Collected Studies

Coal Seam Natural Gas

Also Known as “Coalbed Methane”
NEWLY-UPDATED EDITION

IOGCC
A Publication of the Interstate Oil and Gas Compact Commission
The Interstate Oil and Gas Compact Commission gratefully acknowledges the dedication and efforts of IOGCC Federal Projects Manager Keith Thomas in compiling this collection of studies.

For more information about the IOGCC or this report, visit the IOGCC Web site at www.iogcc.state.ok.us, call 405/525-3556 or send e-mail to iogcc@iogcc.state.ok.us.

Winter 2002-2003
Foreword

This publication represents the second compilation of studies directly addressing natural gas from coal seams - often called coalbed methane by industry and government officials. This source of natural gas has been recognized as a source of energy since ancient times. Capturing it for beneficial use has been the tough part. The world has lost untold quantities of natural gas. In countries other than the United States and Canada, it continues to be vented and flared in wasteful volumes. Colorless, odorless natural gas dissipates quickly into the atmosphere when freed from the rock in which it is trapped. Thirty years ago, the United States made a national policy decision to capture natural gas from what were then considered “more difficult” rocks, including coal.

Since the underground mining of coal began, humans have been aware that gas trapped in coal is freed when the coal is broken open. In traditional underground mining operations, a prime safety consideration for miners is venting gas from the mine.

Though the resource was identified, developing it as commercial natural gas was considered so difficult at the time that a federal tax credit to develop “coalbed methane” was put in place. Many believed the credit was a hollow incentive to the industry. However, this federal policy decision proved to be important for the development of this natural gas.

Extensive research has shown that gas from coal is our nation’s most abundant new source of natural gas. It remained a novel concept to those accustomed to natural gas coming from more traditional rocks such as sandstone and limestone.

Natural gas whose source is coal now accounts for 7 percent of total production in the United States. Twenty years ago the figure was virtually zero.

Because public policy supports development of natural gas from coal, extensive research has been conducted to learn how to harness this resource for beneficial human use. These studies have never before been published in a single volume. The most significant early work comes from the Gas Research Institute, which paved the way for current production practices. States, universities, companies and other research institutions have added to this volume of work. Even today more research is being conducted across the nation as natural gas is sought in different kinds of coal.

Because this is now an important part of the total U.S. energy mix, it is time to move away from using the confusing term “coalbed methane.” The resource is simply natural gas, which the public understands and uses virtually every day. That is why we are calling this resource “natural gas” and identifying its source rock as coal seams.

Christine Hansen
Executive Director
# Table of Contents

**INTRODUCTION** ........................................................................................................1

**ACRONYMS**..............................................................................................................5

**BIBLIOGRAPHY** ....................................................................................................7

**INDEXES**

<table>
<thead>
<tr>
<th>INDEX</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Location</td>
<td>239</td>
</tr>
<tr>
<td>II</td>
<td>Mining</td>
<td>291</td>
</tr>
<tr>
<td>III</td>
<td>Reference Materials</td>
<td>307</td>
</tr>
<tr>
<td>IV</td>
<td>Resource Evaluation and Development</td>
<td>309</td>
</tr>
<tr>
<td>V</td>
<td>Water</td>
<td>389</td>
</tr>
</tbody>
</table>
Introduction

One of our country’s most valuable caches of natural gas comes from a source once seen as a nuisance to the coal mining industry. Coal seam natural gas (CSNG) must now be seen as having great potential as a fossil fuel resource. There is a voluminous amount of information on this issue. Valuable studies dating back 50 years or more have been produced. The many sides of this issue have been considered for years. What is not disputed is that the United States has very large coalbeds that cover vast areas of the country. See Figure 1. The question is what to do with the natural gas present in those coalbeds.

Figure 1

The coal industry has long recognized the removal of the methane-rich gas in the coalbeds as a dangerous part of the mining process. To safely mine the coal, the gas must be removed. In the past, CSNG had to be vented to allow for coal development. Such degasification wasted this valuable resource because economical methods for utilization had not been developed.

A great amount of research has been conducted on these coalbeds and the natural gas they contain. The CSNG occurs within the coal in two ways. CSNG is usually stored on the internal surfaces of the coal (sorbed gas), but can also exist in the cleats (natural fractures) as free gas in the coalbeds. To produce the more commonly found sorbed gas, it must be “desorbed” from the internal surfaces of the coal and allowed to migrate out of the matrix into natural fractures where it can be extracted.¹  See Figure 2.

The cleats found in coalbeds are usually filled with water. This water can be saline. To produce CSNG from a coalbed, the water must be removed. Removal of the water allows the gas to enter these fractures and then be extracted through a wellbore. In the early stages of CSNG production the volume of water can be great, which creates a problem for the operator, the landowner and the state. Following the completion of a CSNG well, the amount of water produced decreases with time and the volume of CSNG increases. In the later stages of production from a CSNG well, the volume of gas decreases while the amount of water produced will usually stay at the decreased level. See Figure 3. The water discharge must be done in an economical and environmentally responsible manner.

---

2 Id.
Much has been written on CSNG. A wealth of information exists about the potential for exploration and production of this resource. Studies on CSNG are not confined to the coalbeds in a limited area, but rather have been conducted in many of the coal basins throughout the country. These studies have been conducted by the federal government, the geological surveys of many of the states, and by private industry. There have been in-depth studies into such issues as the environmental impact of production of natural gas from coal seams, the most economical ways to produce CSNG, and the relationship between CSNG production and coal mining interests.

In keeping with its long history of helping states to stay informed on issues pertaining to the efficient production of oil and gas, the Interstate Oil and Gas Compact Commission (IOGCC) will maintain a list of documents discussing development of CSNG. This bibliography of scientific papers, reports, articles and studies addresses pertinent issues many IOGCC member states face. The sources of these documents are the states, the United States Geological Survey, the Gas Technology Institute and other organizations. It is the desire of the IOGCC that by sharing the information available, the burden of addressing issues related to the production of natural gas from coal seams will be lessened. States have a wealth of information on this topic and must now use it to their benefit.

This compilation of CSNG information does not include all relevant documents on this issue, but rather illustrates the quality and quantity of information on the topic. This bibliography represents only a small amount of the information. These documents contain information that will help the states understand many aspects of CSNG development. The IOGCC will collect as many of the pertinent documents as possible. Papers, reports, articles and studies dealing with issues important only to those engaged in the exploration of CSNG are not included. Many of the documents can be reproduced and supplied upon request by the IOGCC or retrieved online. However, many of the documents listed in this publication can be obtained only from the organizations listed with that document.

The IOGCC gratefully acknowledges the cooperation of many of the state oil and gas regulatory agencies and the state geological surveys. With the help of its member states, the IOGCC will continue to update and expand this list.
Acronyms

The following is a list of acronyms used in this publication.

AAPG . . . . American Association of Petroleum Geologists
ACS . . . . . American Chemical Society
AGS . . . . Alaska Geological Survey
AGU . . . American Geophysical Union
BIA . . . Bureau of Indian Affairs, U.S. Department of the Interior
BRI . . . Basin Research Institute, Louisiana State University
CBM . . . . Coalbed Methane
CGS . . . . Colorado Geological Survey
COGCC . . . Colorado Oil & Gas Conservation Commission
COMPAS . . Coalbed Methane Production and Stimulation Database
CSM . . . . Colorado School of Mines
CSNG . . . Coal Seam Natural Gas
DGGS . . . Division of Geological and Geophysical Surveys, Alaska Dept. of Natural Resources
DOE . . . U.S. Department of Energy
EPA . . . . U.S. Environmental Protection Agency
FTE . . . . . Freeze-thaw/evaporation
GIS . . . . Global Information System
GRI . . . . . Gas Research Institute
GSA . . . . Geological Society of America
GSC . . . . Geological Survey of Canada
GTI . . . . . Gas Technology Institute
IOGCC . . Interstate Oil and Gas Compact Commission
KGS . . . Kansas Geological Survey
LLL . . . . Lawrence Livermore Laboratory
MBMG . . Montana Bureau of Mines & Geology
MGS . . . . Montana Geological Society
MRCP . . . Methane Recovery From Coalbeds Project, U.S. Department of Energy
NDGS . . . North Dakota Geological Survey
NETL . . . National Energy Technology Laboratory, U.S. Department of Energy
NMGS . . . New Mexico Geological Society
NPDES . . National Pollutant Discharge Elimination System
OGS . . . . Oklahoma Geological Survey
PGS . . . . Pennsylvania Geological Survey
RMAG . . Rocky Mountain Association of Geologists
SEPM . . . Society of Economic Paleontologists and Mineralogists
SNG . . . . Substitute Natural Gas
SPE . . . . Society of Petroleum Engineers
STR . . . . Salinity / Toxicity Relationship
TSOP . . . . The Society of Organic Petrology
UGMS . . Utah Geological and Mineralogical Survey
USBM . . . United States Bureau of Mines
USGS . . . United States Geological Survey
WGA . . . . Wyoming Geological Association
WOGCC . . Wyoming Oil & Gas Conservation Commission
WSGS . . . Wyoming State Geological Survey
The Bibliography

The citations in this bibliography are listed alphabetically by author. Works by the same author are organized with the older of the citations listed first. The indexes at the end of the bibliography are provided to help locate works on a specific topic or on a specific area.


   **Summary:** MRCP Report.


   **Summary:** MRCP Report.


   **Summary:** MRCP Report.


   **Summary:** Symposium Document.


   **Summary:** This GTI report includes the speaker visuals used at this workshop. Also included are papers from other related conferences.

**Summary:** This GTI report presents a reservoir characterization of the basal Fruitland (Upper Cretaceous) coal for the Carracas Canyon Unit. The aim is to provide further understanding of the relationship between reservoir properties and coal seam gas producibility.


**Summary:** USGS Open File Report.


**Summary:** USGS Open File Report.


**Summary:** USGS Open File Report.


**Summary:** Non-USGS publication with USGS authors.


**Summary:** Article.

Summary: This report discusses the data collected on a well drilled into the Fruitland coal formation in the San Juan Basin of Colorado. The data was analyzed to determine methane production characteristics.


Summary: This report discusses the data collected on a well drilled into the Fruitland formation coal in the San Juan Basin of southeast Colorado. The data was analyzed to determine the potential of the coal seam natural gas reservoir.


Summary: SPE Paper

15. State of Alaska, Division of Oil and Gas, Department of Natural Resources, 1999, Coalbed Methane Study, available online.

Summary: Brief synopsis of the status and potential of the development and impact of coalbed methane in Alaska. For more information, contact Jim Clough, Alaska Division of Geological & Geophysical Surveys, 907/451-5030.


Summary: Paper.


Summary: AAPL Conference Document.


Summary: Symposium Document.

**Summary:** AAPG Article.


**Summary:** AICHE Conference Document.


**Summary:** Article.


**Summary:** Article.


**Summary:** Paper.


**Summary:** SPE Convention Document.


**Summary:** NMGS Guidebook.


Summary: OGS Report.


Summary: Conference paper, which discusses how modeling can address the interaction between regional groundwater flow, the flow system in fractured coalbeds within the Ferron Sandstone, and faults. Discusses how use of a 3-D discrete fracture network model can be used to describe a groundwater flow system in a coalbed. Presented at the 1998 annual meeting of the American Association of Petroleum Geologists.


Summary: Conference paper, which discusses how modeling can address the interaction between regional groundwater flow, the flow system in fractured coalbeds within the Ferron Sandstone, and faults. Discusses how use of a 3-D discrete fracture network model can be used to describe a groundwater flow system in a coalbed. Presented at the 1999 annual meeting of the Geological Society of America.


Summary: Article.


Summary: Regional groundwater model for the San Juan Basin. This model was developed as part of the comprehensive 3M Project (the three Ms stand for mapping, modeling and monitoring).

Summary: MRCP Report.


Summary: AAPL Conference Document.


Summary: SPE Paper presented at the Rocky Mountain Regional Meeting of the Society of Petroleum Engineers.


Summary: USGS Open File Report.


Summary: USGS Open File Report.


Summary: This article in a Non-USGS publication by USGS authors discusses the findings of the 1995 National Assessment of Oil and Gas Resources, which was conducted by the USGS. This conference document examines physical and economic variables to explain the disparity between economic and technically recoverable coal seam natural gas.


Summary: Article.

**Summary:** WSGS Publication.


**Summary:** This report discusses research conducted to identify sedimentologic controls on the occurrence of coalbed methane in the Fruitland Formation in the San Juan Basin.


**Summary:** Article.


**Summary:** Symposium Document.


**Summary:** Annual report, which describes the geologic framework and hydrologic regime of coal seam natural gas produced from the Fruitland Formation of the San Juan Basin.


**Summary:** Report containing an evaluation of coalbed methane in the Fruitland Formation. Describes coal seam natural gas occurrences and resources, regional hydrodynamics, coal rank, composition of the coal gas, and fracture patterns.

**Summary**: Symposium Document.


**Summary**: Symposium Document.


**Summary**: Report from the New Mexico Bureau of Geology and Mineral Resources.


**Summary**: Report from the New Mexico Bureau of Geology and Mineral Resources.


**Summary**: AAPG/SEPM Convention Document.


**Summary**: Article.


**Summary**: SPE Conference Document.

**Summary:** USBM Report.


**Summary:** Article.


**Summary:** USGS Report prepared in cooperation with the U.S. Department of Energy.


**Summary:** AAPG Bulletin.


**Summary:** USGS Open File Report.


**Summary:** Conference Document.

Summary: Conference Document.


Summary: USGS Open File Report.


Summary: AAPG Conference Document.


Summary: GSA Short Course.


Summary: GSA Conference Document.


Summary: USGS Open File Report.


Summary: Alaska DGGS Report.

**Summary:** AAPG Bulletin.


**Summary:** AAPG Conference Document.


**Summary:** Article.


**Summary:** This is a final report on the implementation of previously developed physical models of hydraulic fracturing on wells with coalbed methane and tight gas sands.


**Summary:** This GRI report discusses the tests being conducted on plastic pipe being used by gas utility companies in the U.S. and Canada.


**Summary:** Paper.

Summary: This is a report on the Rock Creek Methane from Multiple Coal Seams Completion Project. This project focused on well drilling and completion, with emphasis on wellbore access and hydraulic stimulation.


Summary: Final report discusses the effectiveness of dewatering techniques for coal seam gas wells in the Warrior Coal Field. Contains field evaluations of gas lift and progressive cavity pumps.


Summary: This SPE paper places the environmental issues surrounding coal seam natural gas development in the San Juan Basin into historical perspective. The findings of sampling and testing programs conducted near the New Mexico community of Cedar Hill are discussed.


Summary: Article.


Summary: Symposium Document.

**Summary:** This report discusses the differences in treatment pressure behavior during the hydraulic fracturing operations on coal seams and conventional formations.

77. **Bell, Gregory J.; and Jones, Arfon H.; 1988, Coalbed Methane Production and Stimulation (COMPAS) Database Documentation and User’s Manual, available from the Gas Technology Institute as GRI-88/0028.**

**Summary:** This report discusses the COMPAS database, which contains information on 172 hydraulic fracture treatments for 122 wells.

78. **Bell, G. J.; Jones, A. H.; Morales, R. H.; and Schraufnagel, Richard A., 1989, Coal Seam Hydraulic Fracture Propagation on a Laboratory Scale, available from the publisher, the University of Alabama, School of Mines and Energy Development.**

**Summary:** This conference paper reports on the varied pressure responses of coal seams to hydraulic fracture stimulation.

79. **Bell, G. J.; and Jones, A. H., 1989, Variation of Mechanical Strength With Rank of Gassy Coals, from the proceedings of the 1989 Coalbed Methane Symposium, Tuscaloosa, Alabama, available as Paper 8924.**

**Summary:** Symposium Document.


**Summary:** GSA Conference Document.


**Summary:** CSM Publication.

82. **Berggren, L. W.; and Sanderson, G. A., 2001, Recent Developments in the Application of the § 29 Tax Credit to Coal Seam Gas, from the proceedings of the International Coalbed Methane Symposium, Tuscaloosa, Alabama, available as Paper 104.**

**Summary:** Symposium Paper.

**Summary:** Article.


**Summary:** Conference Paper.


**Summary:** AAPG Bulletin.


**Summary:** AAPG Conference Document.


**Summary:** EIA Report.


**Summary:** Geological Society Report.


**Summary:** Article.

**Summary:** This report discusses the ability to evaluate the production and reserve potential of coal seam reservoirs.


**Summary:** This report discusses the ability to evaluate the production and reserve potential of coal seam wells.


**Summary:** Symposium Paper.


**Summary:** Details factors affecting methane development, drilling and completion methods for degasifying coalbeds. It also contains a detailed case study of a Piceance Basin mine.


**Summary:** USGS Open File Report.


**Summary:** Article.

**Summary:** USGS Open File Report.

97. Boyer, C. M., II; and Hirko, N. M., 1985, *Rock Creek Methane from Multiple Coal Seams Completion Project. Phase I Test Plan*, available from the Gas Technology Institute as GRI-86/0155.

**Summary:** This report discusses the Rock Creek Methane from Multiple Coal Seams Completion Project.

98. Boyer, C. M., II; Briscoe, F. H.; Camp, B. S.; et al., 1986, *Geologic and Reservoir Characterization for the Multiple Coal Seams Completion Project at Rock Creek*, available from the Gas Technology Institute as GRI-87/0083.1.

**Summary:** GRI Topical Report.


**Summary:** Final report on a well that was completed into the Mary Lee and Blue Creek coal seams in the Black Warrior Basin of Alabama. This well completion was used to evaluate the geologic and reservoir parameters which affect the stimulation and production of coal seam natural gas.


**Summary:** Final report of findings from a coal seam natural gas well completed into the Mary Lee and Blue Creek coal seams in the Warrior Basin of Alabama. Evaluates the geologic and reservoir parameters that affect the stimulation and production of coalbed methane. Appendixes address such issues as gas and water production, hydraulic fracturing, and a mini-frac analysis.


**Summary:** This report discusses the evaluation of the economic potential for commercial production of natural gas from the coal seams at Rock Creek in the Warrior Basin of Alabama.

102. Boyer, C. M., II; Briscoe, F. H.; Camp, B. S.; Dobscha, F. X.; and Malone, P. G., 1986, *Rock Creek Methane from Multiple Coal Seams Completion Project. Demonstrated Drilling and Completion Technology for the Multiple Coal Seams Completion Project*, available from the Gas
Technology Institute as GRI-87/0084.

Summary: This report discusses details of drilling, casing and cementing.


Summary: This report gives the data on the methane contents of the natural gas from coal seam wells drilled at the Big Indian Creek site in the Warrior coal basin in Alabama.


Summary: This report contains the appendixes to the data in Volume I (GRI-85/0285).


Summary: This report gives an analysis of the subsurface geology of six Pennsylvanian age coal seams. This was done to estimate the coal volumes present in the Central Appalachian Basin.


Summary: GRI Report.


Summary: This report explores the potential of the natural gas from coal seams resource and the key mechanisms controlling its production.


Summary: Symposium Paper.

**Summary:** EPA Report.


**Summary:** This report on GRI-sponsored research discusses the advancements made in the low cost recovery of natural gas from coal seams.


**Summary:** This report focuses on three vehicles of GRI’s technology transfer.


**Summary:** Article.


**Summary:** Conference Document.


**Summary:** AAPG Bulletin.

Summary: USGS Open File Report.


Summary: USGS Paper.


Summary: Paper.


Summary: PGS Open-File Report.


Summary: Symposium Document.


Summary: Symposium Document.


Summary: Symposium Document.

**Summary:** Symposium Document.


**Summary:** This GRI study discusses the cost impact of internal corrosion on gas production operations.


**Summary:** This is the final report on a literature search that resulted in a computerized retrieval system for well testing methods and data analysis procedures.


**Summary:** Report discusses the results discovered from data gathered from five coal seam natural gas projects located in the Piceance, San Juan and Warrior basins. The data was used to evaluate single-phase tests for determining hydrological properties.


**Summary:** This is a report on the evaluation of hydrologic testing of coalbeds.


**Summary:** This is a report on the development of hydrologic concepts and well testing techniques. Discusses a test devised to determine permeability and static reservoir pressure of a coal seam as well as the condition of the wellbore.

**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.

**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.


**Summary:** BLM Report.

143. Bureau of Land Management; Holsan, Gary, *Draft Environmental Assessment, Pennaco Energy Deer Creek Exploratory Coalbed Methane Project*, available from the BLM.
Summary: BLM Report.


Summary: Symposium Paper.


Summary: AAPG Report.


Summary: Article.


Summary: Symposium Paper.


Summary: GSA Meeting Document.


Summary: Report.

**Summary:** Symposium Paper.

151. Butala, Steven J. M.; Medina, Juan Carlos; Bowerbank, Christopher R.; Lee, Milton L.; Felt, Scott A.; Taylor, Terrence Q.; Andrus, Dallan B.; Bartholomew, Calvin H.; Yin, Pequi; and Surdam, Ronald C., 1997, *Catalytic Effects of Mineral Matter on Natural Gas Formation During Coal Maturation*, available from the Gas Technology Institute as GRI-97/0213.

**Summary:** This report discusses a study conducted to determine if mineral catalysts affect gas formation during coal maturation.


**Summary:** Doctoral Dissertation.


**Summary:** Article.


**Summary:** Article.


**Summary:** Article.


**Summary:** Symposium Paper.

**Summary:** Symposium Paper.


**Summary:** AAPG Convention Document.


**Summary:** This report discusses the geologic parameters and the methodology used in the identification, confirmation, and development of coalbed methane resources.


**Summary:** USGS Bulletin.


**Summary:** MGS Report.


**Summary:** AAPG Report.

Summary: RMAG Report.


Summary: AAPG Meeting Document.


Summary: Article.


Summary: OGS Publication.


Summary: OGS Open File Report.


Summary: AAPG Meeting Document.


Summary: OGS Open File Report.


Summary: OGS Open File Report.

**Summary:** OGS Open File Report.


**Summary:** OGS Circular.


**Summary:** RMAG Report.


**Summary:** OGS Open File Report.


**Summary:** USGS Open File Report.


**Summary:** AAPG Conference Document.


**Summary:** Alabama Geological Society Document.


**Summary:** Contains production database, seven cross sections, five structure and production isopach maps, production bubble map, cross sections index map and two new surface maps of the Fruitland Formation coal zones located on the Southern Ute Reservation. This 1999 report contains descriptions of suspected seep locations, fracture data, and coal correlation with the western outcrop region.


**Summary:** USGS Circular.


**Summary:** Article.


**Summary:** This is a final report on research conducted to identify mechanisms that influence the propagation of hydraulic fractures in coal seams and the surrounding strata, correlate the production of methane with identifiable fracture characteristics, and to specify the most effective fracture treatment designs.


**Summary:** This report discusses laboratory tests and computer simulations conducted to investigate the mechanical, physical and chemical phenomena associated with the hydraulic fracturing of coal seams.

**Summary:** Discusses the differences between the Powder River Basin and various other documented cases where subsurface fluids have been withdrawn. The authors of this report also compare coal seam natural gas production and water production from sandstones in the same area.


**Summary:** GSA Meeting Document.


**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** SPE Conference Document.


**Summary:** This is an annual report on data used to evaluate the geologic and production parameters for coal seam natural gas in the Brookwood and Oak Grove coal degasification fields in the Black Warrior Basin of Alabama.

**Summary:** AAPG Report.


**Summary:** USGS Publication.


**Summary:** Article.


**Summary:** This symposium paper details the coalbeds in Kentucky and the potential for natural gas from coal seams as a resource.


**Summary:** SPE Conference Document.


**Summary:** Report prepared for DOE.

Summary: TRW Report prepared for DOE.


Summary: MRCP Report.


Summary: Report prepared for DOE.


Summary: SPE Symposium Document.


Summary: Report prepared for DOE.


Summary: AAPG Report.


Summary: AAPG Report.

**Summary:** AAPG Report.


**Summary:** Symposium Paper.


**Summary:** RMAG Report.


**Summary:** GSC Paper.


**Summary:** Article.


**Summary:** Symposium Paper.

Summary: Article.


Summary: Symposium Paper.


Summary: Article.


Summary: Symposium Paper.


Summary: Conference Document.


Summary: USGS Circular.


Summary: GSA Conference Document.

**Summary:** Presents a review of the main aspects of coalbed gas geochemistry and advances in research.


**Summary:** This final report presents a listing of a technology transfer effort to implement stimulation concepts developed for the Gas Research Institute. Discusses the improvement of hydraulic fracturing operations, the development of computer-based monitoring systems and provides a detailed account of data from a large number of wells.


**Summary:** Symposium Document.


**Summary:** This SPE paper discusses the fracture permeability of the Fruitland Formation coalbed methane reservoirs in the San Juan Basin.


**Summary:** NMGS Guidebook.


**Summary:** This SPE paper provides an updated overview on coal seam natural gas potential in the Raton Basin.

**Summary:** RMAG Report.


**Summary:** Report.


**Summary:** AAPG Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** RMAG Report.


**Summary:** Alaska DGGS Publication.

**Summary:** This AAPG conference document presents facts and figures on the potential for production of Alaskan coal seam natural gas.


**Summary:** CGS Report.


**Summary:** AGU Report.


**Summary:** MBMG Publication.


**Summary:** Conference paper, which reports the findings of a USGS study of the geologic and engineering controls on gas production from coalbeds. These coalbeds are found in the Ferron Sandstone member of the Mancos Shale of eastern Utah. Presented at the 1999 annual meeting of the Geological Society of America.


**Summary:** BLM Report.


**Summary:** BLM Report.

**Summary:** DOE Report.


**Summary:** CGS Report.


**Summary:** CGS Publication.


**Summary:** CGS Publication.


**Summary:** This report, prepared by the COGCC staff, summarizes the findings of an investigation into changes in the levels of methane in water from water wells in La Plata County, Colorado. The report compares methane levels in ground water prior to coalbed methane development with those after the beginning of development.


