Project Report

Clean Drinking Water Team

Cuba January 2019

(3) Water Filters Project

(13) Participants: CDWT Team: Rick, Cordella, Jerry, Fabiola Volunteers: Lois, Maryanne, John, Bailey, Elizabeth, Leslie, Amy, Karen, Dana

Objective: The objective of this project was to install (3) clean drinking water filter systems in Cuba. In addition, we hoped to strengthen our relationship with Pepe Brengas and Bishop Griselda at the Episcopal Cathedral in Havana.

Results: We installed (2) water filter systems and delivered (1) system to a plumber who installed the system in Jiqui. We traveled to Cuba under religious visa with (9) volunteers and (4) CDWT team members. We met with Bishop Griselda at the Cathedral for about 30 minutes. We were given a tour of the construction of apartments at the Cathedral complex and we spoke at length about setting up a network of water teams and coordinating through FECC.

Access to clean drinking water is at the core of the mission for Clean Drinking Water Team (CDWT). On 28 July 2010, through Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realization of all human rights. The greatest waterborne risk to health is the transmission of bacterial contamination. The World Health Organization (WHO) guidelines for Drinking-Water use *E. coli* as the main indicator of microbiological contamination of drinking-water.

In Cuba most of the population has access to the municipal water system. Unfortunately, most water samples taken have shown the municipal water system tested positive with coliform bacteria. This may be due to frequent power outages which is a leading cause for leakage into the water system. Although the municipal water system is treated with chlorine there has been no detectable presence of free chlorine at the water test sites. As a result, people prefer to drink bottled water or risk getting ill from bacteria in the water. The risk rises dramatically after a rain storm.

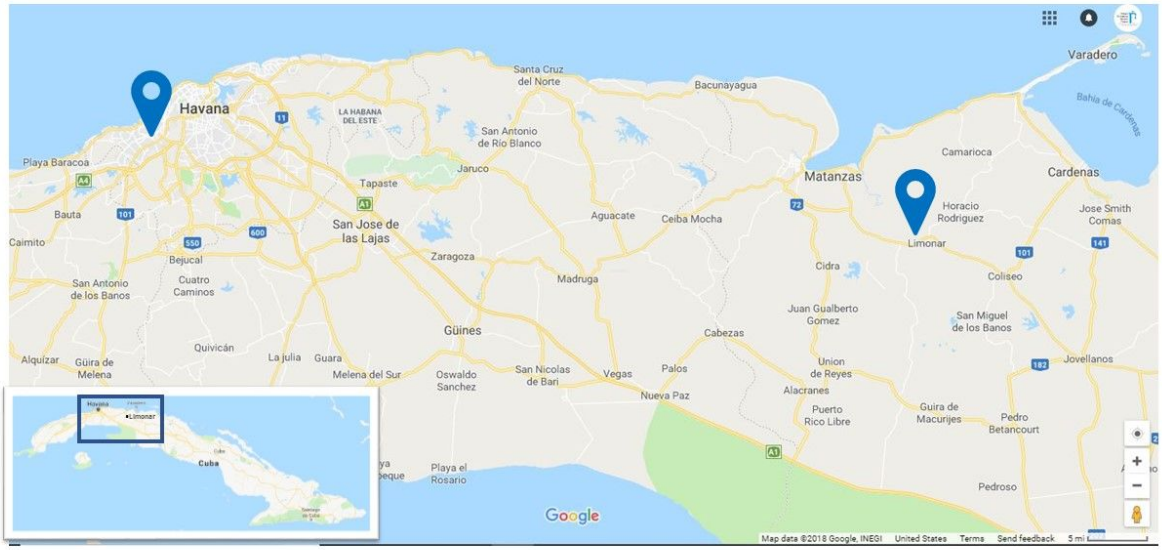
A multi-stage water filter system with UV light purification has been chosen to remedy the situation.

Project Report

Clean Drinking Water Team

Project Team & Location

The team traveled from Miami (MIA) to Camaguey, Cuba (CWA) on a one hour flight via American Airlines. After clearing immigration with religious visas and customs a mini-bus met the team and took them to Ciego-de-Avila Hotel in Ciego de Avila. The team stopped for dinner, inspected St Lucas church in Ciego de Avila and then checked into the hotel. After installing (2) filter systems, one in Moron and a 2nd in Ciego de Avila, it was not possible to drive to Jiqui due to time limitations. A plumber from Jiqui, who worked along side the team in Moron, took the third system to Jiqui and installed it a Trinity Church. The team departed Ciego de Avila for Havana where they met with the Episcopal Bishop and attended Suday church service in Luyano, where they also inspected the system installed by CDWT on May 2018.



