Executive Summary

The University of Pittsburgh Humanities, Engineering and Design (Pitt HEAD) team of 12 civil engineering students travelled to Panama for 10 days in February 2014 to implement the second phase of a three phase water infrastructure improvement project for the indigenous community of Kuna Nega. This report details the design, construction and engineering analysis of that project.

The Kuna Nega community is supplied water by a pressure main running from Panama City. Periodically, this pressure main is shut off for up to 36 hours, and the community is supplied water solely by an existing 10,000 gallon storage tank. The existing tank does not have sufficient capacity to supply the entire community for more than 10 hours. In addition, part of the community lies at a higher elevation than the existing tank, and therefore does not receive any water when the pressure main is shut off. To address these problems, the following improvements were proposed:

- Construction of a 25,000 gallon storage tank to supplement the existing tank
- Creation of a high pressure zone and 10,000 gallon tank at the highest point in the community to supply water to the area not serviced by the existing tank
- Installation and replacement of valves to improve system efficiency and simplify maintenance

During the Phase I implementation trip in October 2013, the project team began construction of the 25,000 gallon storage tank and connected the western portion of the community via a 625 ft pipeline.

During the Phase II implementation trip in February 2014, the project team continued construction of the 25,000 gallon storage tank and created the high pressure zone by pumping water to the area of the community lying at a higher elevation than the existing tank. In addition to the water infrastructure improvements, the project team built an 18 ft x 12 ft garbage shed foundation for the local school. In exchange, the school allowed the project team to use their 1000 gallon storage tank as a wet well for the submersible pump.

The Phase III implementation trip in Fall 2014 will conclude the water infrastructure improvement project in Kuna Nega by building a 10,000 gallon storage tank at the highest point in the community.