**Summary:** Symposium Paper.

Society of America.

**Summary:** GSA Meeting Document.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Report.


**Summary:** Reports on the findings of a six year multi-well project that sought to develop, improve, evaluate and communicate the technology required to produce natural gas from deep coal seams in the Piceance Basin.


**Summary:** Reports on the findings of a study on the effects of hydraulic fracturing on deep coal seams in the Piceance Basin.

**Summary:** Article.


**Summary:** Reports on the findings of the GRI Deep Coal Seam Project. Data given on drilling, reservoir testing, core analysis, logging and stimulation of low permeability coal reservoirs in the Piceance Basin.


**Summary:** Symposium Paper.


**Summary:** Report on study that investigated future water production in the San Juan Basin. The study identified alternative water treatment technologies, which might be competitive with underground disposal.


**Summary:** Article.


**Summary:** This SPE paper discusses the use of alternate treatment technologies for coal seam natural gas produced water in the San Juan Basin to make the water suitable for surface discharge.


**Summary:** This SPE paper discusses water contamination caused by methane seepage from coal seam natural gas wells in the San Juan Basin.


**Summary:** AAPG Convention Document.


**Summary:** Article.


**Summary:** This report presents the results of a regional geologic assessment of the Menefee formation in the San Juan basin.


**Summary:** Article.


**Summary:** Symposium Document.


**Summary:** USGS Open File Report.

**Summary:** USGS Open File Report.


**Summary:** Article.


**Summary:** This conference report gives a description and application of a new method for resource assessment of recoverable coal seam natural gas.


**Summary:** USGS Circular.


**Summary:** Society of Organic Petrology Report.


**Summary:** USGS Open File Report.


Summary: USGS Open File Report.


Summary: IEA Coal Research Report.


Summary: SPE Report.


Summary: AAPG Publication.

272. Dallegge, Todd A.; and Barker, Charles E., 2000, Coal-bed Methane Gas-In-Place Resource Estimates Using Sorption Isotherms and Burial History Reconstruction; An Example from Ferron Sandstone Member of the Mancos Shale, available from the United States Geological Survey as P 1625-B.

Summary: USGS Professional Paper.


Summary: AAPG Bulletin.


Summary: Report.

**Summary:** This conference paper is an assessment of how natural gas produced waters were handled in the U. S. in 1990.


**Summary:** American Chemical Society Meeting Document.


**Summary:** Article.


**Summary:** Symposium Document.


**Summary:** RMAG Report.

280. David, C., 1999, *This Land is Your Land, This Land is My Land: But Who Owns The Coal Gas*?

**Summary:** Paper.


**Summary:** Report.

**Summary:** Article.


**Summary:** Report on a guidance manual for the management of water produced from wells in the Black Warrior Basin of Alabama.


**Summary:** GSC Bulletin.


**Summary:** Report.


**Summary:** GSC Bulletin.


**Summary:** GSC Open-File Report.


**Summary:** Report.

**Summary:** WSGS Publication.


**Summary:** WSGS Publication.


**Summary:** WSGS Publication.


**Summary:** WSGS Publication.


**Summary:** WSGS Publication.


**Summary:** WSGS Publication.


**Summary:** WSGS pamphlet that details the development of coal seam natural gas in the state of Wyoming.

available from the Wyoming State Geological Survey as MS-53.

Summary: WSGS Publication.


Summary: WSGS Publication.


Summary: WSGS Publication.


Summary: WSGS Publication.


Summary: Article.


Summary: This GRI report discusses the findings of a six year multi-well project that sought to develop, improve, evaluate and communicate the technology required to produce natural gas from deep coal seams in the Piceance Basin.


Summary: This GRI topical report discusses the data from a six year multi-well project that focuses on the technology required to produce gas from deeply buried coal in the Piceance Basin.


Natural Gas from Coal Seams
available from the American Association of Petroleum Geologists.

**Summary:** AAPG Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** This report discusses the gas-in-place in the Fruitland Formation coals in the San Juan Basin. Discusses the geology of the coal formation to provide a foundation for evaluating the coal seam natural gas in place.


**Summary:** RMAG Report.


**Summary:** This conference paper evaluates techniques that can be used to predict the orientation and the location of areas with a greater natural gas from coal seams reservoir permeability prior to drilling. From data collected from the Fruitland formation in the Cedar Hill Field, northern San Juan Basin, New Mexico.


Summary: Symposium Paper.


Summary: Article.


Summary: Symposium Paper.


Summary: USBM Bulletin.


Summary: USBM Report.


Summary: Symposium Paper.


Summary: USBM Report.

**Summary:** USBM Circular.


**Summary:** USBM Report.


**Summary:** USBM Circular.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** USBM Bulletin.


**Summary:** USBM Bulletin.

**Summary**: Symposium Paper.


**Summary**: Symposium Paper.


**Summary**: Symposium Paper.


**Summary**: AAPG Report.


**Summary**: USBM Circular.


**Summary**: Symposium Paper.


**Summary**: Article.

**Summary:** Symposium Paper.


**Summary:** Society of Sedimentary Geology Report.


**Summary:** Conference Technical Paper.


**Summary:** Symposium Paper.


**Summary:** This GRI report discusses the geologic and reservoir characterization conducted at Rock Creek Multiple Coal Seam Completion Project.

335. Doelling, H. H.; Smith, A. D.; and Davis, F. D., 1979, Methane Content of Utah Coals, available from the Utah Geological and Mineralogical Survey as Special Studies 49.

**Summary:** UGMS Study.


**Summary:** Symposium Paper.

**Summary:** Article.


**Summary:** Article.


**Summary:** DOE Paper.


**Summary:** Conference paper from the 1989 Coalbed Methane Symposium.


**Summary:** USGS Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.

**Summary:** BRI Bulletin.


**Summary:** This report discusses the planning materials relevant to defining the natural gas from coal seams.


**Summary:** Sets the theoretical and mathematical basis for the conclusions reached in *Subsidence Potential Related to Water Withdrawal in the Powder River Basin*, by Case, James C.; Edgar, Thomas V.; and De Bruin, Rodney H. (Listed above).


**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** Symposium Paper.

as Paper 9769.

**Summary:** Symposium Paper.


**Summary:** USGS Map.


**Summary:** USGS Map.


**Summary:** Conference document from the 1997 Annual Meeting of the GSA.


**Summary:** USGS Open File Report.


**Summary:** USGS Paper.


**Summary:** USGS Paper.

**Summary:** USGS Paper.


**Summary:** USGS Paper.


**Summary:** USGS Paper.


**Summary:** USGS Paper.


**Summary:** RMAG Publication.


**Summary:** Article.

**Summary:** SPE Conference Paper.


**Summary:** Symposium Paper.


**Summary:** WGA Publication.


**Summary:** Symposium Paper.


**Summary:** Report.


**Summary:** Article.


**Summary:** EPA Report.

**Summary:** EPA Report.


**Summary:** EPA Report.


**Summary:** EPA Report.


**Summary:** EPA Report.


**Summary:** EPA Report.


**Summary:** EPA Report.


**Summary:** EPA Report.

377. The Environmental Protection Agency, 1999, *USEPA’s Program to Regulate the Placement of
Waste Water and Other Fluids Underground, available from the U.S. Environmental Protection Agency as EPA 810-F-99-019.

Summary: EPA Report.


Summary: EPA Report.


Summary: EPA Report.


Summary: This GRI report discusses the WELL 1D computer program that is designed to simulate the nonsteady, one dimensional, simultaneous, two-phase flow of water and methane gas through a coal seam to an unstimulated vertical well or to a hydraulically stimulated vertical well connected to a high conductivity vertical fracture.


Summary: This GRI report discusses a series of computer based models for production of methane from coal seams by vertical wells.


Summary: Pennsylvania State University Publication.

**Summary:** Report.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** USGS Paper.


**Summary:** Symposium Paper.


**Summary:** RMAG Guidebook.


Summary: Report.


Summary: AAPG Bulletin.


Summary: USGS Conference Paper included in a USGS Circular.


Summary: Conference paper that discusses the role production of coalbed methane from wells close to and down dip from seep areas plays in the mobilization of the gas that is migrating up dip, thus increasing the rate of gas seepage from old seeps or creating new seeps.


Summary: USGS Open File Report.


Summary: This GSA conference document discusses the differing models for the Fruitland Formation coal in the San Juan Basin.

Summary: Article.


Summary: CGS Open-File Report.


Summary: USBM Report.


Summary: USBM Report.


Summary: Proposed study plan, which outlines work elements and methodology for conducting field experiments at the Cedar Cove degasification field in Alabama. The proposed study would also include aquatic toxicity testing using a natural gas produced water, which was disposed of in the form of stream discharge.


Summary: Report on a study that investigated the potential causes of contamination found in the shallow groundwater of the Animas River Valley.

Summary: Report.


Summary: This GRI report discusses the costs associated with groundwater restoration.


405. Flaherty, K. J., 2000, Quandry or Quest: Problems of Developing Coalbed Methane as an Energy Resource, from The Public Land and Resources Law Digest, v. 37, available from the publisher.

Summary: Article.


Summary: Symposium Paper.


Summary: AAPG Report.


Summary: GSA Conference Document.

Summary: AAPG Report.


Summary: Non-USGS publication by USGS authors.


Summary: Discusses how coalbed gas has gone from being a mining hazard to a conventional gas resource.


Summary: USGS Paper.


Summary: USGS Paper.


Summary: USGS Open File Report.


Summary: SEPM Paper.

Summary: AGS Conference Document.


Summary: Report of some of the findings of a BLM-USGS cooperative CBM project. This joint project sought to collect technical data on CBM resources and reservoirs in the Powder River Basin.


Summary: This GSA conference document discusses the methane gas content in Powder River Basin coals.


Summary: Ground water map of Nebraska.


Summary: Report of project designed to study the formation damage to coal seams caused by drilling fluids.


Summary: AAPG Conference Document.


Summary: USGS Map.

**Summary:** Symposium Paper.


**Summary:** OGS Publication.


**Summary:** OGS Publication.


**Summary:** OGS Map.


**Summary:** OGS Map.


**Summary:** AAPG Bulletin.


**Summary:** AAPG Convention Document.

**Summary:** AAPG Bulletin.


**Summary:** AAPG Meeting Paper.


**Summary:** Article.


**Summary:** This journal article discusses the COMETPC-3 Reservoir Simulator developed for the Gas Research Institute by ICF Resources.


**Summary:** SPE Paper.


**Summary:** Report


**Summary:** Article.

Gale, J.; and Freund, P., 2000, *Coal Bed Methane Enhancement with CO₂ Sequestration* -

Summary: AAPG Conference Paper.


Summary: European Association of Geoscientists and Engineers Conference Paper.


Summary: Article.


Summary: Geological Society Report.


Summary: Article.


Summary: WGA Publication.


Summary: USGS Conference Document.

**Summary:** Article.


**Summary:** Report.


**Summary:** GRI Report.


**Summary:** This is a GRI brochure on the COMETPC 3-D Reservoir Simulator.


**Summary:** List of publications that discuss coal seam natural gas and its technology.


**Summary:** GRI Report.


**Summary:** GRI Report.

the publisher.

**Summary:** GRI Report.


**Summary:** This brochure discusses GRI’s role in transforming natural gas from coal seam production in Alabama.


**Summary:** GRI Report.


**Summary:** Brochure that discusses cost effective handling and the environmentally responsible disposal of the water produced in association with the production of coal seam natural gas.


**Summary:** This article from GRID discusses the GRI program to evaluate the accuracy of analyzing and estimating gas-in-place.


**Summary:** This GRI Bulletin discusses the development of a gas-in-place analysis protocol.


**Summary:** This GRI computer file is a republication of GRI’s coal seam gas guides. This volume contains “A Guide to Coalbed Methane Field Operations” (originally GRI-92/0234) and “A Guide to Coalbed Methane Reservoir Engineering” (originally GRI-94/0397).

**Summary:** This GRI computer file is a republication of GRI’s coal seam gas guides. This volume contains “A Guide to Determining Coalbed Gas Content” (originally GRI-94/0396) and “Coalbed Reservoir Gas-in-Place Analysis” (originally GRI-97/0263).


**Summary:** This GRI computer file updates GRI’s work in natural gas composition assessment and the unconventional gas resources of the U.S.


**Summary:** GRI Publication.

461. Gas Research Institute, *Treating Produced Waters in the San Juan Basin With the Freeze-Thaw/Evaporation Process*, available online from the Gas Technology Institute.

**Summary:** This is a report on the development of a freeze-thaw/evaporation (FTE) purification process to treat produced water.


**Summary:** GTI Publication.


**Summary:** GTI Publication.


**Summary:** CSPG Conference Paper.

**Summary:** AAPG Convention Paper.


**Summary:** SPE Paper.


**Summary:** Article.


**Summary:** Geological Society Report.


**Summary:** Article.


**Summary:** Article.


**Summary:** Report.

472. Gilles, Alex; and Snygg, Arnold, 1981, *Development of Technology for Coal Bed Methane*
**Recovery Program Planning**, available from the Gas Technology Institute as GRI-81/0008.1.

**Summary:** This is a final report on an assessment of the suitability of production methods in the recovery of natural gas from coal seams. Discusses the fact that the most limiting technology is the stimulation of water and gas flow from deeper gassy coal formations.


**Summary:** Report that discusses the technology available for recovering coal seam natural gas. This report also includes: water quality data for mine drainage in the Appalachian Basin and information on methods for the treatment of coal seam water.


**Summary:** Article.


**Summary:** Article.


**Summary:** Article.


**Summary:** Report.


**Summary:** Article.

**Summary:** NETL Conference Document.


**Summary:** Article.


**Summary:** SPE Paper.


**Summary:** SPE Article.


**Summary:** Report.


**Summary:** Symposium Paper.

Summary: Report on the arsenic and fluorine content of Pennsylvanian age coals from the Warrior Basin of northwestern Alabama.

486. Gong, J.; and Ou, M., 1999, *Open Another Window for Oil and Gas Exploration*, from the 35th Session of the Coordinating Committee for Coastal and Offshore Geoscience Programmes in East and Southeast Asia (CCOP), available from CCOP as Technical Reports, v. 35.

Summary: CCOP Meeting Document.


Summary: WGA Document.


Summary: AAPG / SEPM Report.


Summary: AAPG / SEPM Report.


Summary: AAPG / SEPM Report.


Summary: Master’s Thesis.

**Summary:** Symposium Paper.


**Summary:** USBM Circular.


**Summary:** Convention Presentation.


**Summary:** Symposium Paper.


**Summary:** SPE Report.


**Summary:** Article.


**Summary:** This journal article discusses GRI sponsored research into the development of technology for use in the Appalachian Basin.

**Summary:** Mr. Griebling is Director of the Colorado Oil & Gas Conservation Commission. His testimony included: the history and status of CBM development in Colorado; a discussion of methane gas found in the groundwater in the Colorado portion of the San Juan Basin; an explanation of the difference between biogenic and thermogenic methane gas; and discussion of the “3M” Project.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** RMAG Report.


**Summary:** This conference paper discusses research conducted on the concentration of salinity in produced water discharged to surface waters, and how these inorganic ions can be toxic to the
freshwater organisms traditionally used for biomonitoring.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** USGS Report.


**Summary:** AAPG Report.


**Summary:** Symposium Paper.


**Summary:** Conference Presentation.

Summary: Article.


Summary: SPE Paper.


Summary: This is the final report on the development of a three-dimensional hydraulic fracturing model for stimulating methane production from coal seams.


Summary: This is the final report on development of a three-dimensional model that simulates hydraulically driven fracturing as applied to the drainage of methane from coal seams.


Summary: Article.


Summary: Symposium Paper.

Summary: Symposium Paper.


Summary: This GRI report discusses coal permeability and gas desorption.


Summary: Article.


Summary: Article.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Article.


Summary: Report.

525. Harpalani, S.; and Ouyang, S., 1999, A New Laboratory Technique to Estimate Gas Diffusion
Characteristics of Coal, from the proceedings of the 1999 International Coalbed Methane Symposium, Tuscaloosa, Alabama, available from the University of Alabama.

**Summary:** Symposium Paper.


**Summary:** Indiana Geological Survey Paper.


**Summary:** This USGS report discusses the minerals deposits of the Powder River Basin.

528. Harris, Steven C.; Mettee, Maurice F.; and O’Neil, Patrick E., 1987, *Coalbed Methane Development in Alabama: Biological and Hydrological Conditions of Streams Draining the Cedar Cove Degasification Field*, available from the Gas Technology Institute as GRI-87/0038.

**Summary:** This GTI report discusses the impact of produced water from coal seam gas wells in the Cedar Cove field on streams in the surrounding area.


**Summary:** WSGS Publication.


**Summary:** Report.


**Summary:** Canadian Institute of Mining, Metallurgy and Petroleum Meeting Paper.

**Summary:** AAPG Report.


**Summary:** AAPG Convention Document.


**Summary:** GSA Report.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** SPE Paper.


**Summary:** CGS Report.


**Summary:** OGS Bulletin.


**Summary:** OGS Report.


**Summary:** OGS Report.


**Summary:** OGS Report.

Summary: OGS Report.


Summary: OGS Publication.


Summary: OGS Map.


Summary: OGS Bulletin.


Summary: OGS Map.


Summary: OGS Publication.


Summary: OGS Report.


Summary: OGS Publication.

**Summary:** OGS Report.


**Summary:** OGS Report.


**Summary:** OGS Publication.


**Summary:** OGS Publication.


**Summary:** OGS Publication.


**Summary:** OGS Publication.


**Summary:** This GSA conference document discusses the database used in support of the United States Geological Survey led study of natural gas from coal seams resources of the Wasatch Plateau in Utah.

**Summary:** ACS Conference Document.


**Summary:** Symposium Paper.


**Summary:** USGS Report.


**Summary:** USGS Report.


**Summary:** AAPG Report.


**Summary:** Geological Society Report.

Summary: USGS Report.


Summary: USGS Report.


Summary: WSGS Report.


Summary: Article.


Summary: Article.


Summary: Article.


Summary: GTI Map.


Summary: Symposium Paper.

**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** USGS Open File Report.


**Summary:** Symposium Paper.

Summary: This GRI publication provides guidelines to design well completions and hydraulic fracturing treatments in coal seams.


Summary: SPE Report.


Summary: SPE Report.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: This guide provides information on siting, drilling, completion and production of natural gas from coal seams. Discusses key field operations and guidelines for performing those operations.


Summary: Symposium Paper.

Summary: AAPG Meeting Paper.


Summary: Article.


Summary: Kentucky Geological Survey Map.


Summary: MGS Report.


Summary: Report.


Summary: AAPG Report.


Summary: Symposium Paper.


Summary: Article.

**Summary:** Report.


**Summary:** GSC Open-File Report.


**Summary:** USBM Circular.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** This GRI report discusses research conducted to determine the applicability of existing coal seam gas technology to development of coal seam natural gas reservoirs in the Appalachian Basin.


**Summary:** This final report discusses research conducted to determine the applicability of current
technology to development of coal seam natural gas reservoirs in Appalachia.


**Summary:** Article.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** This GRI report discusses the methodologies employed to determine the relative permeability characteristics on several coal samples.


**Summary:** This conference paper discusses the development of a modified porous plate experiment and mathematical model used to improve the measurement and evaluation of gas and water relative permeability, capillary pressure, and pore volume in coal samples.

**Summary:** Report.


**Summary:** Report.


**Summary:** Contains workshop presentations and papers presented at an SPE conference. The materials mainly cover the characterization of reservoir properties favorable to coal seam gas production.


**Summary:** Convention Report.


**Summary:** USBM Report.


**Summary:** USBM Report.

Information Service.

Summary: USBM Report.


Summary: USBM Circular.


Summary: USBM Circular.


Summary: USBM Circular.


Summary: Article.


Summary: Symposium Paper.


Summary: Symposium Paper.

of the 1999 International Coalbed Methane Symposium, Tuscaloosa, Alabama, available from the University of Alabama.

**Summary:** Symposium Paper.


**Summary:** This report summarizes the types of natural gas sources found at various locations in the lower 48 states of the U.S. and several non-U.S. reservoirs.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** USBM Report.


**Summary:** SPE Conference Paper.
Summary: This SPE paper discusses the development of coal seam gas reservoir description from the analysis of production and pressure transient data for a producing openhole cavity well and two observation wells. These San Juan basin wells were completed in the Fruitland Formation.

Summary: RMAG Report.

Summary: OGS Guidebook.


Summary: USGS Report.
Summary: WGA Report.


Summary: WGA Conference Document.


Summary: Report.


Summary: WGA Conference Document.


Summary: Report on natural gas from coal seams in the different basins of the Rocky Mountains. Discusses the geology of the basins and problems associated with production.


Summary: USGS Bulletin.

**Summary:** Conference Paper.


**Summary:** AAPG Bulletin.


**Summary:** Symposium Paper.


**Summary:** SPE Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** RMAG Report.

from the proceedings of the 1991 Coalbed Methane Symposium, Tuscaloosa, Alabama, available from the University of Alabama.

**Summary:** Symposium Paper.


**Summary:** USGS Report / Map.


**Summary:** WGS Guidebook.


**Summary:** Alberta Research Council Report.


**Summary:** Article.


**Summary:** Article.


**Summary:** This report discusses a five-year research plan that was developed for the environmental impacts and constraints associated with gas supply technologies used to produce various types of non-conventional natural gas. Among those types studied was coalbed methane. Contains discussion of the prioritization methodology used to rank research activities, based on environmental and technical criteria.

**Summary:** This final report discusses the development of a research plan for safety issues related to gas supply technologies.


**Summary:** Symposium Paper.


**Summary:** Report.


**Summary:** This GRI report discusses a geologic and hydrologic study of the Sand Wash basin as a framework for evaluating development properties.


**Summary:** AAPG / SEPM Report.


**Summary:** Report.

Summary: Symposium Document.


Summary: Includes structural stratigraphic and hydrologic setting of Mesaverde and Fort Union coals, coal seam natural gas resources, production and possible traps.


Summary: USGS Report.


Summary: Article.


Summary: Texas University Bureau of Economic Geology Report.

Tuscaloosa, Alabama, available from the publisher.

**Summary:** Report.


**Summary:** Article.


**Summary:** Symposium Document.


**Summary:** Report.


**Summary:** Kansas Geographic Information Systems Policy Board Map.


**Summary:** KGS Report.


**Summary:** SPE Conference Paper.

**Summary:** Article.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** This SPE paper defines the quality of water produced from coal seam natural gas wells producing from the Fruitland Formation, characterizes affected soils, evaluates the environmental effects the water has on soil, and discusses specific reclamation procedures for a portion of the San Juan Basin.


**Summary:** This report discusses the geologic assessment of Northern Appalachian Coal Basin gas-in-place estimates.

**Summary**: CGS Open-File Report.


**Summary**: Symposium Paper.


**Summary**: Symposium Paper.


**Summary**: Report.


**Summary**: This GRI-sponsored report gives a summary of the drilling and production statistics from the major coal seam gas and gas shale reservoirs in the U.S.


**Summary**: RMAG Publication.


**Summary**: This GRI report reviews and summarizes the characteristics of geophysical logging
technologies and how they apply to coal seam gas resource evaluation.


**Summary:** Report.


**Summary:** Article.


**Summary:** Conference paper that reports on a program working to identify the mechanisms responsible for high treatment pressures as they relate to lower production of gas produced from wells treated at high pressures. These abnormally high pressures are encountered during hydraulic fracturing. Presented at the 1992 International Gas Research Conference.


**Summary:** This GRI sponsored topical report examines the mechanisms responsible for the high fracturing pressures observed in coal in order to specify stimulation procedures required to achieve fracture characteristics that optimize gas production.


**Summary:** Conference Paper.


**Summary:** Symposium Paper.

**Summary:** This report discusses an investigation of the cavity completion mechanisms causing formation stimulation.


**Summary:** Report.


**Summary:** Symposium Paper.


**Summary:** GRI Topical Report.


**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** USBM Report.

**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** AAPG Report.

Natural Gas from Coal Seams

Persist, available from the publisher, the American Association of Petroleum Geologists.

**Summary:** AAPG Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** USGS Open File Report.


**Summary:** This USGS Professional Paper presents a geologic assessment of coal deposits of the Colorado Plateau and gives new resource estimates for selected assessment units.


**Summary:** USBM Report.


**Summary:** USBM Report.

**Summary:** Report.


**Summary:** Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Article.

**Summary:** Final report on 15 methods for analysis of single-phase well tests as they apply to low permeability coal seam natural gas reservoirs.


**Summary:** Final report on methods developed to characterize the hydrologic properties of coal seam natural gas reservoirs.


**Summary:** Article.


**Summary:** SPE Report.


**Summary:** Symposium Paper.


**Summary:** Doctoral Dissertation.

Summary: AAPG Conference Paper.


Summary: Article.


Summary: Article.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** This report discusses the geologic assessment of Black Warrior Basin, Alabama, gas-in-place estimates.


**Summary:** Article.


**Summary:** AAPG Report.

Summary: Federal Energy Technology Center Conference Report.


Summary: Discussion of residual concentrations and distributions of hydrocarbon gases from methane to n-heptane. Measurements were taken from sediments recovered from seven sites.


Summary: GSA Meeting Paper.

743. Lamarre, Robert, 2000, Coalbed Methane Stratigraphic Traps in Ferron Coals of East-Central Utah, from Texaco Exploration and Production.

Summary: Texaco Report.


Summary: RMAG Report.


Summary: Article.


Summary: AAPG Bulletin.

747. Lambert, S. W.; and Trevits, M. A., 1980, The Feasibility of No-Propant Stimulation to Enhance Removal of Methane from the Mary Lee Coalbed, available from the United States Department of Natural Gas from Coal Seams

Summary: DOE Contracted Study.


Summary: DOE Report.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Article.


Summary: AAPG Report.


