

REFERENCES

This master reference list pertains only to Chapters 1 through 7 of this document. Separate reference lists are provided for each appendix and attachment, and are provided at the end of each of these sections.

- Alabama Oil and Gas Board, Administrative Code, Oil and Gas Report 1, 400-3.
- Alabama Oil and Gas Board. 2002. Public Comment OW-2002-0002-0029 to “Draft Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs.” *Federal Register*. Vol. 63, No. 185. p. 33992, September 24, 2002.
- Andrews, Richard D., Cardott, Brian J., and Storm, Taylor. 1998. The Hartshorne Play in Southeastern Oklahoma: regional and detailed sandstone reservoir analysis and coalbed-methane resources. Oklahoma Geological Survey, Special Publication 98-7.
- Baldwin. 2000. Colorado Oil and Gas Conservation Commission, *personal communication*.
- Bodnar, G. 1999. Colorado Department of Health, *personal communication*.
- Bostic, Joy L., Brady, L. L., Howes, M. R., Burchett, R. R., and Pierce, B. S. 1993. Investigation of the coal properties and the potential for coal-bed methane in the Forest City Basin. U. S. Geological Survey, Open File Report 93-576.
- Brady, L. L. 2002. Kansas Geological Survey, *personal communication*.
- Buckovic. 1979. The Eocene Deltaic System of West-central Washington: in Armentrout, J. M., Cole, M. R., and Terbest H., eds., Cenozoic paleogeography of the western United States: Los Angeles, Soc. Econ. Paleont. and Min., Pacific Section, Pacific Coast Paleogeog. Symposium 3, p. 147-163, as cited by Choate et al., 1980.
- Carrol, R.E., Pashin, J.C., and Kugler, R.L. 1993. Burial history and source rock characteristics of Mississippian and Pennsylvanian strata, Black Warrior basin, Alabama, Alabama Geological Society Guidebook, pp. 79-88.
- Charpentier, Ronald R. 1995. Cherokee Platform Province. U. S. Geological Survey, National Assessment of United States Oil and Gas Resources.
- Chavez, F. 2001. New Mexico Oil Conservation Division, *personal communication*.

- Choate, R, Johnson, D.A., and McCord, J.P. 1980. Geologic overview, coal, and coalbed methane resources of the Western Washington coal region, Lakewood, Colorado. TRW Energy Systems Group Report for U.S. Department of Energy, Morgantown Energy Technology Center, Contract DE-AC21-78MC08089, pp. 353-372.
- Choate, R., Lent, T., and Rightmire, C.T. 1993. Upper Cretaceous geology, coal, and the potential for methane recovery from coalbeds in the San Juan Basin – Colorado and New Mexico. AAPG Studies in Geology, 38:185-222.
- Clark, R.C. and Brown, D. W. 1977. Petroleum's Properties and Analyses in Biotic and Abiotic Systems. In: Effects of Petroleum on Arctic and Subarctic Marine Environments and Organisms, (ed. Malins, D.C.) Vol. 1).
- Close, Jay. C. 1993. Natural Fractures in Coal; Chapter 5 of AAPG Studies in Geology 38, "Hydrocarbons from Coal", pp. 119-133.
- Colorado GIS. 2001. Approved Drilling Permits, <http://cogccweb.state.co.us/cogis/DrillingPermitsList.asp>
- Colorado Oil and Gas Conservation Commission and New Mexico Oil Conservation Division, *personal communication*, 2001.
- Colorado Oil and Gas Conservation Commission. 2001. <http://www.oil-gas.state.co.us/>
- Condra, G. E. and Reed, E. C. 1959. The geological section of Nebraska. Nebraska Geological Survey Bulletin 14A, 1959.
- Consolidated Industrial Services, Inc. 2001. Hydraulic fracturing site visit notes, Western Interior Coal Region, State of Kansas.
- Cordova, Robert M. 1963. Reconnaissance of the ground-water resources of the Arkansas Valley Region, Arkansas. Contributions to the Hydrology of the United States, Geological Survey Water-Supply Paper 1669-BB, 1963.
- Cramer, D.G. 1992. The unique aspects of fracturing western U.S. coalbeds; Journal of Petroleum Technology, October 1992, pp. 1126-1133.
- DASC Web site. 2001a. Kansas elevation map. <http://gisdasc.kgs.ukans.edu/dasc/kanview.html>.
- DASC Web site. 2001b. Ozark Aquifer base map. <http://gisdasc.kgs.ukans.edu/dasc/kanview.html>.

