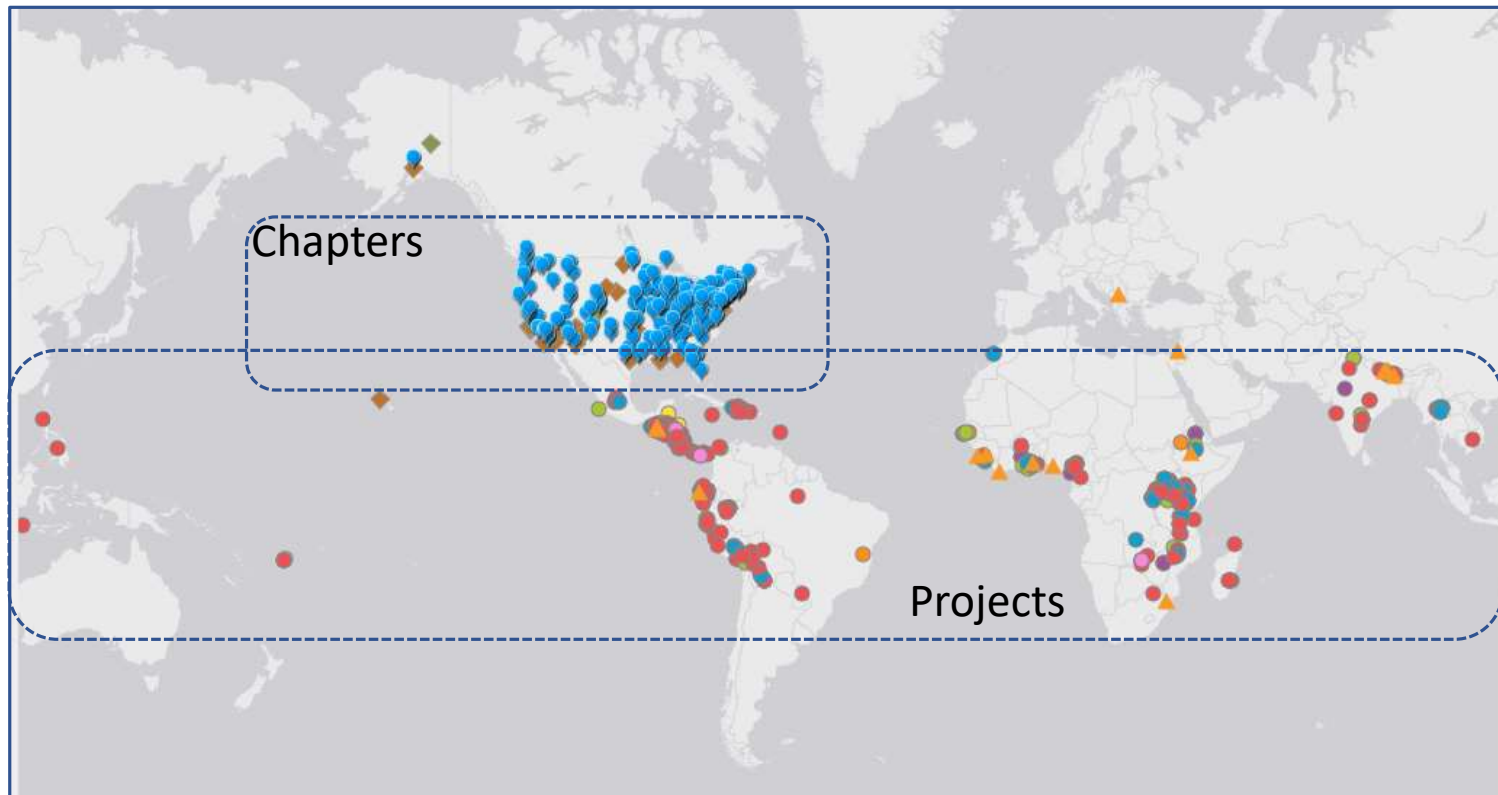
For more info, please visit:
<https://www.ewb-usa.org/>

EWB USA

Building a Better World

Visit <https://www.ewb-usa.org/our-work/where-we-work/>

to learn more about the worldwide efforts of the EWB Professional and Student chapters



Overview of the Chipozo Water Supply Improvement Project

- **Problem:** The 95 families in the Mayan (Pokomchi) village of Chipozo do not have a dependable clean water source