The project sites selected allowed the team to work in two distinct locations on this 6-day trip. All sites were accessible by car in safe areas. All sites selected were in concrete buildings with municipal water and electricity that have dedicated maintenance workers capable of maintaining the water filter systems.

The site in Moron was inside the church entry-way at Trinity Episcopal Church. Moron is approximately 13 miles Northeast of Ciego de Avila. The site in Ciego de Avila was in an office iniside St Lucas Episcopal Church. Both sites are managed by Rev Yohanes. In Moron the team worked with a plumber from Jiqui and a plumber from Ciego de Avila. The second day, the plumber from Ciego also worked along side the team. The system in Ciego was inspected by Cuban Government officials who approve of all work and help being provided to the community. Upon completion of the install in Ciego the team departed for Havana. Travel time between the hotel in Moron was 25 minutes by van and travel from Ciego de Avila to the hotel in Havana was 6 hours.

In Havana the team stayed at Hotel Telefonica a family operated B&B. Carlos, from the Episcopal Cathedral, was our driver for 3 days in Havana.

Project Details

Travel to Cuba presents a unique challenge due to the U.S. blockade and travel restrictions requiring special visas. Religious visas were acquired for 12 of the 13 team members traveling on U.S. passports. One tam member traveled under Person-to-Person visa due to difficulties from joining the team late in the planning phase. All travelers were given a photocopy of their Cuban visa. The original visa was retrieved upon arrival in Cuba. In the MIA airport the American Airlines representative checked the visas and gave each member a Cuba-Ready stamp. The team from PA had difficulty at the gate due to not receiving their Cuba-Ready stamps in PA. After explanation and calls for approval the team received their stamps.

Packing and transport of water filter systems was of concern due to the fragile nature of the UV purification systems. Each water filter system was packed in a blue canvas duffle bag with special care given to protecting the UV light parts. Included in each bag was: 2 filter housings, 4 replacement filters, UV light system, replacement UV bulb, wood mounting plates, PVC valve assemblies, with a small space for spare parts. A copy of the system diagram was put in each bag to assist TSA baggage inspectors. Weight of each bag was exactly 45 lbs. Each bag was closed using a zip tie which helped us detect that two of the four bags were opened and inspected.

(3) additional duffle bags were packed with: PVC pipe, water test kits, 1/2inch hammer drill, spare pipe fittings, and a tool bag with screws, washers and fasteners, kitchen items for each site, donated baseball equipment, clothes and tools.

Moron Trinity Church Location

Upon arrival at the first site in Moron the team unpacked the water system and spread out all the tools and parts on the floor in the church. The group split into small teams to prepare, assemble the system, prepare the water tank connection, install pipe and install the system.

Filter Housings	Remove plastic wrap, verify O-rings, insert pipe fittings using teflon tape, teflon paste, attach mounting brackets
UV Purification System	Remove plastic wrap, assemble light housing, o-ring & bulb, install housing, attach wires
Water supply line	Turn-off water supply, attach water supply line fittings per site requirements, prepare for installation of supply side pipe and fittings.

Project Report

Clean Drinking Water Team

Mounting plates	Attach mounting hardware to wood plates for UV housing, UV controller using ¾" screws and washers
Installation	Select locations for supply line pipe, drill and mount supply line, filter housings, UV system, controller, delivery side pipe and fittings.
Water Test	Take water sample of raw water supply, test for 9 parameters, TDS, coliform and record observations
Tools & Assistance	Organize parts and tools for teams. Acquire 110v electrical outlet and extension cord for installation team, Assist with turning off electricity and water supply.
Photography & GPS	Photograph site before and after, all activities, local participants, surrounding community, Take GPS point for location.
Training	Provide manuals, instructions and replacements parts to locals, provide instruction on how to use, care, test and maintain the system. Get names, address and contact information.
Safety	Ensure team is taking care and being safe. Provide gloves, dust masks, safety glasses, hearing protection. Have first aid ready. Make sure ladders are secure, work area is clear, avoid accidents.

