



## Parallels Across Hemispheres: How Lessons Learned in Rural Guatemala Apply to Challenges in the U.S.

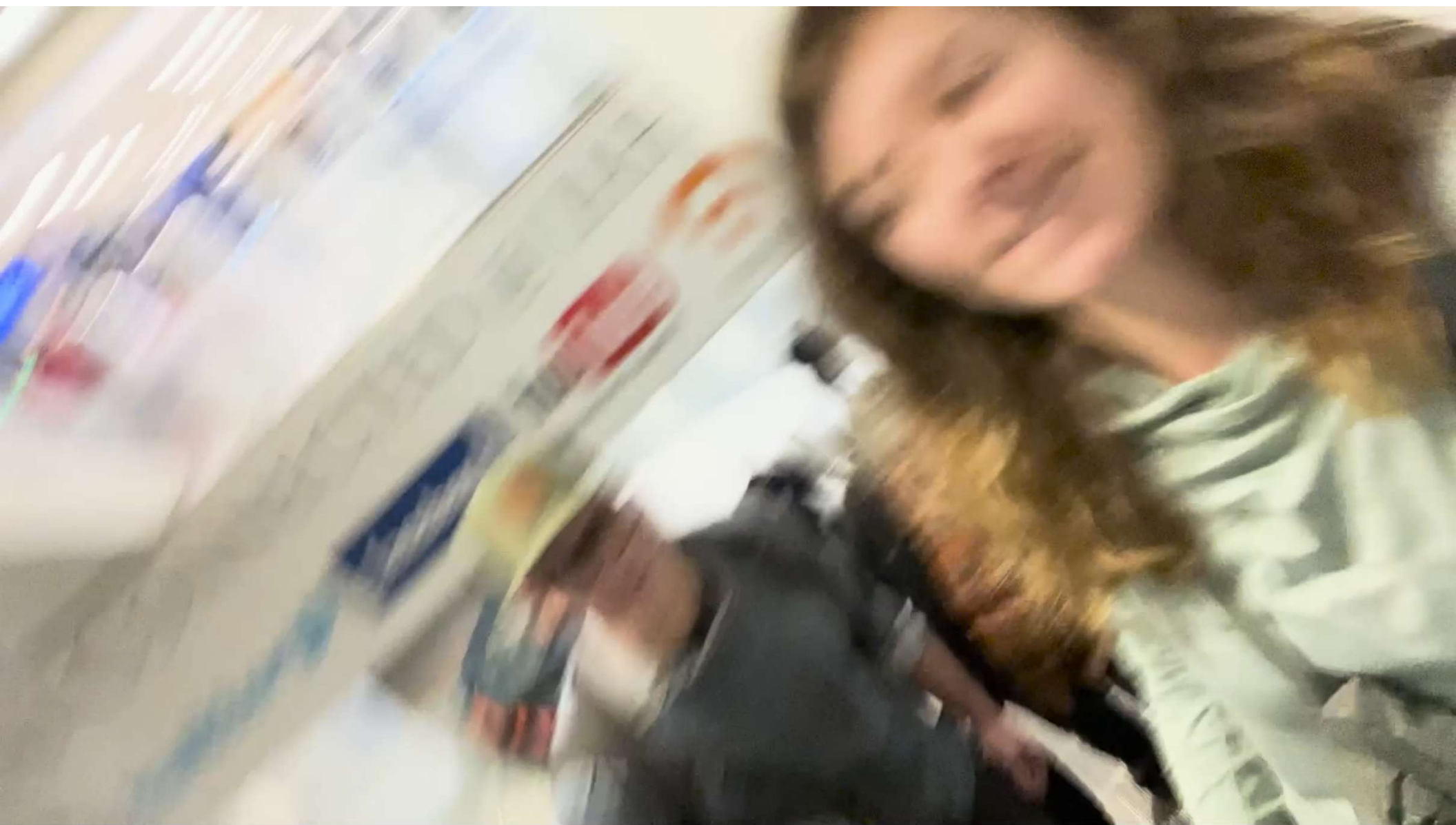


## Agenda

1. Project Background
2. Initiation & Alternatives Analysis
3. Phase 1 Design
4. Phase 2 Design
5. Phase 1 Implementation
6. Phase 3 Design
7. Phase 2 & 3 Implementation
8. Post-Construction Visit
9. Project Monitoring & Evaluation
10. Lessons Learned







