

# Rocky Mountain Section AAPG

## 2008 Technical Program

Wednesday Morning Oral Sessions

### Petroleum Systems Session in Honor of Fred Meissner

*Co-Chairs: E. Coalson and S. Goolsby*

- 8:00 *Introductory Remarks*
- 8:10 **S. Sonnenberg, A. Pramudito:** Meissner Keys to the Bakken Petroleum System, Williston Basin
- 8:30 **E. Coalson, H. DuChene:** Ismay-Hovenweep Petroleum System, Blanding Basin, Utah
- 8:50 **L. Rasmussen, D. Rasmussen:** Pennsylvanian Petroleum System of the Deep Paradox Basin Fold and Fault Belt, Colorado and Utah
- 9:10 *Break*
- 9:20 **P. Lillis, M. Lewan, D. Selby:** Application of Rhenium-Osmium Geochronology to Phosphoria Oils, Wyoming
- 9:40 **J. Forster:** The Mowry-Muddy Hydrocarbon System of the Powder River Basin – A Developing Resource Play
- 10:00 **I. Pasternack:** Lewis Shale Petroleum System, Eastern Greater Green River Basin, Wyoming and Colorado
- 10:20 **S. Goolsby, E. Coalson:** Basin-Centered Gas Accumulations – Fact or Fiction?

### Successful Operations in Sensitive Areas

*Co-Chairs: T. Beaubouef and M. FitzMaurice*

- 8:00 *Introductory Remarks*
- 8:10 **T. Beaubouef:** LiDAR: A Multidisciplinary Dataset for Integrated Solutions in Onshore E & P
- 8:30 **M. Wagaman, M. FitzMaurice:** Seismic Operations in Sensitive Areas
- 8:50 **P. Dickinson:** Design Considerations for Successful Low Environmental Impact Natural Gas Compression Facilities in Sensitive Areas
- 9:10 *Break*
- 9:20 **J. Drewes, K. Benko\*, T. Cath, D. Xu:** Development of Produced Water Management and Treatment Strategies
- 9:40 **R. Brown:** Monte Pallano Gas Field, Abruzzo Region, Italy Terrain Subsidence Monitoring Requirements
- 10:00 **S. Schamel:** Utah Bituminous Sandstone Deposits: The Good, the Bad and the Ugly

- 10:20 **B. Sumner:** Due Diligence in Sensitive Areas: How to Facilitate Project Authorization and Minimize Litigation Risks
- 10:40 **D. Zavadil:** A Case History of Exploration and Development of Natural Gas Resources in an Environmentally Sensitive Area - West Tavaputs Plateau, Utah

## Redevelopment: New Technology in Old Fields

*Co-Chairs: M. Hendricks and B. Watts*

- 8:00 *Introductory Remarks*
- 8:10 **T. Anderson:** Technology in a Teapot: Overview of New Methods for Finding and Extracting Oil in an Old Stripper Field at Teapot Dome, Wyoming
- 8:30 **G. Carlson:** High Pressure Air Injection on the Cedar Creek Anticline
- 8:50 **R. Grundy, H. Harvey:** Use of 3D Seismic to Land Horizontal Wellbores in Thin Beds: Potash Solution Mining near Moab, Utah
- 9:10 *Break*
- 9:20 **R. Balch, A. Iduri:** Data Mining Well Completion Data for the Dakota Formation, San Juan Basin, New Mexico
- 9:40 **J. Arbogast:** Gee Whiz Geophysics...But What about the Log Data? Normalizing, Editing, and Supplementing Log, Core and Production Data from 1935 to the Present
- 10:00 **J. Deardorff, J. McCray, G. Young:** The Carbon Sequestration Potential of Oil and Gas fields in the Denver-Julesburg Basin of Colorado
- 10:20 **R. Broadhead:** Remaining Oil Resources of New Mexico: the Hubbert Curve Denied

### Wednesday Afternoon Oral Sessions

## The Bakken Play: Current Incarnation

*Co-Chairs: D. Eby and J. LeFevre*

- 1:15 *Introductory Remarks*
- 1:25 **D. Jarvie, M. Johnson:** Maturity and Organofacies Assessment of Bakken Shale: Implications for New Areas for Exploration and Production
- 1:45 **E. Roller, A. Pepper, G. Sulysto, D. Schmidt:** Integrated Burial and Thermal Reconstruction of the Bakken Shale in the Canadian and US Williston Basin
- 2:05 **A. Pramudito, S. Sonnenberg:** Reservoir Characterization of the Bakken Formation, Elm Coulee Field, Williston Basin, Montana
- 2:25 **L. Canter, O. Skinner, M. Sonnenfeld:** Facies and Mechanical Stratigraphy of the Middle Bakken, Mountrail County, North Dakota
- 2:45 *Break*