- DeBruin, Rodney H., Lyman, Robert M., Jones, Richard W., and Cook, Lance W. 2000. Information Pamphlet 7. Wyoming State Geological Survey.
- Diamond, W.P. 1987a. Underground observations of mined-through stimulation treatments of coalbeds. *Quarterly Review of Methane from Coal Seams Technology*. v. 4, n. 4 (June 1987), pp. 19-29.
- Diamond, W.P. 1987b. Characterization of Fracture Geometry and Roof Penetration Associated with Stimulation Treatments in Coalbeds. Proceedings of the 1987 Coalbed Methane Symposium, University of Alabama (Tuscaloosa), pp. 243.
- Diamond, W.P. and D.C. Oyler. 1987. Effects of stimulation treatments on coalbeds and surrounding strata, evidence from underground observations. US Department of Interior, RI9083, USBM, pp. 1-47.
- Dion, N. P. 1984. Washington Ground-Water Resources. *In* National Water Summary, U.S. Geological Survey Water-Supply Paper No. 2275, pp. 433-438.
- Duigon, Mark T. and Smigaj, Michael J. 1985. First report on the hydrologic effects of underground coal mining in Southern Garrett County, Maryland, U.S. Geological Survey Report of Investigations No. 41.
- Energy Information Agency. 2001. "U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2000 Annual Report," DOE/EIA-0216 (2000) Advance Summary, Nov. 2001, p. 17.
- Elbel, J.L. 1994. Field evaluation of acid-fracturing treatments with geometry simulation, buildup, and production data; SPE Production and Facilities, v.9 n.1 (February 1994), pp. 43-46.
- Elder, C.H. and Deul, M. 1974. Degasification of the Mary Lee coalbed near Oak Grove, Jefferson county, Alabama, by vertical borehole in advance of mining; U.S. Bureau of Mines Report 7968.
- Eleventh Circuit Court of Appeals, 1997. *LEAF v. EPA*, 118F.3d 1467.
- Ellard, J.S., Roark, R.P., and Ayers, W.B. 1992. Geologic controls on coalbed methane production: an example from the Pottsville formation, Black Warrior Basin, Alabama USA. Symposium on Coalbed Methane Research and Development in Australia. James Cook University, p. 45-61.
- Ely, J.W., Zbitowski, R.I., and Zuber, M.D. 1990. How to develop a coalbed methane prospect: a case study of an exploratory five-spot well pattern in the Warrior basin, Alabama; SPE Paper 20666, Proceedings of the 65th Annual Technical Conference (New Orleans), pp. 487-496.

- Ely, John W. 1985. Secondary recovery of oil, oil wells, hydraulic fracturing. Stimulation Engineering Handbook, ix, 357 p.
- Fetter, C.W. 1994. Applied Hydrogeology, 3rd ed. New York: Macmillan College Publishing Company.
- Flores, R.M. and Bader, L.R., 1999. Fort Union Coal in the Powder River Basin, Wyoming and Montana: A synthesis. U.S. Geological Survey Professional Paper 1625-A, Chapter PS, 49 pp., on CD-ROM.
- Flowerday, C. F., Kuzelka, R. D., and Pederson, D. T., compilers. 1998. The Ground Water Atlas of Nebraska.
- Foster, James B. 1980. Fresh and saline ground-water map of West Virginia. U. S. Geological Survey, West Virginia Geological and Economic Survey, Map WV-12.
- Friedman, Samuel A. 1982. Determination of reserves of methane from coalbeds for use in rural communities in eastern Oklahoma. Oklahoma Geological Survey, Special Publication 82-3, 1982.
- Garrison, James R., Jr. (non-survey author), van den Bergh, T.C.V. (non-survey author), Barker, Charles E., Tabet, David E. (non-survey author). 1997. Depositional sequence stratigraphy and architecture of the Cretaceous Ferron Sandstone; implications for coal and coalbed methane resources; a field excursion. Link, Paul Karl (non-survey editor), Kowallis, Bart J. (non-survey editor), Mesozoic to Recent geology of Utah, *Geology Studies*, 42(2): 155-202.
- Geological Survey of Alabama, 1930's to Present, Hydrogeology Well Records, open-file data for Tuscaloosa, Jefferson and Walker Counties, Alabama, as cited by the Alabama State Oil and Gas Board, 2002.
- Gloyn, Robert W. and Sommer, Steven N. 1993. Exploration for coalbed methane gains momentum in Uinta Basin. *Utah Geological Survey, Oil & Gas Journal, Exploration*, pp. 73-76, May 31, 1993.
- Graham, G. 2001. Colorado Division of Water Resources, *personal communication*.
- Gray, Ian. 1987. Reservoir engineering in coal seams: the physical process of gas storage and movement in coal seams; *SPE Reservoir Engineering*, v. 2, no. 1, pp. 7-14.
- GRI (Gas Research Institute). 1995. Fracturing Experience at the Rock Creek Multiple Coal Seams Project; Topical Report, prepared by S.W. Lambert, J.L. Saulsberry, P.F. Steidl, M.W. Conway, and S.D. Spafford, July 1995.

