

PROJECT FACT SHEET

CONTRACT TITLE: Use of Rocktyping to Characterize Carbonate Reservoir Heterogeneity.

DATE REVIEWED: 01/12/93

DATE REVISED: 12/09/92

OBJECTIVE: The study will be investigating carbonate reservoirs within the Red River Formation (Ordovician) in Sheridan County, northeast Montana, and Williams/Divide County, northwest North Dakota.

ID NUMBER: DE-AC22-90BC14655

B & R CODE: AC1510100

CONTRACT PERFORMANCE PERIOD:

12/07/90 to 12/31/92

PROGRAM: Lt Oil

RESEARCH AREA: Geoscience

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PROJECT SITE:

Denver, CO

SCHEDULED MILESTONES:

Analyze data and initiate interpretation within guidelines.	07/92
Complete statistical analysis, drawlings, crossplots, and drafting of graphics.	07/92
Prepare final report.	08/92
Submit Final Report.	12/92

FUNDING (1000'S)	DOE	OTHER	CONTRACTOR	TOTAL
PRIOR FISCAL YRS	205	0	14	219
FISCAL YR 1993	0	0	0	0
FUTURE FUNDS	0	0	0	0
TOTAL EST'D FUNDS	205	0	14	219

PROJECT DESCRIPTION: The contractor shall apply the techniques of 'rock-typing' and quantitative formation evaluation to borehole measurements in order to identify reservoir and non-reservoir rock types and their properties within the 'C' zone of the Ordovician Red River Formation in the northeast and northwest North Dakota areas of the Williston Basin. Rock-typing discriminates and grades rock units by their pore-size distribution. The effort is directed toward determining the vertical and lateral relationships of the carbonate rock types, their distribution and depositional environments, as well as the porosities, oil saturation and fluid contacts associated with the rock types. Information obtained from the study can be used to predict direction for future exploration, to identify by-passed reserves, wells for recompletion and potential new well locations, and to model the reservoirs for Enhanced Oil Recovery (EOR) projects.

PRESENT STATUS: First draft of Final Report is in the review process.

ACCOMPLISHMENTS: Completed structural map of the Red River 'C' zone.
Completed cross-plots for rock typing.
Completed quantitative formation evaluation, and grading of reservoir rock types.
Completed and submitted for review first draft of Final Report.

BACKGROUND: Petrophysical investigation of geological sections has repeatedly shown that the rocks comprising such sections are usually divisible into groups, each group being characterized by a different set of properties. For such groups, the name 'rock type' is applied. 'Rocktyping' is the process of identifying rock types from borehole measurements. The process is mostly quantitative, as opposed to petrographic and lithofacies interpretations from well logs made with reference to the character of curves on logs. Rock types reflect different pore size distributions. Criteria used for rock-typing in the exploration and development of petroleum resources are: 1) lithology, 2) permeability to fluid and porosity relationship 3) relationships between porosity and porosity log response, 4) relationships between initial and residual hydrocarbon saturation, 5) capillary pressure curve shape, 6) relationships between water saturation and porosity, 7) m and n ('cementation' and 'saturation' exponents), and 8) relationships between compressional and shear wave velocities.

The ability to identify and define the favorable rock types will focus attention to these rock types, cut down the amount of rock and log section to be evaluated, and optimize production and EOR processes.