- 2:55 **M. Mullen, R. Meijs, M. Tunstall, B. Miller, J. Paneitz:** The Successful Application of a Compartmental Completion Technique used to Isolate Multiple Hydraulic Fracture Treatments in Horizontal Bakken Shale Wells in North Dakota

## Business Value of 3D Seismic

*Co-Chairs: R. R. Ray and R. Roux*

- 1:15 *Introductory Remarks*
- 1:25 **V. Rigatti, J. Bates, M. Schutt:** Rockies 3D: Business Drivers and the Multiple Benefits of the Full 3D Seismic and Associated Data-Sets
- 1:45 **N. Lange, R. Pritchett:** The 3D Path to Successful Decisions in O&G Expenditures
- 2:05 **J. Huck:** The Stone Cabin 3D Leads the Deep Exploration and Development of the West Tavaputs Plateau
- 2:25 **S. Zinke, S. Shearer:** Using 3D Seismic to Forecast Development on the Pinedale Anticline, Wyoming
- 2:45 *Break*
- 2:55 **K. Parsons:** Risk Management and the Economic Redemption of Seismic Data in the Sacramento Basin, California S
- 3:15 **D. Scolman:** The Profitable Use of 3D Seismic in Hydrocarbon Discovery and Development
- 3:35 **R. Trevino, M. Bertness:** Non-Exclusive 3D Geophysical Data Projects in the Western US
- 3:55 **N. House:** Tradeoffs in 3D Seismic Acquisition between Shallow and Deep Objectives OR Value of 3D High Density (infill) Seismic Survey to Improve Economic Results of CBM Wells at Cow Creek Unit

### Wednesday-Friday Poster Session

## General Poster Session

**Redevelopment: New Technology in Old Fields** (*authors at posters Wed. 3:15-4:45 pm*)

- **J. Fausnaugh:** Combined Electromagnetic Induction and Magnetic Susceptibility Surveys for the Detection of Near Surface Geochemical Anomalies

**The Bakken Play—Current Incarnation** (*authors at posters Wed. 3:15-4:45 pm*)

- **R. Pollastro, L. Roberts, T. Cook, M. Lewan:** Assessment of Undiscovered Technically Recoverable Oil and Gas Resources of the Bakken Formation, Williston basin, Montana and North Dakota, 2008

**Global Climate Issues** (*authors at posters Wed. 3:15-4:45 pm*)

- **B. Reynolds:** Climate Change through Geologic Time

- **National Center for Atmospheric Research:** Series of Posters and Video Features from NCAR, Boulder
- **P. Trost, F. Varani:** Capture and Beneficial use of Fugitive Production Tank Vapors
- **J. Deardorff, D. Nummedal, J. McCray, G. Young:** A Methodology for Assessing the Carbon Sequestration Potential of Deep Saline Aquifers beneath an Industrial CO<sub>2</sub> Source.

**Successful Operations in Sensitive Areas** (*authors at posters Wed. 3:15-4:45 pm*)

- **R. Garland:** iMapIT™ Interactive Resource Map

**Petrophysics of Shales and Tight Gas Sands: Converting Resource to Reserves** (*authors at posters Wed. 3:15-4:45 pm*)

- **A. Fisher:** Detecting Free Water above Jonah Pay using Pickett Plots and Core Analysis
- **Y. Zhang:** Integrated petrophysical study of the fractured tuff in Junggar Basin
- **Y. Zhang:** Experiment study of mud filtrate salinity effect on NMR T2 data in tight clay
- **J. Gegg:** Cased Hole Solutions: Predicting Open Hole Logs Using Artificial Neural Networks
- **W. Salas, P. Porto, M. Mullen, J. Melrose:** Analysis of Completion Design, Log Parameters, and Production Results to Gain a Better Understanding of Effective Production Enhancement Methods in the Piceance Basin.
- **T. Stroker, N. Harris:** K-Ar Dating of Authigenic Illites: Integrating Diagenetic History of the Mesa Verde Group, Piceance Basin, NW Colorado

