



Delivering Clean Water to the Mountains

By: Adam, Mahdi & Alexander

Our Objective

Our objective is to develop the most mechanically efficient and cost effective method of delivering fresh water to an isolated community in the mountains.



Possible Materials and Methods of Delivery

Underground pipeline channeling.

Above ground pipeline channeling.

Steel pipes, Copper Pipes, PVC, etc...

Centrifugal Pump, Container pump or Drum Pump



The Final Solution

Overground pipeline:

Steel and PVC pipes

Centrifugal Pump:

Multistage pump

Powered by:

Solar panels

Wind turbines

Hydro electric turbine



Why We Chose This Solution?

Infrastructure

Steel and PVC pipes

Sustainable creation of energy

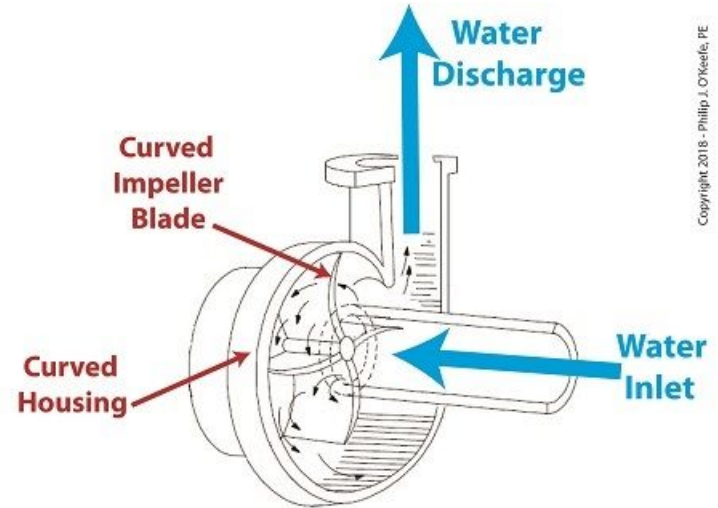
Low cost of material

Non detrimental short and long term effects

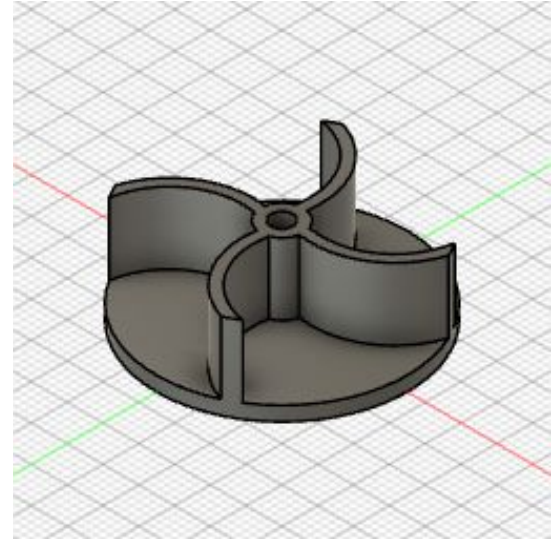
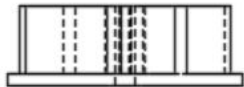
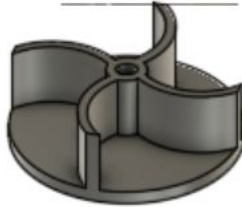
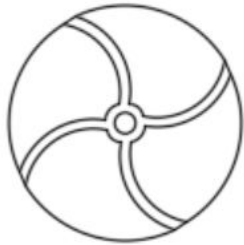


Why we chose this solution - Centrifugal Pump

- Most commonly used pump in a variety of industries (Natural Resources: Oil, Gas, etc..)
- Most power efficient pumps .
- Very simplistic, and minimal moving parts.
- Easy to operate and maintain
- Can handle larger quantities