- Current sources are largely unimproved springs which are not clean or are water catchment on houses which do not supply water in the dry season

- **Opportunity:** The community has identified a spring in a remote area which can support sufficient and clean water flow all year

- But is a rugged and steep path of over 1km in distance and 150meters elevation change

- **Solution:** Build a sustainable solar-powered water distribution system from the spring to the community

- **Current Partners** in the project are:

- Community-Based Organization (CBO): Chipozo COCODE
- Non-Governmental Organization (NGO): CECEP (<http://www.cecep.cosmosmaya.info/>)
- EWB Guatemala

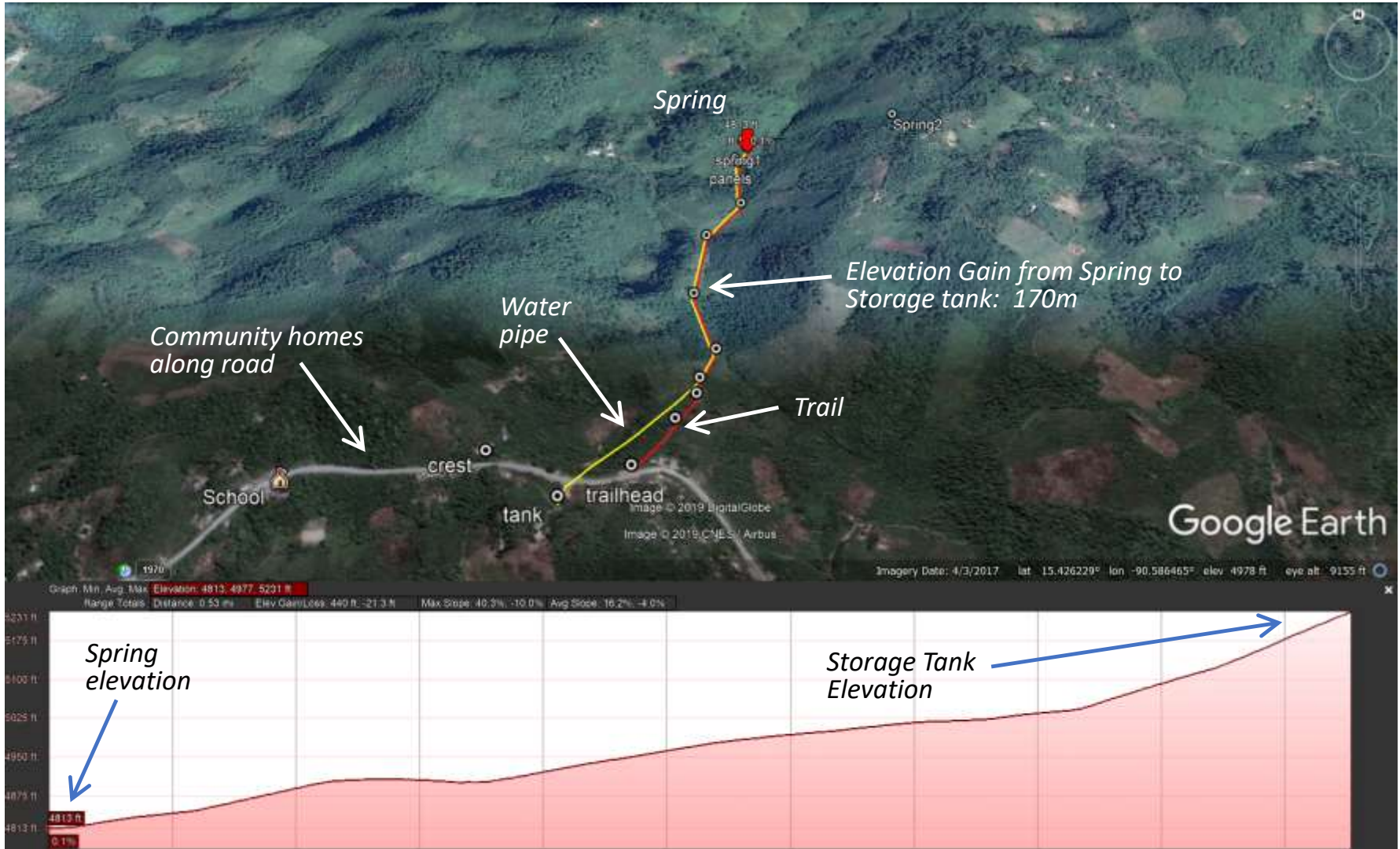


Typical unimproved springs

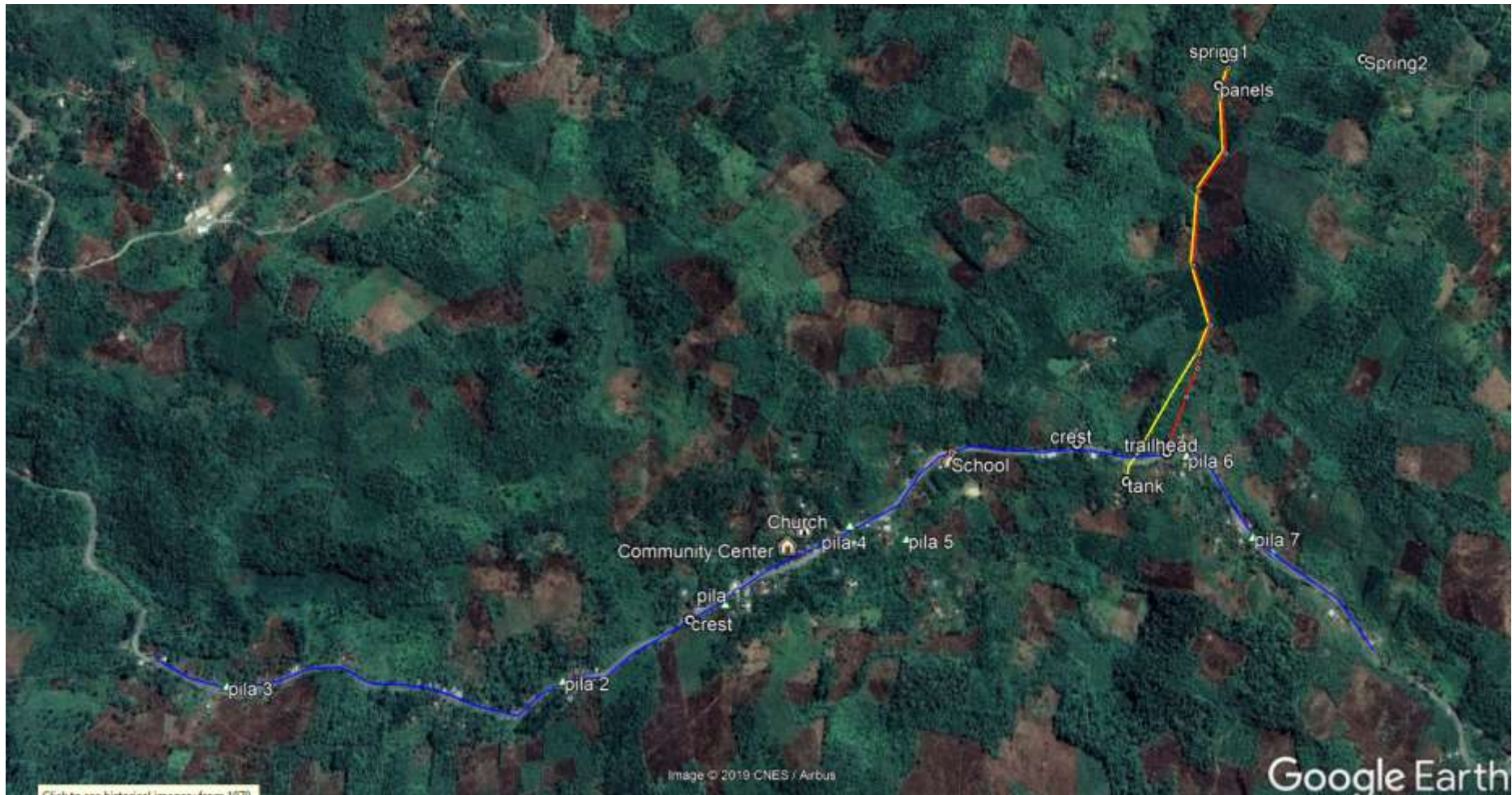


The people we want to help

The Challenge: Pumping 10,000 liters/day to an elevation gain of 170 meters using a solar-powered pump system