Summary: This GRI report discusses research into reasons why Warrior Basin wells producing natural gas from coal seams are not producing satisfactorily.
Summary: This topical report reviews well stimulation design considerations, diagnostic results, and production results for a number of production wells stimulated at the Rock Creek Project.

Summary: Article.

Summary: Symposium Paper.

Summary: AAPG Report.

Summary: Article.

Summary: Alberta Resource Council Short Course.

Summary: Report.

**Summary:** Conference Paper.


**Summary:** This GRI final report discusses the coal seam gas potential of the Raton and Piceance Basins.


**Summary:** Article.


**Summary:** USGS Open File Report.


**Summary:** USGS Report.


**Summary:** USGS Open File Report.


**Summary:** Symposium Paper.

**Summary:** Article.


**Summary:** AAPG Report.

Laubach, S. E.; Tyler, Roger; Tremain, C. M.; Grout, M. A.; and Ambrose, W. A., 1991, *Fracture Patterns in Coal in the Western United States; Observations and Implications for Development of Coalbed Methane Resources*, available from the Geological Society of America.

**Summary:** GSA paper.


**Summary:** WGA Map.


**Summary:** New Mexico Bureau of Mines and Mineral Resources Bulletin.


**Summary:** Article.


**Summary:** USGS Open File Report / Map.

**Summary:** USGS Open File Report / Map.


**Summary:** USGS Map.


**Summary:** USGS Report.


**Summary:** USGS Report / Map.

779. Law, B. E., 1979, *Surface Coal Sections in the Emery Coal Zone, Henry Mountains Coal Field, Garfield and Wayne Counties, Utah*, available from the United States Geological Survey as MF-1082-B.

**Summary:** USGS Report.


**Summary:** This AAPG paper discusses the coal-derived water and how it compares to other formation fluids.


**Summary:** AAPG Conference Document.

**Summary:** USGS Report.


**Summary:** Symposium Paper.


**Summary:** AAPG Bulletin.


**Summary:** Paper.


**Summary:** USGS Report.


**Summary:** Conference Document.


**Summary:** AAPG Report.

**Summary:** Symposium Paper.


**Summary:** USGS Conference Paper.


**Summary:** Symposium Document.


**Summary:** Report.


**Summary:** Article.


**Summary:** Symposium Paper.

Summary: AAPG Report.


Summary: Symposium Paper.


Summary: This GRI report discusses tests that were conducted in the Greater Green River Area and in the Piceance Basin to assess the potential for production of coal seam gas from coalbeds below 2,500 feet.


Summary: This is a conference paper presented at the Coalbed Methane Symposium, 3rd, in 1991. This paper reports on an investigation into the feasibility and costs associated with treatment and disposal of waters produced with coal seam natural gas. Waters from the Black Warrior Basin in Alabama and the Lance-Fox Hills aquifer in Wyoming were used for the evaluation.

799. Leel, Woodruff; and Wickstrom, Charles, 1987, Methane Emissions Along a Salt Marsh Salinity Gradient.

Summary: Report.


Summary: AAPG Report.


Summary: Article.

**Summary:** Article


**Summary:** Symposium Paper.


**Summary:** Alberta Research Council Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Report.


**Summary:** Article.


Summary: AAPG Report.


Summary: Geological Society Report.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: AAPG Bulletin.


Summary: Symposium Paper.


Summary: Conference Paper.

**Summary:** USGS Report.


**Summary:** AAPL Conference Paper.


**Summary:** Article.


**Summary:** Paper contains a summary of data gathered for the development of a guidance manual that presents the methodology for managing produced water in the Black Warrior Basin of Alabama. The method presented manages the water through the use of treatment ponds and National Pollutant Discharge Elimination System (NPDES) permits.


**Summary:** AAPG Report.


**Summary:** Geological Society of China Paper.

Summary: This GRI topical report discusses the findings from engineering analyses and field experiences of the Deep Coal Seam Project in the Piceance Basin of Colorado.


Summary: Discusses reservoir, core and stress tests that were conducted to design fracture stimulation treatments for two wells drilled into the coal seam in the Piceance basin.


Summary: RMAG Report.


Summary: Article.

826. Logan, T. L.; Clark W. F.; and McBane Richard A., 1989, *Comparing Different Coalbed Methane Completion Techniques, Hydraulic Fracture and Openhole Cavity, at the Northeast Blanco Unit, San Juan Basin*, available from the publisher, the University of Alabama, School of Mines and Energy Development.

Summary: This conference paper discusses the different completion techniques used on wells in the San Juan Basin.


Summary: SPE Report.


Summary: AAPG Report.


**Summary:** Symposium Paper.


**Summary:** This GRI topical report outlines the various techniques, costs, and potential hazards associated with openhole cavity completion of natural gas from coal seams.


**Summary:** This final report presents the 11-year history of the Deep Coal Seam and Western Cretaceous Coal Seam Projects.


**Summary:** This GRI report discusses a remedial stimulation treatment done to enhance gas production from a previously hydraulically fractured well.


**Summary:** Report.


**Summary:** Conference paper. Non-USGS publication by USGS and Non-USGS authors.


**Summary:** Report.

**Summary:** Report.


**Summary:** Report.


**Summary:** Report.


**Summary:** American Chemical Society Meeting Paper.


**Summary:** Discussion of potential for self-ignition of coal in the immediate vicinity of coal seam natural gas wells of the Powder River Basin. This report details the conditions that favor spontaneous combustion in subbituminous coals of the Powder River Basin.


**Summary:** Society for Mining, Metallurgy, and Exploration Report.


**Summary:** Report.

**Summary:** USGS Report.


**Summary:** USGS Report.


**Summary:** Article.


**Summary:** Article.


**Summary:** Conference Document.


**Summary:** AAPG Report.


**Summary:** Symposium Paper.

Institute Gas Technology Symposium, Calgary, Canada, available from the Society of Petroleum Engineers as SPE-59784.

Summary: SPE Symposium Paper.


Summary: This is a final report on a five-year research plan that was developed to support design and permitting for disposal of solid wastes from a coal gasification facility. Discusses the regulatory and legal liabilities associated with the disposal.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.

Energy Technology Center as Technical Report 82-3.

Summary: DOE Report.


Summary: Doctoral Dissertation.


Summary: CIM Meeting Paper.


Summary: AAPG Conference Paper.


Summary: BIA Report.


Summary: Symposium Paper.


Summary: Symposium Paper.

**Summary:** AAPG Bulletin.


**Summary:** PGS Article.


**Summary:** PGS Report.


**Summary:** PGS Article.


**Summary:** PGS Report.


**Summary:** PGS Report.


**Summary:** PGS Report.

870. Mason, Richard Z.; Siegel, Martin M.; Barone, Saverio Peter; and Gash, Bruce W., 1987, *Economic

**Summary:** DOE Conference Paper.


**Summary:** RMAG Report.


**Summary:** Symposium Paper.


**Summary:** Indiana Geological Survey Open-File Study.


**Summary:** Paper.


**Summary:** Indiana Geological Survey Open-File Study.


**Summary:** AAPG Convention Paper.

American Association of Petroleum Geologists.

Summary: AAPG Report.


Summary: GRI Report.


Summary: GRI Report.


Summary: This GRI topical report discusses the findings on a San Juan basin coal seam gas well drilled in Colorado. This report includes data on coal content, gas content, permeability, thickness, pressure, and fracture geometry estimates.


Summary: This GRI topical report discusses the findings on a San Juan basin coal seam gas well drilled in Colorado. This report includes data on coal content, gas content, permeability, thickness, pressure, and fracture geometry estimates.


Summary: RMAG Report.

883. Mavor, Matt J.; Britton, Randy; Close, Jay C.; Dern, Robert R., Jr.; Dhir, Rahul; Logan, Terry;

**Summary:** This GRI topical report includes two papers on the methodology of economic evaluation of the Fruitland Formation coalbed natural gas reservoirs.


**Summary:** This GRI topical report discusses two openhole cavity wells evaluated to determine the reasons for the greater productivity of cavity well completions relative to cased, fractured well completions.


**Summary:** This GRI topical report outlines procedures and presents examples of the methodology required to evaluate the properties of coal seam gas reservoirs for deliverability projections.


**Summary:** This GRI topical report discusses the measurement and interpretation of sorption isotherm data in relation to predicting the gas production performance of a coal seam gas reservoir.


**Summary:** This GRI topical report summarizes the project, whose primary purpose was to quantify the reasons for the increased productivity of San Juan basin, Fruitland Formation coal seam gas wells.


**Summary:** GRI Topical Report.

**Summary:** SPE Report.


**Summary:** GRI Topical Report.


**Summary:** Symposium Paper.


**Summary:** This conference paper discusses San Juan Basin, Fruitland Formation coal seam natural gas wells completed with openhole cavities using a controlled injection-blowout technique.


**Summary:** This GRI annual report discusses the Western Cretaceous Coal Seam Project’s concentration on dynamic open hole completions in natural gas wells.


**Summary:** Article.


**Summary:** This GRI topical report summarizes coal seam natural gas reservoir and fluid properties as well as the techniques necessary to obtain quantitative estimates of the properties.

**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** This report prepared by the Gas Research Institute is a “how-to” manual that helps producers accurately determine the gas-in-place volume of coal seam natural gas reservoirs.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** This SPE paper presents the results of field trials of a new fracturing-fluid system and liquid surface-modification additive for coating proppant in the Fruitland Coal reservoir in the San Juan Basin.

Summary: This USGS report discusses ways to mitigate the impact of energy gasses on the environment.


Summary: This section of the Department of Energy’s Annual Energy Outlook 2000 discusses unconventional gas sources such as coal seam natural gas, tight sands and gas shales.


Summary: Law review article.


Summary: TRW Report.


Summary: USBM Report.


Summary: USBM Report.


Summary: USBM Report.

Summary: USBM Report.


Summary: CGS Symposium Paper.


Summary: Report.


Summary: TORP Report.


Summary: AAPG Report.


Summary: Conference Document.


Summary: Final report on study of oil and gas pumping systems evaluated for coal seam natural gas dewatering operations. Ten well systems are evaluated. First of two volumes.


Summary: Final report on study of dewatering operations. Supplies dewatering system designs for six pump types. Includes tables and graphs that illustrate the associated costs.

**Summary:** Article.


**Summary:** USGS Maps / Report.


**Summary:** USGS Maps / Report.


**Summary:** USGS Maps / Report.


**Summary:** Report.


**Summary:** RMAG Report.


**Summary:** Article.

**Summary:** USGS Map / Report.


**Summary:** This guide discusses methods for quantifying the amount and type of gas present in coalbeds through the use of recovered coal samples.


**Summary:** This GRI topical report discusses an investigation which describes the release and migration of methane through coal. Emphasis is on samples taken from the Blue Creek Seam in Alabama.


**Summary:** DOE Symposium Document.


**Summary:** DOE Symposium Document.


**Summary:** SPE Conference Document.

Summary: Symposium Document.


Summary: DOE Report.


Summary: Report.


Summary: Article.


Summary: Article.


Summary: USGS Conference Document.


Summary: USGS Publication.

937. Meissner, F. F., 1984, Cretaceous and Lower Tertiary Coals as Source for Gas Accumulations in
the Rocky Mountain Area, available from the Rocky Mountain Association of Geologists in Hydrocarbon Source Rocks of the Greater Rocky Mountain Region.

**Summary:** RMAG Report.


**Summary:** Article.


**Summary:** AAPG Conference Paper.


**Summary:** This SPE conference paper discusses a variety of coal seam gas recovery research. Primarily focuses on the San Juan and Warrior basins.


**Summary:** Article.


**Summary:** BLM Report.


**Summary:** USGS Report.

**Summary:** USGS Conference Paper.


**Summary:** Report.


**Summary:** GSA Meeting Document.


**Summary:** NETL Conference Report.


**Summary:** GSA Report.


**Summary:** Report.


**Summary:** Article.

**Summary:** Article.


**Summary:** USGS Report.


**Summary:** Article.


**Summary:** Article.


**Summary:** AAPG Bulletin.


**Summary:** This AAPG bulletin discusses drilling for coal seam natural gas in the Upper Cretaceous Ferron Sandstone of central Utah.


**Summary:** AAPG Meeting Paper.

958. Morales, Graciela; and Barrufet, Maria, 2002, *Desalination of Produced Water Using Reverse*
Osmosis, from Gas TIPS, v. 8, no. 3, available from the Gas Technology Institute.

Summary: Article.


Summary: Symposium Paper.


Summary: Article.


Summary: Article.


Summary: Symposium Paper.

963. Mount, David R.; and Gulley, David D., 1992, Development of a Salinity/Toxicity Relationship to Predict Acute Toxicity of Saline Waters to Fresh Water Organisms, available from the Gas Technology Institute as GRI-92/0301.

Summary: Report on work to develop a Salinity / Toxicity Relationship (STR) that can be used to predict the toxicity of saline waters to freshwater organisms. Reports on the application of STR to field data.


Summary: This conference paper summarizes the findings of studies as they apply to the surface discharge of produced waters. Discusses how aquatic organisms respond to the discharge.

**Summary:** This journal article discusses a GRI study into the environmental acceptability of discharging coalbed produced waters in the Black Warrior Basin. Discusses the safety of discharging such waters.


**Summary:** This conference paper discusses the Salinity/Toxicity Relationships equations used to provide accurate predictions of the toxicity of produced waters.


**Summary:** Mountain Fuel Resources technical proposal.


**Summary:** DOE Contracted Report.


**Summary:** Bibliography containing more than 260 items in two sections: Coalbed Methane and Tight Gas Sands.


**Summary:** DOE Report.


**Summary:** Article.

**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** RMAG Report.


**Summary:** Symposium Paper.


**Summary:** RMAG Report.


**Summary:** NDGS Report.

**Summary:** Report.


**Summary:** Geological Society Report.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** Article.


**Summary:** GSA Report.


**Summary:** This SPE paper discusses a method for identifying potentially successful coal seams for completion by the openhole cavity technique. Data from numerous San Juan basin wells was used. Discusses the application of the findings to unexplored basins.

**Summary:** EPA Report.


**Summary:** This journal article discusses the evaluation of the accuracy of measurements on coal seam reservoirs by the GRI’s Basic Research Group.


**Summary:** This GRI report discusses new log and core analysis methods used to determine the gas-in-place volume of coalbed reservoirs.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** GRI Report.


**Summary:** AAPG Bulletin.

**Summary:** Symposium Paper.


**Summary:** SPE Meeting Paper.


**Summary:** Article.


**Summary:** This GRI report discusses the potential for production of natural gas from Rocky Mountain region coal seams.


**Summary:** This SPE paper discusses the development of a model for predicting the effective cleat porosity of coal seam gas reservoirs.


**Summary:** This GRI report discusses new methods used to determine the gas-in-place volume of coalbed reservoirs.

from the proceedings of the 2000 SPE/Canadian Energy Research Institute Gas Technology Symposium, Calgary, Canada, available from the Society of Petroleum Engineers as SPE 59786.

**Summary:** SPE Symposium Paper.


**Summary:** AAPG Meeting Report.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** WGA Publication.


**Summary:** This SPE paper describes experiments that investigated the occurrence of cements in the permeability pathways in coal samples from mines and cores. Samples were taken from the San Juan and Warrior basins.

Symposium, Tuscaloosa, Alabama, available as Paper 8735.

**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** RMAG Report.


**Summary:** Article.


**Summary:** Article.


**Summary:** Article.

Summary: This USGS Fact Sheet describes the coal seam natural gas industry in the United States and broadly discusses some of the concerns associated with its production.


Summary: RMAG Report.


Summary: This is a proposal for a study designed to provide stratigraphic and structural framework, and coal thickness models for use by industry for exploration.


Summary: This SPE paper discusses sidetracking mills used to mill a casing window and drill the required lateral in one trip.


Summary: SPE Meeting Paper.


Summary: AAPG Bulletin.

1018. Ogha, Kotaro; Higuchi, Kiyoshi; Shimada, Souhei; and Deguchi, Gotai, 1995, *Evaluation of Methane Drainage from Mining Panel*, from the proceedings of the 1995 International Unconventional

**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Report.


**Summary:** AAPG Conference Document.


**Summary:** Article.


**Summary:** Article.


**Summary:** Article.

Summary: Article.


Summary: Article.


Summary: Article.


Summary: Article.


Summary: Article.


Summary: Maps.


Summary: Article.


Summary: Symposium Paper.

1033. Oldaker, P. R., 1991, Hydrogeology of the Fruitland Formation, San Juan Basin, Colorado and
New Mexico, available from the Rocky Mountain Association of Geologists in Coalbed Methane of Western North America.

**Summary:** RMAG Report.


**Summary:** Symposium Document.


**Summary:** This GRI annual report discusses the use of geophysical log data to estimate coal formation parameters for optimization of gas production.


**Summary:** This GRI report discusses the identification and development of methodologies for estimating zone thickness, coal quality, gas content, isotherm, permeability, and cleat orientation from log data.


**Summary:** USGS Conference Document.


**Summary:** Findings of a study into the biological and water quality impacts of coal seam natural gas production water disposal into surface water streams in the Cedar Cove degasification field within Alabama’s Warrior Coal Basin.


**Summary:** Examines the environmental fate and effect of a natural gas produced water effluent. This study provides information and methodologies for defining acceptable conditions under which produced waters from coal seam natural gas wells can be discharged into surface waters.


**Summary:** Conference paper that discusses the instream effects of an NPDES-permitted discharge of produced waters on biological communities in a stream environment. Data from this study was used to develop concentration response models.


**Summary:** Final report on samples of coal seam natural gas produced water that was discharged to a receiving stream in the Warrior Coal Basin of Alabama. The study was conducted to determine the long-term environmental effects.


**Summary:** Reports on the development and testing of an instream bioassessment technique for assessing the effects of stream discharged production water. This bioassessment technique was developed in the coal seam natural gas fields of Alabama’s Warrior Basin.


**Summary:** This is a conference paper that reviews studies containing relevant information to the biological fate and effect of saline waters discharged to stream environments. Presents data relative to studies relating to producing natural gas from coal seams.

Summary: This conference paper asserts that recent implementation of water quality-based control of effluents with toxicity testing and possible biocriteria requirements is proof that in the future there will be a more comprehensive regulation of the discharge of waste water. Discusses the Cedar Cove Model within the framework of existing discharge permit requirements, future regulation, and coal seam natural gas studies completed in the state of Alabama.


Summary: Presents results of water-quality, aquatic toxicity, and biomonitoring studies in the Warrior Coal Basin of Alabama. Presents the Cedar Cove Model, which is a systematic approach for monitoring the discharge of produced-water effluents to surface waters.


Summary: SPE Conference Paper.


Summary: Article.


Summary: Conference paper discusses study that summarizes underground injection activity as an alternative to stream discharge of coal seam natural gas produced waters.


Summary: Article.

Summary: Report.


Summary: This SPE conference paper discusses the coalbed properties necessary for horizontal drilling and completion. Several techniques are compared.


Summary: USGS Open-File Report.


Summary: Article.


Summary: Symposium Paper.


Summary: British Columbia Ministry of Energy and Mines Report.


Summary: USBM Report.

**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** SPE Conference Paper.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** SPE Report.


**Summary:** SPE Report.

**Summary:** This SPE conference paper discusses alternative stimulation techniques, such as the openhole cavity completion, used on coal seam gas wells in the San Juan basin.


**Summary:** Article.


**Summary:** AAPG Report.


**Summary:** This SPE paper discusses applications of the concept of altered-stress fracturing as they apply to the San Juan Basin.


**Summary:** This SPE paper discusses the different treatments of an operator’s coal seam gas wells in the San Juan and Black Warrior Basins.


**Summary:** SPE Symposium Paper.

the Global Energy Marketplace; Liberating Beliefs, Great Expectations, and Elegant Solutions, from the proceedings of the 2000 AAPG Rocky Mountain Section Meeting, available from the American Association of Petroleum Geologists.

**Summary:** AAPG Meeting Document.


**Summary:** Symposium Paper.


**Summary:** This is an annual report that discusses the geologic evaluation of coal seam natural gas production parameters for the Black Warrior Basin in Alabama.


**Summary:** Geological Survey of Alabama Bulletin.


**Summary:** This GRI topical report discusses the geologic evaluation of coal seam natural gas production parameters for the Black Warrior Basin in Alabama.


**Summary:** Symposium Paper.

**Summary:** AAPG Bulletin.


**Summary:** AAPG Publication.


**Summary:** Symposium Paper.


**Summary:** Conference paper that discusses productivity parameters in coal seam natural gas wells and the geologic controls on natural gas production from those wells.


**Summary:** Documents the rapid growth of the coal seam natural gas industry since 1984. Summarizes the current state of the industry in Alabama. This report also discusses the numerous scientific and technological advances made since 1984.


**Summary:** A review paper that discusses stratigraphic and structural controls on coal seam natural gas production in the United States with emphasis on the Black Warrior and San Juan basins.

Summary: This research paper discusses the influence of extensional and compressional folds and faults on the performance of coal seam natural gas wells.

1083. Pashin, J. C.; and Carroll, R. E., 1999, *Day 1 Road Log; Stop 5, Nunnally and Harkness Coal Zones at Grant’s Mill*, from *Geology of the Cahaba Coalfield*, available from the publisher.

Summary: Report.


Summary: Report.


Summary: This paper discusses fracturing, faulting, and mineralization in coal seam natural gas reservoirs.


Summary: Conference Paper.


Summary: Report.


Summary: Symposium Paper.

Summary: This paper discusses the potential for enhanced coal seam natural gas recovery through injection of carbon dioxide and the basic considerations of geology, technology, and infrastructure required to formulate an enhanced recovery strategy.


Summary: This report discusses geologic factors affecting the potential for carbon sequestration and enhanced coal seam natural gas recovery. Includes important stratigraphic, structural, geothermic, hydrologic, and coal quality data.


Summary: Canadian Institute of Mining and Metallurgy Report.


Summary: Symposium Paper.


Summary: Article.


Summary: AAPG Convention Document.

**Summary:** SPE Meeting Paper.


**Summary:** Symposium Paper.


**Summary:** GRI Report.


**Summary:** This GRI report discusses a study that examined common and potential fracturing fluids in terms of coal-fluid interactions.


**Summary:** Report on laboratory research into hydraulic fracturing procedures and products used on coal seam natural gas wells. Contains appendix with additional research papers.


**Summary:** Findings of a project that coordinates laboratory data with field operations to ensure the application of current technology in stimulating coalbed methane wells. Data used in designing fracturing and remedial treatments in the Black Warrior Basin.


**Summary:** This GRI report summarizes research conducted on formation damage resulting from
hydraulic fracturing.


**Summary:** This GRI topical report discusses research into the mechanisms of formation damage following hydraulic fracturing and its impact upon gas well productivity.


**Summary:** USBM Report.


**Summary:** SPE Symposium Document.


**Summary:** AAPG Report.


**Summary:** Article.


**Summary:** Article.

Summary: PTTC Workshop.


Summary: Article.


Summary: Article.


Summary: Bibliography lists reports, papers and workshop citations on the topic of coal seam natural gas. This bibliography contains only works funded by the GRI, or which extensively used GRI data.


Summary: Bibliography of research and development reports. Contains reports on coal seam natural gas in the Appalachian Basin.


Summary: Bibliography of publications on natural gas exploration in the San Juan Basin. Contains citations of works on the topic of coal seam natural gas.


Summary: This USGS Fact Sheet discusses the potential for natural gas production from the coal seams in the Forest City Basin.

Models Used in Coal Mine Methane Resource Estimation and Reserve Evaluation, from the proceedings of the Second International Methane Mitigation Conference, Novosibirsk, Russia.

**Summary:** Conference Document.

1116. Pillard, David, *Predicting the Toxicity of Common Ions Found in Produced Waters*, available online from the Gas Technology Institute or from ENSR Consulting, Engineering, and Remediation.

**Summary:** This article discusses a software application developed to help producers determine the cause of toxicity in produced waters.


**Summary:** Report.


**Summary:** USBM Report.


**Summary:** Illinois Institute of Natural Resources Document.


**Summary:** Symposium Paper.


**Summary:** This publication discusses many aspects of development of coal seam natural gas in
the Powder River Basin.


**Summary:** SPE Meeting Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** SPE Symposium Paper.

**Summary:** SPE Report.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** This conference paper discusses fracture void simulations that exhibit the spatial correlations observed in natural fractures.


**Summary:** Discusses the production potential of natural gas from coal seams. This annual report examines the work that has been done to determine how multiphase flow is controlled by the geometry of the voids in the coal cleats and the amount of saturation of each phase.


**Summary:** Symposium Paper.

**Summary:** This final report discusses data on the gas-water relative permeability characteristics of coal cleats. Discusses data on the effective cleat porosity, aperture, and interconnectedness properties of five coal drill core samples.


**Summary:** This is an annual report that discusses data on the effective cleat porosity, aperture, and interconnectedness properties of coal core samples taken from the Fruitland Formation in the San Juan Basin of Colorado and New Mexico.


**Summary:** Symposium Paper.


**Summary:** This report describes a method for simulating three-dimensional fracture networks used in the development of a simulator that realistically models macroscopic and meso-scale geometrical properties of coal cleats.


**Summary:** Report.


**Summary:** Describes the 3M Model, which was developed to conduct a large scale, two-dimensional simulation of the Colorado portion of the Fruitland Coal in the San Juan Basin. Provides a tool that can be used to evaluate the impact of various factors on gas seepage. This coal seam natural gas model can also be used to evaluate potential infill drilling, alternative production or operation scenarios, or other coal seam natural gas issues.

**Summary:** GSA Meeting Paper.


**Summary:** Article.


**Summary:** Report.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** Article.


**Summary:** SPE Meeting Paper.

**Summary:** Report.


**Summary:** Conference Paper.


**Summary:** Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** NETL Conference Document.

**Summary:** Article.


**Summary:** RMAG Conference Document.


**Summary:** Article.


**Summary:** PTTC Article.


**Summary:** GSA Conference Paper.


**Summary:** Report provides preliminary data on water samples taken from 47 coal seam natural gas wells drilled in the Powder River Basin, Wyoming. The samples were taken between June 1999 and May 2000. Includes data on major, minor and trace elements.

