

## ***Establishment of an Industry-Driven Consortium Focused on Improving the Production Performance of Domestic Stripper Wells***

**DE-FC26-00NT41025**

### **Goal**

The Stripper Well Consortium's (SWC) goal is to help keep stripper wells operating by developing low-cost technologies. SWC seeks to enhance the ability of the domestic oil and gas industry to keep stripper wells producing at economic rates—in an environmentally safe manner—and to maximize recovery of the domestic hydrocarbon resource, thereby impacting all areas of the United States. Stripper wells are defined as oil wells that produce 10 barrels (bbl) per day of oil or less and gas wells that produce 60 thousand cubic feet (Mcf) per day of gas or less.

### **Performer**

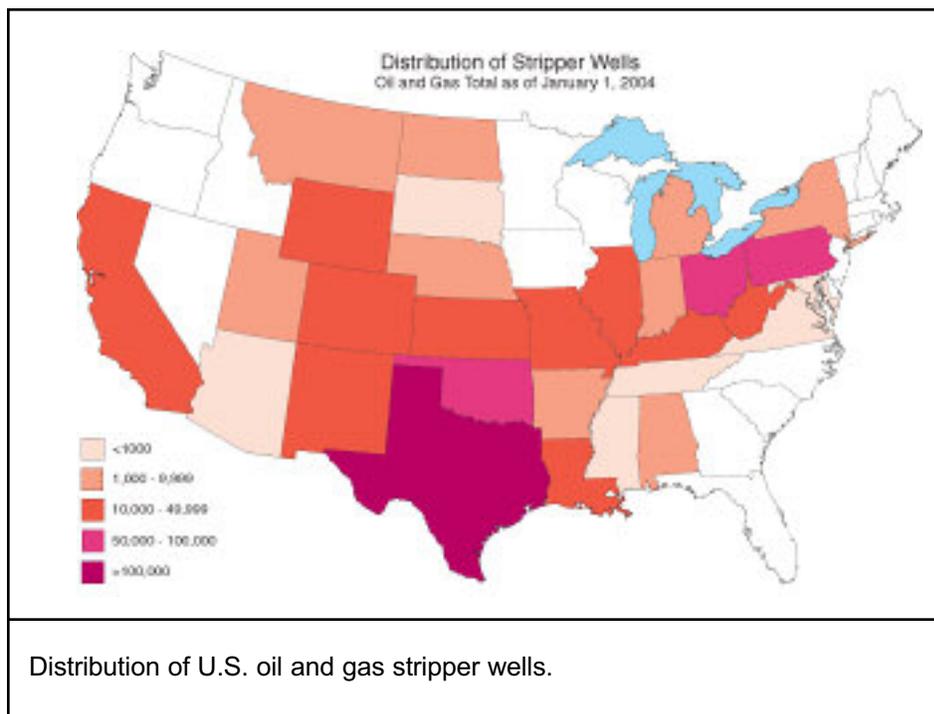
*Pennsylvania State University (PSU)  
University Park, PA*

### **Project Results**

SWC has worked through grants to universities and operators to enhance stripper well production. The economic impact of stripper wells can be calculated by the loss to the economy when stripper wells are plugged and abandoned. These losses, based on average production rates and prices for 2003 and U.S. Department of Commerce multipliers, are significant. For example, roughly 160,000 jobs are dependent on stripper well production. If the U.S. had to import all of the oil and gas currently provided by stripper wells, it would cost Americans nearly \$45 million per day. Loss of severance tax revenue from stripper wells that were plugged in 2003 cost producing States more than \$19 million. If all stripper wells were to be plugged, the States would lose nearly \$700 million in annual revenue. Placed in the context of 2005 oil and gas prices the economic value of stripper wells to States are even more significant.

### **Benefits**

Stripper wells contribute to the economy by supporting employment in smaller communities throughout the United States and by helping to avoid an even greater transfer of American wealth overseas in return for



imported oil. Because most stripper wells are operated by small companies in communities far from major cities, the economic benefits from stripper production remain focused at the regional or local level. The Interstate Oil and Gas Compact Commission (IOGCC) estimates that for every \$1 of stripper oil or gas production, \$1.01734 of economic activity is created. About 10 American jobs are dependent on each \$1 million of stripper production.

### **Background**

IOGCC, which reports the annual status of U.S. stripper wells, recorded 393,463 stripper oil wells producing an average of 2.18 bbl/day oil, and 260,563 stripper gas wells producing an average of 15.5 Mcf per day, (January 1, 2004). This is roughly 77 percent of the U.S. total oil wells and 63 percent of the Nation's total gas wells. The United States has more oil and gas wells than any other country. As of December 31, 2003, there were more than 524,000 producing oil wells in the United States, more than three times the combined total for the next three leaders: China, Canada, and Russia. The United States is the world leader in producing gas wells too, with just over 390,000. However, most of these wells produce relatively small volumes of oil and gas, often on an intermittent and marginally economic basis.