# Project Background

- Chaquijyá = “place with no water”
- Village in Sololá Department in Guatemala highlands
- Community Size:
  - ▶ 226 households
  - ▶ 1,250 individuals
- Limited access to clean water
  - ▶ Water trucked in or collected at river
- Limited access to sanitation
  - ▶ Mostly un-lined pit latrines





## Core Project Team



**CHAQUIJYÁ COMMUNITY**  
Water Committee (CBO), Construction  
Support, Land Acquisition



**EWB-USA**  
Overall Project Support & Program Management



**ISF-Guatemala**  
Country Office Support and Construction



**PRIVATE DONOR**  
Project Funding



**HDR**  
Technical Design &  
Construction Services



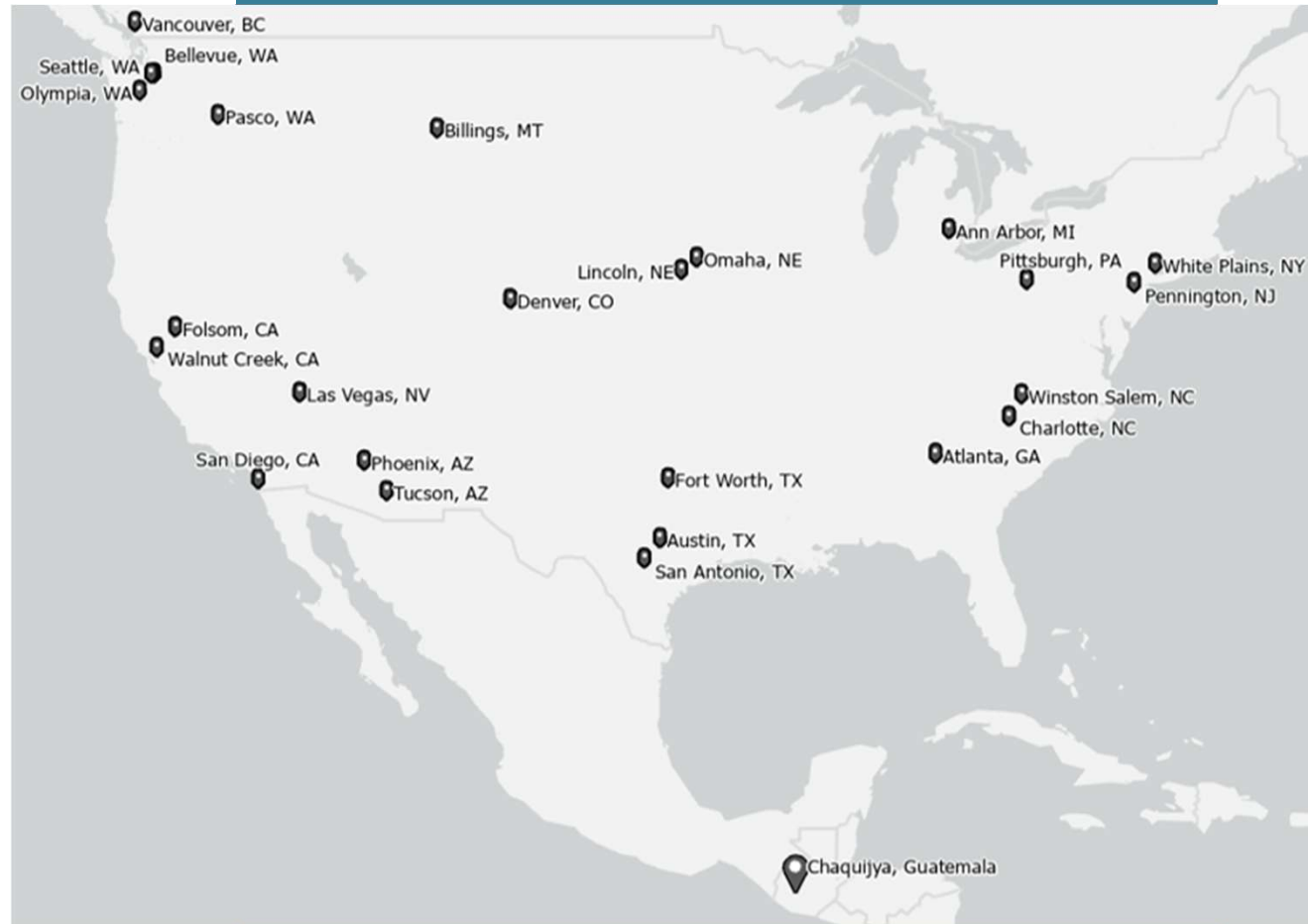
40 volunteers



25 offices



4,000+ hours





## Project Characteristics

- 540-foot Well
- 12.5 HP, 75 GPM, 520' TDH Pump
- 4-inch Transmission Line
- Passive Chlorination
- 2.5 m<sup>3</sup> Elevated Tank
- 50 m<sup>3</sup> Ferrocement Tank
- 6-mile Distribution System
- Pressure Tanks, ARVs, and Valves
- 226 Household Meter Boxes



## Design Criteria

- ISF-Guatemala Standards
- 2040 Design life
- 226 Households
- 5.5 People per Home
- 90 LPPD or 130 m<sup>3</sup>/day
- Diurnal Curve
- Chlorination Residual