The installation went smoothly despite not having prior information about the location. The water supply in Maron was from a water tank located on the roof. The team needed to cut the existing metal pipe, install a new universal fitting, a Tee and connect 10 meters of flexible pipe. Cuban fittings are threaded which required the pipe be threaded using a hand threader. The ½" drill and 2inch bit were ideal for drilling into the cement and running pipe through the wall. After making the connection to the water supply line installation went quick. The team drilled into the wall hanging the filter housings, the UV system, controller and delivery line. A 110v outlet was situated close by to plug in the controller along using an extension cord. A hole was drilled through the exterior wall installing a faucet accessible to the street. A shut-off valve allows the church staff to turn-off the exterior water faucet at night. The system was powered up, lines were flushed and after a few minutes the team drank glasses of purified water celebrating along with Rev Yohanes and the church staff.

Installation took approximately 4 hours.

Ciego de Avila Location

The Ciego installation also went well despite not knowing what connections would be required. The water supply was from a water tank located on the roof. The team needed to tap into the water supply line which was a 2" plastic pipe with a damaged universal fitting. We worked with a local plumber to replace the universal fitting and to install a Tee for the new supply line. The 2" drill bit was ideal for drilling into the wall to bring the supply line into the office where the system was being installed. After making the connection to the water supply line installation went quick. The team drilled into the cement wall hanging the filter housings, the UV system, controller and delivery line. A 110v outlet was available close by. A delivery line with shut-off valve was installed through the exterior wall delivering water access for the community. The system was powered up, lines were flushed and after a few minutes the team drank glasses of purified water celebrating along with the staff from the plumber.

While we doing the install two Cuban government inspectors paid us a visit. They asked about our work, what we were installing and how it would benefit the local community. They were very happy with our work and the answers we gave to all their questions. After 45 minutes they posed for a photo and then left.

Installation took approximately 4 hours.

Upon completion of the second installation the team boarded a van for Havana.

Luyano, Havana Church of the Resurrection

The Team attended Sunday service in Luyano at Church of the Resurrection. Fr Ivan was out of town but his daughter Rev Damaris lead the service and her brother Emanuel was also present. After the service we inspected the water filter system. It was in perfect working order and being used daily. The gages showed a slight 5psi difference in pressure so we changed the filters for the first time since the system was installed 8 months ago. We photographed the filters which were not very dirty. We powered up the system and the group filled water bottles and drank the water.

Results

Results from this project were installation of 3 complete water filter & purification systems, inspection of the system in Luyano, and delivery of two counter-top water filters at the home of Raul and Carlos. Approximate people served will be 600 from the three new locations.

Project Report

Clean Drinking Water Team

Lessons Learned

This project demonstrated CDWT can effectively assess needs, evaluate available resources and implement a sustainable water project. Among the lessons learned are:

1. Require a photo of the project installation site to properly design the system and acquire all needed fittings.
2. Compression fittings: The connection to the existing water supply proved to be the most difficult part of the installation. Without forward knowledge of the site more contingency parts are needed (T's, 90's, compression, pipe cutter, pipe threader)
3. Assemble a set of tools in the country to avoid transporting tools every visit.
4. Safety equipment was much appreciated by the volunteers: next time bring hearing protection
5. Tool suggestions: more screw drivers, cordless screw gun, new volt meter, pipe threader, 2inch drill bits, hammer drill
6. Instruction manual in local language
7. Water test instructions and pamphlet in local language

Funding & Costs

Description	Income/Revenue	Expense
Revenue from Jerry and Fabiola	$1,300.00	
Revenue from Rick and Cordella	$1,080.00	
St Davids contribution	$3,000.00	
Bethesda-by-the-Sea contribution	$1,500.00	
In-country transportation		$1,091.00
Visas		$500.00
Airfare, hotel		$2,160.00
Meals and travel expenses		$1,428.00
Water filter systems		$2,493.29
Pats & fittings		$828.07
AA seats and baggage		$325.42
Shirts and Hats		$666.54
Counter-top water filters and cartridges		$296.64
Funds from general donations	*$2,925.96*	
TOTAL	**$9,805.96**	**$9,805.96**

Acknowledgements

Project Report

Clean Drinking Water Team

We would like to thank St Davids Episcopal Church and the Episcopal Church of Bethesda-by-the-Sea for contribution of $3,000 and 1,500 for the systems and in-country travel costs.

The water at Moron was tested using the portable test lab, test strips, TDS meter and coliform test.