The Oklahoma Geological Survey (OGS), the Geological Information Systems department, and the School of Petroleum and Geological Engineering at the University of Oklahoma have engaged in a program to identify and address Oklahoma's oil recovery opportunities in fluvial-dominated deltaic (FDD) reservoirs. This program includes the systematic and comprehensive collection and evaluation of information on all of Oklahoma's FDD reservoirs and the recovery technologies that have been (or could be) applied to those reservoirs with commercial success. This data collection and evaluation effort will be the foundation for an aggressive, multifaceted technology transfer program that is designed to support all of Oklahoma's oil industry, with particular emphasis on smaller companies and independent operators in their attempts to maximize the economic producibility of FDD reservoirs.
Specifically, this project will identify all FDD oil reservoirs in the State; group those reservoirs into plays that have similar depositional and subsequent geologic histories; collect, organize and analyze all available data; conduct characterization and simulation studies on selected reservoirs in each play; and implement a technology transfer program targeted to the operators of FDD reservoirs to sustain the life expectancy of existing wells with the ultimate objective of increasing oil recovery.

The elements of the technology transfer program include developing and publishing play portfolios, holding workshops to release play analyses and identify opportunities in each of the plays, and establishing a user lab called the OGS Geosystems Extension Laboratory. The laboratory will contain all the play data files, as well as other oil and gas data files, together with the necessary hardware and software to analyze the information. Technical support staff will be available to assist interested operators in the evaluation of their producing properties, and professional geological and engineering outreach staff will be available to assist operators in determining appropriate recovery technologies for those properties.

SUMMARY OF TECHNICAL PROGRESS

The execution of this project is being approached in three phases. The current Phase 1: Planning and Analysis will last eighteen months, and includes system design, play definition, and database development activities. Data from the Natural Resources Information System (NRIS), an Oklahoma data system which has been developed through the support of the Department of Energy's Bartlesville Project Office, will provide the foundation for this data collection effort. Phases 2 and 3 will include implementation and technology transfer activities in which the collected information is organized and made available to the industry through the various methods. The milestone schedule and log for Phase 1 is included as Exhibit 1. Activities for Phase 1 have been divided into five primary tasks.

Task 1.1 Design/Develop Database Systems: System design and development activities were initiated during this quarter for the primary databases of the project. For the reservoir database, system design goals include a comprehensive data dictionary and a flexible design which will allow the capture of variable data from numerous sources into a systematic format. The initial specification includes about 150 data elements, with the capability of recording the data source for each element. A bibliographic database is being developed to systematically record source information for each reservoir and for recovery technologies; literature
references as well as unpublished data sources will be identified in this database.

An operator database will be maintained which will identify names and addresses of all active operators in Oklahoma, as well as the specific FDD plays in which they have operations. The initial operator system was developed during this quarter; update processes for this system will be defined as the project develops.

Task 1.2 Data Research: Data research activities also have been initiated this quarter. One fundamental precursor to the analysis of FDD reservoirs is the appropriate delineation of the boundaries of the fields in which the FDD reservoirs occur. Project staff are working closely with the Oklahoma Nomenclature Committee of the Midcontinent Oil and Gas Association to identify necessary updates to the official field boundaries; initial efforts this quarter have included working to complete field definitions in Beaver County, an area which will be included in the Morrow play.

Reservoir identification activities were also initiated during this quarter. Based on lease and well maps generated from the NRIS data, initial delineations were made of the geographic locations of reservoirs that may be in FDD depositional environments. The initial operator database was developed during this quarter through a combined scanning and data entry effort; as play boundaries are further defined, the operators' properties in FDD reservoirs will be identified based on input from the NRIS data system. Efforts were also initiated during this quarter to perform comprehensive searches for relevant literature and theses, and to define approaches to collection of private domain data through the reservoir characterization and simulation pilot studies.

Task 1.3 Play ID/Folio Plans: During this quarter the initial planning sessions were completed to identify Oklahoma's FDD plays and begin their boundary definitions. As a result, preliminary definitions have been developed for ten FDD plays within the state, all of which are within the Pennsylvanian System. At this point, the major plays have been identified as the Skiatook-Kansas City Play which includes Layton, Marchand and Cleveland sandstones; the Upper Cherokee Play including the Prue and Skinner sandstones; the Middle Cherokee Play for the Red Fork sandstone; and the Lower Cherokee Play including the Bartlesville and Booch sandstones.

Other identified plays include the Shawnee Play (Hoover, Carmichael, and Endicott sandstones), the Douglas Play (Wade & Tonkawa sandstones), the Ochelata-Lansing Play (Cottage Grove sandstone), the Marmaton Play (Peru sandstone), the Atoka Play (Gilcrease and Dutcher sandstones), and the Morrow Play (Upper and Lower Morrow sandstones). In the coming months, additional data collection efforts will help refine the play boundaries by identifying where these sandstones
have been deposited through fluvial-dominated deltaic processes.

1.4 Computer Applications: User lab development activities include both the acquisition of hardware and software, and the development of user interfaces for the data and applications that will be available through the user lab. Research is being conducted on the most valuable and cost-effective hardware and software selections for the user lab, and some acquisitions have already been completed. Advanced Revelations has been selected as the p.c.-level database software package that will offer the needed flexibility for user interfaces to the large and varying databases of this project. While the effort required to develop these interfaces will be fairly significant, it is expected that in the long run the users (many of whom will be novices with computers) will be best served by a system which is tailored to the needs of these reservoir applications. Design efforts for these user interfaces have begun as part of the database design efforts in Task 1.1.

1.5 Management/Reporting: As this is the first quarter of the project, significant management activities have been required to designate staff assignments and initiate project tasks. Some staffing requirements have yet to be filled, including the hiring of one of the three designated Play Leaders; search activities are underway for an experienced petroleum geologist to fill this position.

Two contract deliverable reports were completed this quarter, including the Project Management Plan and the first topical report regarding the initial planning phase of the Play Identification process.

REFERENCES/PUBLICATIONS

Since the project is in its earliest stages of planning and analysis, no publications have resulted from the project work thus far.

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