

“Refrac Pilot”

Submitted by:

Whiting Petroleum Corporation

- ☐ **Request for - \$600,000; Total Project Costs - \$1,300,000**
Project Duration: 30 days

PROJECT DESCRIPTION

- Whiting Oil & Gas Corporation (WOGC) assembled multidisciplinary teams comprised of a Geologist, Completions Engineer, Production Engineer, Reservoir Engineer and Landman for seven different prospect areas across the Williston Basin. Teams were charged with the task of evaluating each well for its refrac potential. The technical teams have assembled their top candidates, and WOGC will start with refracturing the TWO SHIELDS BUTTE 14-33-6H well to unlock reserve potential that is thought to have been bypassed during the initial completion. This well was completed in May, 2009, with only 6 Frac Stages and and 929,000 lbs. of proppant, which calculates to only 600 lbs. proppant per lateral foot of wellbore, and a stage spacing of 700' per stage. Although considered an adequate completion at the time, the well is surrounded by subsequent wells with enhanced completions that yield far better results. This well represents the first of ten wells in WOGC's Refrac Pilot program – learning from this well will be carried forward and applied to the other nine candidates.

- The ultimate standard of success for the proposed Refrac Pilot will be the economic outcome of the project, and how well the techniques used translate to additional candidates. After the refrac is complete, WOGC will closely monitor the performance of the TWO SHIELDS BUTTE 14-33-6H well and make any operational adjustment necessary to ensure the well produces at its optimum potential. Well tests will be taken at regular intervals (at least monthly) to gauge the production performance. Through regular reports to the WOGC, along with a detailed final report, other operators in the Williston Basin will be able to apply the lessons learned from WOGC's proposed Refrac Pilot and begin to unlock potential in their respective inventories of older wells. The eventual result will be an overall enhancement of production and reserve recovery across the Williston Basin.
- The Commission is being asked to fund \$600,000 of the \$1,300,000 estimated cost for the proposed refac of the Two Shields Butte 14-33-6H well.

TECHNICAL REVIEWERS' RATING SUMMARY					
		Technical Reviewer			
Statement	Weighting Factor	<u>G-40-01A</u>	<u>G-40-01B</u>	<u>G-40-01C</u>	<u>Average Weighted Score</u>
Objectives	9	3	4	3	30
Achievability	7	2	4	3	21
Methodology	8	3	4	2	24
Contribution	8	3	4	5	32
Awareness / Background	5	3	4	3	16
Project Management	3	3	4	3	10
Equipment / Facilities	2	3	5	3	7
Value / Industry-Budget	4	3	4	3	13
Financial Match – Budget	4	3	3	3	12
Average Weighted Score		143	198	158	166
Maximum Weighted Score				250 possible points	

TECHNICAL REVIEWER TOTALS

- G-40-01A

Average Weighted Score: 143 out of 250

FUNDING TO BE CONSIDERED

- G-40-01B

Average Weighted Score: 198 out of 250

FUND

- G-40-01C

Average Weighted Score: 158 out of 250

DO NOT FUND

DIRECTOR'S RECOMMENDATIONS

Fund in the amount of \$600,000 contingent on:

- **Applicant providing more detail on the specific reasons why the initial well was chosen over other potential candidates;**
- **Applicant providing quarterly reports on the first well for the first year and a final report at the end of the year;**
- **Applicant providing data and analysis from all 10 wells in the Refrac Pilot Program as each of the other 9 wells are refractured and the data analysis has been completed -- at a minimum a semi-annual report on each of the wells in the 10-well pilot project. One possible alternative is to have the information made available as part of the EERC Bakken Optimization Program.**