1161. Rice, Cynthia A.; and Nuccio, Vito, 2000, Water Produced with Coalbed Methane, available online from the United States Geological Survey as FS-0156-00.
Summary: USGS Fact Sheet.


Summary: RMAG Report.


Summary: USGS Open-File Report.


Summary: AAPG Conference Document.


Summary: Article.


Summary: AAPG Conference Document.

**Summary:** Symposium Paper.


**Summary:** Symposium Document.


**Summary:** AAPG Bulletin.


**Summary:** AAPG Conference Document.


**Summary:** USGS Circular.


**Summary:** AAPG Report. Non-USGS publication with USGS authors.


**Summary:** USGS Conference Document.

Summary: Symposium Paper.


Summary: USGS Circular.


Summary: USGS Conference Document.


Summary: USGS Report.


Summary: USGS Report.


Summary: USGS Fact Sheet.


Summary: USGS Report.

Summary: MRCP Report.


Summary: AAPG Report.


Summary: AAPG Convention Report.


Summary: Report.


Summary: AAPG Report.


Summary: AAPG Report.


Summary: This SPE paper discusses several aspects of the Mineral Extraction Agreement between the current owner of a large tract of property in Colorado and New Mexico and the previous owner, who retained the mineral rights that include the Raton Basin coal seam natural gas.
1189. Roberts, S. B.; Clark, A. C.; and Carey, M. A., 1988, *Analyses of Seven Core Samples from Two Tertiary Coal Beds in the Sagwon Member of the Sagavanirktok Formation, North Slope, Alaska*, available from the United States Geological Survey as OF 88-0021.

**Summary:** USGS Report.


**Summary:** WSGS Report.


**Summary:** USGS Map / Report.


**Summary:** USGS Paper.


**Summary:** USGS Paper.


**Summary:** USGS Paper.

Summary: USGS Paper.


Summary: USGS Paper.


Summary: This AAPG conference document discusses the potential for natural gas production from coal seams in the Denver Basin of Colorado.


Summary: USGS Paper.


Summary: SPE Meeting Paper.


Summary: SPE/Canadian Energy Research Institute Symposium Paper.

**Summary:** Article.


**Summary:** USGS Report.


**Summary:** USGS Report.


**Summary:** Article.


**Summary:** Article.


**Summary:** Report.


**Summary:** AAPG Report.

Changes Along the Southwestern Margin of the Late Cretaceous Seaway, West-Central New Mexico, available from the New Mexico Bureau of Mines and Mineral Resources as Bulletin 121.

**Summary:** New Mexico Bureau of Mines and Mineral Resources Report.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** This GRI report discusses a theoretical approach applied to determine the economic potential of methane production from the D Coal Seam at the Red Mountain Unit in the Piceance Basin, Colorado.


**Summary:** This is a final report on a survey used to explore the potential for utilization of coal seam natural gas. Discusses the premise that if certain methods of drainage and degasification used by coal mining companies to capture methane become routine, then the investment necessary to make methane collection profitable will be justified.

**Summary:** EPA Report.


**Summary:** Symposium Paper.


**Summary:** USGS Open-File Report.


**Summary:** This AAPG conference document discusses the potential for production of natural gas from coal seams along the Gulf Coast of Texas.


**Summary:** University of Oklahoma Conference Document.


**Summary:** Master’s Thesis.


**Summary:** SPE Report.

**Summary:** This GRI topical report discusses research designed to facilitate development of shallow coalbed methane reserves that were bypassed while the deeper seams were explored and developed.


**Summary:** This GRI report summarizes the resource evaluation, reservoir testing, stimulation testing, stimulation design, implementation, diagnostics, water disposal, and production results of coal seam gas wells completed at the Rock Creek site field laboratory.


**Summary:** This SPE document provides practical methods for the evaluation and development of coal seam natural gas reservoirs.


**Summary:** Symposium Paper.


**Summary:** This conference paper discusses a three-dimensional reservoir simulation study used to history match the first 400 days of gas and water production from a multi-completion well in the Black Warrior Basin.


**Summary:** Article.

**Summary:** Article.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** USGS Fact Sheet.


**Summary:** Report.


**Summary:** AAPG Report.


**Summary:** Symposium Paper.

Development Faces Technology Gaps, from Oil & Gas Journal, v. 88, no. 6, available from the publisher.

Summary: This journal article examines the major technology, research needs, and problem areas faced by the coal seam natural gas industry.

1235. Schraufnagel, Richard A.; Saulsberry, J. L.; and Lambert, S. W., 1989, Gas Production from Multiple Wells at Rock Creek, available from the publisher, the University of Alabama, School of Mines and Energy Development.

Summary: This conference paper discusses the Methane from Multiple Coal Seams Project at Rock Creek and its evaluation of the technology required for cost effective production of methane from multiple coal seams through single wellbores.


Summary: SPE Report.


Summary: AAPG Report.


Summary: SPE Conference Paper.


Summary: This NETL conference document discusses the sequestration of CO₂ in coal seams as a way to mitigate rising levels of CO₂ in the atmosphere.

1240. Schuenemeyer, J. H.; Flores, R. M.; Stricker, G. D.; Ellis, M. S.; Gunther, G. L.; Taber, T. Y.; and Ochs, A. M., 1997, A Method to Estimate the Uncertainty of Coal Resources, available from the publisher, the Geological Society of America in Abstracts with Programs - Geological Society of
America, 29 (6).

**Summary:** GSA Conference Document.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** This GRI report discusses computerized models that were developed to simulate the transient two-phase flow of methane gas and/or water through coal seams.


**Summary:** Bibliography of information on natural gas from coal seams.


**Summary:** Bibliography of information on coal seam natural gas.

**Summary:** RMAG Publication.


**Summary:** Bibliography of information on natural gas from coal seams.


**Summary:** Bibliography of information on natural gas from coal seams.


**Summary:** Article.


**Summary:** Article.


**Summary:** Report.


**Summary:** RMAG Publication.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** RMAG Report.


**Summary:** Article


**Summary:** AAPG / SEPM Report.


**Summary:** Article.

**Summary:** AAPG Bulletin.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** AAPG Report.


**Summary:** AAPG Conference Document.


**Summary:** GSA Report.


**Summary:** Symposium Document.

**Summary:** AAPG Convention Document.


**Summary:** AAPG / SEPM Report.


**Summary:** South Texas Geological Society Report.


**Summary:** AAPG Convention Report.


**Summary:** Report.


**Summary:** AAPG Bulletin.


**Summary:** AAPG Bulletin.

Summary: USGS Map.


**Summary:** This SPE paper discusses pressure falloff tests performed on enhanced coal seam natural gas recovery pilot in the San Juan Basin. The tests were performed to determine effective permeability to gas, wellbore skin and the average reservoir pressure.


**Summary:** SPE Meeting Paper.


**Summary:** Article.


**Summary:** RMAG Report.


**Summary:** USBM Report.


**Summary:** SPE Report.

Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Conference Paper.


Summary: Evaluates the quality and effects of coal seam natural gas produced water discharged into the Big Sandy Creek of Alabama. Compares these waters with those from other coal seam natural gas fields in Alabama.


Summary: Symposium Paper.


Summary: Symposium Paper.

Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Article.


Summary: Article.


Summary: AAPG Report.


Summary: AAPG Report.


Summary: AAPG Report.


Summary: AAPG Report.

**Summary:** Article.


**Summary:** This conference paper discusses an economic analysis that was conducted for substitute natural gas (SNG) production from deep coal in the Powder River Basin of Wyoming. Results are presented in tables.


**Summary:** Report.


**Summary:** WSGS Report.


**Summary:** SPE Conference Paper.


**Summary:** GSA Meeting Paper.


**Summary:** Symposium Paper.

**Summary:** This GRI topical report discusses the COMPAS II, a microcomputer program that provides information on oil and gas wells.


**Summary:** Symposium Paper.


**Summary:** AAPG Report.


**Summary:** Article.


**Summary:** Article.


**Summary:** Article.


**Summary:** Symposium Paper.

**Summary:** GSA Meeting Paper.


**Summary:** SPE Report.


**Summary:** Report.


**Summary:** Symposium Paper.


**Summary:** RMAG Report.


**Summary:** Symposium Paper.


**Summary:** Article.

from the Rocky Mountain Association of Geologists, in Coalbed Methane of Western North America.

**Summary:** RMAG Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** This report discusses the 1991 results of the Coalbed Methane Multiple Coal Seam Project.


**Summary:** Symposium Paper.

Summary: Symposium Paper.


Summary: This GRI report discusses the database developed that documents tight gas, coalbed methane, and shale gas production and activity for 263 basin and formation categories.


Summary: Report.


Summary: Symposium Paper.


Summary: USGS Report.


Summary: Discusses the USGS project, “Assessment of Geologic Reservoirs for Carbon Dioxide Sequestration”.


Summary: Symposium Paper.

**Summary:** AAPG Convention Paper.


**Summary:** Article.


**Summary:** Article.


**Summary:** Conference paper discusses a study of hydraulic fractures in coalbeds. Project focused on 13 wells where induced fractures were intercepted by mining in the Warrior Basin.


**Summary:** This report presents data on the inspection of fractures from 13 wells that were intercepted by mining in the Warrior Basin in Alabama.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.
Summary: This report assesses the coal seam natural gas resources of the Raton Basin.

Summary: Report.

Summary: Article.

Summary: This paper discusses the analysis of production operations from the first carbon dioxide enhanced coal seam natural gas pilot. The paper asserts that the San Juan Basin test well shows that injection of carbon dioxide into deep coal seams for enhancement of coal seam natural gas recovery and the sequestration of greenhouse gas is technically and economically feasible.

Summary: Symposium Paper.

Summary: AAPG Conference Report.

Summary: This report assesses the coal seam natural gas resources of the Raton Basin.
Injection for Coalseam Gas Recovery, from the proceedings of the 1993 SPE Gas Technology Symposium, Calgary, Canada, available from the Society of Petroleum Engineers as SPE 26199.

**Summary:** This SPE symposium paper presents the results of a preliminary economic evaluation of the nitrogen injection process for potential application to the Fruitland Formation in the San Juan basin.


**Summary:** Article.


**Summary:** KGS Report.


**Summary:** AAPG Bulletin.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** KGS Open-File Report.

Summary: Article.


Summary: Article.


Summary: Strategic Research Institute Conference Document.


Summary: Strategic Research Institute Conference Document.


Summary: Article


Summary: Examines drilling, completion, pipe size, spacing, and recovery of methane at the Hawk’s Nest East Mine in Colorado.


Summary: USGS Conference Document.


Summary: Society of Organic Petrology Conference Document.

**Summary:** USGS Professional Paper.


**Summary:** USGS Professional Paper.


**Summary:** Society of Mining, Metallurgy, and Exploration Conference Document.


**Summary:** Conference Document.


**Summary:** GSA Conference Document.


**Summary:** Symposium Paper.

Summary: Alberta Research Council Report.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Article.


Summary: Article.


Summary: USGS Report.


Summary: Symposium Paper.


Summary: DOE Contracted Study.

**Summary:** This GRI-sponsored report summarizes the geologic features, the basic coal characteristics, and the extent of coal seam gas resources in the 10 major coal-bearing basins and regions of the United States.


**Summary:** Utah Geological Association Report.


**Summary:** Symposium Paper.


**Summary:** USGS Open File Report.


**Summary:** Report.


**Summary:** Article.


**Summary:** Article.

Summary: Symposium Paper.


Summary: This report presents an overview of a workshop on coal seam gas exploration and production in the Black Warrior basin.


Summary: This report presents an overview of a workshop on coal seam gas exploration and production in the Black Warrior basin.


Summary: Article.


Summary: AAPG Report.


Summary: Symposium Paper.

**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** This GRI-sponsored report discusses the bottomhole pressure data obtained from an observation well during cavity completion of a coal seam gas well.


**Summary:** University of Texas Report.


**Summary:** Conference Document.


**Summary:** Paper.


---

**Natural Gas from Coal Seams**

**Summary:** Article.

1393. Thomas, Keith T., 2002, *Collected Studies: Coal Seam Natural Gas; Also Known as Coalbed Methane*, available from the Interstate Oil and Gas Compact Commission.

**Summary:** This IOGCC / U. S. Environmental Protection Agency / U. S. Department of Energy publication is a bibliography of coal seam gas publications. Contains 922 listings.


**Summary:** This IOGCC publication is a bibliography of coal seam gas publications. Contains 245 listings.


**Summary:** Article.


**Summary:** Article.


**Summary:** Gas Processors Association Convention Paper.

Landmen.

**Summary:** American Association of Petroleum Landmen Conference Paper.


**Summary:** SPE Conference Paper.


**Summary:** Report on the development of a toxicity database from which predictive ion toxicity models could be created. These models would be used in the evaluation of options for meeting permit toxicity limits regulated by the National Pollutant Discharge Elimination System (NPDES).


**Summary:** AAPG Bulletin.


**Summary:** Article.


**Summary:** This GRI report discusses computer reservoir simulations that were used to examine the technical problems and costs for turning a vertical well to the horizontal at the pay zone and then propagating hydraulic fractures from the horizontal portion.


**Summary:** CGS Open-File Report.

**Summary:** CGS Report.


**Summary:** CGS Maps.


**Summary:** CGS Report.


**Summary:** RMAG Report.


**Summary:** New Mexico Bureau of Mines and Mineral Resources Report.


**Summary:** USGS Report / Map.


**Summary:** CSPG / CIM Convention Paper.

**Summary:** Symposium Paper.


**Summary:** Report on the development of a model for evaluating coal seam natural gas potential in frontier basins, or for finding “sweet spots” in basins with established production.


**Summary:** This report discusses an evaluation of coal seam natural gas potential of four basins in the western United States. The evaluation was done in the context of characteristics identified in the San Juan Basin.


**Summary:** AAPG Conference Document.


**Summary:** CGS Publication.


**Summary:** Symposium Paper.

**Summary:** Review of coal seam natural gas potential in the Greater Green River Basin in Wyoming and Colorado. Reports on recent production that has resulted in little gas and large volumes of water.


**Summary:** Symposium Paper.


**Summary:** Report.


**Summary:** Texas University Bureau of Economic Geology Report.


**Summary:** This report focuses on the refinement and validation aspects of a coal seam natural gas producibility model.

Summary: Report on the development of the third portion of a Gas Research Institute coal seam natural gas producibility model. Compares the geologic and hydrologic settings of the Piceance, San Juan and Sand Wash basins. This report also reviews the key geologic and hydrologic controls on producibility.


Summary: Bureau of Economic Geology Report.


Summary: Symposium Paper.


Summary: Article.


Summary: Report.


Summary: AAPG - SEPM Convention Report.

Summary: USGS Map.


Summary: USGS Paper.


Summary: USGS Report.


Summary: USGS, Central Region Energy Resources Team Report.


Summary: USGS, Central Region Energy Resources Team Report / Maps.


Summary: AAPG Conference Report.


Summary: Symposium Paper.

States Geological Survey as OF 91-0590.

Summary: USGS Report.


Summary: GSA Report.


Summary: AAPG Report.


Summary: Article.


Summary: Report.


Summary: Describes existing national discharge regulations, current methods for managing coal seam natural gas produced water, current discharge permitting process, and how the increasing volume of discharged water due to increased coal seam natural gas development will affect the process.


Summary: Symposium Paper.

**Summary:** SPE Conference Paper.


**Summary:** Contracted Report.


**Summary:** This GRI-sponsored report discusses a study that characterizes the structural changes in the progressive stages of coal thermal maturation.


**Summary:** This report discusses a study that examined the content and composition of heavy hydrocarbon constituents in coal seam reservoirs.


**Summary:** USGS Professional Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.

**Summary:** Report.


**Summary:** Report.


**Summary:** WGA Symposium Document.


**Summary:** USGS Fact Sheet that discusses the water co-produced with oil and gas in the oilfields of the United States.


**Summary:** Article.


**Summary:** This GSA conference document discusses the potential for production of natural gas from coal seams along the Gulf Coastal Plain.

Warwick, P. D.; Augourg, C. E.; and Willett, J. C., 1999, *Tertiary Coals in South Texas; Anomalous Cannel-Like Coals of Webb County (Claibourn Group, Eocene) and Lignites of Atascosa County (Jackson Group, Eocene); Geologic Setting, Character, Source-Rock and Coal-Bed

**Summary:** USGS Open File Report.


**Summary:** USGS Open File Report that illustrates the location and geology of coalbeds in the Gulf Coastal Plain and their potential for coal seam natural gas production.


**Summary:** USGS Open File Report.


**Summary:** RMAG Report.


**Summary:** Article.


**Summary:** USGS Report.


**Summary:** Symposium Paper.

**Summary:** Report.


**Summary:** DOE Contracted Study.


**Summary:** CGS Report.


**Summary:** AAPG Bulletin.

1467. Wheaton, J. R.; and Lovelace, B. K., *Hydrologic Issues Associated with Coal-Bed Methane Development in Montana*, Reclamation Research Unit.

**Summary:** Report.


**Summary:** Symposium Document.


**Summary:** Symposium Document.

1470. Wieczner, Bilha; and Irvin, Marcia, 1989, *Coalbed Methane Development in Alabama: A*...
Bibliography, available from the Gas Technology Institute as GRI-89/0343.

**Summary:** Bibliography that contains listings of reports on coal seam natural gas development in Alabama. Publication dates range from 1890 through 1989.


**Summary:** Article.


**Summary:** Article.


**Summary:** Article.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Geological Survey of Alabama Circular.

Summary: Geological Survey of Alabama Circular.


Summary: SPE Meeting Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: Symposium Paper.


Summary: AAPG Convention Report.


Summary: AAPG Report.


Summary: AAPG Report.


Summary: This CGS report provides geologic information on the coal seam natural gas resources of the Denver Basin.

**Summary:** Documents the distribution of mappable Cretaceous Fruitland Formation Coals of the San Juan Basin and provides a grid of correlated subsurface cross sections in La Plata County, Colorado.


**Summary:** Article.


**Summary:** Canadian Society of Petroleum Geologists Report.


**Summary:** Wyoming DEQ Report.


**Summary:** WGA Report.


**Summary:** WGA Guidebook.


**Summary:** WOGCC Report.

**Summary:** WSGS Map.


**Summary:** WSGS Map.


**Summary:** WSGS Map.


**Summary:** WSGS / DEQ Report / Map.


**Summary:** Wyoming Water Resources Center Report.


**Summary:** Article.


**Summary:** Symposium Paper.

**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Report.


**Summary:** This GRI report discusses the evaluation of various data bases. This was done to determine the reliability and sufficiency of available information for assessing each of the major unconventional gas resources.


**Summary:** AAPG Report.


**Summary:** Symposium Paper.

**Summary:** Article.


**Summary:** Article.


**Summary:** This SPE conference paper discusses a three-dimensional, multi-well reservoir simulation study on the Cedar Hill field. This study provides insight into the reservoir parameters of the basal Fruitland coals in the northern San Juan basin.


**Summary:** Article.


**Summary:** This SPE conference paper discusses a study of San Juan basin coal seam gas resources. In the study, combinations of key reservoir parameters and operational characteristics were evaluated to provide an understanding of coal seam gas behavior and to better assess the techniques used in recovery of the gas.


**Summary:** Symposium Paper.

**Summary:** This SPE conference paper discusses the significant improvement in gas production from Fruitland coal play in the San Juan basin as a result of open-hole cavity completions.


**Summary:** Article.


**Summary:** Geological Society of China Meeting Paper.


**Summary:** USBM Report.


**Summary:** USBM Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.

**Summary:** This conference paper discusses methods used to estimate reservoir characteristics and to predict the natural gas potential of coal seam wells in the Northern and Central Appalachian basins.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.


**Summary:** Report.


**Summary:** Article.


**Summary:** Symposium Paper.

1530. Zou, Y.; Yang, Q.; Kang, X.; and Tang, D., 2000, *Maturity Control on the Patterns of Hydrocarbon Regeneration from Coal*, from the proceedings of the 2000 Meeting of the Geological Society of
China, Beijing, China, in Papers on Geology of China, available from the Geological Society of China.

**Summary:** Geological Society of China Meeting Paper.


**Summary:** This SPE conference document discusses GRI conducted field evaluations of coal seam natural gas technology at the Rock Creek Project site in Alabama.


**Summary:** Symposium Paper.


**Summary:** Article.


**Summary:** SPE Report.


**Summary:** Symposium Paper.


**Summary:** Symposium Paper.

**Summary:** SPE Short Course.


**Summary:** Article.


**Summary:** Report.


**Summary:** Article.


**Summary:** Symposium Paper.


**Summary:** Article.
Index

The following indexes place the listings from the bibliography into easily recognizable categories. Most of the listings appear in more than one of the indexes.

I

LOCATION

Contains listings that are basin or state specific, or are specific to federal lands (including Indian reservations). Citations appear alphabetically by author/editor and include the title of the work. Refer to the bibliography for more information on the publication.


4. Advanced Resources International Inc., Data Analysis and Reservoir Characterization for Fruitland Coal, Carracas Canyon Unit, San Juan Basin.

5. Affolter, R. H.; Simon, F. O.; and Stricker, G. D., Chemical Analyses of Coal from the Healy, Kenai, Seldovia, and Utokok River 1:250,000 Quadrangles, Alaska.

6. Affolter, R. H.; Hatch, J. R.; Matson, R. E.; and Sauer, L. A., III, Chemical Analyses of Coal from the Tongue River Member, Fort Union Formation, Decker Coal Deposit, Big Horn County, Montana.

7. Affolter, R. H.; Hatch, J. R.; and Culbertson, W. C., Chemical Analyses of Coal from the Tongue River Member, Fort Union Formation, Moorhead and Southeastern Part of the Northward Extension of the Sheridan Coal Fields, Powder River and Big Horn Counties, Montana.


12. State of Alaska, Division of Oil and Gas, Department of Natural Resources, *Coalbed Methane Study*.


25. Ayers, W. B., Jr., *Coal Resources of the Tongue River Member of the Fort Union Formation (Palaeocene), Powder River Basin*.
26. Ayers, W. B.; Ambrose, W. A.; and Yeh, J. S., *Coalbed Methane in the Fruitland formation - Depositional and Structural Controls on Occurrence and Resources*.


28. Ayers, W. B.; and Zellers, S. D., *Geologic Controls on Occurrence and Producibility of Coalbed Methane, Fruitland Formation, North-Central San Juan Basin, New Mexico*.


32. Ayers, W. B., *Methane Production from Thermally Immature Coal, Fort Union Formation, Powder River Basin*.


34. Barker, C. E.; and Pierce, B. S., *Burial History and Coal Petrography of the Ferron Coals, Utah as Factors in Their Variable Coal Bed Gas Content*.


40. Barker, Charles E.; Pierce, Brenda S.; Garrison, James R., Jr.; and van den Bergh, T. C. V., *The Influence of Burial History on the Coalbed Gas Content of Ferron Coals, San Rafael Swell, Utah.*


42. Barker, Charles E.; Biewick, Laura R. H.; Warwick, Peter D.; and San Filipo, John R., *Preliminary Gulf Coast Coalbed Methane Exploration Maps; Depth to Wilcox, Apparent Wilcox Thickness and Vitrinite Reflectance.*


47. Beckstrom, J. A.; and Boyer, D. G., *Aquifer Protection Considerations of Coalbed Methane Development in the San Juan Basin.*


51. Boreck, Donna L.; and Weaver, Jean N., *Coalbed Methane Study of the “Anderson” Coal Deposit, Johnson County, Wyoming; A Preliminary Report.*


54. Bostic, Joy; Brady, Lawrence; Howes, Mary; Burchett, Raymond R.; and Pierce, Brenda S., *Investigations of the Coal Properties and the Potential for Coal-bed Methane in the Forest City Basin*.


56. Boyer, C. M.; Briscoe, F. H.; Camp, B. S.; et al., *Geologic and Reservoir Characterization for the Multiple Coal Seams Completion Project at Rock Creek: Topical Report*.


60. Boyer, C. M., II; Militzer, M. R.; and Schwerer, F. C., *Preliminary Economic Assessment Potential for Producing Methane for the Multiple Coal Seams Completion Project at Rock Creek*.

61. Boyer, C. M., II; Briscoe, F. H.; Camp, B. S.; Dobscha, F. X.; and Malone, P. G., *Rock Creek Methane from Multiple Coal Seams Completion Project. Demonstrated Drilling and Completion Technology for the Multiple Coal Seams Completion Project*.


64. Boyer, C. M., II; and Hirko, N. M., *Rock Creek Methane from Multiple Coal Seams Completion Project. Phase I Test Plan*.

65. Brady, L. L.; and Guy, W. J., *Coal Resources and Coalbed Methane Potential in the Kansas Portion of the Forest City Basin*.

66. Brownfield, M. E.; Affolter, Ronald H.; and Stricker, G. D., *High Chromium Content in Tertiary Coals, Northwestern Washington; A Key to Their Depositional History*.


69. Brunner, D. J.; Carothers, P.; Surowka, J.; Surma, A.; and Schultz, K., *Coalbed Methane Recovery and Electric Power Generation at the Wesola Mine in Myslowice, Poland.*


90. Campbell, F. W.; Hoffman, G. K.; Kottlowski, F. E.; and Arkell, B. W., *Geology and Coal Resources of New Mexico’s Small Coalfields.*

91. Campen, Betsy; and Campen, Ted, *Coalbed Methane in Montana.*


100. Carey, M. A.; Roberts, S. B.; and Clark, A. C., Chemical Analyses for Nine Coal Samples from the Sagwon Member (Tertiary) of the Sagavanirktok Formation, North Slope, Alaska.