The number of producing stripper wells changes depending on how many wells

enter the ranks (by declining in production) and leave the ranks (by increasing production or being plugged and abandoned) of stripper wells each year. Although a net of about 8,000 aging oil wells drop to stripper status each year, roughly another 14,000 are plugged and abandoned, leaving a net reduction in the oil well total of about 6,000 wells/year. (The U.S. stripper oil well population has been gradually declining over the past decade.) At the same time, a net of nearly 14,000 gas wells per year, on average, have dropped to stripper well status over the past decade (about 17,000 per year during 2000-2003, when gas prices were stagnant). Roughly 3,800 stripper gas wells are plugged and abandoned in the United States each year, on average, resulting in an average net increase in the stripper gas well population over the past decade of about 10,000 wells per year.

### **Summary**

SWC is an industry-driven consortium with active industrial participation and leadership. Under SWC's bylaws, each SWC member appoints one representative to a Technical Advisory Committee. This committee is responsible for steering the technical direction of the consortium and is responsible for electing a seven-member Executive Council that is responsible for selecting from solicited proposals the research projects to be funded.

Research is conducted in three broad areas

identified as key challenges to stripper well productivity:

- Reservoir remediation.
- Wellbore clean-up.
- Surface system optimization.

Research outside of these three areas may be considered pending approval of the program sponsors. Specific research projects are developed by the membership using a standardized proposal template. Proposal submission is limited to full members of the consortium, and collaboration among full members is encouraged. Projects are funded on an annual basis. Project participants must contribute at least 30 percent of the cost of each project in the form of cash or in-kind support.

Among the SWC milestones:

- In 2002, 14 projects were selected; four were either extensions or complements to projects from the previous year.
- In 2003, three of the funded projects built upon previous work.
- SWC revised the constitution and bylaws to include a new membership group, Supporting Members. These members do not pay an annual fee but pay a registration fee for each meeting they attend and can submit proposals.
- In May 2004, SWC reviewed 19 proposals and committed \$1 million to co-fund 10 proposals.

### **Current Status (August 2006)**

The initial project was completed in September 2004. SWC received additional DOE funding May 1, 2004, to pursue the same goals, with this follow-up project scheduled for completion in April 30, 2009. DOE funding of \$7,400,000 is expected for this follow-up project, with the performer contributing \$1,850,000. SWC currently has about 50 members; more than 80% are companies within the domestic oil and gas industry, split roughly evenly between producers and service/supply companies.

### **Recently Funded Projects**

The nine projects recently selected in April 2006 include:

- Increased Pumping Capacity and Depth for Airlift System - Airlift Services International.

- Liquid Lifting from Deviated and Horizontal Tight-Shale Gas Wells - Colorado School of Mines.
- Foam Control System for Natural Gas - Composite Engineers.
- Advanced ASJ Drilling System - Impact Technologies.
- Novel Single Stage Water Mitigation Treatment - Impact Technologies.
- Pumper/Well Tender PDA Program for Small Producing Companies - Oklahoma Marginal Well Commission.
- Modify and Extend Casing Plunger Technology to Tubing - PAAL, Inc .
- Reducing Water Production in Mississippian Reservoirs Using Gelled Polymer Systems - University of Kansas.
- Best Practices Guide to Optimizing Multizone Coalbed Natural Gas Well Completions - WellDog, Inc.

### **Funding**

This project was awarded as a sole-source contract.

### **Publications**

SWC annually holds two open technology transfer workshops where research results are presented to industry. SWC's website at <http://www.energy.psu.edu/swc> has a complete listing and abstracts for all funded projects. The website hosts a newsletter that highlights specific projects, solicits projects proposals, and communicates technology information to members and the public.

Published and distributed more than 5,000 DVDs, *Independent Oil: Rediscovering America's Forgotten Wells*.

**Project Start:** September 30, 2000

**Project End:** June 30, 2005

**Anticipated DOE Contribution:** \$400,000

**Performer Contribution:** \$0

### **Contact Information**

*NETL* – Daniel Ferguson ([daniel.ferguson@netl.doe.gov](mailto:daniel.ferguson@netl.doe.gov) or 918-699-2047)

*PSU* – Joel Morrison ([jlmm9@psu.edu](mailto:jlmm9@psu.edu) or 814-865-4802)