**Basin Analysis of the Mississippi Interior Salt Basin and
Petroleum System Modeling of the Jurassic Smackover
Formation, Eastern Gulf Coastal Plain**

**Quarterly Report
April 1 - June 30, 1998**

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Modeling of the Jurassic Smackover Formation, Eastern Gulf Coastal Plain"*

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Project Objectives

Part 2 (Basin Analysis of the Mississippi Interior Salt Basin) objectives are to provide a comprehensive analysis of the Mississippi Interior Salt Basin in Years 2 and 3 of the project and to transfer effectively the research results to producers through workshops and topical reports.

Work Accomplished

Task 1—Tectonic History

The regional base map for the oil and gas fields, land grid map, field and reservoir productivity tabulation and well location and formation top database have been prepared. The well database consists of over 3,000 oil and gas wells that penetrated Jurassic strata in the Mississippi Interior Salt Basin area. Subsurface structure maps and isopach maps have been constructed on key stratigraphic horizons. The structure maps and isopach maps have been compared to reconstruct the tectonic history of the basin. The 48 wells for the five regional cross sections have been selected and interpreted and the cross sections have been drawn.

Task 2—Depositional History

The biostratigraphy/stratigraphy for the selected well has been completed. The well logs for the regional cross sections have been interpreted. The isopach maps have been compared for reconstruction of the basin history.

Task 3—Burial History

Standard burial and thermal history software has been acquired. Profiles for the 48 wells used in the cross sections are being modeled using this software to determine the burial history of the basin. Sedimentation and subsidence rate determinations are being made for these wells.

Task 4—Thermal History

Oil and source rock analysis data have been tabulated and the distribution of the data are being plotted on the regional base map. Select well samples have been examined to assess the amount of organic matter available for vitrinite reflectance study of kerogen for crucial stratigraphic intervals. This study produced limited results. Geothermal gradient and heat flow data from the literature for the basin have been evaluated. Thermal alteration indices in combination with bottomhole temperature data are being used in combination with the results of the vitrinite reflectance study to determine geothermal gradients.

Task 5—Technology Transfer

Planning workshops were held in Tuscaloosa, Alabama, on September 26, 1997, and in Jackson, Mississippi, on November 6, 1997, to discuss with producers the research plan for Part 2 of the project. The recommendations received at the workshops have been incorporated into the research plan. Technology transfer workshops focusing on carbonate reservoir characterization and modeling were held in Tuscaloosa, Alabama, on March 3, 1998, and in Jackson, Mississippi, on March 4, 1998.

The first year report, field production data, and a case history study of the Smackover Formation at Appleton Field have been posted on the website of the Eastern Gulf Region of the Petroleum Technology Transfer Council.

Work Planned

Task 1—Tectonic History

Interpretation of the tectonic history of the basin will continue to be made from the structure and isopach maps and regional cross sections.

Task 2—Depositional History

Sequence stratigraphic analysis will continue. Interpretation of the depositional history of the basin will continue to be made utilizing the isopach maps, regional cross sections, well cuttings/core descriptions from the wells, and sequence stratigraphic analysis.

Task 3—Burial History

Interpretation of the burial histories for the 48 wells selected for the regional cross sections will be finalized. Sedimentation and subsidence rate determinations will be completed.

Task 4—Thermal History

Interpretation of the thermal histories for the 48 wells selected for the regional cross sections will be finalized. Geothermal gradient, heat flow, and subsurface temperature grid constructions will be completed.

Task 5—Technology Transfer

Planning for the workshops on the tectonic and depositional history and the burial and thermal history of the basin will be completed. The workshops will be held early in 1999.

Task 6—Topical Reports

Report preparation will continue. Topical reports (2) on the tectonics and depositional history and the burial and thermal history of the basin will be completed by October 1, 1998.

Time Frame

Planned	
Completed	xxxx