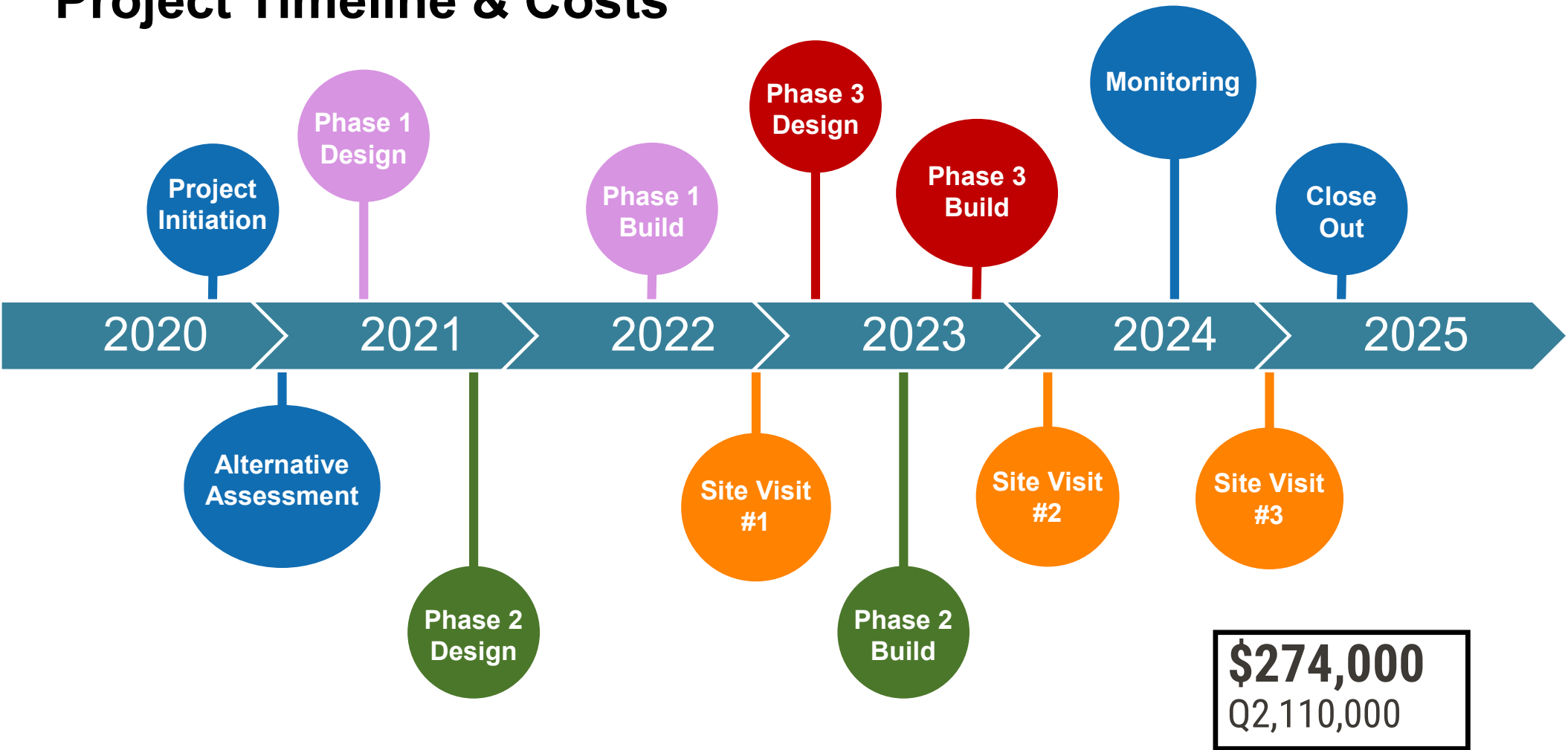




## Design Approach

- **Evaluate Provided Information**
  - ▶ Household Interviews and Information
  - ▶ Topographical Survey Data
  - ▶ Design Requirements
- **Evaluate Original Alternatives**
  - ▶ Proposed Alternatives
  - ▶ Water Quality Testing
- **Define New Alternatives**
- **Design**
- **Implementation**
- **Monitoring and Evaluation**

# Project Timeline & Costs







## Household Survey Results

- Initial 2020 Surveys
- Mostly Spanish Speaking
- 5-10 Person Households
- Mostly Own Homes
- Occasional GI and Skin Issues
- Un-Lined Latrines and Septic
- Grey Water to Soil

**Lesson Learned:**  
**Understand Unique Client Needs**

# Household Survey Results

- Water Dirty and Inconsistent
- Drinking, Cooking, & Cleaning
- Boiled, Collected, or Bought
- Water is Greatest Need
- Q10-40/Month for Private
- Q5-20/Month for Public

**Lesson Learned:  
Establish Community Trust**







## Alternatives Analysis

- Spring Box
- Pump
- Tank
- Distribution System
- Electricity Line
- EWB(ISF) Guatemala Services

**Lesson Learned:  
Cost Volatility**



# Phase 1 Design

- Tank Design
- CIP versus Ferrocement
- Water Quality & Quantity
- Well Study
- Land Acquisition
- Remote Well Implementation



# Remote Implementation

## Lesson Learned: Virtual Design and Implementation

07:25

Chaquiyya Project  
Albert, Arturo, Craig, Don,...

Kristi Shaw

A	B	C	D	E	F	G
0				300		
20				320		
40				340		
60				360		
80				380		
100				400		
120				420		
140				440		
160				460		
180				480		
200				500		
220				520		
240				540		
260				560		
280				580		

14:20

There are high gamma Ray readings between 420-480. I want to block those off if we can.

