

# **ADVANCED TECHNOLOGIES FOR STRIPPER GAS WELL ENHANCEMENT**

## **QUARTERLY REPORT**

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## **ABSTRACT**

As part of Task 1 in the Advanced Technologies for Stripper Gas Well Enhancement, Schlumberger – Holditch Reservoir Technologies (H-RT) has partnered with two Appalachian Basin producers, Great Lakes Energy (formerly Range Resources) and Belden & Blake Corporation, to develop methodologies for the identification and enhancement of stripper wells with economic upside potential. These industry partners have provided data for over 700 wells in northwestern Pennsylvania.

Phase 1 goals of this project are to develop and validate methodologies that can quickly and cost-effectively identify wells with enhancement potential. We are currently in the final stages of developing and testing our new Access/Excel based software and processing this well data to generate a list of potential candidate wells that can be used in Phase 2 to validate these methodologies. Preparation of the Final Technical report has begun.

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## **INTRODUCTION**

During this report period, we have continued to work with two industry partners, Great Lakes Energy (formerly Range Resources) (GLE), and Belden & Blake Corp (B&B). GLE supplied data for approximately 205 wells located in Warren, Venango, and Crawford counties, Pennsylvania. B&B supplied data for nearly 501 wells in Venango and Warren counties, Pennsylvania. Using the data, we are finalizing the Access/Excel software routines, reviewing the entire data entry, and processing procedure for errors.

## **EXPERIMENTAL**

We are using and developing software tools to evaluate the production data and conduct a quick, first-pass examination for wells with enhancement potential. Using these tools, we generate a single Production Indicator (PI) that is representative of the entire production life of a well. The current software has the ability to calculate two PI's, a cumulative gas at a user input time period (i.e. 1 yr, 2 yr, 5 yr, etc.), and an average gas rate over the life of the well (cumulative gas/months produced). We are able to compare either PI of a given well to the surrounding wells within a user input radius (e.g. 4000ft) and determine wells within that radius that perform significantly below the statistical reference of offset wells.

The software compares the PI of the target well to the average of its offsets. A user inputs a desired percentage (e.g. 50%) that the target well needs to be below the average in order to be recognized as a low-performer. The program then processes the entire well list and identifies target wells that meet the above criteria. This gives a quick, automated method to identify wells that are under-performers in an area and that may have potential for production enhancement.

Once this first pass is completed and we have identified a group of wells that may have enhancement potential, we will work with the industry partners to review completion, geologic, and production data in more detail. This will further refine the list and establish a good foundation for a Phase II field demonstration.

## **RESULTS AND DISCUSSION**

The well data has been downloaded into Microsoft ACCESS™ databases and has been quality-checked for internal errors or omissions. B&B did indicate that some wells may be missing in the current database and are working on updated information. The database has been linked to a new Microsoft Excel file specifically designed to aid in recognizing wells with possible production enhancement potential.

A user-friendly interface has been of paramount importance in making the program relatively easy to use by the operators. The development work for this interface was nearly completed during this reporting period. Finalization of this will occur in the next quarter and the software product will be completed and included in the final report.

## **CONCLUSION**

We have received data for more than 700 wells and are in the final stages of identifying wells with possible production enhancement potential. The software for well identification is in its final stage of development and when completed will provide an easy and fast way to identify wells that may have upside potential.

Initial preparation of the Final Technical Report was begun with an anticipated completion date of the first quarter of 2001.

From our experience in the Appalachian Basin, we are confident that a good sample of stripper wells with enhancement potential can be found in this data set. We are also confident that the methodologies developed to date can quickly and economically select stripper wells with economic upside potential. By accomplishing this, we will provide producers throughout the U.S. a means of increasing existing gas production and increase the U.S. natural gas reserve base.