

JOHN P. SEIDLE, PhD, PE
Partner
Sr. Reservoir Engineer



MHA Petroleum Consultants LLC
730 17th Street, Suite 410
Denver, Colorado 80202-3510 USA
Tel.: +1 303 277 0270
Fax: +1 303 277 0267
Email: jseidle@mhausa.com

Education:

- B.S., Aeronautical Engineering, University of Colorado, 1972
- M.S., Aeronautical Engineering, Stanford, 1973
- Ph.D., Mechanical Engineering, University of Colorado, 1981

Professional Profile:

35+ years of industry experience, primarily in unconventional reservoirs
SEC and PRMS compliant Reserve and Resource evaluations
Reservoir engineering and economic studies for coalbed methane, shales, and tight oil
Property evaluation, technical assistance for acquisition and divestitures
Expert witness testimony for litigation and regulatory commissions
Unconventional well performance analysis
Instructor for industry classes, primarily unconventional reservoirs
29 technical papers, six patents
Editor and chapter author, SPEE Monograph 4, "Estimating Ultimate Recovery of Developed Wells in Low-Permeability Reservoirs"
Unconventional reservoir experience in USA, Canada, Australia, China, India, South Africa, New Zealand, Colombia, Mexico, France, UK, Turkey, Poland, Mongolia, Ukraine

Work Experience:

MHA PETROLEUM CONSULTANTS LLC, Denver, Colorado:
(June 2006-present) **Vice President and Senior Reservoir Engineer**

Project manager and reservoir engineer involved in all aspects of unconventional reservoirs including exploration, development, production optimization, and enhanced recovery projects as well as reserves and economics evaluations, acquisitions and divestments, and technical support for investors and banks. Expert witness for litigation and regulatory hearings.

SPROULE ASSOCIATES INC., Denver, Colorado
(March 1999 to May 2006) **Senior Reservoir Engineer**

Coalbed methane and unconventional gas reservoir and economic studies, pressure transient test analyses, reservoir evaluations, simulation studies, reserves determinations, property evaluations, technical assistance for litigation, acquisition and divestiture support.

AMOCO PRODUCTION CO., MIDCONTINENT BUSINESS UNIT, Denver, Colorado:
(August 1998 to February 1999) **Reservoir Engineer**

Reservoir Engineer for Red Oak Field, Arkoma Basin, Oklahoma. Duties included production analysis, well test interpretation, reservoir studies, and simulations.

AMOCO PRODUCTION CO., RESEARCH CENTER, Tulsa, Oklahoma:
(August 1981 to August 1998) **Research Engineer, Senior Research Engineer**

Involved in all phases of coalbed methane research including laboratory studies, field work, pressure transient analysis, development of reservoir simulators, rock properties testing, and enhanced recovery.

Professional Memberships:

Society of Petroleum Engineers
Society of Petroleum Evaluation Engineers
American Association of Petroleum Geologists

Professional Registrations:

Registered Professional Engineer, Colorado # 35603
Registered Professional Engineer, Oklahoma # 16656
Registered Professional Engineer, Wyoming # 9506

Technical Monographs:

1. Editor, *SPEE Monograph 4: Estimating Ultimate Recovery of Developed Wells in Low-Permeability Reservoirs*, 2016.
2. *Fundamentals of Coalbed Methane Reservoir Engineering*, PennWell, 2010.
3. "Gas Sorption on Coal and Measurement of Gas Content", D. Yee, J. Seidle, W. Hanson, *Chapter 9 in Hydrocarbons for Coal AAPG Studies in Geology #38*, eds. B. Law and D. Rice, 1993.

Technical Papers:

1. Seidle, J.P., and O'Connor, L.S., "Estimation of Unconventional Well Recoveries and Economics from Transient Flow Data", SPE 179983, presented at the SPE/IAEE Hydrocarbon Economics and Evaluation Symposium held in Houston, Texas, USA, 17-18 May 2016.
2. Savimaki, Deborah and Seidle, John P., "An Assessment of Selected Rate-Decline Models for Horizontal Oil Wells in the Niobrara Formation", SPE 167011, presented at the SPE Unconventional Resources Conference and Exhibition-Asia Pacific held in Brisbane, Australia, 11-13 November 2013.