- GRI (Gas Research Institute). 1996. Coordinated Studies in Support of Hydraulic Fracturing of Coalbed Methane, Final Report # GRI-95/0283, prepared by Stim-Lab, Inc. February 1996, pp. 2.4-1-2.4-3.
- GTI (Gas Technology Institute) Web site. 2002. Drilling and Production Statistics for Major US Coalbed Methane and Gas Shale Reservoirs.
<http://www.gastechnology.org>
- Halliburton, Inc., Virginia Site Visit. 2001. EPA observed hydraulic fracturing of gas wells performed by Halliburton, Inc. for Consol Energy (VA) in the Central Appalachian Basin. August 9, 2001.
- Halliburton, Inc. 2002. *Personal communication* with Halliburton staff, fracturing fluid experts: Joe Sandy, Pat Finley, and Steve Almond. March 1, 2002.
- Halliburton, Inc. 2003. *Personal communication* with Halliburton staff, fracturing fluid expert, Steve Almond. April 2003.
- Hanson, M.E., Neilsen, P.E., Sorrels, G.G., Boyer, C.M., and Schraufnagel, R.A. 1987. Design, execution, and analysis of a stimulation to produce gas from thin multiple coal seams; SPE Paper 16860, Proceedings, 1987 Society of Petroleum Engineers annual technical conference and exhibition.
- Harper, T.R., Hagans, J.T., and Martins, J.P. 1985. Fracturing without proppant. SPE 13858, Proceedings SPE Low Permeability Reservoirs Symposium (Denver), p. 83.
- Heath, Brian. 1999. Environmental Analyst, Wyoming Department of Environmental Quality, Water Quality Division. Telephone Interview with EPA conducted August 19, 1999.
- Hemborg, H. T. 1998. Spanish Peak Field, Las Animas County, Colorado: Geologic setting and early development of a coalbed methane reservoir in the Central Raton Basin. Colorado Geological Survey, Dept. of Natural Resources, Denver, CO, Resource Series 33, 34 pp.
- Hill, David. 2001. Gas Technology Institute. *Personal communication*, peer-review panelist.
- Hinkel, J.J., Nimerick, K.H., England, K., Norton, J.C., and Roy, M. 1991. Design and evaluation of stimulation and workover treatments in coal seam reservoirs; Proceedings 1991 Coalbed Methane Symposium, University of Alabama (Tuscaloosa), Tuscaloosa, pp. 453-458.

- Holditch, S.A. 1990. Completion methods in coal seam reservoirs. SPE Paper No. 20670. Proceedings 1990 SPE Annual Technical Conference and Exhibition (Production Operations and Engineering), pp. 533-542.
- Holditch, S.A. 1993 Completion methods in coal-seam reservoirs; Journal of Petroleum Technology, v.45 n.3 (March 1993), pp. 270-276.
- Holditch, S.A., Ely, J.W., Semmelbeck, M.E., Carter, R.H., Hinkle, J., and Jeffrey, R.G. 1988. Enhanced recovery of coalbed methane through hydraulic fracturing; SPE Paper 18250, Proceedings 1988 SPE Annual Technical Conference and Exhibition (Production Operations and Engineering), p. 689.
- Holditch, S.A., Ely, J.W., and Carter, R.H. 1989. Development of a coal seam fracture design manual; Proceedings, 1989 Coalbed Methane Symposium, Tuscaloosa, Alabama, pp. 299-320.
- Holland, W. 1999. La Plata County, *personal communication*.
- Hopkins, Herbert T. 1966. Fresh-saline water interface map of Kentucky. U. S. Geological Survey, Kentucky Geological Survey, Series X.
- Hudson, Harold & Staff, BJ Services, 2002. *Personal communication*, conference call with EPA on April 19, 2002.
- Hunt, A. M., and Steele, D. J. 1991. Coalbed methane development in the Northern and Central Appalachian Basins – past, present and future. The 1991 Coalbed Methane Symposium, The University of Alabama/Tuscaloosa, May 13-16, 1991.
- Jeffrey, R.G., J.R. Enever, T. Ferguson, J. Bride, R. Phillips, and S. Davidson. 1993. Small-scale hydraulic fracturing and mineback experiments in coal seams. Proceedings of the 1993 International Coalbed Methane Symposium. University of Alabama (Tuscaloosa). May 17-21, 1993. pp. 79-88.
- Jeu, S.J., Logan, T.L., and McBane, R.A. 1988. Exploitation of deeply buried coalbed methane using different hydraulic fracturing techniques; SPE paper 18253, Proceedings 63rd Annual Technical Conference (Houston).
- Johnson, R. C. 1989. Geologic history and hydrocarbon potential of Late Cretaceous-age, low-permeability reservoirs, Piceance Basin western Colorado: U. S. Geological Survey Bulletin 1787-E, 51 p.
- Johnston, William D., Jr., 1933. Ground water in the Paleozoic rocks of northern Alabama: Geological Survey of Alabama, Special Report No. 16, as cited by the Alabama State Oil and Gas Board, 2002.