103. Carroll, C. J., Correlation of Fruitland Formation Coals and Coalbed Methane Leakage on the West Side of the Southern Ute Reservation, La Plata County, Colorado.

104. Carroll, C. J., Correlation of Producing Fruitland Formation Coals and Coalbed Methane Leakage on the Southern Ute Reservation.


118. Clark, W. F.; and Helmer, T., *Completing, Equipping, and Operating Fruitland Formation Coalbed Methane Wells in the San Juan Basin, New Mexico and Colorado*.

119. Clarkson, C. R.; and Bustin, R. M., *Variation in Micropore Capacity and Size Distribution with Composition in Bituminous Coal of the Western Canadian Sedimentary Basin*.

120. Clarkson, C. R.; and Bustin, R. M., *Variation in Permeability with Lithotype and Maceral Composition of Cretaceous Coals of the Canadian Cordillera*.


122. Clayton, J. L.; Rice, D. D.; and Stanton, R. W., *Geochemical and Geological Controls on Generation and Accumulation of Oil and Gas from Coalbeds, Western United States*.


135. Collett, Timothy S., *Composition and Source of the Gas Associated with Coalbed Gas Production from Coals in Eastern Utah*.

136. Collins, Lesley, *Seridan Area Coal Bed Methane Decision Record Available*.


144. Condon, S. M., *Fracture Patterns in the Ferron Sandstone Member of the Mancos Shale, Western San Rafael Swell and Eastern Wasatch Plateau, East-Central Utah*.


149. Cox, D. O.; Decker, A. D.; and Stevens, S. H., *Analysis of Fruitland Water Production, Treatment and Disposal, San Juan Basin*.

150. Cox, David O., *Coal-Seam Water Production and Disposal, San Juan Basin*.


---

**Natural Gas from Coal Seams** 249

163. Culbertson, W. C.; Hatch, J. R.; and Affloter, R. H., Geology and Coal Resources of the Hanging Woman Creek EMRIA Site, Big Horn and Powder River Counties, Montana.


165. Dallegge, Todd A.; and Barker, Charles E., Coal-bed Methane Gas-In-Place Resource Estimates Using Sorption Isotherms and Burial History Reconstruction; An Example from Ferron Sandstone Member of the Mancos Shale.


171. Dawson, M.; and Kalkreuth, W., Coal Rank and Coalbed Methane Potential of Cretaceous/Tertiary Coals in the Canadian Rocky Mountain Foothills and Adjacent Foreland.


175. DeBruin, R. H.; Lyman, R. M.; Jones, R. W.; and Cook, L. W., Coalbed Methane in Wyoming.

176. DeBruin, R. H., Oil and Gas Field Map of the Powder River Basin.

177. DeBruin, R. H., Oil and Gas Field Maps of Southeastern Wyoming Basins.


---

**Natural Gas from Coal Seams**

251


199. Duigon, Mark T.; and Smigaj, Michael J., *First Report on the Hydrologic Effects of Underground Coal Mining in Southern Garrett County, Maryland.*


201. Ellard, J. S.; Roark, R. P.; and Ayers, W. B., *Geologic Controls on Coalbed Methane Production: An Example from the Pottsville Formation, Black Warrior Basin, Alabama.*


203. Ellis, M. S.; Gunther, G. L.; Ochs, A. M.; Schuenemeyer, J. H.; Power, H. C.; Stricker, G. D.; and Blake, Dorsey, *Coal Resources, Greater Green River Basin, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*

204. Ellis, M. S.; Gunther, G. L.; Ochs, A. M.; Cararoc, V. V.; Schuenemeyer, J. H.; Power, H. C.; Stricker, G. D.; and Blake, Dorsey, *Coal Resources of the Hanna and Carbon Basins, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*


207. Ellis, M. S.; Keighin, C. W.; Gunther, G. L.; Flores, R. M.; Stricker, G. D.; Roberts, S. B.; Ochs, A. M.; and Bader, L. R., *Constraints on Coal Resource Estimation; A Depositional Perspective.*


Ellis, M. S.; Flores, R. M.; Ochs, A. M.; Stricker, G. D.; Gunther, G. L.; Rossi, G. S; Bader, L. R.; Schuenemeyer, J. H.; and Power, H. C., *Gillette Coalfield, Powder River Basin; Geology, Coal Quality, Coal Resources, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*

Ellis, M. S.; Flores, R. M.; Ochs, A. M.; Stricker, G. D.; Gunther, G. L.; Rossi, G. S; Bader, L. R.; Schuenemeyer, J. H.; and Power, H. C., *Sheridan Coalfield, Powder River Basin; Geology, Coal Quality, Coal Resources, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*


Enever, J. R. E.; and Hennig, A., *The Relationship Between Permeability and Effective Stress for Australian Coals and Its Implications with Respect to Coalbed Methane Exploration and Reservoir Modelling.*


Fahy, M. F., *Warrior Basin Coalbed Fractured Reservoir Characterization.*


223. Fassett, J. E. ed., *Geology and Coal-Bed Methane Resources of the Northern San Juan Basin, Colorado and New Mexico*.


226. Fassett, James E., *The Mystery of the Escaping Gas; Forensic Geology in the Northern San Juan Basin, La Plata County, Colorado*.

227. Fassett, James E., *Once a Menace, Now a Burgeoning Source of Energy; Coalbed Methane in the Warrior and San Juan Basins*.

228. Fassett, James E., *Subsurface Correlation of Late Cretaceous Fruitland Formation Coal Beds in the Pine River, Florida River, Carbon Junction, and Basin Creek Gas-Seep Areas, La Plata County, Colorado*.


231. Fields, H. H.; Cervik, J.; and Goodman, T. W., *Degasification and Production of Natural Gas from an Air Shaft in the Pittsburgh Coalbed*.


234. Finch, Steven T., Jr., *Fracture and Methane-Contamination Study: Animas River Valley from Bondad, Colorado to Cedar Hill, New Mexico*.


254 *Natural Gas from Coal Seams*

Flores, R. M.; Ochs, A. M.; Bader, L. R.; Johnson, R. C.; and Vogler, D., *Framework Geology of the Fort Union Coal in the Powder River Basin, 1999 Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*

Flores, R. M., *Geology and Coal Bed Methane Resources of the Fort Union Formation, Powder River Basin, Wyoming*

Flores, R. M.; Bader, L. R., *A Summary of Tertiary Coal Resources of the Raton Basin, Colorado and New Mexico*

Flores, Romeo M.; Moore, Timothy A.; Stanton, Ronald W.; and Stricker, Gary D., *Textural Controls on Coalbed Methane Content in the Subbituminous Coal of the Powder River Basin*


Forgotson, J. M.; and Friedman, S. A., *Arkoma Basin (Oklahoma) Coal-bed Methane Resource Base and Development*

Foster, James B., *Fresh and Saline Ground-Water Map of West Virginia*

Friedman, S. A., *Coal-bed Methane Resources in Arkoma Basin, Southeastern Oklahoma*

Friedman, S. A., *Coal-bed Methane Resources and Reserves of Osage County, Oklahoma*

Friedman, S. A., *Determination of Reserves of Methane from Coal Beds for Use in Rural Communities in Eastern Oklahoma*

Friedman, S. A., *Fracture and Structure of Principal Coal Beds Related To Coal Mining and Coalbed Methane, Arkoma Basin, Eastern Oklahoma*

Friedman, S. A., *Investigations of the Coal Reserves in the Ozarks Section of Oklahoma and Their Potential Uses*

Friedman, Samuel A.; and Sawyer, K. C., *Map of Eastern Oklahoma Showing Locations of Active Coal Mines, 1977-79*

Friedman, Samuel A.; and Woods, Ronald J., *Map Showing Potentially Strippable Coal Beds in Eastern Oklahoma*

Ganow, H. C., *In Situ Coal Gasification at the Hoe Creek, Wyoming Field Site - An Overview*
Garcia-Gonzalez, Mario; MacGowan, Donald B.; and Surdam, Ronald C., *Coal as a Source Rock of Petroleum and Gas: A Comparison Between Natural and Artificial Maturation of the Almond Formation Coals, Greater Green River Basin in Wyoming.*

Garrison, James R., Jr.; van den Bergh, T. C. V.; Barker, Charles E.; and Tabet, David E., *Depositional Sequences Stratigraphy and Architecture of the Cretaceous Ferron Sandstone; Implications for Coal and Coalbed Methane Resources; A Field Excursion.*

Gas Research Institute, *Arkoma Basin, Oklahoma and Arkansas.*

Gas Research Institute, *Cherokee Basin, Kansas and Oklahoma.*

Gas Research Institute, *Coalbed Methane: GRI Changes the Way Industry Does Business in Alabama.*

Gas Research Institute, *Coalbed Methane Potential of the U. S. Rocky Mountain Region.*

Gas Research Institute, *Treating Produced Waters in the San Juan Basin With the Freeze-Thaw/Evaporation Process.*

Gas Research Institute, *Western Interior Coal Region (Arkoma, Cherokee, and Forest City Basins).*

Gilles, Alex; and Snygg, Arnold, *Development of Technology for Coalbed Methane Recovery Program Planning. Appendix A, Technology Options.*

Gloyn, Robert W.; and Sommer, Steven N., *Exploration for Coalbed Methane Gains Momentum in Uinta Basin.*


269. Grau, R. H., III, Results of an Eight Year Methane Drainage Project from Horizontal Holes in the Pittsburgh Coalbed.


271. GRID, Gas Supply: Coalbed Methane Research Extends to Appalachian Basin.


276. Gurney, J., Ample Reserves but Poor Prospects for U. S. Oil and Gas.


282. Harris, Steven C.; Mettee, Maurice F.; and O’Neil, Patrick E., Coalbed Methane Development in Alabama: Biological and Hydrological Conditions of Streams Draining the Cedar Cove Degasification Field.


287. Hawkins, W. B.; Groshong, R. H.; and Pashin, J. C., *Normal Faults Along the Southwestern Margin of the Alabama Promontory; Multiple Episodes of Paleozoic Activity.*


293. Hemish, LeRoy A., *Coal Geology of McIntosh County, Oklahoma.*


296. Hemish, LeRoy A., *Coal Geology of Rogers County and Western Mayes County, Oklahoma.*


299. Hemish, LeRoy A., *Coalescence of the Secor and Secor Rider Coal Beds in the Shady Grove Creek Area, Northeastern McIntosh County, Oklahoma, with Interpretations Concerning Depositional Environments.*


**Natural Gas from Coal Seams**

259
316. Hildebrand, Ricky T., *Ground-water Composition as an Indicator of Sodium Content in Coal in the Powder River Basin, Southeastern Montana and Northeastern Wyoming*.


260
331. Hughes, J. D.; Dawson, F. M.; Duggan, J.; Hallas, D. F.; Khitrova, G.; Marchioni, d. L.; Richardson, R.; and Wynne, D., *Regional Analysis of the Ardley Coal Zone, Alberta, for Coalbed Methane Production and CO₂ Sequestration.*

332. Hunt, A. M.; and Steele, Derek J., *Coalbed Methane Development in the Appalachian Basin.*

333. Hunt, A. M.; and Steele, Derek J., *Coalbed Methane Development in the Northern and Central Appalachian Basins - Past, Present and Future.*


351. Johnson, R. C.; and Rice, D. D., Composition and Origins of Shallow (<1,000 ft) Coalbed Gasses, Wind River Reservation, Wyoming.


353. Johnson, Ronald C.; and Flores, Romeo M., Developmental Geology of Coalbed Methane from Shallow to Deep in Rocky Mountain Basins and in Cook Inlet-Matanuska Basins, Alaska, USA and Canada.

354. Johnson, R. C., Geologic History and Hydrocarbon Potential of Late Cretaceous-Age, Low-Permeability Reservoirs, Piceance Basin Western Colorado.


356. Johnson, Ronald C.; Barker, Charles E.; Pawlewicz, Mark J.; Crysdale, Bonnie L.; Clark, Arthur C.; and Rice, Dudley D., Preliminary Results of a Coalbed Methane Assessment of the Wind River Indian Reservation, Wyoming.


386. Kirschbaum, Mark A.; Roberts, Laura N. R.; and Biewick, Laura R. H., *Geologic Assessment of Coal in the Colorado Plateau; Arizona, Colorado, New Mexico, and Utah*.


392. Lamarre, Robert, *Coalbed Methane Stratigraphic Traps in Ferron Coals of East-Central Utah*.


395. Lamarre, Robert A.; and Pratt, Timothy J., *Reservoir Characterization Study: Calculation of Gas-in Place in Ferron Coals at Drunkard's Wash Unit, Carbon County, Utah.*


397. Lambert, S. W.; Saulsberry, J. L.; and Reeves, S. R., *Coalbed Methane Production Improvement/Recompletion Project in the Warrior Basin.*


399. Lambert, S. W.; and Trevits, M. A., *The Feasibility of No-Propant Stimulation to Enhance Removal of Methane from the Mary Lee Coalbed.*

400. Lambert, S. W.; Saulsberry, J. L.; Steidl, P. F.; Conway, M. W.; and Spafford, S. D., *Fracturing Experience at the Rock Creek Multiple Coal Seams Project.*

401. Lambert, S. W.; Niederhofer, J. D.; and Reeves, S. R., *Multiple Coal Seam Well Completion Experience in the Deerlick Creek Field, Black Warrior Basin, Alabama.*

402. Lambert, S. W.; Graves, S. L.; and Jones, A. H., *Warrior Basin Drilling and Stimulation.*


405. Langenberg, W., *Coalification Patterns and Coalbed Methane Potential in the Cadomin Area, Alberta, Canada.*

406. Larsen, Veryl E.; and Merry, Ray D., *Geologic Investigation of the Methane Potential of Western U. S. Coal Beds.*


408. Larson, L. R., *Coal-Spoil and Ground-Water Chemical Data from Two Coal Mines; Hanna Basin and Powder River Basin, Wyoming.*


412. Laubach, S. E.; Tyler, Roger; Tremain, C. M.; Grout, M. A.; and Ambrose, W. A., *Fracture Patterns in Coal in the Western United States; Observations and Implications for Development of Coalbed Methane Resources.*

413. Laubach, S. E.; and Tremain, C. M., *Fracture Swarms: Potential Targets for Methane Exploration in Upper Cretaceous Sandstone and Coal, Northern San Juan Basin.*

414. Laubach, S. E.; Tyler, Roger; Ambrose, W. A.; Tremain, C. M.; and Grout, M. A., *Preliminary Map of Fracture Patterns in Coal in the Western United States.*

415. Law, B. E.; Barnum, B. E.; and Wollenzien, T. P., *Coal Bed Correlations in the Tongue River Member of the Fort Union Formation, Monarch, Wyoming and Decker, Montana.*

416. Law, B. E., *Coal Deposits of the Emery Coal Zone, Henry Mountains Coal Field, Garfield and Wayne Counties, Utah.*


419. Law, B. E., *Geologic Map and Coal Deposits of the Gillette West Quadrangle, Campbell County, Wyoming.*

420. Law, B. E., *Geophysical Logs of Test Holes from the Henry Mountains Coal Field, Garfield and Wayne Counties, Southeastern Utah.*

421. Law, B. E.; and Grazia, S. L., *Preliminary Geologic Map and Coal Resources of the Decker Quadrangle, Big Horn County, Montana.*

422. Law, B. E., *Surface Coal Sections in the Emery Coal Zone, Henry Mountains Coal Field, Garfield and Wayne Counties, Utah.*


424. Laxminarayana, Chikatamarla; and Crosdale, Peter J., *Controls on Methane Sorption Capacity of Indian Coals.*


429. Lewis, R. T., *Coalbed Methane Production of the Buck Knob Anticline Field, Wise County, Virginia*.

430. Lindsey, P.; Campbell, R. N.; Moore, T. A.; and Ferm, J. C., *Lithological Types and Environmental Characteristics of the Waikato Coal Measures, New Zealand*.


432. Logan, Terry L., *Baseline Stimulation Results for a Deep Coal Seam at the Red Mountain Unit, Piceance Basin, Colorado*.

433. Logan, T. L., *Coalbed Methane; 6, Western Basins Dictate Varied Operations*.


437. Logan, T. L., *Horizontal Drainhole Drilling Techniques Used in Rocky Mountain Coal Seams*.


443. Lyman, R. M.; DeBruin, R. H.; Harris, R. E.; and Hausel, W. D., Wyoming.


446. Lyons, Paul C., *The Central and Northern Appalachian Basin; A Frontier Region for Coalbed Methane Development.*

447. Lyons, Paul C., *Central-Northern Appalachian Coalbed Methane Flow Grows.*

448. Lyons, Paul C., *Coalbed Methane Potential in the Appalachian States of Pennsylvania, West Virginia, Maryland, Ohio, Virginia, Kentucky, and Tennessee; An Overview.*

449. Lyons, Paul C.; and Ryder, Robert T., *Selected Bibliography of Appalachian Coalbed Methane.*


455. Maoyuan, Sun; and Shengchu, Huang, *Programs, Policies and Laws to Promote the Development of Coalbed Methane in China.*


465. Mastalerz, M.; and Kvale, E. P., *Coalbed Gas Potential in Illinois Basin Based on Recent Data from Indiana.*


467. Mavor, M.; Pratt, T. J.; Crandlemire, A.; and Ellerbrok, G., *Assessment of Coalbed Methane Resources at the Donkin Mine Site, Cape Breton, Nova Scotia, Canada.*


475. Mavor, Matt J.; Britton, Randy; Close, Jay C.; Dern, Robert R., Jr.; Dhir, Rahul; Logan, Terry; Marshall, Rick; and Pratt, Tim, *Western Cretaceous Coal Seam Project: Economic and Reserve Evaluation of the San Juan Basin, Fruitland Formation Coalbed Natural Gas Reservoirs.*


481. Mavor, M. J.; Close, J. C.; and Pratt, T. J., Western Cretaceous Coal Seam Project: Summary of the Completion Optimization and Assessment Laboratory (COAL) Site.


488. McKinnon, I., Canadian Coalbed Methane.

489. McLellan, M. W.; and Biewick, L. H., Geologic Map of the Bloom Creek Quadrangle, Powder River County, Montana.

490. McPherson, Malcomb J.; and Harpalani, Satya, Permeability and Sorption Tests on Coal.


495. Meissner, F. F., *Cretaceous and Lower Tertiary Coals as Source for Gas Accumulations in the Rocky Mountain Area*.

496. Meissner, F. F.; and Thomasson, R., *Exploration Opportunities in the Greater Rocky Mountain Region, Central Western, U.S.A.*

497. Meissner, F. F., *Mechanisms and Patterns of Gas Generation, Storage Expulsion-migration and Accumulation Associated with Coal Measures, Green River and San Juan Basins, Rocky Mountain Region, USA*.


503. Mitcham, S. A.; and Wobeser, G., *Effects of Coalbed Methane Development on the Water-Quality and Fish and Benthic Invertebrate Communities of the Big Sandy Creek Drainage System, Alabama*.


Murphy, Edward C.; and Goven, Gerald E., *The Coalbed Methane Potential of North Dakota Lignites.*


Murrie, G. W., *Coal and Gas Resources of the Lower Hartshorne Coalbed in LeFlore and Haskell Counties, Oklahoma.*

Muthukumarappan, R.; Rogers, R. E.; and Weida, D., *Analysis of the Success of Cavity Completions in the Fairway Zone of the San Juan Basin.*


Nelson, Charles R., *New Methods for Coalbed Reservoir Gas-In-Place Analysis: Results from Case Studies in the San Juan, Powder River, Black Warrior and Central Appalachian Basins.*


525. Niederhofer, J. D.; and Lambert, S. W., *Lease Operating Expenses for Multiple-Zone Completion Wells, Black Warrior Basin, Alabama.*

526. Nielsen, P. E.; and Hanson, M. E., *Analysis and Implications of Three Fracture Treatments in Coal at the USX Rock Creek Site Near Birmingham, Alabama.*


532. *Oil & Gas Journal,* *Deeper Wildcatting Under Way in Two New Mexico Areas.*

533. *Oil & Gas Journal,* *Infill Drilling Land Use Issues Heat in SW Colorado.*

534. *Oil & Gas Journal,* *Large Alberta Coalbed Methane Program Launched.*


536. *Oil & Gas Journal,* *New Mexico Raton Basin Coalbed Methane Development Resumes.*

537. *Oil & Gas Journal,* *Two British Columbia Basins May be Opened for Exploration.*


539. Oklahoma Corporation Commission, *Depth to Base of Treatable Water Map Series.*


O’Neil, Patrick E.; Harris, Steven C.; Mettee, Maurice F.; Isaacson, H. Ronald; and Evans, James M., *Biological Fate and Effect of Coalbed Methane Produced Waters Discharged into Streams of the Warrior Basin, Alabama.*


O’Neil, Patrick E.; Mettee, Maurice F.; and Harris, Steven C., *Coalbed Methane Development in Alabama: Biological and Hydrological Conditions of Streams Draining the Cedar Cove Degasification Field.*

O’Neil, P. E.; and Harris, S. C., *Development of an Instream Bioassessment Methodology for the Surface Disposal of Coalbed Methane Produced Waters.*

O’Neil, Patrick E.; Harris, Steven C.; Mettee, Maurice F.; McGregor, Stuart W.; and Shepard, Thomas E., *Long-Term Biomonitoring of a Produced Water Discharge from the Cedar Cove Degasification Field, Alabama.*


Ortiz, Isais; Weller, T. F.; Anthony, R. V.; Frank, James; Linz, David G.; and Nakles, David V., *Disposal of Produced Waters: Underground Injection Option in the Black Warrior Basin.*


555. Osmonson, L. M.; Rohrbacher, T. J.; Molnia, C. L.; and Sullivan, G. L., *Coal Recoverability in the Hilight Quadrangle, Powder River Basin, Wyoming; A Prototype Study in a Western Coal Field.*


562. Palmer, I. D., *Induced Stresses Due to Propped Hydraulic Fracture in Coalbed Methane Wells.*


567. Pashin, Jack C.; and Hinkle, Frank, *Coalbed Methane in Alabama.*


569. Pashin, J. C.; and Carroll, R. E., *Day 1 Road Log; Stop 5, Nunnally and Harkness Coal Zones at Grant’s Mill.*


574. Pashin, J. C.; and Carroll, R. E., Geology of the Cahaba Coalfield.


576. Pashin, Jack C.; Carroll, Richard E.; Hatch, Joseph R.; and Goldhaber, Martin B., Mechanical and Thermal Control of Cleating and Shearing in Coal; Examples from the Alabama Coalbed Methane Fields.

577. Pashin, J. C.; and Carroll, R. E., Origin of the Pottsville Formation (Lower Pennsylvanian) in the Cahaba Synclinorium of Alabama: Genesis of Coalbed Reservoirs in a Synsedimentary Foreland Thrust System.

578. Pashin, J. C., Productivity of Coalbed Methane Wells in Alabama.

579. Pashin, J. C., Regional Analysis of the Black Creek-Cobb Coalbed-Methane Target Interval, Black Warrior Basin, Alabama.


581. Pashin, J. C., Stratigraphy and Structure of the Pottsville Formation in the Cahaba Coalfield.

582. Pashin, J. C.; and Groshong, R. H., Jr., Structural Control of Coalbed Methane Production in Alabama.


594. Picciano, Laura, *Gas Research Institute’s Appalachian Basin Research: Selected Bibliography*.

595. Picciano, Laura; and Sole, Linda S., *San Juan Basin Bibliography: Selected References*.

596. Pierce, Brenda, *Coalbed Methane in the Forest City Basin*.


606. Ramurthy, M.; Weida, D.; and Rogers, R. E., Analysis of the Success of Cavity Completions in the Fairway Zone of the San Juan Basin.


608. Reeves, S. R.; Lambert, S. W.; and Zuber, M. D., A Field Derived Inflow Performance Relationship for Coalbed Gas Wells in the Black Warrior Basin.


612. Rice, Cynthia A.; and Nuccio, Vito, Water Produced with Coalbed Methane.

613. Rice, C.A., Waters Co-Produced with Coalbed Methane from the Ferron Sandstone in East-Central Utah.


616. Rice, Dudley D.; and Threlkeld, Charles N., Comparison of Natural Gases Produced from Upper Cretaceous Fruitland Formation Coal Beds and Adjacent Reservoirs, San Juan Basin, New Mexico and Colorado.


627. Roberts, R. D., *Coalbed Methane Development: A Land Owner’s Prospective*.

628. Roberts, S. B.; Clark, A. C.; and Carey, M. A., *Analyses of Seven Core Samples from Two Tertiary Coal Beds in the Sagwon Member of the Sagavanirktok Formation, North Slope, Alaska*.


633. Roberts, S. B.; Gunther, G. L.; Taber, T. T.; Ochs, A. M.; Blake, Dorsey; Ellis, M. S.; Stricker, G. D.; Wilde, Edith M.; Schuenemeyer, J. H.; and Power, H. C., Decker Coalfield, Powder River Basin, Montana; Geology, Coal Quality, and Coal Resources, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.

634. Roberts, S. B.; and Bossiroy, Dominique, Stratigraphy and Coal Geology of the Lower Part of the Fort Union Formation in the Grass Creek Coal Mine Area, Southeastern Bighorn Basin, Wyoming.

635. Roberts, S. B.; and Stanton, R. W., Stratigraphy and Depositional Setting of Thick Coal Beds in the Grass Creek Coal Mine, Southeastern Bighorn Basin, Wyoming.

636. Roberts, S. B.; and Rossi, G. S., A Summary of Coal in the Coalmont Formation (Tertiary), North Park Basin, Colorado, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.

637. Roberts, S. B.; and Rossi, G. S., A Summary of Coal in the Fort Union Formation (Tertiary), Bighorn Basin, Wyoming and Montana, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.

638. Robinson, L. N.; Culbertson, W. C.; and Affolter, R. H., Geology, Coal Resources, and Coal Quality of the Prairie Dog Creek EMRIA Study Area, Rosebud County, Montana.

