

**U.S. Geological Survey  
Digital Data Series DDS-69-N**

*National Assessment of Oil and Gas Project:*

**Petroleum Systems and Assessment of Undiscovered Oil  
and Gas in the Raton Basin–Sierra Grande Uplift Province,  
Colorado and New Mexico—USGS Province 41**

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## **Introduction**

The purpose of the U.S. Geological Survey's (USGS) National Oil and Gas Assessment is to develop geologically based hypotheses regarding the potential for additions to oil and gas reserves in priority areas of the United States. The USGS recently completed an assessment of undiscovered oil and gas resources of the Raton Basin–Sierra Grande Uplift Province of southeastern Colorado and northeastern New Mexico (USGS Province 41). The Cretaceous Vermejo Formation and Cretaceous-Tertiary Raton Formation have production and undiscovered resources of coalbed methane. Other formations in the province exhibit potential for gas resources and limited production.

This assessment is based on geologic principles and uses the total petroleum system concept. The geologic elements of a total petroleum system include hydrocarbon source rocks (source rock maturation, hydrocarbon generation and migration), reservoir rocks (sequence stratigraphy and petrophysical properties), and hydrocarbon traps (trap formation and timing). The USGS used this geologic framework to define two total petroleum systems and five assessment units. All five assessment units were quantitatively assessed for undiscovered gas resources. Oil resources were not assessed because of the limited potential due to levels of thermal maturity of petroleum source rocks.



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## Contact Information

This volume is one of a series of products resulting from the National Oil and Gas Assessment project of the U.S. Geological Survey. Inquiries about this CD-ROM or the project should be addressed to:

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## Using This CD

The descriptive and interpretive text chapters of this volume are in PDF format. Use Acrobat Reader 7.0 (installer for Mac and Windows provided on this CD-ROM) to access and bring up these chapters.

Contained on this CD-ROM are tabular data and graphical images in support of the assessment. The chapter text PDF contains links to the data and images. Data-table files are presented as tab-delimited text files (.tab files), usable in spreadsheet and database software. Graphical and summary-table files are presented as portable document format files (.pdf files).

GIS information is presented in the Spatial folder and its subdirectories that contain the spatial data, documentation, and export files. The Spatial folder also contains the ArcGIS

project (prov41.mxd), the ArcReader project ((prov41.pmf), and a description of the GIS project in both .htm and .pdf formats.

The Spatial/Doc folder contains metadata for the Raton Basin-Rio Grande Uplift Province spatial data in .htm format. The Spatial/Export folder contains Arc/Info export files (.e00). The Spatial/Images folder contains images used in both the GIS projects and the Metadata documents. The Spatial/Shape folder contains ArcView/ArcGIS shapefiles used in the two GIS projects.

## **GIS Projects—Getting Started**

### **Raton Basin-Sierra Grande Uplift Province GIS Project Display Options**

There are several display options available to view spatial data contained on this CD-ROM:

#### **ArcMap**

A customized ArcMap project has been included (DDS69N/SPATIAL/prov41.mxd) to facilitate the display of the data. This project is included on the CD-ROM under the assumption that a large portion of viewers will have access to ArcMap software. While not necessary to view the data, it is expected that the use of this project will lend more functionality to the data.

The ArcMap project utilizes relative path names, which is an option when saving the file. To open the project, start ArcMap and navigate to the file location on this CD-ROM (SPATIAL/prov41.mxd).

#### **ArcReader**

If ArcMap software is not available, the ArcMap project has been converted to an ArcReader project (SPATIAL/prov41.pmf). ArcReader is free software provided by ESRI. The ArcReader project maintains most of the functionality present in the ArcMap project. To open the ArcReader project, download the ArcReader software from ESRI; start ArcReader and navigate to the ArcReader .pmf file on this CD-ROM. This freeware may be downloaded from [www.esri.com](http://www.esri.com) or follow the link below:

ArcReader can be downloaded for Windows from ESRI's website <http://www.esri.com/software/arcgis/arcreader/download.html>

#### **Other**

The spatial data are also provided in the ESRI Shapefile format (SPATIAL/Shape folder) or as ArcInfo 8.3 Export files (see SPATIAL/Export folder), should the user need to view the data in ArcInfo or a non-ESRI application.

## Contents of This CD-ROM

When the CD-ROM is opened, the following folders appear on the screen:

ACROBAT--contains installer for Acrobat Reader 7.0.

OPEN\_FIRST--from OPEN\_FIRST.pdf in this folder, navigate to the ReadMe file, an executive summary, pages of chapter titles, and the GIS data and metadata.

READ\_ME--you can access the ReadMe file from this folder also.

REPORTS--listing of, and links to, the chapters, plus the tabular data.

SPATIAL--folder containing files for the GIS data and metadata.

There are several routes to the information in this volume.

## System Requirements

### MAC OS X

#### Adobe Reader 7

- Power PC G3, G4, G5 processor
- Mac OS X v.10.2.8 or 10.3
- 128 MB of RAM
- 80 MB of available hard disk space (110 MB required for the full version)
- 800 x 600 screen resolution

### WINDOWS

#### Adobe Reader 7.0 MS Windows

- Intel Pentium-class processor
- Windows XP Professional or Home Edition with SP1 or SP2, or Tablet

#### PC Edition

- Microsoft Windows 2000 with Service Pack 2 (SP2)
- 128 MB of RAM
- 90 MB of available hard-disk space for the full version
- 800 x 600 monitor resolution

### Requirements for ArcReader 9.2 for Windows:

- 1.5 GHz Intel Pentium or Intel Zeon Processors
- Windows XP Home and Professional Editions
- 256 MB RAM Minimum, 512 MB recommended
- 410 MB Disk Space

### Requirements for ArcView 8.x for Windows:

- 450 MHz Pentium minimum, 800 MHz recommended
- Microsoft Windows NT 4.0 with Service Pack 6a or Windows 2000 or Windows XP Home and Professional Editions
- 128 MB RAM, 256 Recommended

Note: Installers for Acrobat Reader 7.0 for Macintosh and Windows platforms are provided on this CD-ROM.



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