- Jones, A.H., and Schraufnagel, R.A. 1991. In-situ stress variations in the Black Warrior basin; Proceedings of 1991 Coalbed Methane Symposium, University of Alabama (Tuscaloosa), Tuscaloosa, p. 75.
- Jones, A.H., Bell, G.J., and Morales, R.H. 1987a. Examination of potential mechanisms responsible for the high treatment pressures observed during stimulation of coalbed reservoirs; SPE Paper 16421, Proceedings, Department of Energy/SPE Symposium: Gas from Low Permeability Reservoirs, p. 317.
- Jones, A.H., Bell, G.J., and Morales, R.H. 1987b. The influence of coal fines/chips on the behavior of hydraulic fracture stimulation treatments; Proceedings of 1987 Coalbed Methane Symposium, University of Alabama (Tuscaloosa), Tuscaloosa, pp. 93-102.
- Kaiser, W.R. and Ayers, W.B.Jr. 1994. Coalbed methane production, Fruitland formation, San Juan Basin: geologic and hydrologic controls. New Mexico Bureau of Mines and Minerals Bulletin 146: Coalbed methane in the upper Cretaceous Fruitland formation, San Juan Basin, New Mexico and Colorado, pp. 187-207.
- Kaiser, W.R. and Scott, A.R. 1994. Hydrologic setting of the Fort Union Formation, Sand Wash Basin. Report of Investigations – Geologic and Hydrologic Controls on Coalbed Methane, Texas, University, Bureau of Economic Geology, 220, pp. 115-125.
- Kaiser, W.R., Scott, A., Zhou, N., Hamilton, D.S., and Tyler, R. 1994a. Resources and Producibility of Coalbed Methane in the Sand Wash Basin. Report of Investigations – Geologic and Hydrologic Controls on Coalbed Methane, Texas University, Bureau of Economic Geology, 220, pp. 129-145.
- Kaiser, W.R., Swartz, T.E., and Hawkins, G.J. 1994b. Hydrologic framework of the Fruitland formation, San Juan Basin. New Mexico Bureau of Mines and Minerals Bulletin 146: Coalbed methane in the upper Cretaceous Fruitland formation, San Juan Basin, New Mexico and Colorado, pp. 133-164.
- Kelafant, J. R., Wicks, D. E., Kuuskraa, V. A. March 1988. A geologic assessment of natural gas from coal seams in the Northern Appalachian Coal Basin. Topical Report – Final Geologic Report (September 1986 – September 1987).
- Keller, Adam. 1999. Planner with La Plata County, *personal communication*.
- Koenig, R.A. 1989. Hydrologic characterization of coal seams for optimum dewatering and methane drainage; Quarterly Review of Methane from Coal Seams Technology, v.7, pp. 30-33.