639. Robson, S. G.; and Wright, Winfield G., Ground-Water Resources of the Florida Mesa Area, La Plata County, Colorado.


641. Roybal, G. H.; Anderson, O. J.; and Beaumont, E. C., eds., Coal Deposits and Facies Changes Along the Southwestern Margin of the Late Cretaceous Seaway, West-Central New Mexico.

642. Sakashita, Bruce J.; and Seccomb, James C., Preliminary Economic Assessment of the Commercial Potential for Deep Coalbed Methane Production from the Red Mountain Unit, Piceance Basin, Colorado.

643. Sanfilipo, John R.; Barker, Charles E.; Stanton, Ron W.; Warwick, Peter D.; and Morris, Loyd E., A Shallow Coal-bed Methane Show in the Gulf Coast of Texas, Indication of Down-dip Commercial Potential?


649. Schraufnagel, Richard A.; Saulsberry, J. L.; and Lambert, S. W., *Gas Production from Multiple Wells at Rock Creek*.

650. Schraufnagel, R. A., *Multiple Seam Completion and Production Experience at Rock Creek*.

651. Schraufnagel, R. A.; Lambert, S. W.; Stubbs, P. B.; Dobscha, F. X.; and Boyer, C. M., II, *The Rock Creek Field Laboratory - A Project Update*.


656. Scott, A. R., *Coal and Coalbed Methane Resources of Texas*.


668. Serov, V. I., *Economical Aspects of Coalbed Methane Extraction and Utilization by Coal Mines in the CIS.*


670. Shepard, Thomas E.; O’Neil, Patrick E.; Harris, Steven C.; and McGregor Stuart W., *Effects of Coalbed Methane Development on the Water-Quality and Fish and Benthic Invertebrate Communities of the Big Sandy Creek Drainage System, Alabama.*

671. Shi, J. Q.; and Durucan, S., *Identifying the Key Factors Controlling Openhole Cavity Completions at the San Juan Basin - A Numerical Study.*

672. Shirley, Kathy, *Maverick Has Potential Chat Sparks Texas Coal Gas Play.*


678. Snyder, G. T.; Fehn, U.; Riese, W. C.; Franks, S. G.; and Moran, J. E., *Paleohydrology of a Coal Bed Methane Reservoir: I-29 and CI-36 Results for the Fruitland Formation, CO.*

679. Spafford, S. D.; and Stubbs, P. B., *Reservoir Pressure Profiles and Desorption Estimates for the Mary Lee Coal Group Based on Monitor Well Data at the Rock Creek Project.*
680. Spafford, S. D., *Stimulating Multiple Coal Seams at Rock Creek with Access Restricted to a Single Seam.*

681. Sparks, D. P.; Lambert, S. W.; and McLendon, T. H., *Coalbed Gas Well Flow Performance Controls, Cedar Cove Area, Warrior Basin, U.S.A.*


685. Staub, J. R., *Reservoir Sequences in the Coal Beds of Southern West Virginia.*


688. Steidl, P. F., *Observations of Induced Fractures Intercepted by Mining in the Warrior Basin, Alabama. Rock Creek Methane From Multiple Coal Seams Completion Project.*


692. Stevenson, R., *Thoresby Colliery Outbursts; A Lesson Learned.*

693. Stoeckinger, W. T., and Brady, L. L., *Coalbed Methane Potential in Eastern Kansas.*


701. Stricker, G. D.; and Ellis, M. S., Coal Quality and Geochemistry, Greater Green River Basin, Wyoming, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.

702. Stricker, G. D.; and Ellis, M. S., Coal Quality and Geochemistry, Hanna and Carbon Basins, Wyoming, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.


704. Stricker, Gary D.; and Ellis, Margaret S., Laramide Tectonism and Paleogeography; Their Effects on Quality and Hazardous Air Pollutant Trace Element Trends in Rocky Mountain Province Paleocene Coals.

705. Stricker, G. D.; Flores, R. M.; and Ochs, A. M., Powder River Basin Coalbed Methane; The USGS Role in Investigating This Ultimate Clean Coal By-production.


707. Sun, M.; and Fan, Z., China’s Coalbed Methane Industry Development Can Benefit from U.S. Example.

708. TRW, Inc., Summary of Geologic Features of Selected Coal-Bearing Areas of the United States.

709. Tabet, D. E.; and Quick, J. C., Extension of the Hams Fork Coal Region, Summit County, Utah; Potential Coalbed Gas.


711. Takla, G.; and Vavrusak, Z., Coal Seam Emissions from Ostrava-Karvina Collieries in the Czech Republic During Mining and After Mines Closure.


720. Tewalt, S. J.; and Halili, N. E., *Arsenic in the Coal Beds and Surface Waters of the Warrior Basin, Western Alabama.*


723. Thomasson, M. Ray; and Meissner, Fred F., *US Rockies ‘Discoveries’: Analogs for the Future.*


727. Tremain, C. M.; Laubach, S. E.; and Whitehead, N. H., III, *Coal Fracture (Cleat) Patterns in Upper Cretaceous Fruitland Formation Coal Seams, San Juan Basin.*


734. Tyler, R.; Laubach, S. E.; Ambrose, W. A.; Tremain, C. M.; and Grout, M. A., *Coal Fracture Patterns in the Foreland of the Cordilleran Thrust Belt, Western United States.*


740. Tyler, Roger; Laubach, S. E.; Ambrose, W. A.; Grout, M. A.; and Tremain, C. M., *Face-Cleat Patterns in Rocky Mountain Foreland Basins, Western United States; Permeability Indicators for Coalbed Methane.*


752. Van Voast, Wayne A., *Fracture Patterns in Coal in the Western United States; Observations and Implications for Development of Coalbed Methane Resources.*


756. Vo, D. T.; Ohaeri, C. U.; and Montoya, G. L., *Pressure Buildup Analysis of Early-Time Data from Coalbed Methane Wells in the Rincon Unit, San Juan Basin, New Mexico.*


761. Warwick, P. D.; SanFilipo, J. R.; Barker, Charles E.; and Morris, L. E., *Coal-bed Methane in the Gulf Coastal Plain; A New Frontier*?


764. Warwick, Peter D.; Barker, C. E.; SanFilipo, John R.; and Morris, L. E., *Preliminary Results from Coal-bed Methane Drilling in Panola County, Texas*.

765. Warwick, P. D.; Augourg, C. E.; and Willett, J. C., *Tertiary Coals in South Texas; Anomalous Cannel-Like Coals of Webb County (Claiborne Group, Eocene) and Lignites of Atascosa County (Jackson Group, Eocene); Geologic Setting, Character, Source-Rock and Coal-Bed Methane Potential*.

766. Weaver, J. N.; Gruber, J. R., Jr., *Coal and Coal Bed Methane Resources of the Absaroka - Beartooth Study Area*.


771. Wieczner, Bilha; and Irvin, Marcia, *Coalbed Methane Development in Alabama: A Bibliography*.

772. Williams, Peggy, *CBM in the Piceance Basin*.

773. Williams, Peggy, *Coalbed Methane in the Cherokee Basin*.
774. Willis, C., *Rocky Mountain Coal Seams Call for Special Drilling Techniques*.


780. Wray, L. L., *Raster Image Correlations of Surface and Sub-Surface Late Cretaceous Fruitland Formation Coals in the Northern San Juan Basin, La Plata County, Colorado*.

781. Wyman, R. E., *Gas Resources in Elmworth Coal Seams*.


786. Wyoming Water Resources Center, University of Wyoming, *A Study of Techniques to Assess Surface and Groundwater Impacts Associated with Coal Bed Methane and Surface Coal Mining: Little Thunder Creek Drainage, Wyoming*.


---

**Natural Gas from Coal Seams** 289

791. Young, Genevieve, *Coal Reservoir Characteristics from Simulation of the Cedar Hill Field, San Juan Basin.*


Contains listings of works that address coal mining and coalbed methane issues. Citations appear alphabetically by author/editor and include the title of the work. Refer to the bibliography for more information on the publication.

2. Ayers, W. B., Jr., *Coal Resources of the Tongue River Member of the Fort Union Formation (Palaeocene), Powder River Basin, Wyoming and Montana*.
8. Bertard, C.; Bruyet, B.; and Gunther, J., *Determination of Desorbable Gas Concentration of Coal (Direct Method)*.
13. Brady, L. L.; and Guy, W. J., *Coal Resources and Coalbed Methane Potential in the Kansas Portion of the Forest City Basin*.


49. Diamond, W. P.; McCulloch, C. M.; and Bench, B. M., *Use of Surface Joint and Photolinear Data for Predicting Subsurface Coal Cleat Orientation.*
50. Diessel, Claus, *Sequence Stratigraphy Applied to Coal Seams; Two Case Histories*.


52. Draffin, C. W.; et al, *Underground Coal Conversion - Program Description*.

53. Duigon, Mark T.; and Smigaj, Michael J., *First Report on the Hydrologic Effects of Underground Coal Mining in Southern Garrett County, Maryland*.


55. Ellis, M. S.; Gunther, G. L.; Ochs, A. M.; Schuenemeyer, J. H.; Power, H. C.; Stricker, G. D.; and Blake, Dorsey, *Coal Resources, Greater Green River Basin, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*.

56. Ellis, M. S.; Gunther, G. L.; Ochs, A. M.; Cararoc, V. V.; Schuenemeyer, J. H.; Power, H. C.; Stricker, G. D.; and Blake, Dorsey, *Coal Resources of the Hanna and Carbon Basins, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*.


59. Ellis, M. S.; Flores, R. M.; Ochs, A. M.; Stricker, G. D.; Gunther, G. L.; Rossi, G. S; Bader, L. R.; Schuenemeyer, J. H.; and Power, H. C., *Gillette Coalfield, Powder River Basin; Geology, Coal Quality, Coal Resources, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*.

60. Ellis, M. S.; Flores, R. M.; Ochs, A. M.; Stricker, G. D.; Gunther, G. L.; Rossi, G. S; Bader, L. R.; Schuenemeyer, J. H.; and Power, H. C., *Sheridan Coalfield, Powder River Basin; Geology, Coal Quality, Coal Resources, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*.


---

294 **Natural Gas from Coal Seams**


68. Fassett, James E., *Coal-bed Methane; A Contumacious, Free-spirited Bride; The Geologic Handmaiden of Coal Beds*.

69. Fields, H. H.; Cervik, J.; and Goodman, T. W., *Degasification and Production of Natural Gas from an Air Shaft in the Pittsburgh Coalbed*.

70. Fields, H. H.; et al, *Degasification of Virgin Pittsburgh Coalbed Through a Large Borehole*.


73. Flores, R. M., *Creation of Digital Databases and Derivative Products for Coal and Coalbed Methane Resource Assessment; A Short Course*.


76. Friedman, S. A., *Fracture and Structure of Principal Coal Beds Related To Coal Mining and Coalbed Methane, Arkoma Basin, Eastern Oklahoma*.

77. Friedman, S. A., *Investigation of the Coal Reserves in the Ozarks Section of Oklahoma and Their Potential Uses*.


83. Garrison, James R., Jr.; van den Bergh, T. C. V.; Barker, Charles E.; and Tabet, David E., *Depositional Sequences Stratigraphy and Architecture of the Cretaceous Ferron Sandstone; Implications for Coal and Coalbed Methane Resources; A Field Excursion.*

84. Gas Research Institute, *Survey of Coal Industry Programs for Utilization of Methane from Coal Seams.*


87. Grau, R. H., III, *Results of an Eight Year Methane Drainage Project from Horizontal Holes in the Pittsburgh Coalbed.*


91. Hemish, LeRoy A., *Coal Geology of McIntosh County, Oklahoma.*


94. Hemish, LeRoy A., *Coal Geology of Rogers County and Western Mayes County, Oklahoma.*


97. Hemish, LeRoy A., *Coalescence of the Secor and Secor Rider Coal Beds in the Shady Grove Creek Area, Northeastern McIntosh County, Oklahoma, with Interpretations Concerning Depositional Environments.*


105. Hemish, LeRoy A.; and Beyma, Kenneth N., *A Stratigraphic and Structural Study of the Eram Coal and Associated Strata in Eastern Okmulgee County and Western Muskogee County, Oklahoma.*


107. Herring, J. R.; and Dean, W. E., *Methane Fluxes from Coal Rank Increase and Natural Coal Fires.*


134. Kline, R. J.; Mokwa, L. P.; and Blankenship, P. W., *Island Creek Corporation’s Experience with Methane Degasification*.


140. Kumar, P.; and Lochan, Rajiw, *Mine Related Coalbed Methane Recovery & Utilization Project in India*.


144. Leighfield, K. G., *Coal as an Energy Resource*.

145. Li, L.; and Tang, F., *Two Kinds of Nontraditional Mining Technology*.


149. Lyman, R. M., *Minerals Update; Coal Update*.

151. McCulloch, C. M.; Deul, M.; and Jeran, P. W., *Cleat in Bituminous Coalbeds*.

152. McCulloch, C. M.; Lambert, S. W.; and White, J. R., *Determining Cleat Orientation of Deeper Coalbeds from Overlying Coals*.


162. Murrie, G. W., *Coal and Gas Resources of the Lower Hartshorne Coalbed in LeFlore and Haskell Counties, Oklahoma*.


166. Ogha, Kotaro; Higuchi, Kiyoshi; Shimada, Souhei; and Deguchi, Gotai, *Evaluation of Methane Drainage from Mining Panel*.

167. Ogha, Kotaro; Shimada, Souhei; Ishii, Eiji; Tamari, Akira, *Gas Drainage Control of Deep Coal Seams*.
168. Ohga, K.; and Higuchi, K., *Utilization of Methane and Injection of Carbon Dioxide into Abandoned Coal Mines.*


173. Oyler, D. C.; and Diamond, W. P., *Drilling a Horizontal Coalbed Methane Drainage System from a Directional Surface Borehole.*


183. Roberts, S. B.; and Bossiroy, Dominique, Stratigraphy and Coal Geology of the Lower Part of the Fort Union Formation in the Grass Creek Coal Mine Area, Southeastern Bighorn Basin, Wyoming.

184. Roberts, S. B.; and Stanton, R. W., Stratigraphy and Depositional Setting of Thick Coal Beds in the Grass Creek Coal Mine, Southeastern Bighorn Basin, Wyoming.

185. Roberts, S. B.; and Rossi, G. S., A Summary of Coal in the Coalmont Formation (Tertiary), North Park Basin, Colorado, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.

186. Roberts, S. B.; and Rossi, G. S., A Summary of Coal in the Fort Union Formation (Tertiary), Bighorn Basin, Wyoming and Montana, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.

187. Robinson, L. N.; Culbertson, W. C.; and Affolter, R. H., Geology, Coal Resources, and Coal Quality of the Prairie Dog Creek EMRIA Study Area, Rosebud County, Montana.

188. Ruppel, T. C.; Grein, C. T.; and Bienstock, D., Adsorption of Methane/Ethane Mixtures on Dry Coal at Elevated Pressures.


190. Schenker, Jeffrey H., A Molecular Dynamic Investigation into the Competitive Adsorption of Gas Species on Coal.

191. Schuenemeyer, J. H.; Flores, R. M.; Stricker, G. D.; Ellis, M. S.; Gunther, G. L.; Taber, T. Y.; and Ochs, A. M., A Method to Estimate the Uncertainty of Coal Resources.


203. Steidl, P. F., *Observations of Induced Fractures Intercepted by Mining in the Warrior Basin, Alabama. Rock Creek Methane from Multiple Coal Seams Completion Project*.

204. Stevenson, R., *Thoresby Colliery Outburst; A Lesson Learned*.

205. Stoeckinger, W. T., *Methods to Measure Directly the Gas Content of Coals*.

206. Strategic Research Institute, *3rd Annual Coalbed and Coal Mine Methane Conference*.


208. Stricker, G. D.; and Ellis, M. S., *Coal Quality and Geochemistry, Greater Green River Basin, Wyoming, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*.

209. Stricker, G. D.; and Ellis, M. S., *Coal Quality and Geochemistry, Hanna and Carbon Basins, Wyoming, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*.

210. Stuart, A. D.; Mahoney, M. R., and Danell, R. E., *Developments in Methane Drainage for Improved Coal Mining Safety and Environmental Performance*.

211. Su, X; Feng, Y.; Chen, J.; and Pan, J., *The Annealing Mechanisms of Cleats in Coal*.

212. Svenster, P. G., *Diffusion of Gases Through Coal*.

214. Takla, G.; and Vavrusak, Z., *Coal Seam Gas Emissions from Ostrava-Karvina Collieries in the Czech Republic During Mining and After Mines Closure*.


218. Ting, F. T. C.; and Wang, P. B., *Coal Anisotropism and its Relationship to Methane Concentration in Coal*.


221. Van Voast, Wayne A., *Fracture Patterns in Coal in the Western United States; Observations and Implications for Development of Coalbed Methane Resources*.


227. Yuan, G.; and Huang, K., *Classification of Mineral Resources Associated and Accompanied with Coal Measures*.


304 Natural Gas from Coal Seams


III

REFERENCE MATERIALS

Contains listings of bibliographies of coalbed methane information. Citations appear alphabetically by author/editor and include the title of the work. Refer to the bibliography for more information on the publication.

1. Gas Research Institute, Selected Bibliography of Coalbed Methane Technology.

2. Gas Technology Institute, Selected References: Unconventional Gas Resources.


4. Lyons, Paul C.; and Ryder, Robert T., Selected Bibliography of Appalachian Coalbed Methane.


8. Picciano, Laura, Gas Research Institute’s Appalachian Basin Research: Selected Bibliography.


14. Thomas, Keith T., Collected Studies: Coal Seam Natural Gas; Also Known as Coalbed Methane.


16. Tyler, R. N.; Zhou, N.; McMurray, R. G.; Jackson, M. L. W.; and Tremain, C. M., Selected References Related to Coalbed Methane In the Greater Green River, Piceance, Powder River, Raton, and San Juan Basins.
17. Wieczner, Bilha; and Irvin, Marcia, *Coalbed Methane Development in Alabama: A Bibliography.*
IV

RESOURCE EVALUATION AND DEVELOPMENT

Contains listings of works that discuss hydraulic fracturing, chemical composition of coals, environmental impact and/or safety issues. Citations appear alphabetically by author/editor and include the title of the work. Refer to the bibliography for more information on the publication.


6. Advanced Resources International Inc., Data Analysis and Reservoir Characterization for Fruitland Coal, Carracas Canyon Unit, San Juan Basin.

7. Affolter, R. H.; Simon, F. O.; and Stricker, G. D., Chemical Analyses of Coal from the Healy, Kenai, Seldovia, and Utokok River 1:250,000 Quadrangles, Alaska.

8. Affolter, R. H.; Hatch, J. R.; Matson, R. E.; and Sauer, L. A., III, Chemical Analyses of Coal from the Tongue River Member, Fort Union Formation, Decker Coal Deposit, Big Horn County, Montana.

9. Affolter, R. H.; Hatch, J. R.; and Culbertson, W. C., Chemical Analyses of Coal from the Tongue River Member, Fort Union Formation, Moorhead and Southeastern Part of the Northward Extension of the Sheridan Coal Fields, Powder River and Big Horn Counties, Montana.

10. Affolter, R. H.; Stricker, G. D.; Roberts, S. B.; and Brownfield, M. E., Geochemical Variation of Arctic Margin Low-Sulfur Cretaceous and Tertiary Coals, North Slope, Alaska.


15. State of Alaska, Division of Oil and Gas, Department of Natural Resources, Coalbed Methane Study.


17. Allen, Randy, Coalbed Methane Primer.


19. American Association of Petroleum Geologists, Gulf Coast Coals Being Studied by the USGS.

20. American Institute of Chemical Engineers, Modeling CO$_2$ Sequestration in Abandoned Mines.

21. American Oil and Gas Reporter, IPAMS Challenges CBM Dispute Bill.


23. Ammosov, I. I.; and Eremin, I. V., Fracturing in Coal.


35. Ayers, W. B., Jr., *Coal Resources of the Tongue River Member of the Fort Union Formation (Palaeocene), Powder River Basin, Wyoming and Montana*.


37. Ayers, W. B., Jr.; Ambrose, W. A.; and Yeh, J. S., *Coalbed Methane in the Fruitland Formation - Depositional and Structural Controls on Occurrence and Resources*.


45. Ayers, W. B., Jr., *Methane Production From Thermally Immature Coal, Fort Union Formation, Powder River Basin*.


52. Barker, C. E.; and Pierce, B. S., *Burial History and Coal Petrography of the Ferron Coals Utah as Factors in Their Variable Coal Bed Gas Content.*


56. Barker, C. E., *A Field and Laboratory Procedure to Desorb Coal Bed Gasses from Drill Core and Cuttings.*


60. Barker, Charles E.; Biewick, Laura R. H.; Warwick, Peter D.; and San Filipo, John R., *Preliminary Gulf Coast Coalbed Methane Exploration Maps; Depth to Wilcox, Apparent Wilcox Thickness and Vitrinite Reflectance.*


70. Bell, Gregory J.; and Jones, Arfon H.; *Coalbed Methane Production and Stimulation (COMPAS) Database Documentation and User’s Manual*.


72. Bell, G. J.; and Jones, A. H., *Variation of Mechanical Strength With Rank of Gassy Coals*.


75. Berggren, L. W.; and Sanderson, G. A., *Recent Developments in the Application of the § 29 Tax Credit to Coal Seam Gas*.

76. Bertard, C.; Bruy et, B.; and Gunther, J., *Determination of Desorbable Gas Concentration of Coal (Direct Method)*.


89. Boyer, C. M.; and Kelafant, J. R., *Geologic Assessment of Natural Gas from Coal Seams in the Central Appalachian Basin*.

90. Boyer, C. M., II; Briscoe, F. H.; Camp, B. S.; et al., *Geologic and Reservoir Characterization for the Multiple Coal Seams Completion Project at Rock Creek: Topical Report*.


96. Boyer, C. M., II; Militzer, M. R.; and Schwerer, F. C., *Preliminary Economic Assessment Potential for Producing Methane for the Multiple Coal Seams Completion Project at Rock Creek.*

97. Boyer, C. M., II; Briscoe, F. H.; Camp, B. S.; Dobscha, F. X.; and Malone, P. G., *Rock Creek Methane from Multiple Coal Seams Completion Project. Demonstrated Drilling and Completion Technology for the Multiple Coal Seams Completion Project.*

98. Boyer, C. M., II; Briscoe, F. H.; Camp, B. S.; Diamond, W. P.; Malone, P. G.; and Militzer, P. G., *Rock Creek Methane from Multiple Coal Seams Completion Project. Final Geologic Report. Big Indian Creek Site, Volume I.*

99. Boyer, C. M., II; Briscoe, F. H.; Camp, B. S.; Diamond, W. P.; Malone, P. G.; and Militzer, P. G., *Rock Creek Methane from Multiple Coal Seams Completion Project. Final Geologic Report. Big Indian Creek Site, Volume II.*

100. Boyer, C. M., II; and Hirko, N. M., *Rock Creek Methane from Multiple Coal Seams Completion Project. Phase I Test Plan.*


103. Brady, L. L.; and Guy, W. J., *Coal Resources and Coalbed Methane Potential in the Kansas Portion of the Forest City Basin.*

104. Brownfield, M. E.; Affolter, Ronald H.; and Stricker, G. D., *High Chromium Content in Tertiary Coals, Northwestern Washington; A Key to Their Depositional History.*


120. Bureau of Land Management; Bureau of Indian Affairs; and Southern Ute Indian Tribe, *Draft Environmental Impact Statement, Oil and Gas Development on the Southern Ute Indian Reservation.*


---

**Natural Gas from Coal Seams**

140. Butala, Steven J. M.; Medina, Juan Carlos; Bowerbank, Christopher R.; Lee, Milton L.; Felt, Scott A.; Taylor, Terrence Q.; Andrus, Dallan B.; Bartholomew, Calvin H.; Yin, Pequi; and Surdam, Ronald C., *Catalytic Effects of Mineral Matter on Natural Gas Formation During Coal Maturation.*


144. Byrer, C. W.; and Guthrie, H. D., *Carbon Dioxide Sequestration Potential in Coal Deposits.*


147. Campbell, F. W.; Hoffman, G. K.; Kottlowski, F. E.; and Arkell, B. W., *Geology and Coal Resources of New Mexico’s Small Coalfields.*


150. Cao, Y. D.; and Glick, D. C., *Coal and Gas Outbursts in Footwalls of Reverse Faults.*


155. Carey, M. A.; Roberts, S. B.; and Clark, A. C., *Chemical Analyses for Nine Coal Samples from the Sagwon Member (Tertiary) of the Sagavanirktok Formation, North Slope, Alaska.*


158. Carroll, C. J., *Correlation of Fruitland Formation Coals and Coalbed Methane Leakage on the West Side of the Southern Ute Reservation, La Plata County, Colorado.*

159. Carroll, C. J., *Correlation of Producing Fruitland Formation Coals and Coalbed Methane Leakage on the Southern Ute Reservation.*


165. Cates, L. M.; and Groshong, R. H., Jr., *Regional Thin-Skinned Extension in a Foreland Basin; Prediction from Balanced Cross Sections, Confirmation by Field Mapping.*


182. Clark, W. F.; and Helmer, T., *Completing, Equipping, and Operating Fruitland Formation Coalbed Methane Wells in the San Juan Basin, New Mexico and Colorado.*


187. Clarkson, C. R.; and Bustin, R. M., *Variation in Micropore Capacity and Size Distribution with Composition in Bituminous Coal of the Western Canadian Sedimentary Basin.*
188. Clarkson, C. R.; and Bustin, R. M., *Variation in Permeability with Lithotype and Maceral Composition of Cretaceous Coals of the Canadian Cordillera.*


---

**Natural Gas from Coal Seams** 321
204. Collett, Timothy S., *Composition and Source of the Gas Associated with Coalbed Gas Production From Coals in Eastern Utah*.