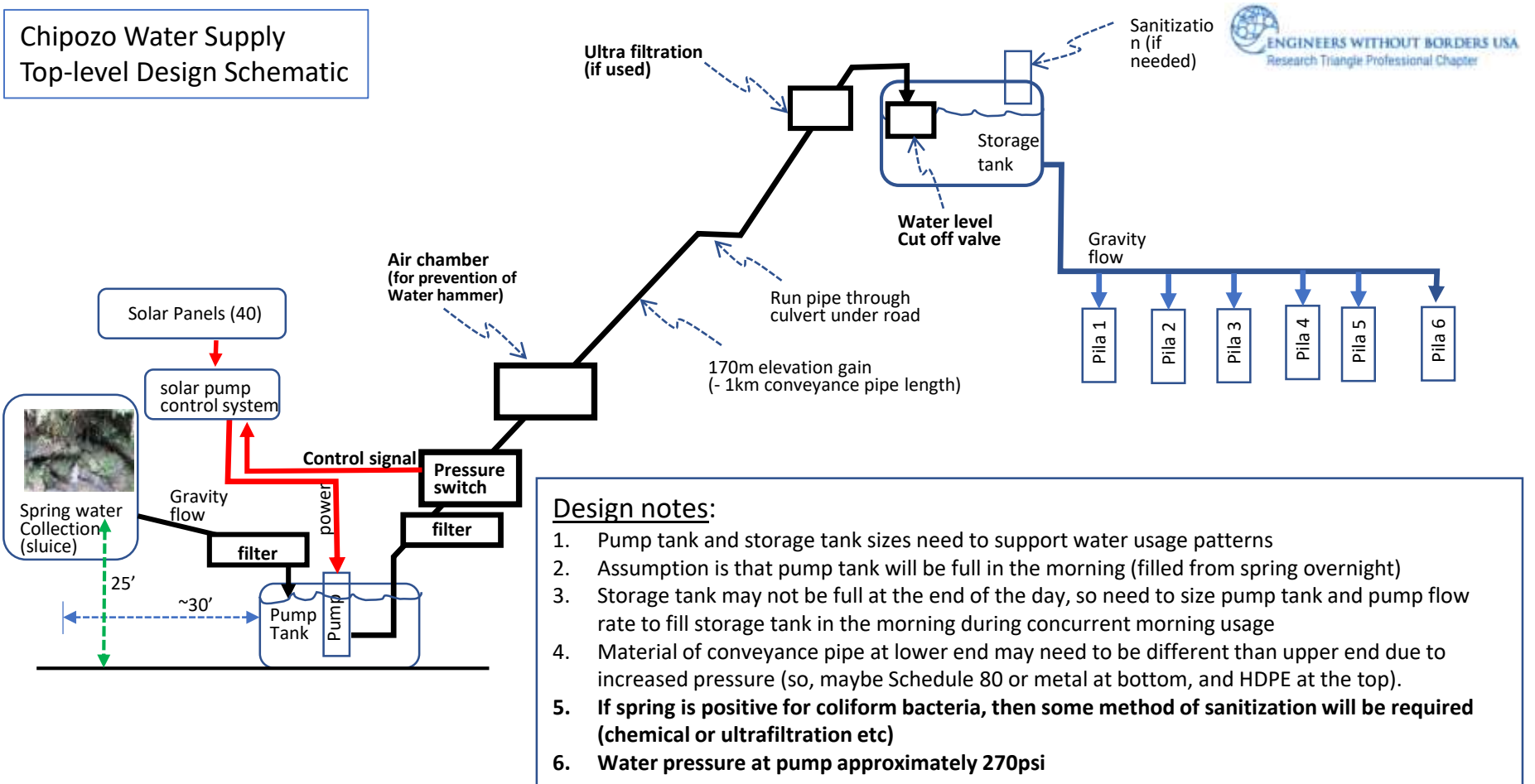


Pila locations and elevations



Top-level Schematic of System Design

Chipozo Water Supply
Top-level Design Schematic