14:21

~Steve +502 3182 5328

Ok. They don't have any ten foot screen sections. They were just able to cut the one solid pipe for



07:26

Chaquiyya tank - H...  
Albert, Arturo, Craig, Don,...

Hola hola! Espero que esté bien. Miran mi pregunta sobre la penetracion por flotador y acceso? Quiero confirmar que les instalamos. Gracias.

20:14

Y SELLO DEDOR TUBERÍA

2-Inch PVC Penetration Secured in Roof Slab

TUBO DE ENTRADA







## Phase 1 Implementation

- First Site Visit January 2023
- Ferrocement Tank Construction
- Data Acquisition for Design
- Tank Layout and Approach
- Community Workshop
- Confirm Pipeline Alignment
- Discuss Chlorination
- Celebrate

**Lesson Learned:  
Political Impacts**

## Phase 2 Design

- Water Modeling
- Pump Design
- Distribution System Design
- ARVs
- Break-Pressure Tanks
- Pipe Bridge
- Virtual Implementation & CM







## Phase 3 Design

- High-Elevation Homes
- Elevated Tank Design
- Tank and Well Controls
- Well Site
- Tank Site
- Chlorination
- Virtual Implementation & CM

# Phase 3 Implementation

- Second Visit February 2024
- Chlorinator Parts Support
- Construction Inspection
- Vendor Coordination
- System Inspection & Punchlist
- Community Workshop
- Celebration







## Monitoring and Evaluation

- Virtual Punch List and Support
- Third & Final Visit February 2025
- System Walkthrough & Punchlist
- Operations Issues and Solutions
- Community Surveys
- O&M Manual Workshop
- Signed Agreement & Closeout



# Lessons Learned

Adapting to Unique Client Concerns

Establishing Community Trust

Cost Volatility

Virtual Design and Implementation

Political Impacts









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