

**BUILDING AND TESTING A NEW TYPE OF VACUUM PUMP FOR
CASINGHEAD PRESSURE REDUCTION IN STRIPPER WELLS**

Lead Organization: W & W Vacuum & Compressors, Inc
Key Contact: Paul Weatherbee
(325) 695-4637, wildcattr@aol.com
SWC Co-funding: \$105,000

Recently W&W Vacuum & Compressors, Inc. has developed the Weatherbee Wedge Pump, a new, patented technology, for introduction into the oil and gas industry. It is anticipated that this new technology will potentially eliminate the problems which have, for the most part, made it economically unreasonable for the small, independent operator to attempt to increase production in stripper wells.

Casinghead gas has always restricted the oil and gas production in stripper wells due to the pressure the "wet" or "rich" gas exerts on the formation. Existing technology used for this purpose cannot pull the volume of vacuum (throughput) necessary to alleviate the pressures exerted on the formation. Furthermore, currently used devices cannot economically handle the high BTU gas that is typical of casinghead gas. In these devices the condensate from the high BTU gas contaminates must be separated thus requiring an expensive multi-component system.

The concept behind casinghead pressure reduction is rather simplistic. Casinghead gas is relatively wet (16 - 18 GPM) as it is basically flashgas from the formation. The weight of this column of wet gas sitting on the formation has an incremental effect on bottom hole pressure. This pressure is obviously dictated by oil specific gravity and the well depth. When wellhead pressure is added (i.e., flowline or surface separation), the pressure on the formation is significantly impacted. The well pressure seen at the formation level is further complicated by fluctuating wellhead pressure from the gas line. The concept is easily understood - by relieving the pressure in the casinghead, the weight (pressure) on the formation is reduced thus allowing oil or gas to more easily flow from the formation into the wellbore. Furthermore, by reducing the pressure on the formation, down hole pump gas locking problems are dramatically reduced. Although each formation responds differently, but many mature basins have shown phenomenal increases in production.

It is believed that the Weatherbee Wedge Pump would be ideally suited to increase production in stripper wells without having to purchase the costly pumps and multi-stage components currently in use. The Weatherbee Pump will be relatively inexpensive, easy to operate and cost effective. In addition to the operators who have the financial and technical resources available to them and can justify the expense necessary to purchase and operate the expensive and complex systems on the market now, it is believed that an entire new market can be targeted (the small, independent operator) who, to date, has been priced out of the market for this technology. The objectives of this Proposal and research project are: (1) to build three prototype models to determine the feasibility of using the Weatherbee Wedge Pump as a pressure reducing pump on stripper wells in order to increase oil and gas production;(2) design and build a test stand to simulate various wellhead conditions most common in stripper wells, and; (3) bench testing of prototypes which will allow automated real-time measurement of pressures and flow rates during operation of prototype pumps.