211. Condon, S. M., *Fracture Patterns in the Ferron Sandstone Member of the Mancos Shale, Western San Rafael Swell and Eastern Wasatch Plateau, East-Central Utah*.


214. Conway, M. W., *Is It Time to Put the Final Nail in the Fraccing Coffin?*


221. Cox, David O., *Coal-Seam Water Production and Disposal, San Juan Basin*.


226. Crosdale, P. J.; Beamish, B. B.; and Valix, M., *Coalbed Methane Sorption Related to Coal Composition*.


236. Dallegge, Todd A.; and Barker, Charles E., *Coal-bed Methane Gas-In-Place Resource Estimates Using Sorption Isotherms and Burial History Reconstruction; An Example from Ferron Sandstone Member of the Mancos Shale.*


240. Das, B. M.; Nikols, D. J.; Das, Z. U.; and Hucka, V. J., *Factors Affecting Rate and Total Volume of Methane Desorption from Coalbeds.*

241. David, C., *This Land is Your Land, This Land is My Land: But Who Owns The Coal Gas?*


265. Diamond, W. P.; and Oyler, D. C., *Effects of Stimulation Treatments on Coalbeds and Surrounding Strata*.


273. Diamond, W. P.; McCulloch, C. M.; and Bench, B. M., *Use of Surface Joint and Photolinear Data for Predicting Subsurface Coal Cleat Orientation.*


283. Eddy, G.; Gillies, Alex; Lewis, K.; Lindeman, R. A.; and Snygg, Arnold, *Testing Requirements for Field Based Coalbed Methane Projects.*

284. Edgar, Thomas V.; and Case, James C., *Preliminary Hazards Report PHR 00-1; Pumping Induced Settlement of Aquifers.*


286. Ellard, J. S.; Roark, R. P.; and Ayers, W. B., *Geologic Controls on Coalbed Methane Production: An Example from the Pottsville Formation, Black Warrior Basin, Alabama, USA.*


289. Ellis, M. S.; Gunther, G. L.; Ochs, A. M.; Cararoc, V. V.; Schuenemeyer, J. H.; Power, H. C.; Stricker, G. D.; and Blake, Dorsey, *Coal Resources of the Hanna and Carbon Basins, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*


292. Ellis, M. S.; Keighin, C. W.; Gunther, G. L.; Flores, R. M.; Stricker, G. D.; Roberts, S. B.; Ochs, A. M.; and Bader, L. R., *Constraints on Coal Resource Estimation; A Depositional Perspective.*

293. Ellis, M. S.; Flores, R. M.; Ochs, A. M.; Stricker, G. D.; Gunther, G. L.; Rossi, G. S; Bader, L. R.; Schuenemeyer, J. H.; and Power, H. C., *Gillette Coalfield, Powder River Basin; Geology, Coal Quality, Coal Resources, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*

294. Ellis, M. S.; Flores, R. M.; Ochs, A. M.; Stricker, G. D.; Gunther, G. L.; Rossi, G. S; Bader, L. R.; Schuenemeyer, J. H.; and Power, H. C., *Sheridan Coalfield, Powder River Basin; Geology, Coal Quality, Coal Resources, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*


298. Enever, J.; Casey, D.; and Bocking, M., *The Role of In-Situ Stress in Coalbed Methane Exploration*.

299. Engler, Tom; and Perry, Kent, *Creating a Roadmap for Unconventional Gas R & D*.

300. The Environmental Protection Agency, *Draft Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs*.

301. The Environmental Protection Agency, *Environmental Protection with a Profit*.


303. The Environmental Protection Agency, *Opportunities for Coal Mine Gas Projects Created by Electric Industry Restructuring*.


307. Ertekin, T.; Sung, W.; and Bilgesu, H. I., *Structural Properties of Coal that Control Coalbed Methane Production*.

308. Esterle, J. S.; Kolastschek, Y.; and O’Brien, G., *Relationship Between In-Situ Coal Stratigraphy and Particle Size and Composition After Breakage in Bituminous Coals*.


313. Fassett, J. E. ed., *Geology and Coal-Bed Methane Resources of the Northern San Juan Basin, Colorado and New Mexico*.

315. Fassett, James E., *The Mystery of the Escaping Gas; Forensic Geology in the Northern San Juan Basin, La Plata County, Colorado.*

316. Fassett, James E., *Once a Menace, Now a Burgeoning Source of Energy; Coalbed Methane in the Warrior and San Juan Basins.*


322. Flaherty, K. J., *Quandry of Quest; Problems of Developing Coalbed Methane as an Energy Resource.*


324. Flores, R. M.; Rice, D. D.; and Gruber, J., *Coalbed Gas Potential and Reservoir Heterogeneity, Tertiary Fort Union Formation, Powder River Basin, Montana*

325. Flores, Romeo M., editor, *Coalbed Methane; From Coal-Mine Outbursts to a Gas Resource.*

326. Flores, Romeo M., *Coalbed Methane; From Hazard to Resource.*


333. Flores, R. M.; and Bader, L. R., *A Summary of Tertiary Coal Resources of the Raton Basin, Colorado and New Mexico*.


337. Friedman, S. A., *Coalbed Methane Production Shows Wide Range of Variability*.


339. Friedman, S. A., *Determination of Reserves of Methane from Coal Beds for Use in Rural Communities in Eastern Oklahoma*.


341. FrontBurner, *Reservoir Modeling / A Bright Light for Coalbed Methane Production*.


346. Gale, J.; and Freund, P., *Geological Storage of CO₂*
347. Gamson, P. D.; Beamish, B. B.; and Johnson, D. P., *Coal Microstructure and Micropermeability and Their Effects on Natural Gas Recovery*.


350. Garcia-Gonzalez, Mario; MacGowan, Donald B.; and Surdam, Ronald C., *Coal as a Source Rock of Petroleum and Gas; A Comparison Between Natural and Artificial Maturation of the Almond Formation Coals, Greater Green River Basin in Wyoming*.

351. Garrison, James R., Jr.; van den Bergh, T. C. V.; Barker, Charles E.; and Tabet, David E., *Depositional Sequences Stratigraphy and Architecture of the Cretaceous Ferron Sandstone; Implications for Coal and Coalbed Methane Resources; A Field Excursion*.


353. Gas Research Institute, *Coalbed Methane Potential of the U.S. Rocky Mountain Region*.

354. Gas Research Institute, *Coalbed Methane Reservoir Simulators*.

355. Gas Research Institute, *Disposal Technology for Water Produced from Coalbed Methane Wells*.


359. Gas Research Institute, *Geosciences: Accurately Estimating Coal Seam Reservoir Gas-In-Place*.

360. Gas Research Institute, *Improved Coal Seam Reservoir Gas-In-Place Analysis Protocol*.

361. Gas Research Institute, *Open-hole Cavity Completions, Fracturing, and Restimulation*.

362. Gas Research Institute, *Survey of Coal Industry Programs for Utilization of Methane From Coal Seams Guides*.


368. Gayer, R.; and Harris, I., *Coalbed Methane and Coal Geology*.


370. George, J. D. St.; and Barakat, M. A., *The Change in Effective Stress Associated with Shrinkage from Gas Desorption in Coal*.

371. Gilles, Alex; and Snygg, Arnold, *Development of Technology for Coal Bed Methane Recovery Program Planning*.


376. Glikson, M.; Boreham, C. J.; and Thiede, D. S., *Coal Composition and Mode of Maturation, a Determining Factor in Quantifying Hydrocarbon Species Generated*.


381. Goktas, B.; and Ertekin, T., *Development of a Local Grid-Refinement Technique for Accurate Representation of Cavity Completed Wells in Reservoir Simulators*.

383. Golding, S. D., *4-D Permeability Characterization of Coal Enhances Exploration and Production of CBM.*


385. Gong, J.; and Ou, M., *Open Another Window for Oil and Gas Exploration: Unconventional Natural Gas.*


396. Griff, M. T., *Recent Federal Initiatives to Promote Unconventional Gas: High Octane Delivery or Just Hot Air?*


401. Hallinger, Donald E., *Coal-bed Methane; An Unconventional But Viable Source of Natural Gas.*


404. Hanson, M. E.; Neilsen, P. E.; Sorrels, G. G.; Boyer, C. M.; and Schraufnagel, R. A., *Design, Execution, and Analysis of a Stimulation to Produce Gas from Thin Multiple Coal Seams.*


406. Hanson, Merle; and Thorson, Lew, *Hydraulic Fracture Model Development for Application to Design Hydraulic Fracture Treatments for Enhancing Methane Production from Coal.*


408. Harpalani, S., *Compressibility of Coal and Its Impact on Gas Production from Coalbed Reservoirs.*


415. Harpalani, S.; and Ouyang, S., A New Laboratory Technique to Estimate Gas Diffusion Characteristics of Coal.


417. Harpalani, Satya, Permeability Changes Resulting from Gas Desorption.


419. Harris, Steven C.; Mettee, Maurice F.; and O’Neil, Patrick E., Coalbed Methane Development in Alabama: Biological and Hydrological Conditions of Streams Draining the Cedar Cove Degasification Field.


422. Hatch, J. R., Hydrocarbon Source-rock Evaluation of Desmoinesian (Middle Pennsylvanian) Coals from Part of the Western Region of the Interior Coal Province.

423. Hawkins, W. B.; Groshong, R. H.; and Pashin, J. C., Normal Faults Along the Southwestern Margin of the Alabama Promontory; Multiple Episodes of Paleozoic Activity.

424. Hayes, Thomas, Drillers Find Coalbeds Yield Gas and Profits.


428. Heim, R. N.; and Van Kirk, C. W., Integrated Three-Dimensional Seismic and Three-Dimensional Reservoir Flow Simulation Exposes the Effects of Faulting on Coal Gas Production at Cedar Hill.


436. Higgs, M. D., *Laboratory Studies into the Generation of Natural Gas from Coal.*

437. Higley, Debra K., *A Method to Estimate the Uncertainty of Coal Resources.*


439. Hildebrand, Ricky T., *Ground-water Composition as an Indicator of Sodium Content in Coal in the Powder River Basin, Southeastern Montana and Northeastern Wyoming.*


442. Hill, David G., *New Database Quantifies Impact of Unconventional Gas in U.S.*


457. Hollub, V. A., *Results of Camera Surveys at Rock Creek*.


**Natural Gas from Coal Seams**

465. Hunt, A. M.; and Steele, Derek J., *Coalbed Methane Development in the Appalachian Basin*.

466. Hunt, A. M.; and Steele, D. J., *Coalbed Methane Development in the Northern and Central Appalachian Basins - Past, Present and Future*.


474. Hyman, Laura A.; Brugler, Mercer; Deneshjou, Dane; and Henry, A., *Improved Evaluation of Coal Reservoirs Through Specialized Core Analysis*.


476. ICF Resources, Inc., *Coalbed Methane Workshop Sponsored by the Gas Research Institute (at the) 1991 SPE Rocky Mountain Regional / Low Permeability Reservoirs Symposium, April 14, 1991*.


490. Johnson, D. J.; and Scholes, P. L., *Predicting Cleat in Coal Seams from Mineral and Maceral Composition with Wireline Logs.*


495. Johnson, Ronald C.; and Flores, Romeo M., Developmental Geology of Coalbed Methane from Shallow to Deep in Rocky Mountain Basins and in Cook Inlet-Matanuska Basins, Alaska, USA and Canada.

496. Johnson, R. C., Geologic History and Hydrocarbon Potential of Late Cretaceous-Age Low-Permeability Reservoirs, Piceance Basin Western Colorado.


498. Johnson, Ronald C.; Barker, Charles E.; Pawlewicz, Mark J.; Crysdale, Bonnie L.; Clark, Arthur C.; and Rice, Dudley D., Preliminary Results of a Coalbed Methane Assessment of the Wind River Indian Reservation, Wyoming.


Natural Gas from Coal Seams 341


531. Karacan, C. O.; and Okandan, E., *Heterogeneity Effects on the Storage and Production of Gas from Coal Seams*.


537. Kelso, B. S., *Geologic Controls on Open-hole Cavity Completions in the San Juan Basin*.


541. Khavari-Khorasani, G.; and Michelsen, J. K., *Coal Bed Gas Content and Gas Undersaturation*.


342  

*Natural Gas from Coal Seams*


Kirschbaum, Mark A.; Roberts, Laura N. R.; and Biewick, Laura R. H., *Geologic Assessment of Coal in the Colorado Plateau; Arizona, Colorado, New Mexico, and Utah.*


Kissel, F. N., *The Methane Migration and Storage Characteristics of the Pittsburgh, Pocahontas No. 3, and Oklahoma Hartshorne Coalbeds.*

Kizil-sshtein, L., Ya, *Heavy-metal Geochemistry of Coal; An Ecological Aspect.*

Kizil-sshtein, L., Ya, *Vanadium Geochemistry of Coal; An Ecological Aspect.*


Knox, L. M.; and Hadro, J., *Canister Desorption Techniques: Variation and Reliability.*


Koenig, Robert A.; and Bell, Gregory J., *Design of Single-Phase Flow Tests for Water-Saturated Coalbed Methane Reservoirs.*


Kopp, O. C.; Bennett, M. E., III; and Clark, C. E., *Volatiles Lost During Coalification.*


583. Kumar, P.; and Lochan, Rajiw, *Mine Related Coalbed Methane Recovery & Utilization Project in India*.


590. Lamarre, Robert, *Coalbed Methane Stratigraphic Traps in Ferron Coals of East-Central Utah*.


593. Lamarre, Robert A.; and Pratt, Timothy J., *Reservoir Characterization Study: Calculation of Gas-in-Place in Ferron Coals at Drunkard’s Wash Unit, Carbon and Emery Counties, Utah*.


595. Lambert, S. W.; Saulsberry, J. L.; and Reeves, S. R., *Coalbed Methane Production Improvement/Recompletion Project in the Warrior Basin*.

596. Lambert, S. W.; Palmer, I. D.; and Spitler, J. L., *Coalbed Methane Well Completions and Stimulations*.
Lambert, S. W., *Comparison of Open Hole, Slotting and Perforating Completion Methods for Multiseam Coalbed Gas Wells.*

Lambert, Stephen W.; and Siegfried, Robert W., *Evaluation of Frontier Coalbed Methane and Shale Plays in the United States.*

Lambert, S. W.; and Trevits, M. A., *The Feasibility of No-Propant Stimulation to Enhance Removal of Methane from the Mary Lee Coalbed.*

Lambert, S. W.; Saulsberry, J. L.; Steidl, P. F.; Conway, M. W.; and Spafford, S. D., *Fracturing Experience at the Rock Creek Multiple Coal Seams Project.*

Lambert, S. W.; and Lombardi, T. E., *Frontier Coalbed Gas Area Selection; Screening Process.*

Lambert, S. W.; Niederhofer, J. D.; and Reeves, S. R., *Multiple Coal Seam Well Completion Experience in the Deerlick Creek Field, Black Warrior Basin, Alabama.*


Lambert, S. W.; Graves, S. L.; and Jones, A. H., *Warrior Basin Drilling and Stimulation.*

Lang, Karl, *Options for Coalbed Methane Water Management.*


Langenberg, W., *Coalification Patterns and Coalbed Methane Potential in the Cadomin Area, Alberta, Canada.*

Larsen, Veryl E.; and Merry, Ray D., *Geologic Investigation of the Methane Potential of Western U.S. Coal Beds.*


Lasseter, Edward L., Jr., *Organizational Aspects of the Warrior Basin Environmental Cooperative.*


Laubach, S. E.; Tremain, C. M.; and Ayers, W. B., *Coal Fracture Studies: Guides for Coalbed Methane Exploration and Development.*
614. Laubach, Stephen E.; and Tremain, Carol M., *Distribution and Origin of Regional Coal Fracture (Cleat) Domains in Upper Cretaceous Fruitland Formation Coal; Possible Effects on Coalbed Stimulation and Methane Production.*

615. Laubach, S. E.; Tyler, Roger; Tremain, C. M.; Grout, M. A.; and Ambrose, W. A., *Fracture Patterns in Coal in the Western United States; Observations and Implications for Development of Coalbed Methane Resources.*


625. Law, B. E., *Geophysical Logs of Test Holes from the Henry Mountains Coal Field, Garfield and Wayne Counties, Southeastern Utah.*

626. Law, B. E.; and Rice, D. D., *Hydrocarbons from Coal.*


628. Law, B. E., *The Relationship Between Coal Rank and Cleat Spacing; Implications for the Prediction of Permeability in Coal.*

630. Lawrence, A. W., *Coalbed Methane Produced-water Treatment and Disposal Options.*

631. Laxminarayana, Chikatamarla; and Crosdale, Peter J., *Controls on Methane Sorption Capacity of Indian Coals.*


637. Leel, Woodruff; and Wickstrom, Charles, *Methane Emissions Along a Salt Marsh Salinity Gradient.*

638. Leighfield, K. G., *Coal as an Energy Resource.*

639. Lemons, B. N.; and Nemirow, L., *Maximizing the Section 29 Credit in Coal Seam Methane Transactions.*

640. Levine, J. R., *Coalification: The Evolution of Coal as Source Rock and Reservoir Rock for Oil and Gas.*


642. Levine, J. R., *Generation, Storage and Migration of Natural Gas in Coal Bed Reservoirs.*

643. Levine, J. R., *The Impact of Oil Formed During Coalification on Generation and Storage of Natural Gas in Coalbed Reservoir Systems.*


Levine, J. R., *Oversimplifications Can Lead to Faulty Coalbed Gas Reservoir Analysis Five.*


Li, H.; and Ogawa, Y., *Enhanced Methane Storage and Generation in the Shear Zones Along Coal Seams: A Potentially Significant Coalbed Methane Reservoir.*


Lindley, Laura, *Coalbed Methane Life Cycle of a Federal Unit.*

Lindsay, P.; Campbell, R. N.; Moore, T. A.; and Ferm, J. C., *Lithological Types and Envirogeotechnical Characteristics of the Waikato Coal Measures, New Zealand.*


Littke, R.; and Leythaeuser, D., *Migration of Oil and Gas in Coals.*


Logan, Terry L., *Baseline Stimulation Results for a Deep Coal Seam at the Red Mountain Unit, Piceance Basin, Colorado.*


Logan, T. L., *Coalbed Methane; 6, Western Basins Dictate Varied Operations.*

Logan, T. L.; Clark W. F.; and McBane Richard A., *Comparing Different Coalbed Methane Completion Techniques, Hydraulic Fracture and Openhole Cavity, at the Northeast Blanco Unit, San Juan Basin.*

Logan, T. L.; Clark W. F.; and McBane R. A., *Comparing Openhole Cavity and Cased Hole Hydraulic Fracture Completion Techniques, San Juan Basin, New Mexico.*


665. Logan, T. L., *Horizontal Drainhole Drilling Techniques Used in Rocky Mountain Coal Seams.*


672. Lyman, Robert M.; and DeBruin, Rodney H., *Coalbed Methane Update.*


677. Lyons, Paul C., *Coalbed Methane Potential in the Appalachian States of Pennsylvania, West Virginia, Maryland, Ohio, Virginia, Kentucky, and Tennessee; An Overview.*


690. Maoyuan, Sun; and Shengchu, Huang, *Programs, Policies and Laws to Promote the Development of Coalbed Methane in China*.


699. Mason, Richard Z.; Siegel, Martin M.; Barone, Saverio Peter; and Gash, Bruce W., *Economic Evaluation of Underground Coal Gasification of Western Subbituminous Coal*.

700. Massarotto, P.; Rudolph, V.; and Golding, S. D., *4-D Permeability Characterization of Coal Enhances Exploration and Production of CBM*.


703. Mastalerz, M.; and Kvale, E. P., *Coal-bed Gas Potential in Davies County, Indiana*.

704. Mastalerz, M.; and Kvale, E. P., *Coal-bed Gas Potential in Illinois Basin Based on Recent Data From Indiana*.


706. Mavor, M.; Pratt, T. J.; Crandlemire, A.; and Ellerbrok, G., *Assessment of Coalbed Methane Resources at the Donkin Mine Site, Cape Breton, Nova Scotia, Canada*.

707. Mavor, Mathew J., *Coal Gas Reservoir Cavity Completion Well Performance*.


715. Mavor, M. J.; and Vaughn, J. E., *Increasing Absolute Permeability in the San Juan Basin Fruitland Formation*

717. Mavor, M. J.; Pratt, T. J.; and Nelson, C. R., Quantify the Accuracy of Coal Seam Gas Content.


719. Mavor, M. J.; and Logan, T. L., Recent Advances in Coal Gas-well Openhole Well Completion Technology.


722. Mavor, Matt J.; Britton, Randy; Close, Jay C.; Dern, Robert R., Jr.; Dhir, Rahul; Logan, Terry; Marshall, Rick; and Pratt, Tim, Western Cretaceous Coal Seam Project: Economic and Reserve Evaluation of San Juan Basin, Fruitland Formation Coalbed Natural Gas Reservoirs.


728. Mavor, M. J.; Close, J. C.; and Pratt, T. J. Western Cretaceous Coal Seam Project: Summary of the Completion Optimization and Assessment Laboratory (COAL) Site.


734. McCulloch, C. M.; Lambert, S. W.; and White, J. R., *Determining Cleat Orientation of Deeper Coalbeds from Overlying Coals.*


737. McCulloch, C. M.; and Deul, M, *Methane from Coal.*


750. McPherson, Malcomb J.; and Harpalani, Satya, *Permeability and Sorption Tests on Coal*.


760. Meissner, F. F.; Thompson, R., *Exploration Opportunities in the Greater Rocky Mountain Region, Central Western, U.S.A.*


768. Mitcham, S. A.; and Wobeser, G., *Effects of Coalbed Methane Development on the Water-Quality and Fish and Benthic Invertebrate Communities of the Big Sandy Creek Drainage System, Alabama.*


777. Moore, B. R.; and Moore, P. R, *Low Altitude Airborne Multispectral Microfracture Analysis in the Control of Oil and Gas Production, Coalbed Methane and Site Location of Directional Drilling.*

778. Morales, Graciela; and Barrufet, Maria, *Desalination of Produced Water Using Reverse Osmosis.*

780. Morgan, J. P.; Automation Key in Coalbed Methane.

781. Moritis, G., Emerging Technologies to Boost Hydrocarbon Production Efficiency.


783. Mount, David R.; and Gulley, David D., Development of a Salinity/Toxicity Relationship to Predict Acute Toxicity of Saline Waters to Fresh Water Organisms.

784. Mount, David R.; O’Neil, Patrick E.; and Evans, James M., Discharge of Coalbed Produced Water to Surface Waters – Assessing, Predicting, and Preventing Ecological Effects.

785. Mount, David R.; Drottar, Kurt R.; Gulley, David D.; Frillo, John P.; and O’Neil, Patrick E., Use of Laboratory Toxicity Data for Evaluating the Environmental Acceptability of Produced Water Discharge to Surface Waters.


787. Mountain Fuel Supply Company, Demonstration Project for Methane Recovery from Unminable Coalbeds, Progress Report No. II.


791. Mukhopadhyay, P. K.; Fowler, M. G.; and Dow, W., Selected Papers from the Symposium of Coal and Terrestrial Organic Matter as a Source Rock for Petroleum.

792. Mullen, M. J., Cleat Detection in Coalbeds Using the Microlog.


800. Murrie, G. W., *Coal and Gas Resources of the Lower Hartshorne Coalbed in LeFlore and Haskell Counties, Oklahoma*.

801. Muthukumarappan, R.; Rogers, R. E.; and Weida, D., *Analysis of the Success of Cavity Completions in the Fairway Zone of the San Juan Basin*.


358 Natural Gas from Coal Seams


819. Niederhoffer, J. D.; and Lambert, S. W., Lease Operating Expenses for Multiple-Zone Completion Wells, Black Warrior Basin, Alabama.

820. Nielsen, P. E.; and Hanson, M. E., Analysis and Implication of Three Fracture Treatments in Coal at the USX Rock Creek Site Near Birmingham, Alabama.

821. Nikiforuk, Andres, Into the Black.


824. Nolde, J. E.; and Spears, D., A Preliminary Assessment of In-place Coalbed Methane Resources in the Virginia Portion of the Central Appalachian Basin.


826. Nuccio, V. F., What is it? And Why All the Fuss?


833. Ogha, K.; and Higuchi, K., *Utilization of Methane Injection of Carbon Dioxide into Abandoned Coal Mines.*

834. *Oil & Gas Journal, Deeper Wildcatting Under Way in Two New Mexico Areas.*

835. *Oil & Gas Journal, Emerging Natural Gas Resources.*

836. *Oil & Gas Journal, Infill Drilling Land Use Issues Heat in SW Colorado.*

837. *Oil & Gas Journal, Large Alberta Coalbed Methane Program Launched.*


839. *Oil & Gas Journal, New Mexico Raton Basin Coalbed Methane Development Resumes.*

840. *Oil & Gas Journal, Two British Columbia Basins May be Opened for Exploration.*


845. O’Neil, Patrick E.; Mettee, Maurice F.; and Harris, Steven C., *Coalbed Methane Development in Alabama: Biological and Hydrological Conditions of Streams Draining the Cedar Cove Degasification Field.*


---

360  Natural Gas from Coal Seams


853. Osmonson, L. M.; Rohrbacher, T. J.; Molina, C. L.; and Sullivan, G. L., *Coal Recoverability in the Hilight Quadrangle, Powder River Basin, Wyoming; A Prototype Study in a Western Coal Field*.

854. Outlaw, L., *Western Active Across Revenue Chain*.


858. Oyler, D. C.; and Diamond, W. P., *Drilling a Horizontal Coalbed Methane Drainage System from a Directional Surface Borehole*.


