**PROJECT MANAGER QUALIFICATIONS**

Jeffrey Marr is a licensed professional civil engineer in Minnesota and serves as the Associate Director of Engineering and Facilities at the St. Anthony Falls Laboratory (SAFL), University of Minnesota (UMN). He received both his BS (1996) and MS (1999) from the University of Minnesota, Department of Civil Engineering and has worked at SAFL for 23 years. Marr’s research interests are broad and include topics in hydraulics and sediment transport, wind energy, river and delta systems, tailing ponds, deep water gravity currents, and reservoir sedimentation and erosion. In wind, Marr serves as the manager of the UMN wind engineering research program. Recent projects include work in physical modeling experiments in transportation hydraulics, wind turbine noise, and complex fluid mechanics research involving public and private organizations. Jeff Marr manages SAFL’s Applied Research and Engineering group, which supports faculty research and carries out applied research with public and private sponsors. Marr is an experienced project manager and principal investigator, having served as lead manager for the $16M renovation of SAFL completed in 2014 and the $8M project to establish UMN’s wind energy research field station including our 2.5MW research turbine at UMore Park in Rosemount, MN.

Lian Shen will also participate in this study. Shen is the Director of the St. Anthony Falls Laboratory and a Professor in the Department of Mechanical Engineering at University of Minnesota, Twin Cities. He earned his Doctor of Science degree from Massachusetts Institute of Technology (MIT) in 2001. After three years of postdoctoral training at MIT, he joined the faculty of Johns Hopkins University in 2004. In 2012, he was recruited by University of Minnesota to join its faculty. Shen is a world expert on the study of environmental fluid flows and renewable energy. He is currently serving on the national committee of ASCE Environmental & Water Resources Institute on CFD Applications in Water and Wastewater Treatment. He is also on the editorial boards of three internal academic journals. Shen has organized several national and international conferences and symposiums.

**ORGANIZATION DESCRIPTION**

This project will be performed at the St. Anthony Falls Laboratory (SAFL, http://www.safl.umn.edu) at University of Minnesota. SAFL is an interdisciplinary fluid mechanics research and educational institution. It has 22 faculty members and 35 research and administrative staff members. SAFL is a world-renowned research laboratory specialized in environmental and engineering fluid mechanics. SAFL researchers have been performing many innovative environmental studies for the state of Minnesota. Some of the projects were/are funded by the Minnesota Environment and Natural Resources Trust Fund.

The proposed research leverages on the unique and advanced capability of measuring environmental flows at SAFL, which has 16,000 ft2 of research space dedicated to physical modeling and experimentation. The facility, which has recently been upgraded with a $16M renovation, has a wind tunnel and 15 general purpose flumes, tanks, and channels readily configurable to the needs of the projects. The SAFL wind tunnel is equipped with the ability to control and measure air velocity and temperature.

The proposed project will use the UMN wind energy research station, which is a premier research facility of SAFL. To help advance its goal of 20% wind power by 2030 in the United States, the Department of Energy awarded an $8 million grant to SAFL to build a wind research station containing a utility scale wind turbine and a 130 m meteorological tower in Rosemount, MN. The Clipper Liberty 2.5 MW turbine built is heavily instrumented in order to collect an immense amount of data and assist in research. The turbine began operating and collecting data in October 2011. This project will use the field measurement data of UMN wind station.