- Larsen, Very E., 1989. Preliminary evaluation of coalbed methane geology and activity in the Recluse Area, Powder River Basin, Wyoming, Quarterly Review of Methane from Coal Seams Technology, June.
- Laubach, S. E., Marrett, R. A., Olson, J. E., and Scott, A. R., 1998, Characteristics and origins of coal cleat: a review: International Journal of Coal Geology, v. 35, p. 175–207, as cited by Olson, Jon, 2002.
- Laubach, S.E. and C.M. Tremain, 1991. Regional coal fracture patterns and coalbed methane development, in J.C. Roegiers, ed., Rock Mechanics as a Multidisciplinary Science, Proceedings of the 32nd U.S. Symposium, University of Oklahoma at Norman. Rotterdam, A.A. Balkema, p. 851-859.
- Law, Ben E., Rice, Dudley D., Flores, Romeo M. 1991. Coalbed gas accumulations in the Paleocene Fort Union Formation, Powder River Basin, Wyoming. Rocky Mountain Association of Geologists, Coalbed Methane.
- Levine, J.R. 1993. Coalification: the evolution of coal as a source rock and reservoir rock for oil and gas; AAPG Studies in Geology 38, pp. 39-77. [Note: This source was also cited by the Alabama Oil and Gas Board. 2002. Public Comment OW-2002-0002-0029 to “Draft Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs.” *Federal Register*. Vol. 63, No. 185. p. 33992, September 24, 2002.]
- Lyons, Paul C. 1997. Central-Northern Appalachian Coalbed Methane Flow Grows. Oil & Gas July 7, 1997, pp. 76-79.
- Mavor, M.J., Dhir, R., McLennan, J.D., and Close, J.C. 1991. Evaluation of the hydraulic fracture stimulation of the Colorado 32-7 No. 9 well, San Juan basin; Rocky Mountain Association of Geologists Guidebook, “Coalbed methane of Western North America”, Fall Conference and Field Trip, pp. 241-249.
- McCord, E. 1999. Attorney at Law, *personal communication*.
- Macfarlane, A. 2001. Kansas Geological Survey, *personal communication*.
- McKee, C.R., Bumb, A.C., and Koenig, R.A. 1989. Stress-dependent permeability and porosity of coal; Proceedings 1987 Coalbed Methane Symposium, University of Alabama (Tuscaloosa), pp. 16-19.
- Merchat, Walt. 1999. Consultant for the Powder River Basin Resource Council, Telephone Interview with EPA conducted May 17, 1999.
- Messina, Inc. Web site. 2001. Fracturing fluid manufacturer for the oil and gas industry. www.messinaoil-chem.com.

- Missouri Division of Geological Survey and Water Resources. 1967. Mineral & Water Resources of Missouri, 43(2).
- Montgomery, Scott L. 1999. Powder River Basin, Wyoming: An expanding coalbed methane (CBM) play. American Association of Petroleum Geologists Bulletin, (August).
- Morales, R.H, McLennan, J.D., Jones, A.H., and Schraufnagel, R.A. 1990. Classification of treating pressures in coal fracturing; Proceedings of the 31st U.S. Symposium on Rock Mechanics, 31, pp. 687-694.
- Mukherjee, Hemanta and Cudney, Greg. 1993. Extension of acid fracture penetration by drastic fluid-loss control. JPT Journal of Petroleum Technology, 45(2):102-105.
- Naceur, K.B. and Touboul, E. 1990. Mechanisms controlling fracture height growth in layered media; SPE Production Engineering, v.5 n.2 (May 1990), pp. 142-150.
- Nielsen, P. E. and Hanson, M. E. 1987. Analysis and Implications of Three Fracture Treatments in Coals at the USX Rock Creek Site Near Birmingham, Alabama, 1987 Coalbed Methane Symposium, Tuscaloosa, AL (Nov. 16-19, 1987).
- Nolte, K.G. and Economides, M.J. 1991. Fracture design and validation with uncertainty and model limitations; Journal of Petroleum Technology, v.43 n.9 (September 1991), pp. 1147-1155.
- Nolte, K.G. and Smith, M.B. 1981. Interpretation of fracturing pressures; Journal of Petroleum Technology, September 1981, pp.1767-1775.
- Oklahoma Corporation Commission (OCC), Depth to Base of Treatable Water Map Series, 2001.
- Oklahoma Geological Survey Web site. 2001. <http://www.ou.edu/special/ogs-pttc>.
- Olson, Jon. 2001. University of Texas at Austin. *Personal communication*, peer-review panelist.
- Osborne, Paul. 2002. USEPA Region VIII UIC Program, *personal communication*.
- Palmer, I.D., Davids, M.W., and Jeu, S.J. 1989. Analysis of unconventional behavior observed during coalbed fracturing treatments, Proceedings of the 1989 Coalbed Methane Symposium, University of Alabama/Tuscaloosa, April 17-20, 1989, pp. 395-411.
- Palmer, I.D. and Sparks, D.P. 1990. Measurement of induced fractures by downhole TV camera in coalbeds of the Black Warrior Basin; Society of Petroleum Engineers

