Intern Edwin Wong’s project, co-sponsored by the DWRC and the UD’s College of Engineering, was titled “Direct Contact Membrane Distillation of Brackish and Contaminated Water Sources for Sourcing Potable Water.” He was advised by Dr. Steven Dentel of the UD’s Department of Civil and Environmental Engineering.

Abstract
A basic overview of the concepts of Direct Contact Membrane Distillation (DCMD) is presented in a framework considering the impacts on water resources. The primary concept was based on adapting a principle used in an enhancement to Reverse Osmosis to decrease the frequency and intensity of scaling that occurs when insoluble salts deposit on a membrane with mineral-rich feed waters. The membrane used in this study was a 0.22-μm pore size polypropylene flat sheet membrane by GE® Water Process Technologies. Testing was performed on solutions with 150 g/L NaCl and 15 and 30 mg/L of Min-U-Sil®-5 silica and Kaolinite and Bentonite clay particles. Testing revealed that addition of suspended particles to the solution did not drastically alter the flux or salt rejection performance of the membrane during the testing period of 9 hours. Visual inspection of SEM images showed that higher concentrations of silica did not appear to yield any significant decrease in scaling, but that increasing concentrations of Kaolinite and Bentonite clay decreased scaling. Additionally, it is inferred that an increased concentration would lower the variability of the transmembrane flux. To confirm, additional tests with another suspended solids type and higher concentrations of suspended solids would need to be performed.