

A horizontal splash of blue water with bubbles, set against a light blue gradient background.

American Society of Civil Engineers (ASCE) Environmental Design Competition



Status Update 1

CENE 486C

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Project Summary

- Pacific Southwest Conference (PSWC) 2018 located in Tempe, Arizona [1]
- Design and construct a reusable, low-cost household water treatment system [1]
- Intended for the households of developing countries. The system will also be scalable to accommodate the needs of communities.



*Figure 1: PSWC 2017 Environmental Competition in Irvine, CA
Photo courtesy of Celine Bannourah*



Schedule Status

~~1. Literature Review~~

~~2. Unit Design~~

3. Acquisition of Materials

4. Fabrication

- 2 weeks behind due to testing

5. Prototype Testing

- 2 weeks behind due to unforeseen difficulties

6. 30% Report

7. Finalize Design

8. Present at PSWC

9. 60% Report

10. 90% Webpage

11. Final Presentation

12. Final Paper

Reason for Delays

- Project management
- Clay is more difficult to remove than anticipated
 - Turbidity >1,000 NTU

Table 1: Contaminant Quantities Per 34 Liter Sample [2]

Contaminant	Quantity Per Nine Gallon Sample
Miracle Gro All Purpose Plant Food	1,000 g
Bulk Apothecary Kaolin Clay	1,000 g
Star Kay White Pure Lavender Extract	30 mL
Wastewater Treatment Plant (WWTP) Effluent	20 mL

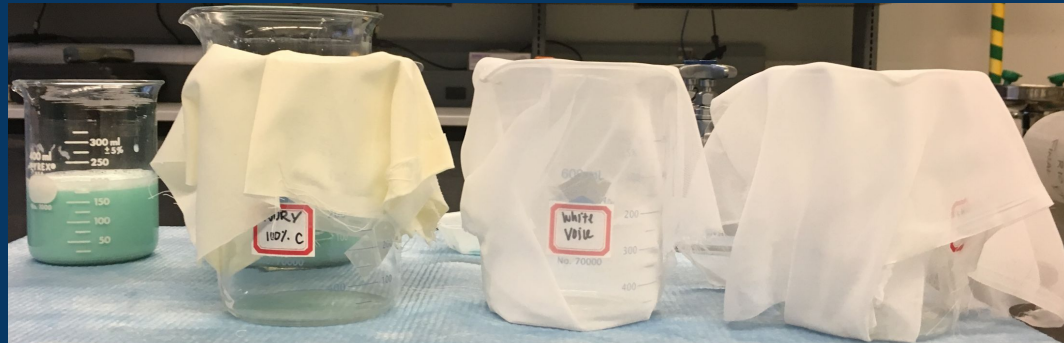


Figure 2: Testing Filtration Abilities of Fabrics
Photo courtesy of Cameron Rhodes

Work Completed

- Experimental Plan
- First phase of material acquisition
 - Lab testing
 - Simulated sample
 - Treatment device
- Tested parameters of simulated sample
 - Chlorine still needed
- Began unit testing for turbidity
 - Fabrics, sand and gravel



*Figure 3: Lab Testing
Photo courtesy of Cameron Rhodes*



Current and Future Work

January 23rd - February 5th

- Retest contaminants and parameter analysis
- Continue design alternatives and prototype testing
- Begin Unit Integration
- 30% Report

Table 2: Untreated Sample Test Results

Parameters	Test Result
<i>Total P-PO₄³⁻</i>	Absorbance > 3.5 mg/L
<i>Total N-NO₃⁻</i>	5.5 mg/L
<i>Turbidity</i>	> 1,000 NTU
<i>Chlorine</i>	N/A
<i>Total coliforms</i>	Non Conclusive
<i>Odor</i>	Present



References

- [1] American Society of Civil Engineers Environmental Design Competition. (2017). Flagstaff: Northern Arizona University, pp.1-9.
- [2] "WHO | Environment and health in developing countries", Who.int, 2017. [Online]. Available: <http://www.who.int/heli/risks/ehindevcoun/en/>. [Accessed: 17- Oct- 2017].
- [3] "Water and Development — Global Issues", Globalissues.org, 2017. [Online]. Available: <http://www.globalissues.org/article/601/water-and-development>. [Accessed: 17- Oct- 2017]
- [4] Earth Habitat. (2017). Fresh Water Scarcity and Pollution. [online] Available at: <https://earthhabitat.wordpress.com/2010/02/23/fresh-water-scarcity-and-pollution/> [Accessed 30 Nov. 2017].

Appendix

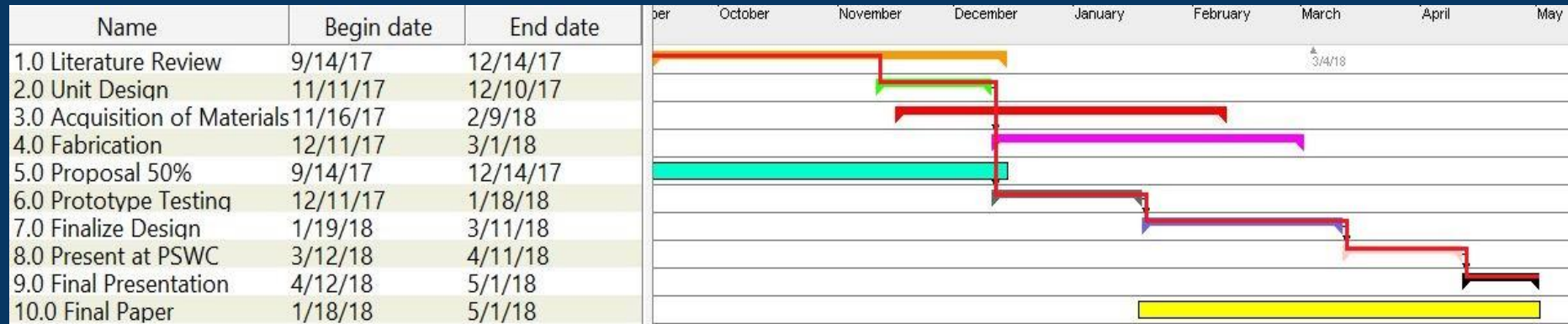


Figure 4: Gantt Chart Schedule