Executive Summary

The objective of this Project is to demonstrate a new, advanced completion / stimulation method named Directed Slotting-Fracturing (DSF) technology. DSF technology combines hydroslotting, the patented and proprietary excavation technology that cuts two 180°-phased slots through the casing, cement, and deep into the formation, with hydraulic fracturing. This demonstration will show that the orientation and long-distance direction of a hydraulic fracture can be controlled by the orientation and design characteristics of the actuating hydroslot if aligned with the maximum in-situ formation stresses. In other words, the hydroslot will cause the fracture to propagate along a pre-determined course for several tens to hundreds of feet, by altering the near-wellbore geology with properly oriented man-made stress regimes that exceed the maximum in-situ stresses in the near-wellbore zone, and follow the maximum stresses in the formation that are present naturally.

Directed Slotting-Fracturing, or DSF technology, introduces a new paradigm to the well-known rule that hydraulic fractures tend to propagate according to naturally-occurring path(s) of maximum and minimum stresses (usually perpendicular to the least principal strain). The new paradigm is that the hydroslotting component alters those naturally-occurring stress regimes in a well's near-wellbore zone, and this enables a hydraulic fracture to follow along a new path of (pre-planned) artificial stresses. If the hydroslot is oriented and designed properly, then this Project should be able to demonstrate how DSF can take into account the existing layout of local gas well activity, and expose the best gas characteristics of the local geology.

This demonstration will be implemented on a Medina gas well owned by Chautauqua Energy, Inc. and evaluation assistance will be provided by Earth Energy Consultants. Letters of in-kind support have been attached. Results of the demonstration will be compared to those of known hydro-fractures that have been set off through standard shot holes, notches, or other types of perforations.

Preliminary research comparing some of Chautauqua Energy's stripper wells to its best performers has revealed that, notwithstanding the poor performances of the stripper wells over the last twenty years, in fact, many have extensive reserves that have never been accessed due to near-wellbore damage and/or insufficient drainage, and also contain significant by-passed pay in lower porosity intervals (4-6%) that have never even been touched, which are only accessible with hydroslotting (altogether exceeding 600 MMCF for a small sample area of 200 acres). The upside potential of using DSF on all Medina stripper wells, based on the research of the small sample area, makes this Project commercially sound.

If the proposed technical approach is successful, it could lead to an important shift in the way old wells are re-stimulated, new wells are completed, and spud locations are chosen. The encouraging cost-benefit analysis gives independent operators a lower-cost alternative to drilling a new well, with practically equal performance results. When widely applied, DSF can add significant reserves to the energy resources of NY State, and ultimately, from similar gas fields across the nation.