Project Responsibility Matrix

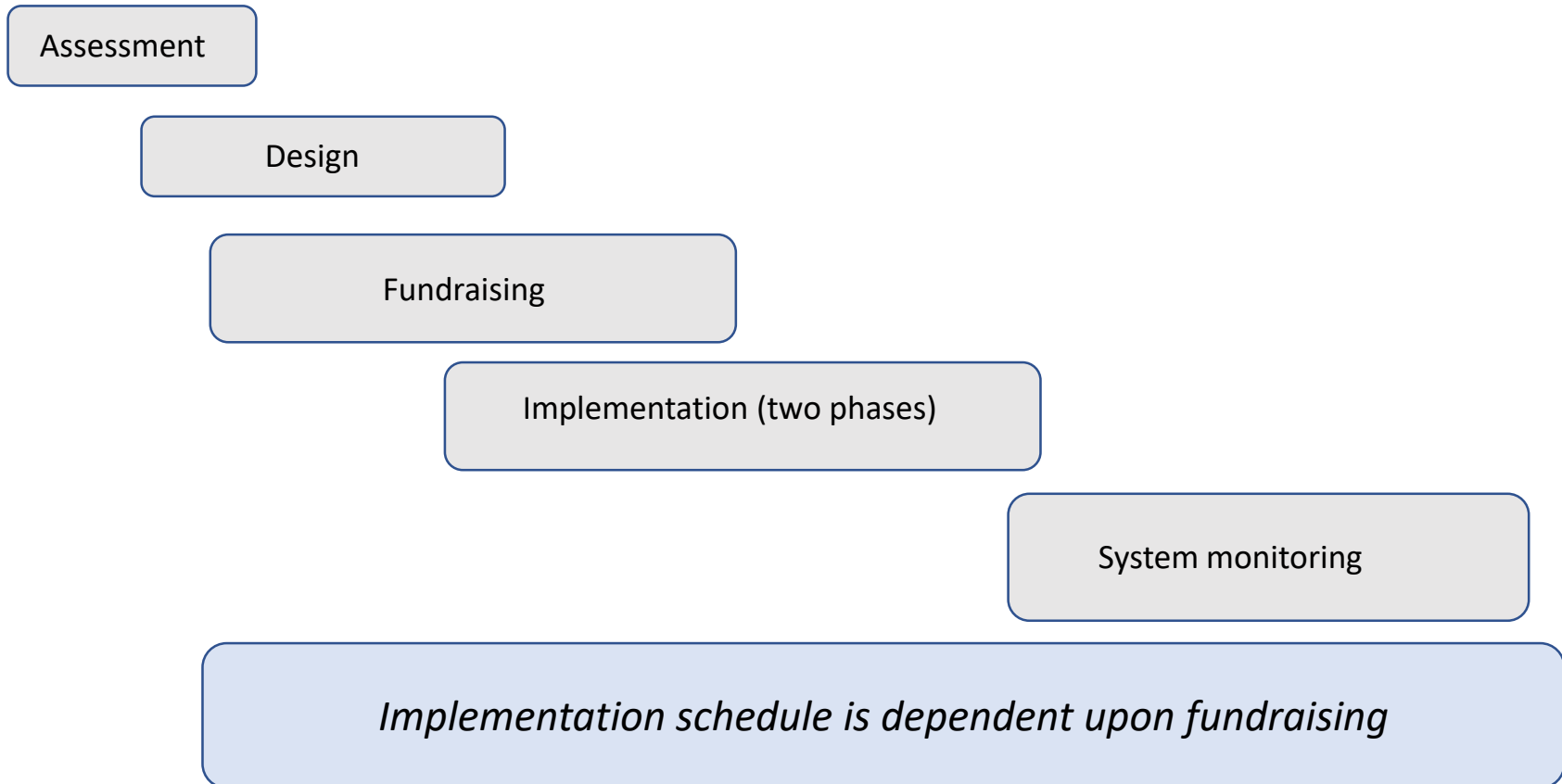
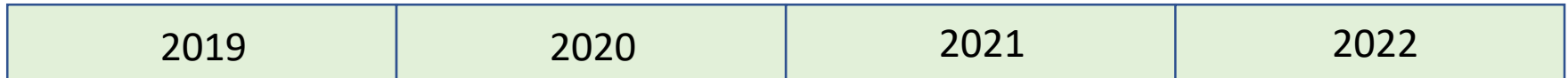
- a team effort of EWB RTP with the community!