- paper number 20660, Proceedings, 1990 Society of Petroleum Engineers annual technical conference and exhibition, pp. 445-458.
- Palmer, I.D., Fryar, R.T., Tumino, K.A., and Puri, R. 1991a. Comparison between gel-fracture and water-fracture stimulations in the Black Warrior basin; Proceedings 1991 Coalbed Methane Symposium, University of Alabama (Tuscaloosa), pp. 233-242.
- Palmer, I.D., Fryar, R.T., Tumino, K.A., and Puri, R. 1991b. Water fracs outperform gel fracs in coalbed pilot; Oil and Gas Journal, August 12, 1991, pp.71 – 76.
- Palmer, I.D., King, N.S., and Sparks, D.P. 1991c. The character of coal fracture treatments in Oak Grove field, Black Warrior basin, SPE paper no. 22914, Proceedings, 1991 Society of Petroleum Engineers annual technical conference and exhibition, pp. 277-286.
- Palmer, I.D., King, N.S., and Sparks, D.P. 1993a. The character of coal fracture treatments in the Oak Grove field, Black Warrior Basin. *In Situ*, Journal of Coal Research, 17(3):273-309.
- Palmer, I.D., Lambert, S.W., and Spitler, J.L. 1993b. Coalbed methane well completions and stimulations. Chapter 14 of AAPG Studies in Geology 38, pp. 303-341.
- Pappajohn, S. P., and Mitchell, T. E. 1991. Delineation of prospective coalbed methane trends in western and central Washington State. *In* Schwochow, S. D. Coalbed methane of western North America guidebook for the Rocky Mountain Association of Geologists Fall Conference and Field Trip Sept. 17-20, 1991, Glenwood Springs, CO, pp. 163-178.
- Pashin, J.C. and Hinkle, F. 1997. Coalbed Methane in Alabama. Geological Survey of Alabama Circular 192, 71 pp.
- Pashin, J.C. 1994a. Coal body geometry and syn-sedimentary detachment folding in the Oak Grove coalbed methane field, Black Warrior basin, Alabama; AAPG Bulletin, v. 78, pp. 960-980.
- Pashin, J.C. 1994b. Cycles and stacking patterns in Carboniferous rocks of the Black Warrior foreland basin; Transactions of the Gulf Coast Association of Geological Societies (AAPG), 44, pp.555-563.
- Pashin, J.C., Ward, W.E., Winston, R.B., Chandler, R.V., Bolin, D.E., Richter, K.E., Osborne, W.E, and Sarnecki, J.C. 1991. Regional analysis of the Black Creek-Cobb coalbed methane target interval, Black Warrior Basin, Alabama. Alabama Geological Survey Bulletin 145, 127 pp.

- Pennsylvania Department of Conservation and Natural Resources, 2002.
- Petroleum Technology Transfer Council Web site. 1999.
<http://www.pttc.org>
- Petzet, G. Alan. 1996. Utah coalbed gas exploration poised for growth. *Oil & Gas Journal, Exploration*, p. 54, August 5, 1996.
- Platt, Steve. January, 2001. U.S. EPA Region 3, *personal communication*.
- Potter, T.L. and K.E. Simmons. 1998. Total Petroleum Hydrocarbon Criteria Working Group Series, Volume 2. Composition of Petroleum Mixtures. The Association for Environmental Health and Science. Available on the Internet at:
<http://www.aehs.com/publications/catalog/contents/tph.htm>.
- Powder River Coalbed Methane Information Council (PRCMIC). 2000. Coalbed Methane Development Information, Sheridan, Wyoming.
- Powell, R. J., McCabe, M. A., Slabaugh, B. F., Terracina, J. M., Yaritz, J. G., and Ferrer, D. 1999. Applications of a new, efficient hydraulic fracturing fluid system. *SPE Production and Facilities*, 14(2):139-143, 1064-668X.
- Quarterly Review. 1993. Coalbed methane – state of the industry. *Methane From Coal Seams Technology*, August, 1993.
- R. Morrison & Associates, Inc. 2001. Environmental Tool Box (newsletter). “Does diesel #2 fuel oil contain benzene?” Fall 2001.
- Rahim, Z. and Holditch, S.A. 1992. The effects of mechanical properties and selection of completion interval upon the created and propped fracture dimensions in layered reservoirs; SPE Paper 24349, Proceedings of the 1992 Rocky Mountain Regional Meeting (Denver).
- Rahim, Z., Holditch, S.A, Zuber, M.D., and Buehring, D.R. 1998. Evaluation of fracture treatment using a layered-reservoir description: Field examples; *SPE Production and Facilities*, v.13 n1 (February 1998), pp. 21-27.
- Rice, C.A., Ellis, M.S., and Bullock, J.H., Jr. 2000. Water co-produced with coalbed methane in the Powder River Basin, Wyoming: preliminary compositional data. U.S. Geological Survey Open-File Report 00-372.
- Rice, D.D. 1993. Composition and origins of coalbed gas; *AAPG Studies in Geology* 38, pp. 159-184.

