

## One Way to Determine Water Project Sustainability

Water samples for our first water projects in Guatemala had to be sent for testing to a laboratory in Guatemala City, nearly 200 km. away. Yet there was a branch of the Guatemala National University, San Carlos U., in Chiquimula, called CUNORI (El Centro Universitario de Oriente). The school has an emphasis on Agricultural Engineering with a soil testing laboratory. We toured the lab in 2008 and asked if they would be willing to do a complete water analysis, including fecal coliform. They said yes, if they had the equipment.

In Matching Grant # 70982 we included nearly \$9,000 to upgrade their lab to do complete water analysis. We wanted to be able to periodically test water from our projects to show continued delivery of potable water, without sending samples to a far away lab. The following pictures show the lab, lab personnel, some of the purchased equipment, how the lab is being used and a test result from one of our projects.

This is a picture of part of the water testing lab.



Engineer Jose Ramiro Garcia with the laboratory staff.



Here are a couple of pictures of the equipment purchased.

Sample preparation equipment shown with Rotarians Veronica Guzman and Lorena Tobar.



Microscopes. Notice the labels on each piece of equipment indicating that three Rotary Clubs were responsible for the funds for the grant, the Rotary Clubs of Chiquimula, Menifee (CA) and Fort Collins. Being a Rotary Matching Grant, the funds from the clubs was matched by District and Rotary Foundation funds to make the club's donations 3.5 times larger.



A portable meter for field or lab testing for pH, conductivity, dissolved Oxygen, etc.



Besides testing water samples for our water projects, the enhanced water testing capability has helped the University to use the lab for a wider variety of special projects.

Students can now be trained in complete water testing. This picture shows some students being trained with equipment supplied by the Matching Grant.



The water testing lab can now be used for a wider variety of projects that the University staff and students can participate in. A PowerPoint presentation from CUNORI about the types of special projects being done with the resources of the water testing lab includes this slide.

**INVESTIGACIONES**

**EJECUTADAS:**

- Evaluación de la Calidad Fisicoquímica y Microbiológica el Agua de Pozos de la Ciudad de Chiquimula.
- Evaluación de la Calidad del Agua para Usos Agronómicos en la Producción de Hortalizas Especiales en la Región de Trifinio.
- Determinación de las Zona de Recarga Hídrica y Calidad del Agua de la Microcuenca del Río Tacó, Departamento de Chiquimula.
- Contaminación que Provocan las Aguas Servidas Sobre la Red Hidrológica Superficial de la Ciudad de Chiquimula.



The water testing lab processed over 300 water samples during 2011 and continued that level of testing in 2012. Water samples come from a wide variety of communities, organizations and businesses as shown here.



The testing results of a water sample from a home in El Carrizal, Guatemala is shown here. The water distribution system in El Carrizal was our first project in Guatemala and was completed in 2008 with Rotary Matching Grant # 65673.

Referido por:	Club Rotario Chiquimula de la Sierra	No. Muestra:	03
Identificación de la Muestra:	Aldea El Carrizal	Fecha:	2014-07-10
Localización:	Aldea El Carrizal, San Jacinto, Chiquimula		
Tipo de Fuente:	Nacimiento		
Uso de Agua:	Consumo humano, doméstico		
Teléfono:			

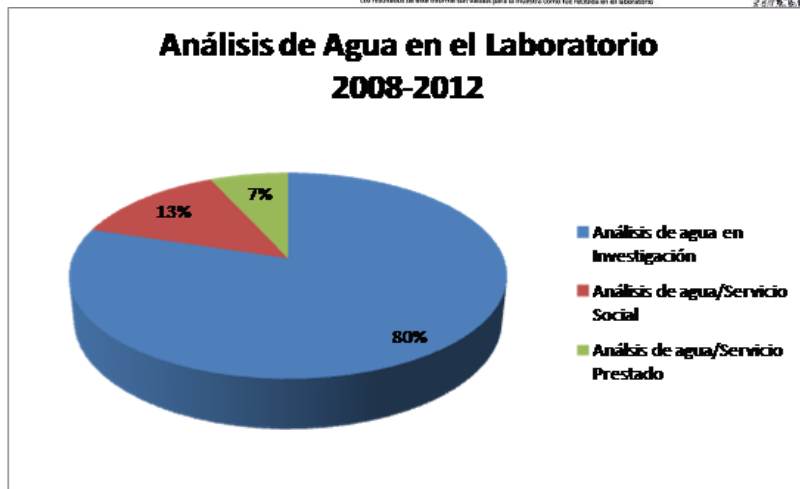
ANÁLISIS DE FÍSICO-QUÍMICO DE AGUA				
PARAMETROS	RESULTADOS	Límite Máximo ASESORAR	Límite Máximo PERMISIBLE	
Turbidez NTU	0.5	5	15	
Conductividad µS/cm	534		menor de 1.500	
Temperatura* °C	23.7	19 a 25	24	
Sólidos Totales mg/l	356	500	1000	
Sólidos Disueltos Totales mg/l	341.78	---	500	
Calcio Disuelto mg/l	7.81	8	4	
Calcio Disuelto % Sat.	111.7		80 a 100	
pH Unidades	7.78	7.0 a 7.5	6.5 a 8.5	
Fosfatos mg/l	0.510	0.5	1	
Nitrato mg/l	0.9	---	15	
Nitrato mg/l	0.0040	---	0.1	
Sulfato mg/l	45.00	100	250	
UNIDADES BACTERIAS DE UNIDADES BOD5 mg/l CaCO3	3.00	---	25	
Dureza mg/l CaCO3	224	100	500	

**ANÁLISIS BACTERIOLÓGICO DE AGUA**

PARAMETROS	RESULTADOS	Valor de Referencia
COLIFORMES TOTALES	0.0 NMP/100 ml	2
ESCOLERICHIA COLI	0.0 NMP/100 ml	3
COLIFORMES FECIALES	0.0 NMP/100 ml	3

Leticia Ramos López  
 Responsable Laboratorio Ambiental

Los resultados de este informe son válidos para la muestra como fue recibida en el laboratorio.



The University lab is also used to perform free service work for some organizations. About 20% of their work is service oriented.

The following are previous stories about the work of Water for the Americas. You can enter the addresses into your browser and see these stories.

Report from October 2012 Trip to Chiquimula, Guatemala,  
<http://www.clubrunner.ca/Data/5440/5244/HTML/183964//WaterfortheAmericasGuatemalaTripReportOctober2012.pdf>

Report on the Raul Mejia Gonzales School Water Project,  
<http://www.clubrunner.ca/Data/5440/5244/HTML/183930//ReportonTheRaulMejiaGonzalesSchoolWaterProjectsp.pdf>

Report on the La Catocha Distribution Tank Construction,  
[http://www.clubrunner.ca/Data/5440/5244/HTML/183932//LaCatocha\\_ElPostheWaterProjectStory.pdf](http://www.clubrunner.ca/Data/5440/5244/HTML/183932//LaCatocha_ElPostheWaterProjectStory.pdf)

