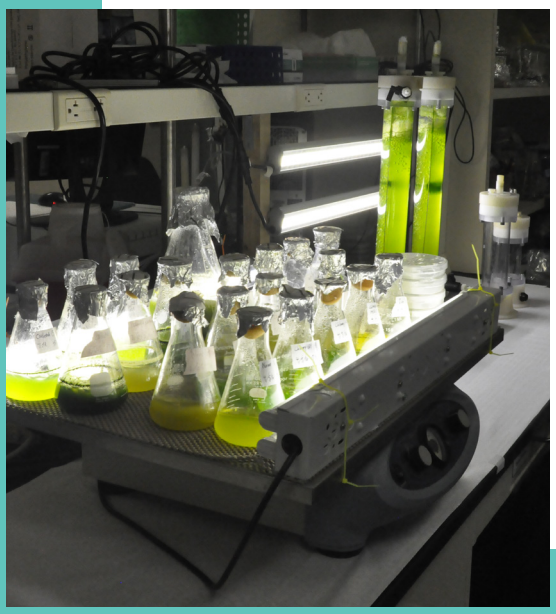
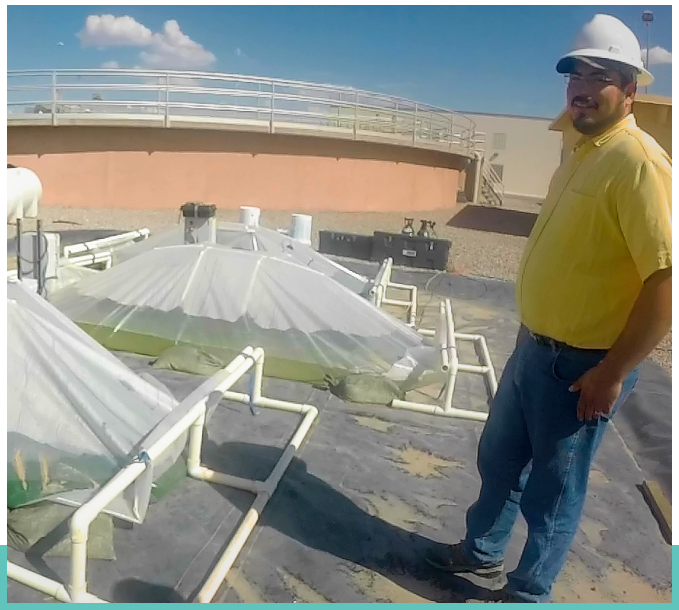
# BIOALGAL ENERGY

Bioalgal energy development can play a key role in creating a future that better utilizes alternative fuels and resources. One way that algae will become competitive as a fuel source is to extract co-benefits, such as water treatment, in addition to creating fuel feedstock. The NMSU algal wastewater treatment testbed is pursuing this end at the Las Cruces Wastewater Treatment plant. It is currently the only plant in the country that is treating primary effluent under field conditions to the discharge standards for biological oxygen demand, nitrogen, and phosphorous. In Year 5, *Galdieria sulphuraria* cultures were fed primary-settle wastewater and not only achieved discharge standards for the traditional pollutants in a single step, but reduced bacterial water quality as compared to the existing traditional treatment system.

In a collaboration with SFCC, UNM has been assessing the suitability of high salinity water produced from fracking operations for algae growth, including a mixed algal culture enriched on fracking water and a pure culture of *Duniliella salina*. The team has grown both sources on real fracking water and synthetic media over a range of salinities to determine salinity effects on growth rates, lipid productivity and composition, and community composition (for the mixed culture). Use of fracking water would reduce the need for freshwater for algae cultivation, and also has applications for treatment of these abundant oil and gas wastewaters.







***LEFT:*** A shake-table with various algae cultures in Dr. David Hansen's lab at UNM; ***RIGHT:*** Dr. Omar Holguin with the pilot testbed at the Las Cruces Wastewater Treatment facility