**ECE Senior Capstone Design: Project Definition Document**

***Instructions****: Please complete this form, one each* ***for each project proposed*** *and submit to one of the Course Instructors Drs. Ramiro Jordan or Ravi Jain (rjordan@unm.edu;* [*jain@chtm.unm.edu*](mailto:jain@chtm.unm.edu)*) ASAP, preferably by September 3, 2018.*

**Name of Sponsoring Organization** **(Include Institution and Department):**

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**Project Title: K1 Water Disinfection Generator**

**Brief Project Description**:

Chlorine is the gold standard for disinfection for drinking water, health care facilities, low income settings, disasters, industrial applications, and many others. Chlorine can be made cheaply and effectively using electrolysis of a salt water brine solution with common salt and power the only consumables. This technology represents a huge world-wide market potential. Control systems must be effective at controlling the concentration of chlorine generated in the process, the systems must be capable of recovering from power disruptions, and the systems must identify and communicate alarm conditions.

**Please list the major deliverables you expect to receive from this project**:

The design team will expand on an earlier circuit board design and software program, will work with Aqua Research’s technical lead to build an alpha production control board, will upgrade and enhance the software for communications, alarms and diagnostics, and will build a prototype operational system. The system must be able to recover from interruptions in power without losing control of the process. The user interface must be simple and reliable but must be able to diagnose system faults, recommend corrective actions, and report them out through state-of-the-art communications protocols. A failure mode and effects analysis (FMEA) will be conducted during the course of the design to determine the correct system response for any fault condition in the system.

**Please briefly describe the level of support (technical guidance, materials, computing, etc.) the students will receive**:

Aqua Research will provide all hardware and software required for the project. Any consumables needed or used by the students will be provided by Aqua Research. Aqua Research will provide laboratory space to support the project. The technical lead will provide supervision as required to ensure the program stays on track.

**Please state the funding level to which you can commit and how it will be paid**:

Aqua Research will provide whatever reasonable funding is needed to support the project. Parts can be ordered directly by Aqua Research, or Aqua Research can reimburse students for any expenses.