3. Watson, Marshall and Seidle, John, "Havlena Odeh Method Solution for Coalbed Methane Reservoirs", URTeC 1575791, presented at the Unconventional Resources Technology Conference held in Denver, Colorado USA, 12-14 August 2013.
4. O'Connor, Leslie S. and Seidle, John P., "Well Performance and Economics of Selected U. S. Shales", The Journal of the Society of Petroleum Evaluation Engineers, Vol. VI, Issue 1, Spring 2012. pp 7-14.
5. Gierhart, R. R., Clarkson, C.R., Seidle, J. P., "Spatial Variation of San Juan Basin Fruitland Coalbed Methane Pressure Dependent Permeability: Magnitude and Functional Form", IPTC 11333, presented at the 2007 International Petroleum Technology Conference, Dubai, U.A.E., 4-6 December 2007.
6. Seidle, John P. and O'Connor, Leslie S., "The Impact of Undersaturation on Coal Gas Economics", SPE 107731, presented at the 2007 SPE Rocky Mountain Oil & Gas Technology Symposium, Denver, Colorado, U. S. A. 16-18 April 2007.
7. Clarkson, C. R., Jordan, C. L., Gierhart, R. R. and Seidle, J. P., "Production Data Analysis of CBM Wells", SPE 107705, presented at the 2007 SPE Rocky Mountain Oil & Gas Technology Symposium, Denver, Colorado, U. S. A. 16-18 April 2007.
8. Clarkson, C. R, Bustin, R. M., and Seidle, J. P., "Production Data Analysis of Single-Phase (Gas) CBM Wells", SPE 100313, presented at the Gas Technology Symposium, Calgary, Alberta, 15-17 May, 2006.
9. Seidle, J. P., and O'Connor, L. S., "Production Based Probabilistic Economics for Unconventional Gas", SPE 82024, presented at the SPE Hydrocarbon Economics and Evaluation Symposium, Dallas Texas, 5-8 April, 2003.
10. Seidle, J. P., "Coal Well Decline Behavior and Drainage Areas: Theory and Practice" SPE 75519, presented at the SPE Gas Technology Symposium, Calgary, Alberta, Canada, 30 April-2 May 2002.
11. Seidle, J. P., "Lessons Learned, Lessons Lost – Review of Selected Coalbed Methane Pilots" in Coalbed Methane of North America II, Schwochow and Nuncio, eds., Rocky Mountain Association of Geologists, 2002.
12. Seidle, J. P., "Reservoir Engineering Aspects of CO₂ Sequestration in Coals", SPE 59788, presented at the 2000 SPE/CERI Gas Technology Symposium, Calgary, Alberta, Canada, 3-5 April 2000.
13. Seidle, J. P. "A Modified p/Z Method for Coal Wells", SPE 55605, presented at the 1999 SPE Rocky Mountain Regional Meeting, Gillette, Wyoming, 15-18 May 1999.
14. Yee, D., Chaback, J. J., Raterman, K. T., and Seidle J. P., "Technology for CBM Recovery from Deep Coal Beds – I. Primary Recovery and I I. Enhanced Recovery by Nitrogen Injection", papers presented at the Workshop on Coalbed Methane Recovery and Prospects for a Hydrogen Economy, China Council for International Cooperation on Environment and Development, Beijing, China, 18-19 January 1999.

