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TITLE: PREPARATION OF NORTHERN MID-CONTINENT PETROLEUM ATLAS

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Contractor Name and Address: The University of Kansas Center for Research Inc.

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Objectives

Project will develop a prototype for a digital and hard-copy atlas of petroleum fields and reservoirs in the northern Mid-continent region. A limited number of reservoirs in Kansas are to be included in the prototype project, but the goal is to expand beyond the prototype atlas to include significant reservoirs representing the major plays in Kansas, Nebraska, South Dakota, North Dakota, the Williston basin portion of Montana, the Denver-Julesburg basin of eastern Colorado and southeastern Colorado.

Primary products of the prototype atlas will be on-line accessible digital data bases covering two selected petroleum plays in Kansas. The regional databases will be supplemented with geological field studies of selected fields in each play. Digital imagery, digital mapping, relational data queries, and geographical information systems will be integral to the field studies and regional data sets. Data sets will have relational links to provide opportunity for history-matching, feasibility, and risk analysis tests on contemplated exploration and development projects. The flexible "web-like" design of the atlas provides ready access to data, and technology at a variety of scales from regional, to field, to lease, and finally to the individual bore. The digital structure of the atlas permits the operator to access comprehensive reservoir data and customize the interpretative products (e.g., maps and cross-sections) to their needs. The atlas will be accessible in digital form on-line and through CD-ROM using a World-Wide-Web browser as the graphical user interface.

Regional data sets and field studies will be free-standing entities that will be made available on-line through the Internet to users as they are completed. Technology transfer activities will commence in the early part of this project, providing data information sets to operators prior to the full digital atlas compilation.

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Summary of Technical Progress

"Pages" and data schema for the first field studies of the atlas have been developed and are accessible through the world-wide-web. The atlas structure includes access to geologic, geophysical and production information at levels from the regional, to the field to the individual well. Several approaches have been developed that provide efficient and flexible screening and search procedures. The prototype of the digital atlas is accessible through the Kansas Geological Survey Petroleum Research Section (PRS) HomePage (The Universal Resource Locator [URL] is http://www.kgs.ukans.edu/PRS/PRS.html). The DPA HomePage is available directly at http://www.kgs.ukans.edu/DPA/dpaHome.html. Technology transfer is underway through the use of monthly electronic updates and the on-line availability of the DPA products. Quarterly Progress Reports are posted on the Digital Petroleum Atlas HomePage.

On-line Prototype

The prototype digital atlas is being designed and tested. At present the prototype covers Arroyo and Big Bow fields. The present prototype design consists of the following components:

DPA HomePage:	Access to through a graphical user interface that covers all the counties in Kansas. Only counties highlighted counties have been added to the atlas. Clicking on the other counties will take you to annual oil and gas production files. Information can also be accessed through a form-based search by geographic location, field name and well name. Quarterly Progress Reports are posted and an on-line guide to the DPA is available. URL is http://www.kgs.ukans.edu/DPA/dpaHome.html.
Parameter Searches:	Search and screen all the fields in Kansas (6,000 +/-) by various geological and production criteria. URL is http://www.kgs.ukans.edu/DPA/Forms/GeneralInfo.html.
County Maps:	Regional maps show the field outlines and provide access to selected geologic and geophysical maps. Click on the name of the field to go to pages about that field. Access through a GUI stratigraphic column to show structure or isopach maps.
Field Title Page:	Outline of producing leases; location of discovery well(s), condensed field statistics, and access to field production data.
Regional Setting:	Geologic and production perspective at a regional scale.
General Information:	Basic geologic, geophysical, fluid, engineering, completion, and production data at the field scale.

Geological Information:	Access to geologic field maps and cross-sections though a type log graphical user interface. Clicking on selected horizon provides access to multiple maps at different levels.
Geophysical Information:	At present, geophysical data for Arroyo Field in Stanton County is available.
Reservoir Information	Will contain detailed reservoir engineering and geologic information. (Presently empty)
Well Information	Provides access to information on a single wellbore. Access is through an interactive map (click on the well symbol) and through a forms-based search. Data includes raster image of original completion report, digital "scout ticket" data, production data in graphical and digital formats, and digital log data. Prototype pages have been developed for presentation of core data (such as core photos, porosity and permeability data, descriptions, and thin-sections).