**Fractures and Microfractures–Impact on Resource Play Sweet Spots** (*authors at posters Wed. 3:15-4:45 pm*)

- **P. Yin:** Fracture Diagenesis and its Effects on Reservoir Permeability in Tensleep Sandstones, Wyoming
- **L. Anna, T. Cook:** Assessment of the Mowry Shale and Niobrara Formation as Unconventional Hydrocarbon Systems, Powder River Basin, Montana and Wyoming
- **C. Knight, J. Miskimins:** Relationship of Faults, Fractures, and Critical Stress to Mesaverde Reservoir Performance, North La Barge Field, Sublette County, Wyoming
- **M. Mullen, M. Enderlin:** Is that Frac Job Really Breaking New Rock?

**Shale Gas–From Geochemistry to Completions** (*authors at posters Thursday: 11:00-11:30 am; 4:00-4:45pm*)

- **M. Laine, T. Chidsey, C. Morgan:** Potential Shale Gas Resources in Utah
- **R. Koepsell:** Comparison of Natural Fractures Based Upon Image Logs- Shale Gas Plays of the Western US
- **S. Brown, J Zumbirge, H. Illich, M. Dolan:** ArcGIS Integrated Petroleum System Evaluation of the Greater Green River Basin
- **C. Nelson:** Biogenic Gas Resource Potential of the Upper Cretaceous Pierre Shale in the Denver-Julesburg (DJ) Basin

- **P. Lillis, G. Ellis, M. Dempsey, S. Cumella:** Origin of Gas in the Mamm Creek Field, Piceance Basin, Colorado
- **M. Dolan, D. Majewski, K. Ferworn, S. Brown:** Maturity Determinations in the Vermillion Basin-Baxter Shale: Fluid Maturity Parameters help Interpret Charge and Migration.

**Relevance of Sedimentology and Stratigraphy to Hydrocarbon Plays** (*authors at posters Thursday: 11:00-11:30 am; 4:00-4:45pm*)

- **D. Eby, T. Chidsey, C. Morgan:** The Use of Epifluorescence Techniques to Determine Potential Oil-Prone Areas in the Mississippian Leadville Limestone, Northern Paradox Basin, Utah
- **D. Pyles, R. Slatt:** Integrating Outcrop and Subsurface data to Define Regional and Reservoir-Scale Patterns in the Lewis Shale and Fox Hills Sandstone of the Great Divide and Washakie Basins, Wyoming
- **J. Melick, M. Gardner:** Region-Based Basin Modeling: Correlating Depositional Environment to Connected Pore Volume, Powder River Basin (PRB), Wyoming and Montana
- **J. Ochoa, M. Gardner, J. Schmitt:** Multiple Origins of Thin-Bedded Deepwater Slope Sandstones: El Rosario Formation (Upper Cretaceous – Paleocene) Baja California, Mexico
- **M. Milliken, D. Foster:** New Facility Offers Public Access to Rocky Mountain Core and Data

**Relevance of Structural Geology to Hydrocarbon Plays** (*authors at posters Thursday: 11:00-11:30 am; 4:00-4:45pm*)

- **B. Hennessy, K. Giles:** Characterization of Syn-Depositional Faulting of a Composite Type B Halokinetic Sequence along the La Popa Salt Weld, La Popa Basin, Nuevo Leon, Mexico
- **J. Jackson, B. Trudgill:** Fracture Modeling and Fault Zone Characteristics Applied to Reservoir Characterization of the Rulison Gas Field, Garfield County, Colorado
- **S. Larson, E. Gustason:** Timing, Mechanisms and Modes of Cenozoic Fracturing and Deformation in the Southern Raton Basin, Northern New Mexico
- **S. Smaltz, E. Erslev:** Structural Controls on Detachment Folds Associated with Foreland Arches: Beaver Creek Anticline, Wyoming
- **D. Stone:** The Wyoming Transect: What, Where, How, and Why

### Thursday Afternoon Oral Sessions

## Perception vs. Reality: Resource vs. Reserves

*Co-Chairs: J. Tilden, V. Kuuskra, K. Shanley*

1:15 *Introductory Remarks*

- 1:25 **R. Nehring:** Growing and Indispensable: The Contributions of Rocky Mountain Unconventional Gas Resources and Production to U.S. Gas Reserves and Production
- 1:45 **S. Reeves:** Unconventional Gas Resources to Reserves – A Predictive Approach
- 2:05 **P. Stark:** Transforming Rockies Gas Resources to Supplies: Implications of Gas Production Performance Factors
- 2:25 **B. Richter, D. Simpson, S. Kleinsteiber:** Measuring the Currently Unmeasured in a Resource Play: Model of Rulison Nuclear Re-entry Well Shows Higher Than Expected Gas-in-Place
- 2:45 *Break*
- 2:55 **L. O’Connor, J. Seidle:** Contingent Resources: Definitions and Real World Examples
- 3:15 **R. Barg:** Evaluating Reserves in Resource Plays: Strategies and Pitfalls

