



SDSM&T Senior Design Project

IEEE Senior Design Grant Application

purePack Senior Design Team
South Dakota School of Mines and Technology
501 St. Joseph Street
Rapid City, SD 57701
605.390.0175



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October 25, 2010

SDSM&T IEEE
South Dakota School Mines and Technology
Rapid City, SD 57701

Dear SDSM&T IEEE ,

The purePack Senior Design Project is an aspiration of four engineering students at the South Dakota School of Mines and Technology with the desire to mold engineering concepts developed throughout undergraduate experience in order to design a product that will enhance the lives of others.

The team has an appreciation for safe, healthy environments and realizes a deficit in the portable water purification market. Through this combination, the purePack project was conceptualized. Upon completion of this senior design course in May, the design will incorporate renewable energy power generation to purify contaminated freshwater. This unit will be able to serve many different scenarios, such as an aid in disaster relief areas, remote research areas, and missionary groups with its portable scheme.

An opportunity has presented itself to test the product during this upcoming March. The purePack team will travel with an international engineering organization, Engineers and Scientists Abroad (ESA) to Vicuña, Chile. In Vicuña, an orphanage is being constructed that will house 150 young adults and is in need of engineering solutions. ESA has previously traveled to Vicuña and is more than excited to have the purePack travel with them. The purePack team strives to gain true product performance through field testing, provide consulting toward energy and purification solutions for the orphanage, and grow more culturally conscious of life outside of South Dakota. If the purePack product performs and is received well in Vicuña, the team is planning to donate the unit to the orphanage until a more permanent system is developed.

Due to this project's origin, there is no set sponsor of this project. The team has gained support through the Electrical and Mechanical Engineering departments; however, this only covers a small percentage of the cost of components needed for the unit, not to mention the trip to Vicuña. However, generous organizations such as SDSM&T IEEE can make this dream a reality.

The purePack team, urges you to take a look at the brochure that is included with this letter as it explains more about the project, ESA, traveling to Vicuña and the way to donate to the project tax-exempt. We invite the idea of visiting with you about the project and your donation at a time that suits you. Thank you for your time and substantial consideration.

Sincerely,

The purePack Project Team

Scott Nelson

Lucas Haan

Korey Kelly

Andrew Pavak

Project Expenses

Below is a list of all estimated expenses for the purePack Project. Completion of a working portable water purification system is of highest priority so any funding will first be put towards the product. Excess funding will put towards the development of the orphanage.

U.V. Purification System	\$150
U.V. Replacement Bulb	\$80
Ceramic Filtration System	\$100
Ceramic Replacement Filter	\$50
Sediment Filter	\$50
Housing	\$50
Pump	\$200
Control Circuit	\$50
Solar Panel	\$300
Turbine	\$200
Backpack & Packaging	\$100
Product Total	\$1,330
Chile Trip	\$1500 Each
Trip Total	\$6,000
Project Total	\$7,330

Donations

All donations are tax-deductible and can be to the purePack Project's SDSM&T Foundation Account. The SDSM&T Foundation is the official gift-receiving entity for the South Dakota School of Mines and Technology. As a tax-exempt 501(c)(3) organization, the Foundation exists solely to serve the university by seeking resources necessary to provide students with exceptional intellectual, professional and personal development opportunities.

Donations can be made online at: <https://sites.google.com/site/purepackproject/donations>

or by filling out the attached Foundation Donation Sheet.

Product donations can sent to the purePack Project address:

ECE Department/purePack Senior Design

501 E. Saint Joseph Street

Rapid City, SD 57701

Project Name

purePack Senior Design

Team

Scott Nelson (EE)
IEEE Member

Korey Kelly (EE)
IEEE Member

Andrew Pavsek (EE)
IEEE Member

Lucas Haan (ME)

Project Mission

The mission of the purePack Senior Design Project is to create a portable water purification system that produces clean, drinkable water in contaminated fresh water locations and is powered by renewable energy.

Specifications

The entire system will fit with a backpack, weigh less than 50 pounds and be able to provide bacterially and virally sterile water for 25 people per day. The purePack team plans to join with Engineers and Scientist Abroad to test and implement the system at an orphanage building campus near Vicuña, Chile. To learn more about the project refer to the attached flyer.

Project Expenses

Completion of a working portable water purification system is of highest priority so any funding will first be put towards the product. Excess funding will put towards the development of the orphanage. Attached is a list of all project expenses.

Authorization

Below is the authorization given by the purePack Project advisor.

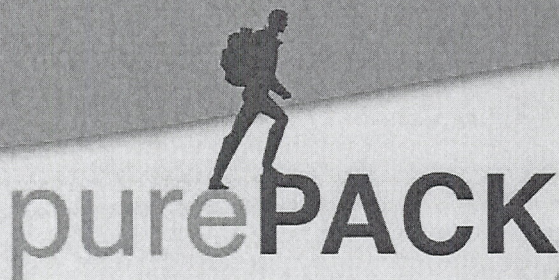


Scott Rausch
SDSM&T Instructor
purePack Project Advisor

SDSM&T

Senior Design Project

purepackproject@gmail.com



Mission Statement

The mission of the Pure Pack Senior Design Project is to create a portable water purification system that produces clean, drinkable water in contaminated fresh water locations and is powered by renewable energy.

Product Users:

Any community without access to electricity or clean water.

e.g. Impoverished communities, remote research stations, etc.

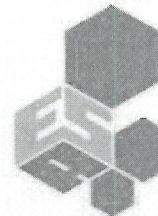
Specifications:

- Weighs less than 50 pounds
- Fits into a backpack
- Supplies 100 L of clean drinking water per day (25 people per day)
- Water is bacterially and virally sterile

Andrew Pavek Electrical Engineer • Korey Kelly Electrical Engineer
Lucas Haan Mechanical Engineer • Scott Nelson Electrical Engineer



Advisors: Scott Rausch • Bernt Askildsen
Dr. Myung-Keun Yoon • Jason Ash

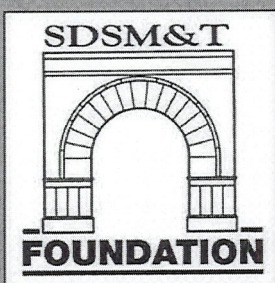
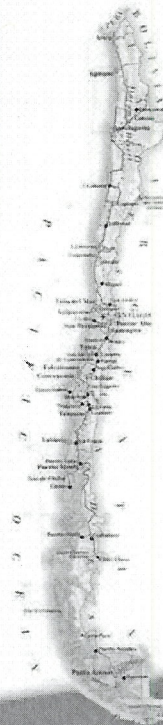


Engineers + Scientists Abroad
Community Enhancement Through Practical Application

Engineers and Scientists Abroad Chile Trip:

The Pure Pack team plans to join Engineers and Scientists Abroad (ESA) on a trip to an orphanage campus near Vicuña, Chile.

The team plans on using this trip as an opportunity to test the Pure Pack design and aid with the construction of the orphanage. We will also provide insight toward power generation and water purification for the orphanage.



Funding Information

The Pure Pack Senior Design Project needs sufficient funding for the product design and for product implementation in Chile.

Help fund the Pure Pack Project through the SDSM&T Foundation at:
<https://sites.google.com/site/purepackproject/project-definition>

SDSM&T Foundation/Pure Pack • 501 E. Saint Joseph St. • Rapid City, SD 57701