ABSTRACT

TITLE:	Design of a Hydraulic Intake Structure for Stream Diversion
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ABSTRACT: More than 3.4 million people die each year from a water related disease, and 99% of these cases occur in the developing world. Implementing a water system that provides safe, potable water to communities in the developing world can decrease the occurrence of water-related diseases. The water intake structure is a critical component of a water system. It is used to divert water from a source into the system. Because of the difficulties associated with using a stream as a water source, there is no universally standard design for the intake structure. Difficulties include: sedimentation and the effects associated with the large variations in seasonal rainfall. The purpose of this project is to design and test a stream diversion intake structure for a gravity fed water system appropriate for rural communities in the developing world. In order for the structure to be appropriate for developing rural communities, it must provide enough water to meet the peak daily demand of the community, be low cost, low maintenance, and easily constructed with limited skilled labor in remote locations. Two variations of the intake structures were designed for the project. Preliminary laboratory testing was performed to analyze components and establish an optimum design suitable for field testing. Both designs were then constructed and tested in streams located in La Plata County. The intake structures were allowed to continuously run for 3 - 5 weeks in order to assess constructability, functionality, maintenance requirements, and potential failures. Both of the structures met all design requirements and project objectives. Having two designs allows for more versatility when selecting a site. This is especially important for implementations in remote, developing communities which frequently exhibit a wide range of stream types. The long-term goal of the project is to publish these designs along with their construction documents for use by nonprofit organizations working with water supply in the developing world.