867. Palmer, I. D., *Induced Stresses Due to Propped Hydraulic Fracture in Coalbed Methane Wells*.


872. Pashin, Jack C.; and Hinkle, Frank, *Coalbed Methane in Alabama*.


874. Pashin, J. C.; and Carroll, R. E., *Day 1 Road Log; Stop 5, Nunnally and Harkness Coal Zones at Grant’s Mill*.


362  
Natural Gas from Coal Seams


886. Pashin, J. C., *Stratigraphy and Structure of the Pottsville Formation in the Cahaba Coalfield.*

887. Pashin, J. C.; and Groshong, R. H., Jr., *Structural Control of Coalbed Methane Production in Alabama.*


900. Penny, Glenn S.; Conway, Michael W.; Almond, Stephen W.; Himes, Ron; and Nick, Kevin E., *Mechanisms and Impact of Damage Resulting from Hydraulic Fracturing*.


906. Petroleum Technology Transfer Council, *Coalbed Methane Workshop On-line (Rockies Newsletter)*.


909. Pierce, Brenda, *Coalbed Methane in the Forest City Basin*.


914. Pratt, T. J.; Mavor, M. J.; and DeBruin, R. H., *Coal Gas Resources and Production Potential of Subbituminous Coal in the Powder River Basin*.


933. Quick, J. C.; and Brill, T., *Provincial Variation of Carbon Emissions from Bituminous Coal: Influence of Inertinite and Other Factors*.


938. Ramaswamy, G., *Production History Provides CBM (Coalbed Methane) Insights*.

939. Ramurthy, M.; Weida, D.; and Rogers, R. E., *Analysis of the Success of Cavity Completions in the Fairway Zone of the San Juan Basin*.


941. Rao, K. L. N., *Perspectives of Non Conventional Hydrocarbon Resources (Coal Bed Methane) In the Next Millennium*.


943. Reeves, Scott, *The Coal-Seq Project*.


951. Rice, Cynthia A.; and Nuccio, Vito, *Water Produced with Coalbed Methane.*


958. Rice, Dudley D.; and Threlkeld, Charles N., *Comparison of Natural Gases Produced from Upper Cretaceous Fruitland Formation Coal Beds and Adjacent Reservoirs, San Juan Basin, New Mexico and Colorado.*


Rice, Dudley D., *Mineral Resources Potential; Leasable Minerals (Energy Sources); Coalbed Resources.*


Riese, C.; Franks, G.; Fehn, U.; and Moran, J. E., *Fruitland Formation Waters, San Juan Basin, Colorado, and Their Relevance to Understanding Fruitland Coalbed Methane Reservoirs.*

Rightmire, Craig T.; and Byrer, C. W., *Coal Bed Methane Exploration and Development.*


Roberts, R. D., *Coalbed Methane Development: A Land Owner’s Prospective.*

Roberts, S. B.; Clark, A. C.; and Carey, M. A., *Analyses of Seven Core Samples from Two Tertiary Coal Beds in the Sagwon Member of the Sagavanirktok Formation, North Slope, Alaska.*

Roberts, S. B.; Wilde, Edith M.; Rossi, G. S.; Blake, Dorsey; Ellis, M. S.; Stricker, G. D.; Ochs, A. M.; Gunther, G. L.; Schuenemeyer, J. H.; and Power, H. C., *Ashland Coalfield, Powder River Basin, Montana; Geology, Coal Quality, and Coal Resources, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*


984. Roberts, S. B.; and Bossiroy, Dominique, *Stratigraphy and Coal Geology of the Lower Part of the Fort Union Formation in the Grass Creek Coal Mine Area, Southeastern Bighorn Basin, Wyoming.*

985. Roberts, S. B.; and Rossi, G. S., *A Summary of Coal in the Coalmont Formation (Tertiary), North Park Basin, Colorado, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region.*


989. Robinson, B. M; and Holditch, S. A., *Coal Gas Requires Stimulation.*


991. Rodvelt, G.; Willis, S.; Mullins, D.; and Toothman, R., *CT Fracturing: Multiple Coals, One Trip.*


994. Roybal, G. H.; Anderson, O. J.; and Beaumont, E. C., eds., *Coal Deposits and Facies Changes Along the Southwestern Margin of the Late Cretaceous Seaway, West-Central New Mexico*.


996. Ruppel, T. C.; Grein, C. T.; and Bienstock, D., *Adsorption of Methane/Ethane Mixtures on Dry Coal at Elevated Pressures*.


1000. Sanderson, G. A.; and Berggren, L. W., *Recent Developments in the Application of the 29 Tax Credit to Coal Seam Gas*.


1002. Sanfilipo, John R.; Barker, Charles E.; Stanton, Ron W.; Warwick, Peter D.; and Morris, Loyd E., *A Shallow Coal-bed Methane Show in the Gulf Coast of Texas, Indication of Down-dip Commercial Potential?*


1007. Saulsberry, J. L.; Schraufnagel, R. A.; and Jones, A. H., *Fracture Height Growth and Production from Multiple Reservoirs*. 

---

370 Natural Gas from Coal Seams

1009. Saulsberry, J. L.; Lambert, S. W.; Wallace, J. A.; Spafford, S. D.; and Steidl, P. F., Rock Creek Multiple Coal Seams Project.


1012. Saxby, J. D.; and Shibaoka, M., Coal and Coal Macerals as Source Rocks for Oil and Gas.

1013. Schaible, Brian, BLM Issues Coalbed Methane Studies.


1017. Schenker, Jeffrey H., A Molecular Dynamic Investigation into the Competitive Adsorption of Gas Species on Coal.

1018. Scholes, P. L.; and Johnston, D., Coalbed Methane Applications of Wireline Logs.


1022. Schraufnager, Richard A.; Saulsberry, J. L.; and Lambert, S. W., Gas Production from Multiple Wells at Rock Creek.

1023. Schraufnager, R. A., Multiple Seam Completion and Production Experience at Rock Creek.

1024. Schraufnager, R. A.; Lambert, S. W.; Stubbs, P. B.; Dobscha, F. X.; and Boyer, C. M., II, The Rock Creek Field Laboratory - A Project Update.

1025. Schroeder, K.; and Ozdemir, E., Sequestration of Carbon Dioxide in Coal Seams.


1028. Schultz, K., *U.S. Environmental Protection Agency’s Promotion of Coalbed Methane*.


1034. Scott, Andrew R., *Bacterially Mediated Reactions in Coal Beds*.

1035. Scott, A. R., *Coal and Coalbed Methane Resources of Texas*.


1040. Scott, Andrew R.; Tyler, Roger; and Clough, James G., *Exploration for Coalbed Methane in Frontier Regions Using Limited Data*.


1057. Serov, V. I., *Economical Aspects of Coalbed Methane Extraction and Utilization by Coal Mines in the CIS.*


1059. Shepard, Thomas E.; O’Neil, Patrick E.; Harris, Steven C.; and McGregor Stuart W., *Effects of Coalbed Methane Development on the Water-Quality and Fish and Benthic Invertebrate Communities of the Big Sandy Creek Drainage System, Alabama.*


1061. Shi, J. Q.; and Durucan, S., *Identifying the Key Factors Controlling Openhole Cavity Completions at the San Juan Basin - A Numerical Study.*


1065. Shirley, K., *Coalbed Methane Comes of Age*.


1068. Shirley, K., *Operators Continue to Expand Coalbed Methane’s Geographic Diversity*.


1071. Siegel, M. M.; James, W. M.; Mason, R. Z.; Gash, B. W.; and Barone, Saverio Peter, *Economic Evaluation of SNG and Methanol Using Underground Coal Gasification*.


1076. Sinha, K.P.; Bell, G. J.; Odette, B. B.; McLennan, J. D.; and Jones, A. H., *Coalbed Methane Production and Stimulation Database - COMPAS II: Documentation and User’s Manual*.


1082. Smith, T. N., *Coalbed Methane Potential for Alaska and Drilling Results for the Upper Cook Inlet Basin*.


1089. Sööt, P. M., *Non-conventional Fuel Tax Credit*.


1091. Sööt, P. M., *Western United States Coalbed Methane Gas Content Correlations*.

1092. Spafford, S. D.; Dobscha, F. X.; Durden, A. H.; Hollub, V. A.; McKinnon, C. L.; Saulsberry, J. L.; Steidl. P. F.; and Stubbs, P. B., *1.1.4 Coalbed Methane Multiple Coal Seam Project 305. Rock Creek Methane from Multiple Coal Seams Completion Project*.


1094. Spafford, S. D.; and Stubbs, P. B., *Reservoir Pressure Profiles and Desorption Estimates for the Mary Lee Coal Group Based on Monitor Well Data at the Rock Creek Project*.

1095. Spafford, S. D., *Stimulating Multiple Coal Seams at Rock Creek with Access Restricted to a Single Seam*.


1098. St. G. J. D., *The Change in Effective Stress Associated with Shrinkage from Gas Desorption in Coal.*

1099. Stahl, R. M.; and Clark, P. E., *Fluid Loss During the Fracturing of Coalbed Methane Wells.*


1101. Stanton, Ronald C., *Sampling of Coal Beds for Analysis.*


1104. Staub, J. R., *Reservoir Sequences in the Coal Beds of Southern West Virginia.*


1109. Steidl, P. F., *Observations of Induced Fractures Intercepted by Mining in the Warrior Basin, Alabama. Rock Creek Methane from Multiple Coal Seams Completion Project.*


1117. Stoeckenger, W. T.; and Brady, L. L., *Coalbed Methane Potential in Eastern Kansas*.


1121. Stoeckinger, W. T., *Methods to Measure Directly the Gas Content of Coals*.

1122. Strategic Research Institute, *3rd Annual Coalbed and Coal Mine Methane Conference*.

1123. Strategic Research Institute, *CBM Water Management Strategies*.

1124. Stremel, Kristine, *Coming Out of the Closet*.


1126. Stricker, G. D.; and Ellis, M. S., *Coal Quality and Geochemistry, Greater Green River Basin, Wyoming, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*.

1127. Stricker, G. D.; and Ellis, M. S., *Coal Quality and Geochemistry, Hanna and Carbon Basins, Wyoming, 1999 Resource Assessment of Selected Tertiary Coal Beds and Zones in the Northern Rocky Mountains and Great Plains Region*.


1129. Stricker, Gary D.; and Ellis, Margaret S., *Laramide Tectonism and Paleogeography; Their Effects on Quality and Hazardous Air Pollutant Trace Element Trends in Rocky Mountain Province Paleocene Coals*.


1132. Su, X; Feng, Y.; Chen, J.; and Pan, J., *The Annealing Mechanisms of Cleats in Coal*.


1139. TRW. Inc., *Summary of Geologic Features of Selected Coal-Bearing Areas of the United States.*

1140. Tabet, D. E.; and Quick, J. C., *Extension of the Hams Fork Coal Region, Summit County, Utah; Potential for Coalbed Gas.*


1155. Tewalt, S. J.; and Halili, N. E., *Arsenic in the Coal Beds and Surface Waters of the Warrior Basin, Western Alabama*.


1157. Thimons, B.; and Kissell, F. N., *Diffusion of Methane Through Coal*.

1158. Thomasson, M. Ray; and Meissner, Fred F., *US Rockies ‘Discoveries’: Analogs for the Future*.


1162. Thungsuntonkhun, W.; and Engler, T., *Well Deliverability of Undersaturated Coalbed Reservoir*.

1163. Ting, F. T. C.; and Wang, P. B., *Coal Anisotropism and Its Relationship to Methane Concentration in Coal*.

1164. Ting, F. T. C., *Original Anisotropism and Its Relationship with Some Physical and Chemical Properties of Coal*.

1165. Towse, Donald, *Feasibility Study: Vertical Fracturing in Directionally Drilled Wells*.

1166. Tremain, Carol M.; and Toomey, James, *Coal Bed Methane Desorption Data*.
1167. Tremain, C. M.; Laubach, S. E.; and Whitehead, N. H., III, *Coal Fracture (Cleat) Patterns in Upper Cretaceous Fruitland Formation Coal Seams, San Juan Basin.*

1168. Tremain, C. M.; Laubach, S. E.; and Whitehead, N. H., III, *Coal Fracture (Cleat) Patterns in Upper Cretaceous Fruitland Formation, San Juan Basin, Colorado and New Mexico - Implications for Coalbed Methane Exploration an Development.*


1177. Tyler, R.; Laubach, S. E.; Ambrose, W. A.; Tremain, C. M.; and Grout, M. A., *Coal Fracture Patterns in the Foreland of the Cordilleran Thrust Belt, Western United States.*


1183. Tyler, Roger; Laubach, S. E.; Ambrose, W. A.; Grout, M. A.; and Tremain, C. M., *Face-Cleat Patterns in Rocky Mountain Foreland Basins, Western United States; Permeability Indicators for Coalbed Methane*.


1193. Urosevic, M.; Evans, B. J.; and Cocker, J. D., *The Prediction of Sweet-Spots Using 2-D Seismic Data*.


1196. Van Voast, Wayne A., *Fracture Patterns in Coal in the Western United States; Observations and Implications for Development of Coalbed Methane Resources*.


1202. Vo, D. T.; Ohaeri, C. U.; and Montoya, G. L., *Pressure Buildup Analysis of Early-Time Data from Coalbed Methane Wells in the Rincon Unit, San Juan Basin, New Mexico*.


1206. Wandry, Craig J.; Law, Ben E.; Spencer, Charles W.; and Barker, Charles E., *Oil, Gas, and Coalbed Methane Resources*.


1212. Warwick, P. D.; SanFilipo, J. R.; Barker, Charles E.; and Morris, L. E., *Coal-bed Methane in the Gulf Coastal Plain; A New Frontier?*


1215. Warwick, Peter D.; Barker, C. E.; SanFilipo, John R.; and Morris, L. E., *Preliminary Results from Coal-bed Methane Drilling in Panola County, Texas.*

1216. Warwick, P. D.; Augourg, C. E.; and Willett, J. C., *Tertiary Coals in South Texas; Anomalous Cannel-Like Coals of Webb County (Claibourne Group, Eocene) and Lignites of Atacosa County (Jackson Group, Eocene); Geologic Setting, Character, Source-Rock and Coal-Bed Methane Potential.*


1218. Weaver, J. N.; Gruber, J. R., Jr., *Coal and Coal Bed Methane Resources of the Absaroka - Beartooth Study Area.*

1219. Weida, S. D.; Reeves, S.; and Young, G. B. C., *Optimizing Coalbed Methane Cavity Completion Operations with the Application of a New Discrete Element Model.*

1220. Weishauptove, Z.; Medek, J.; and Nmec, J, *Decrease of Desorption Intensity of Coalbed Methane Due to Hydraulic Fracturing.*


1226. Wicks, D. E.; and Zuber, M. D., *A Strategy for Coalbed Methane Production Development, Part II.*

1227. Wieczner, Bilha; and Irvin, Marcia, *Coalbed Methane Development in Alabama: A Bibliography.*
1228. Williams, Peggy, *CBM in the Piceance Basin*.

1229. Williams, Peggy, *Coalbed Methane*.

1230. Williams, Peggy, *Coalbed Methane in the Cherokee Basin*.

1231. Willis, C., *Rocky Mountain Coal Seams Call for Special Drilling Techniques*.


1235. Wold, M. B.; and Jeffrey, R. G., *A Comparison of Coal Seam Directional Permeability as Measured in Laboratory Core Tests and in Well Interference Tests*.

1236. Wolf, K.; Ephraim, R.; Bertheux, W.; and Bruining, J., *Coal Cleat Classification and Permeability Estimation by Image Analysis on Cores and Drilling Cuttings*.


1244. Wray, Laura L.; Koenig, Nicole V.; and Seidle, John P., *Can Coalbed Methane and Aquifer Development Co-Exist? Examining the Two Resources in the Denver Basin of Colorado*.


1247. Wray, L. L., *Raster Image Correlations of Surface and Sub-Surface Late Cretaceous Fruitland Formation Coals in the Northern San Juan Basin, La Plata County, Colorado*.


1251. Wyoming Oil & Gas Conservation Commission, *Coal Bed Methane Wells*.


1258. Xinmin, Zhang; and Lingwen, Zhong, *On the Type of Generation and Storage of Coalbed Methane Reservoir*.


1263. Yee, D.; and Hanson, W. B., *Gas Sorption on Coal and Measurement of Gas Content*.


1269. Young, Genevieve, *Coal Reservoir Characteristics from Simulation of the Cedar Hill Field, San Juan Basin.*


1273. Yuan, G.; and Huang, K., *Classification of Mineral Resources Associated and Accompanied with Coal Measures.*


1278. Zhang, Jianbo, Li, Anqi; Liu, Chenglin; and Shixiang, Wu, *Research on Production Enhancement of Coalbed Methane and In-Situ Fracturing Test.*


1282. Zou, Y.; Yang, Q.; Kang, X.; and Tang, D., Maturity Control on the Patterns of Hydrocarbon Regeneration from Coal.

1283. Zuber, Michael D.; and Boyer, Charles, Analysis Optimizes CBM Economics.


1286. Zuber, M. D.; and Olszewski, A. J., Coalbed Methane Production Forecasting: Measurement Accuracy Required for Key Reservoir Properties.


1290. Zuber, M. D., Production Characteristics and Reservoir Analysis of Coalbed Methane Reservoirs.

1291. Zuber, M. D.; and Kuuskraa, V. A., A Reservoir Simulator-Based Methodology for Calculating Reserves of Coalbed Methane Wells.

1292. Zuber, M. D.; and Semmelbeck, M., The Use of Coalbed Methane Simulators for Coal Mining-Related Applications.

1293. Zuber, M. D., The Use of Monte Carlo Analysis to Evaluate Prospective Coalbed Methane Properties.

V

WATER

Contains listings that discuss groundwater, produced water and seawater. NOTE: Works that discuss hydraulic fracturing can be found in Index IV. Citations appear alphabetically by author/editor and include the title of the work. Refer to the bibliography for more information on the publication.


2. Anna, Lawrence O., Numerical Simulation of Water Flow in Ferron Sandstone Coalbeds, Central Utah.


7. Beckstrom, J. A.; and Boyer, D. G., Aquifer Protection Considerations of Coalbed Methane Development in the San Juan Basin.


13. Cox, David O., Coal-Seam Water Production and Disposal, San Juan Basin.


17. Daly, Daniel J.; Stoa, Rodney S.; Bassingthwaite, Scott A.; Sorenson, James A.; Charlton, David S.; Mesing, George; and Evans, James M., *Gas Industry-Related Exploration and Production Waste “Demographics” Utilizing GIS*.

18. Daly, D. J.; and Mesing, G., *Gas Industry-Related Produced-Water Demographics*.


22. Edgar, Thomas V.; and Case, James C., *Preliminary Hazards Report PHR 00-1; Pumping Induced Settlement of Aquifers*.


26. Finch, Steven T., Jr., *Fracture and Methane-Contamination Study: Animas River Valley From Bondad, Colorado to Cedar Hill, New Mexico*.


29. Foster, James B., *Fresh and Saline Ground-Water Map of West Virginia*. 

31. Gas Research Institute, *Disposal Technology for Water Produced from Coalbed Methane Wells*.

32. Gas Research Institute, *Improved Coal Seam Reservoir Gas-In-Place Analysis Protocol*.


38. Hildebrand, Ricky T., *Ground-water Composition as an Indicator of Sodium Content in Coal in the Powder River Basin, Southeastern Montana and Northeastern Wyoming*.


42. Kansas Geographic Information Systems Policy Board, *Kansas Ozark Aquifer*.

43. Kaszuba, J. P.; and Buys, M. W., *Reclamation Procedures for Produced Water Spills from Coalbed Methane Wells, San Juan Basin, Colorado and New Mexico*.

44. Koenig, Robert A.; and Bell, Gregory J., *Design of Single-Phase Flow for Water-Saturated Coalbed Methane Reservoirs*.


46. Lang, Karl, *Options for Coalbed Methane Water Management*.
47. Larson, L. R., *Coal-Spoil and Ground-Water Chemical Data from Two Coal Mines; Hanna Basin and Powder River Basin, Wyoming.*


49. Larson, L. R., *Ground-Water Quality in Wyoming.*


52. Lawrence, A. W., *Coalbed Methane Produced-water Treatment and Disposal Options.*


57. McGinnis, Norman F., *Dewatering Systems and Techniques for Coalbed Methane Wells: Volume I.*


63. Mitcham, S. A.; and Wobeser, G., *Effects of Coalbed Methane Development on the Water-Quality and Fish and Benthic Invertebrate Communities of the Big Sandy Creek Drainage System, Alabama.*

64. Morales, Graciela; and Barrufet, Maria, *Desalination of Produced Water Using Reverse Osmosis.*

65. Mount, David R.; and Gulley, David D., *Development of a Salinity/Toxicity Relationship to Predict Acute Toxicity of Saline Waters to Fresh Water Organisms.*


67. Mount, David R.; Gulley, David D.; and Evans, James M., *Salinity/Toxicity Relationships to Predict the Acute Toxicity of Produced Waters to Freshwater Organisms.*

68. Mount, David R.; Drottar, Kurt R.; Gulley, David D.; Frillo, John P.; and O’ Neil, Patrick E., *Use of Laboratory Toxicity Data for Evaluating the Environmental Acceptability of Produced Water Discharge to Surface Waters.*

69. Oklahoma Corporation Commission, *Depth to Base of Treatable Water Map Series.*

70. O’ Neil, Patrick E.; Harris, Steven C.; Mettee, Maurice F.; Isaacson, H. Ronald; and Evans, James M., *Biological Fate and Effect of Coalbed Methane Produced Waters Discharged into Streams of the Warrior Basin, Alabama.*


72. O’ Neil, Patrick E.; Mettee, Maurice F.; and Harris, Steven C., *Coalbed Methane Development in Alabama: Biological and Hydrological Conditions of Streams Draining the Cedar Cove Degasification Field.*

73. O’ Neil, P. E.; and Harris, S. C., *Development of an Instream Bioassessment Methodology for the Surface Disposal of Coalbed Methane Produced Waters.*

74. O’ Neil, Patrick E.; Harris, Steven C.; Mettee, Maurice F.; McGregor, Stuart W.; and Shepard, Thomas E., *Long-Term Biomonitoring of a Produced Water Discharge from the Cedar Cove Degasification Field, Alabama.*


80. Pillard, David, *Predicting the Toxicity of Common Ions Found in Produced Waters.*


84. Rice, Cynthia A.; and Nuccio, Vito, *Water Produced with Coalbed Methane.*

85. Rice, C.A., *Waters Co-Produced with Coalbed Methane from the Ferron Sandstone in East-Central Utah.*

86. Rice, D. D.; and Threlkeld, C. N., *Occurrences and Origin of Natural Gas in Ground Water, Southern Weld County, Colorado.*


88. Robson, S. G.; and Wright, Winfield G., *Ground-Water Resources of the Florida Mesa Area, La Plata County, Colorado.*

89. Russell, C.; and Richardson, C. P., *Treatment of Fruitland Coal Production Water with Ion Exchange Media.*


94. Shepard, Thomas E.; O’Neil, Patrick E.; Harris, Steven C.; and McGregor Stuart W., *Effects of Coalbed Methane Development on the Water-Quality and Fish and Benthic Invertebrate Communities of the Big Sandy Creek Drainage System, Alabama.*

95. Simmons, B. F., *Treatment and Disposal of Wastewaters Produced with Coalbed Methane by Reverse Osmosis.*

96. Strategic Research Institute, *CBM Water Management Strategies.*

97. Tewalt, S. J.; and Halili, N. E., *Arsenic in the Coal Beds and Surface Waters of the Warrior Basin, Western Alabama.*

98. Tietge, Joseph E.; Mount, David R.; and Gulley, David D., *GRI Freshwater STR Model and Computer Program: Overview, Validation, and Application.*


104. Wray, Laura L.; Koenig, Nicole V.; and Seidle, John P., *Can Coalbed Methane and Aquifer Development Co-Exist? Examining the Two Resources in the Denver Basin of Colorado.*


About the
INTERSTATE OIL and GAS
COMPACT COMMISSION

The Interstate Oil and Gas Compact Commission (IOGCC) represents the governors of 37 states — 30 member and seven associate states — that produce virtually all the domestic oil and natural gas in the United States. Six international affiliates have been accepted into the IOGCC in recent years.

The organization’s mission is to promote the conservation and efficient recovery of domestic oil and natural gas resources, while protecting health, safety and the environment.

Since its creation in 1935, the IOGCC has assisted states in balancing a multitude of interests — maximizing domestic oil and natural gas production, minimizing the waste of irreplaceable natural resources, and protecting human and environmental health — through sound regulatory practices. The IOGCC plays an active role in Washington, D.C., serving as the voice of the states on oil and natural gas issues and advocating states’ rights to govern the resources found within their borders.

For more information about the IOGCC, please call 405/525-3556, visit the World Wide Web at www.iogcc.state.ok.us, or send electronic mail to iogcc@iogcc.state.ok.us

Member States
Alabama (1945)
Alaska (1957)
Arizona (1955)
Arkansas (1941)
California (1974)
Colorado (1935)
Florida (1945)
Illinois (1935)
Indiana (1947)
Kansas (1935)
Kentucky (1942)
Louisiana (1941)
Maryland (1959)
Michigan (1939)
Mississippi (1948)
Montana (1945)
Nebraska (1953)
Nevada (1955)
New Mexico (1935)
New York (1941)
North Dakota (1953)
Ohio (1943)
Oklahoma (1935)
Pennsylvania (1941)
South Dakota (1955)
Texas (1935)
Utah (1957)
Virginia (1982)
West Virginia (1945)
Wyoming (1955)

Associate States
Georgia (1946)
Idaho (1960)
Missouri (1995)
North Carolina (1971)
Oregon (1954)
South Carolina (1972)
Washington (1967)

International Affiliates
Alberta (1996)
Egypt (1999)
Republic of Georgia (2001)
Newfoundland and Labrador (1997)
Nova Scotia (1997)
Venezuela (1997)