- Saulsberry, J.L., Schraufnagel, R.A., and Jones, A.H. 1990. Fracture height growth and production from multiple reservoirs; SPE paper no. 20659, Proceedings, 1990 Society of Petroleum Engineers annual technical conference and exhibition, pp. 433-443.
- Schlumberger, Ltd. 2001. Material Safety Data Sheets for Hydraulic Fracturing Fluids, Memo to EPA from P.A. VanAllan, Health, Safety and Environmental Council, Western Hemisphere. September 18, 2001.
- Schraufnagel, R.A. 1993. Coalbed methane production. Chapter 15 of AAPG Studies in Geology 38, pp. 341-361.
- SDWA (Safe Drinking Water Act) Sections 1422 and 1425.
- Sedam, A. C., and Stein, R. B. 1970. Saline ground-water resources of Ohio. Hydrologic Investigations Atlas HA-366, Department of the Interior, U. S. Geological Survey.
- Smith, D. 2002. Missouri Geological Survey, *personal communication*.
- Soot, P. 1991. Tax incentives spur development of coalbed methane; Oil and Gas Journal, June 1991, pp. 40-42.
- Spafford, S.D. 1991. Stimulating multiple coal seams at Rock Creek with access restricted to a single seam; Proceedings 1991 Coalbed Methane Symposium, University of Alabama (Tuscaloosa), p. 243.
- Steidl, P.F. 1991. Inspection of induced fractures intercepted by mining in the Warrior basin, Alabama; Proceedings 1991 Coalbed Methane Symposium, University of Alabama (Tuscaloosa), pp. 181-191.
- Stevens, S., Lombardi, T. E., Kelso B. S., and Coates, J. M. 1992. A geologic assessment of natural gas from coal seams in the Raton and Vermejo Formations, Raton Basin. GRI Topical Report 92/0345, 84 pp.
- Stevens, S.H., Kuuskraa, J.A., and Schraufnagel, R.A. January, 1996. Technology spurs growth of U.S. coalbed methane. Oil and Gas Journal, pp. 56-63.
- Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizell, N.H. and Padgett, E.T. 1983. Hydrogeology and water resources of San Juan Basin, New Mexico. New Mexico Bureau of Mines and Mineral Resources, Hydrologic Report 6, 70 p.
- TBEG (Texas Bureau of Economic Geology). 2000. *Personal communication* with TBEG Staff.

- Tessin, Robert. 2001. Colorado Oil and Gas Conservation Commission, *personal communication*.
- Thompson, J. E., Mchain, C., Gregory, G., and Gerbrandt, D. 1991. New continuous-mix process for gelling anhydrous methanol minimizes hazards. Proceedings-SPE Annual Technical Conference and Exhibition, October 6 – 9, 1991. Publication by Society of Petroleum Engineers of AIME, pp. 425-436.
- Tyler, R., Scott, A.R. and Kaiser, W.R. 1998. Defining coalbed methane exploration fairways: An example from the Piceance Basin, Rocky Mountain Foreland. Western United States, Conference Document, March 23-25.
<http://georef.cos.com/cgi-bin/getRec?un=2001-012340>
- U.S. Department of the Interior, Bureau of Land Management, Colorado State Office. 1998. Glenwood Spring Resource Area: Oil & Gas Leasing Development, Draft Supplemental Environmental Impact Statement, June 1998.
- U. S. Department of the Interior, Bureau of Land Management, San Juan Field Office. 1999. Coalbed Methane Development in the Northern San Juan Basin of Colorado, A Brief History and Observations, Working Document, December 1999.
- US Environmental Protection Agency. 1987. Guidelines for Delineation of Wellhead Protection Areas. Office of Ground-Water Protection. June 22, 1987.
- US Environmental Protection Agency. 1993. Memorandum: Assistance on compliance of 40 CFR Part 191 with ground water protection standards. From James R. Elder, Director, Office of Ground Water and Drinking Water, to Margo T. Oge, Director, Office of Radiation and Indoor Air. June 4, 1993.
- US Environmental Protection Agency. 1999. USEPA's Program to Regulate the Placement of Waste Water and other Fluids Underground. EPA 810-F-99-019, December 1999.
- US Environmental Protection Agency. 2000. Underground Injection Control (UIC) Program; Proposed Coal Bed Methane (CBM) Study Design. *Federal Register*. Vol. 65, No. 143. p. 45774, July 25, 2000.
- US Environmental Protection Agency. 2001. Underground Injection Control; Request for Information of Ground Water Contamination Incidents Believed To Be Due to Hydraulic Fracturing of Coalbed Methane Wells. *Federal Register*. Vol. 66, No. 146. p. 39396, July 30, 2001.
- US Environmental Protection Agency. 2002. Underground Injection Control (UIC) Program; Hydraulic Fracturing of Coalbed Methane (CBM) Wells Report-- Notice. *Federal Register*. Vol. 67, No. 167. p. 55249, August 28, 2002.

