PUBLIC ABSTRACT

Proposing Organization: Enerdyne LLC

Project Title: Using Cable Suspended Submersible Pumps to reduce Production Costs to Increase Ultimate Recovery in the Red Mountain Field in the San Juan Basin Region

Project Description: The objective of this project reduce costs 50% to improve recovery in marginal oil production from the San Juan basin region of the Rocky Mountains located in New Mexico. Specifically, the Red Mountain field in McKinley County New Mexico will be produced using a new cable suspended submersible pump technology. The field has 3 producers, 8 injectors, 3 plugged wells, and 31 shut in wells. The present day production is about 3 barrels of oil per day (BOPD) average with about 9 barrels of water per day. Production has been erratic because of frequent equipment breakdowns and the remote location. Under the current operating environment, the field is unprofitable, and is in the process of being plugged.

This particular field is an example of a situation where the production rates per well are relatively low, but the reserves in place have hardly been tapped. According to geological estimates, the reasonable estimate of the original oil in place (OOIP) for this field is 2,437 MBO. With historical recovery in this field of 124 MBO, only 5% of the OOIP has been recovered. It is clear that the Red Mountain field has hardly been tapped at this point, and yet it is about to be abandoned due to marginal economics.

Enerdyne LLC estimates that if production costs can be reduced 50%, then this field could recover at least 30% of the OOIP, or ultimately 780 MBO over the next 20 years. Through a partnership with Pumping Solutions Incorporated (PSI) in Albuquerque NM the project will install newly developed submersible oil well pumps on cable suspension to reduce capital and operating costs. PSI has recently completed long term testing of this submersible pumping technology at the RMOTC test field in Casper WY, with good results in similar wells. PSI has also developed a cable suspended pumping system using this pump with a small diameter, continuous, reinforced plastic, coiled production tubing. The pump is run on a wire line, with the power cable and continuous tubing banded to the wireline, which is a □□ D stainless wire rope. The entire system is deployed from a towable trailer with a portable winch system, continuously fed into the well at speeds up to 100 feet/minute. This vastly reduces the cost of a □pull and run□, enabling a single operator with a relatively small and light trailer to perform this operation in about half the time required for a conventional workover.

PSI pumps are very small, approximately 8 feet long, 3 □□ diameter and weigh about 90 pounds. The pumping mechanism is a self contained hydraulically actuated diaphragm pump which is almost immune to the effects of sand. Mean time between failures for these pumps operating in this type of well is greater than 6 months. The cost of the pump is less than half a conventional rod pump, with a rebuild costs comparable to rod pumps. Because the pump is positive displacement, it is very efficient, using about half the power of a conventional pump. Other advantages are silent operation and reduced environmental impact due to a reduction in surface equipment.

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Total Estimated Cost:	$1,205,008
DOE Share:	602,504
Applicant:	602,504

PUBLIC ABSTRACT

Proposing Organization: Vecta Exploration, Inc.

Project Title: Exploring for Subtle Mission Canyon Stratigraphic Traps with Elastic-Wavefield Seismic Technology

Project Description: Vecta Exploration, Inc., and its subcontractor, the Exploration Geophysics Laboratory (EGL) at the Bureau of Economic Geology, will develop a new seismic technology to explore for subtle Mission Canyon oolitic limestone reservoirs in the Williston Basin. This technology will be based on the acquisition and application of full-elastic (9-component) seismic data. Mission Canyon reservoirs are elusive targets when exploration is based on conventional compressional (P) wave seismic data. The attraction of 9-component (9-C) seismic data is that three shear (S) wave modes can also be used for target imaging, these being the SH (horizontal shear), SV (vertical shear), and C (converted shear) modes. Work at EGL has shown that each mode of an elastic wavefield can, and often does, image stratal surfaces across a target interval differently than do the other elastic modes. Thus any of the S modes can depict seismic sequences and seismic facies that are not observed using P waves. This rich, expanded source of stratigraphic and lithofacies information in full-elastic seismic wavefields needs to be utilized in Mission Canyon exploration. The objectives of this study are to acquire, process, and interpret 9C3D seismic data across Mission Canyon plays, develop relationships between drilling objectives and elastic-wavefield attributes, drill confirmation wells, and then share the research findings so that full-elastic seismic technology can be applied to improve oil exploration across the greater Rocky Mountain Frontier area.

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Total Estimated Cost: $2,933,197
DOE Share: 1,199,997
Applicant: 1,733,200