15. Combes, J. M., Chaback, J. J., Prasad, K. V. K., and Seidle, J. P., "The Southern Boundary of the San Juan Basin Coalbed Methane High-Production Fairway, New Mexico", Proceedings of the 1997 International Coalbed Methane Symposium, 1997.
16. Seidle, J.P., Sigdestad, C.A., Raterman, K.T., and Negahban, S., "Characterization of Enhanced Coalbed Methane Recovery Injection Wells", SPE 38861, presented at the 1997 SPE Annual Technical Conference and Exhibition, San Antonio, Texas, 5-8 October, 1997.
17. Seidle, J.P. and Huitt, L.G., "Experimental Measurement of Coal Matrix Shrinkage Due to Gas Desorption and Implications for Cleat Permeability Increases", SPE 30010, presented at the International Meeting on Petroleum Engineering, Beijing, PR China, 14-17 November, 1995.
18. Seidle, J.P., and McAnear, J.F., "Pressure Falloff Testing of Enhanced Coalbed Methane Pilot Injection Wells", SPE 30731, presented at the SPE Annual Technical Conference and Exhibition, Dallas, Texas, 22-25 October, 1995.
19. Seidle, J.P. and Erickson, D.J., "Use of Vogel's Inflow Performance Relation for Coal Wells", SPE 26201, presented at the SPE Gas Technology Symposium, Calgary, Alberta, 28-30 June, 1993.
20. Kemp, R. G., Nixon, D. B., Newman, N. A., and Seidle, J. P. "Geologic controls on the occurrence of methane in coal beds of the Pennsylvanian Hartshorne Formation, Arkoma basin, Oklahoma (abs.): AAPG Bulletin, v. 77, no. 9 (September), p. 1574. Paper presented at AAPG Midcontinent Section Meeting, Amarillo, Texas, October 10-12, 1993.
21. Yee, D, Seidle, J.P., and Hanson, W.B., "Gas Sorption on Coal and Measurement of Gas Content", Chapter 9 in Hydrocarbons from Coal, AAPG Studies in Geology #38, edited by B.E. Law and D.D. Rice, American Association of Petroleum Geologists, Tulsa, Oklahoma, 1993.
22. Palmer, I.D., Mavor, M.J., Seidle, J.P., Spitler, J.L., and Volz, R.F., "Openhole Cavity Completions in Coalbed Methane Wells in the San Juan Basin", SPE 24906, presented at the Society of Petroleum Engineers 67th Annual Technical Conference and Exhibition, Washington, D.C, October 4-7, 1992.
23. Seidle, J.P., Jeansonne, M.W., and Erickson, D.J., "Application of Matchstick Geometry to Stress Dependent Permeability in Coals" SPE 24361, presented at the SPE Rocky Mountain Regional Meeting, Casper, Wyoming, May 18-21, 1992.
24. Seidle, J.P., "A Numerical Study of Coalbed Dewatering", SPE 24358, presented at the SPE Rocky Mountain Regional Meeting, Casper, Wyoming, May 18-21, 1992.
25. Metcalfe, R.S., Yee, D., Seidle, J.P., and Puri, R., "Review of Research Efforts in Coalbed Methane Recovery", SPE 23025, presented at the SPE Asia-Pacific Conference, Perth, Australia, 4-7 November, 1991.

26. Puri, R. and Seidle, J.P., "Measurement of Stress-Dependent Permeability in Coal and Its Influence on Coalbed Methane Production, In Situ, 16(3), 183-202 (1992). Originally presented as paper 9142 at the 1991 Coalbed Methane Symposium, The University of Alabama, Tuscaloosa, Alabama, May 13-16, 1991.
27. Seidle, J.P., Kutas, G.M., and Krase, L.D., "Pressure Falloff Tests of New Coal Wells", SPE 21809, presented at the SPE Rocky Mountain Regional Meeting and Low-Permeability Reservoirs Symposium, Denver, Colorado, April 15-17, 1991.
28. Seidle, J.P. "Long-Term Gas Deliverability of a Dewatered Coalbed" Journal of Petroleum Technology, June 1993, p. 564. Originally presented as SPE 21488 at the SPE Gas Technology Symposium, Houston, Texas, January 23-25, 1991.
29. Seidle, J. P. and Arri, L. E., "Use of Conventional Reservoir Models for Coalbed Methane Simulation", paper CIM/SPE 90-118, presented at the International Technical Meeting hosted by the Petroleum Society of CIM and the Society of Petroleum Engineers, Calgary, Alberta, 10-13 June, 1990.