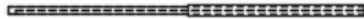


Component 1 - Propeller

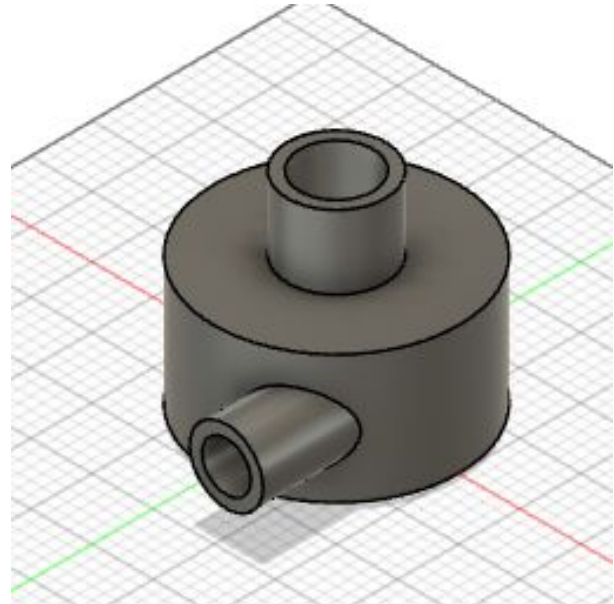
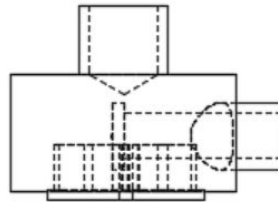
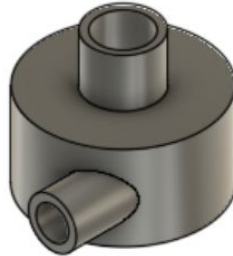
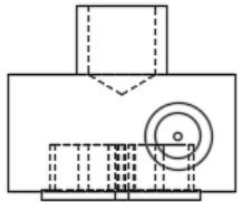
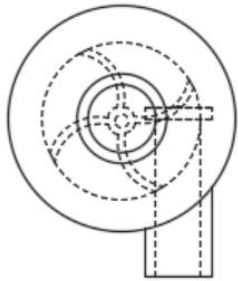




Component 2 - Pipe



Component 3 - Complete pump



Economic Impact

The wind turbines, solar panels and hydroelectricity create a return on investment.

The project creates short term jobs during the creation of the pipeline and long term employment opportunities to maintain the system.



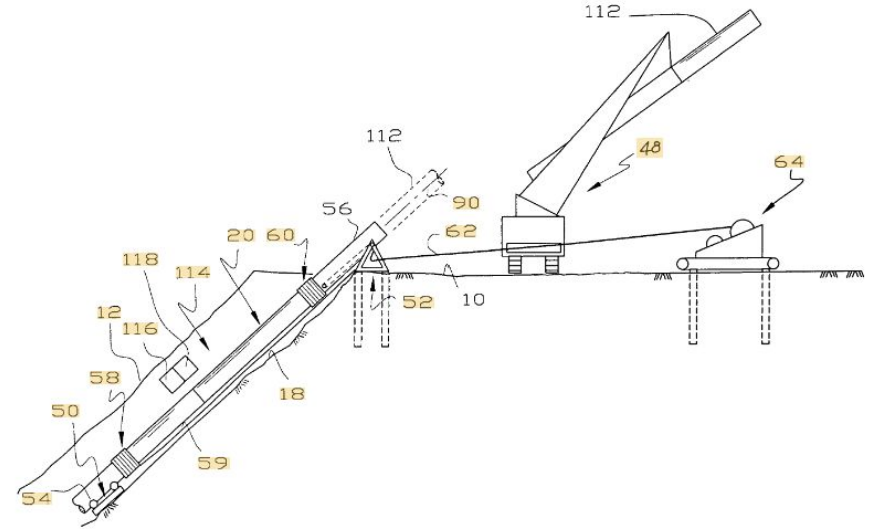
How to implement the solution

Installing 50 centrifugal pumps along the pipeline

Install pipes as far as roads allow

The pipeline is constructed by digging a ditch on the incline and assembling pipe joints together adjacent a top of the incline.

Connected pipes to water reserve at city.





Bibliography

Engineering Expert Witness Blog, Philip J. O'Keefe, PE, MLE, 2018

<http://www.engineeringexpert.net/Engineering-Expert-Witness-Blog/a-centrifugal-pumps-curved-features-are-key-to-functionality>

Wastewater Technology Fact Sheet In-Plant Pump Stations, United States Environmental Protection Agency, Office of Water
Washington, D.C. September 2000 https://www3.epa.gov/npdes/pubs/in-plant_pump_station.pdf

City of Ottawa, 2023

<https://ottawa.ca/en/living-ottawa/drinking-water-stormwater-and-wastewater/drinking-water/water-purification-quality-and-distribution#section-eb7a5ff8-872c-4a18-88aa-48fad4a1711e>

Transporting Water, Resourcefulness 2023, Disco Learning Media <https://stem.guide/topic/transporting-water/>

Water Distribution Pipes, 2020, SSWM, University Course

<https://sswm.info/sswm-university-course/module-2-centralised-and-decentralised-systems-water-and-sanitation-1/water-distribution-pipes>