- United States Geological Survey. 1971. State of Ohio, 1:500,000 topographic map.
- United States Geological Survey. 1973. State of Kentucky, 1:500,000 topographic map.
- United States Geological Survey. 1984. National Water Summary. Hydrologic events, selected water-quality trends, and ground-water resources. United States Geological Survey Water-Supply Paper No. 2275.
- Utah Department of Natural Resources. 2002. Public Comment OW-2001-0002-0090 to "Draft Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs." *Federal Register*. Vol. 63, No. 185. p. 33992, September 24, 2002.
- VA Division of Gas and Oil, 2002. Public Comment OW-2001-0002-0084 to "Draft Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs." *Federal Register*. Vol. 63, No. 185. p. 33992, September 24, 2002.
- Virginia Department of Mines, Minerals, and Energy (VDMME). 2001. *Personal communication* with VDMME staff.
- Valkenburg, Nicholas, Christian, Robert, and Green, Margaret, 1975, Occurrence of iron bacteria in ground-water supplies of Alabama: Alabama Geological Survey Circular 96, 45p, as cited by the Alabama State Oil and Gas Board, 2002.
- Warpinski, Norm, 2001. Sandia Laboratories. *Personal communication*, peer-review panelist.
- Warpinski, N.R., Branagan, P.T., Satler, A.R., Cippolla, C.L., Lorenz, J.G., and Thorne, B.J. 1988. A case study of a stimulation experiment in a fluvial, tight, sandstone gas reservoir. Society of Petroleum Engineers Paper No. 18258, Proceedings 63rd Annual Technology Conference, October 1988 (Houston), pp. 616-632.
- Warpinski, N.R., Schmidt, R.A., and Northrop, D.A. 1982. In-situ stresses: the predominant influence on hydraulic fracture containment; *Journal of Petroleum Technology*, March 1982, pp. 653-664.
- Warpinski, Norman R. 1996. Hydraulic Fracture Diagnostics, *Journal of Petroleum Technology*, (Oct. 1996).
- Willberg, D.M., N. Steinsberger, R. Hoover, R.J. Card. 1998. Optimization of Fracture Cleanup Using Flowback Analysis. SPE #39920. Proceedings-SPE Rocky Mountain Regional/Low Permeability Reservoirs Symposium and Exhibition, April 5-8, 1998. Publication by Society of Petroleum Engineers, pp. 147-159.

- Willberg, D.M., R.J. Card, L.K. Britt, M. Samuel, K.W. England, K.E. Cawiezel, H. Krus. 1997. Determination of the Effect of Formation Water of Fracture Fluid Cleanup Through Field Testing in the East Texas Cotton Valley. SPE #38620. Proceedings-SPE Annual Technical Conference and Exhibition, October 5-8, 1997. Publication by Society of Petroleum Engineers, pp. 531-543.
- Wilson, Robert. February, 2001. Director, Virginia Division of Gas & Oil, Department of Mines, Minerals, and Energy, *personal communication*.
- Winston, R.B. 1990. Vitrinite reflectance of Alabama's bituminous coal; Alabama Geological Survey Circular 139, 54 pp.
- Wright, C.A. 1992. Effective design, real-data analysis, and post-job evaluation of hydraulic fracturing treatments. Methane from Coal Seams Technology Journal, pp. 29-32 (July).
- Zebrowitz, M. J., Kelafant, J. R., and Boyer, C. M. 1991. Reservoir characterization and production potential of the coal seams in Northern and Central Appalachian Basins. Proceedings of the 1991 Coalbed Methane Symposium, The University of Alabama/Tuscaloosa, May 13-16, 1991.
- Zuber, M.D., Kuuskraa, V.A., and Sawyer, W.K. 1990. Optimizing well spacing and hydraulic fracture design for economic recovery of coalbed methane. SPE Formation Evaluation, 5(1):98-102.
- Zuber, M.D., Reeves, S.R., Jones, A.H., and Schraufnagel, R.A. 1991. Variability in coalbed-methane well performance: a case study; Journal of Petroleum Technology, v.43 n.4 (April 1991), pp. 68-475.
- Zuber, Michael D. 1998. Production characteristics and reservoir analysis of coalbed methane reservoirs. Lyons, Paul C. (editor). Appalachian coalbed methane. International Journal of Coal Geology, 38 (1-2):27-45. Meeting: Appalachian coalbed methane, Lexington, KY, United States, Sept. 27-30, 1997.