All components are accessible through a standard suite of "buttons" that are at the bottom of every page.

Technology Transfer

The prototype Digital Petroleum is one of the most visited pages on the Kansas Geological Survey web site (Current usage statistics can be accessed at the bottom of the Petroleum Research Section HomePage or at http://www.kgs.ukans.edu/PRS/usage/past_stats.html). Usage has steadily increased to over 4,000 access "hits" per week (Figure 1). Presentations at Wichita, the Society of Independent Petroleum Earth Scientists (SIPES) national convention in Dallas, and elsewhere have been well received.

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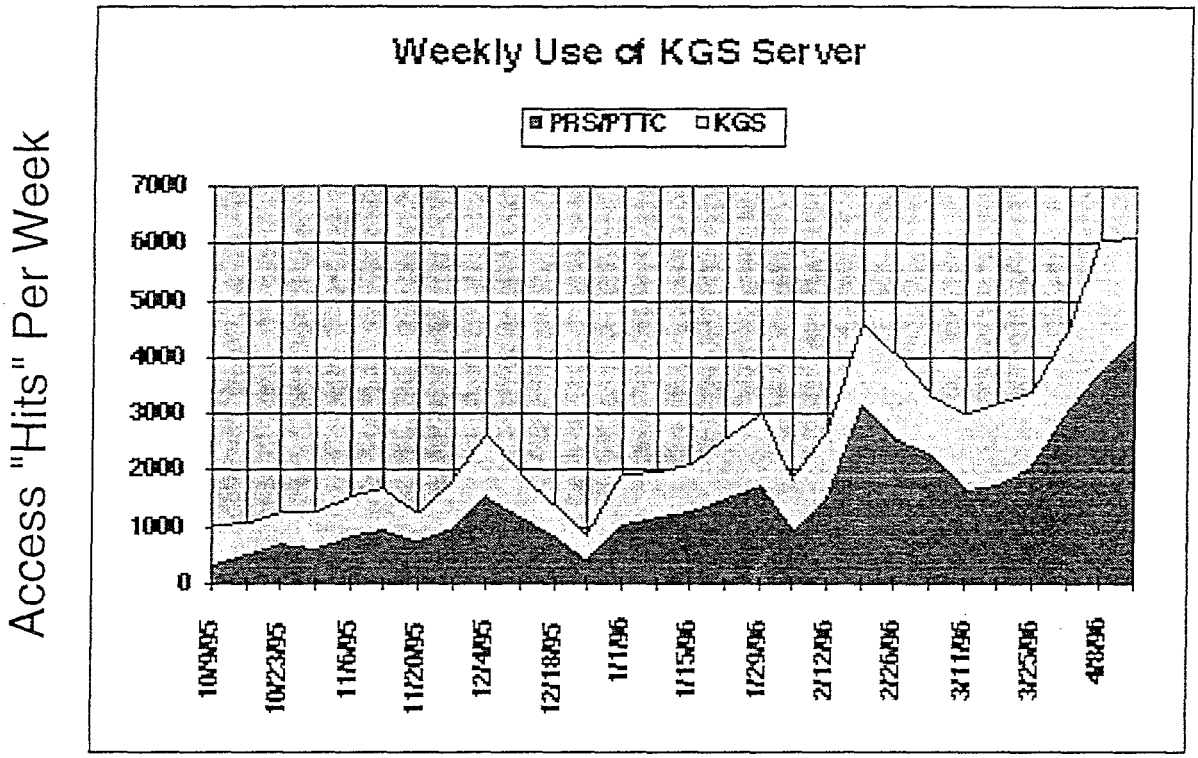

The area of the graph labeled "PRS/PTTC" covers all three of the oil and gas areas of the Kansas Geological Survey web site and includes the Digital Petroleum Atlas. Additional detail and updated statistics are available at http://www.kgs.ukans.edu/PRS/usage/past_stats.html

Figure 1.-- Usage of the Petroleum Research Section (PRS) and Kansas Geological Survey web site through the week of 15 April, 1996. Updated graph and detailed statistics are available at http://www.kgs.ukans.edu/PRS/usage/past_stats.html.