WBS #	Project Task	Responsibility	Comment
	Design system	EWB RTP	
	Approve system design	community	
	Fundraising	EWB RTP	
	Prepare for Implementation		
	Logistics of material purchasing	NGO (CECEP)	
	Transport of materials to Chipozo	NGO (CECEP)	
	Transport of materials to community sites	Community	
	Prepare construction sites	Community	
	Build Tanks and Piping		
	Build Pump tank and storage tank	Mason (with help from community)	
	Dig trenches and assemble piping between tanks	community	With EWB RTP oversight
	Install/configure Solar Power subsystem		
	solar panels		
	Build solar panel mounting structure	EWB RTP, with help from community	
	Install solar panels	EWB RTP	
	install power control unit and pump	solar pump vendor	
	Build Pila Subsystem and water distribution		
	Connect water lines to storage tank	EWB (with help from community)	
	Dig trenches and run water lines to pila locations	community	
	construct concrete pilas and drain	Mason (with help from community)	
	install water meters	EWB RTP	
	Build roof structure	community	
	Training and operations		
	Prepare operations materials	EWB RTP	
	Conduct Training	CECEP (with EWB)	
	Operate and maintain system	Community	

Work Breakdown Structure and Cost Estimate

WBS #	WBS Item	materials	Labor	Total Cost (\$)	Comment
1	Pump subsystem				
1.1	Spring flow capture				
1.1.1	sluice design				
1.2	Pipe from spring to pump tank	\$200	\$310	\$510	
1.3	pump tank (concrete)	\$1,100	\$800	\$1,900	6000 gallons
1.4	tank overflow to stream				
1.5	solar pump	\$5,100			
2	Solar Power subsystem				
2.1	solar panels	12000	300	12400	40 x \$300/each
2.2	solar panel mounting structure	900	400	3200	
2.3	power control unit	750	0	750	
2.4	electric connection to pump				
2.4.1	cable	\$85	0	85	
3	Elevated tank subsystem				
3.1	tank structure (concrete)	\$2,800	\$1,100	3100	18,000 gallons
3.2	sanitization	\$550	\$100	650	
3.3	Elevated tank water level control system	\$160	\$50	210	
4	Pila Subsystem (six pilas)				
4.1	tapstands	\$120 each	\$40each	960	
4.2	wash stations (concrete)	\$400 each	\$350each	4500	
4.3	water meters	\$15 each	0	90	
4.4	roof structure	\$180 each	\$210each	2340	
4.5	pila drain	\$30 each	\$20each	300	
5	Conveyance subsystem (water distribution)				
5.1	pipe from pump tank to elevated tank	6500	600	7100	500 meters 2" galvanized pipe and 700 meters 2" HDPE
5.2	elevated tank to pilas	10000	500	10500	2000 meters 1.5" HDPE pipe and connections (\$5/meter)
				46185	

Chipozo Water Supply: Project Schedule



About CeCEP (our NGO partner)-

http://www.cecep.cosmosmaya.info/menu_02.htm

<https://www.facebook.com/museo.katinamit>



Centro Educativo Comunitario Pokomchi (CECEP) was founded in 1993 through the united efforts of local and international people with the objective of exposing and strengthening the Pokomchi culture.

For this purpose we work in translation (pokomchi-spanish), alphabetization, exhibition of our culture, promotion and distribution of Pokomchi literature and cultural strengthening. Furthermore we work with national and international associations supporting and reinforcing our community through our projects. We manage a community tourism alliance, educational workshops, volunteers, tours around the town, a store of handicrafts made by local artisans, and a school for the languages Spanish and Pokomchi.

With Museo Katinamit (opened in 2001) we offer the unique exhibition of Pokomchi culture, presenting our lifestyle which is considered among one of the oldest in the world and still living.



Chipozo Water Supply Improvement Project: *Conclusion*

- Summary: The goal of this project is to improve the quality and quantity of the water supply for the community of Chipozo in Alta Verapaz Guatemala
- The EWB RTP team is partnered with the community as well as with local NGO CeCEP to ensure the long-range success of the project
 - Following the EWB USA engineering and project management discipline
 - Focusing on implementation of a sustainable and affordable design
 - Ensuing maintainability by the community
- ***The ability to carry out this project to meet the needs of this community is directly dependent upon raising funds for the effort***
 - *Your contribution can make a big difference in the lives of the people of Chipozo!*
 - Donate at <https://support.ewb-usa.org/waterforchipozo> or discuss other options that you may prefer
- Please contact us for any additional information (POC info on cover slide)



From this  to this



Thank you for your support!



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Research Triangle Professional Chapter