## **Petrophysics of Shales and Tight Gas Sands: Impact on Converting Resource to Reserves**

*Co-Chairs: R. Godfrey and R. Merkel*

- 1:15 *Introductory Remarks*
- 1:25 **P. Devine:** Experimental Quantification of “Good Log Characteristics” for Mesaverde Reservoirs of the Piceance Basin, Colorado: Toward a Reconnaissance Method for Evaluating Movable Water in Tight, Shaly Sandstones
- 1:45 **R. Cluff, A. Byrnes:** Evidence for a Variable Archie Porosity Exponent “m” and Impact on Saturation Calculations for Mesaverde Tight Gas Sandstones; Piceance, Uinta, Green River, Wind River, and Powder River Basins
- 2:05 **J. Webb, R. Cluff, D. Krygowski, S. Whittaker, A. Byrnes:** Lithofacies and Petrophysical properties of Mesaverde Tight-Gas Sandstones in Western U.S. Basins
- 2:25 **C. Smith, J. Bray, S. Ramakrishna:** Utilization of Magnetic Resonance Bin Distribution to Determine Specific Permeability
- 2:45 *Break*
- 2:55 **A. Byrnes, D. Osborn, A. Knoderer, O. Metheny, T. Hommertzheim, J. Byrnes, R. Cluff, J. Webb:** Capillary Pressure Properties of Mesaverde Group Low-Permeability Sandstones in Six Basins, Western U.S
- 3:15 **D. Amendt:** Identifying Critically Stressed Fractures Using Borehole GeoMechanics: A Case Study in the Nikanassin
- 3:35 **D. Hoyer, R. Young:** Seismic Petrophysics in Tight Gas Sands – A Piceance Basin, Mesaverde Example
- 3:55 **W. Salas, C. Tamayo, E. Menendez, M. Mullen, J. Shepard, J. Kinser, F. LeGrand, D. Spencer:** Analysis of Production Logs and Calculated Reservoir Properties to Gain a Better Understanding of True Reservoir Quality in an Effort to Eliminate Non-Productive Zones and Enhance Completion Efficiencies in Future Field Development

## Fractures & Microfractures: Impact on Resource Play Sweet-Spots

*Co-Chairs: J. Lorenz and C. Zahm*

- 1:15 *Introductory Remarks*
- 1:25 **K. Lewallen, G. Chen, X. Wu, P. Todd:** Seismic Characterization of Fractured Tight Gas Reservoirs, Piceance Basin, Colorado
- 1:45 **E. LaBarre:** Shear-Wave Splitting Analysis for Natural Fracture Zone Identification, Rulison Field, Piceance Basin, Colorado
- 2:05 **J. Lorenz:** Fracture Characteristics in Core from Tensleep Reservoirs across Wyoming
- 2:25 **D. Meloy:** A Lower Smackover Unconventional Resource Play in Louisiana
- 2:45 *Break*
- 2:55 **D. Keating, M. Fischer:** Fracture and Small Fault Networks in Basement-Involved, Fault-Related Folds above Oblique-Slip Faults: Insights from Physical Models
- 3:15 **J. Johnson, D. Dubois, S. Malone, N. Warpinski, C. Wright, L. Weijers:** An Overview of Hydraulic Fracture Mapping in the Jonah Field and its Implications for Field Development and Completions
- 3:35 **C. Zahm:** Fracture Development within Partially-Decoupled Basement-Involved Folds
- 3:55 **P. Hennings, J. McLennan, T. Allwardt:** Building Better Fracture Models by Combining Structural analysis and Bayesian Updating to Quantify the Relationship between Multiple Fracture Causing Agents

### Friday Morning Oral Sessions

## Shale Gas Plays: From Geochemistry to Completions

*Co-Chairs: M. Brittenham and R. Newhart*

- 8:00 *Introductory Remarks*
- 8:10 **J. Curtis, D. Hill:** Realities of Shale Gas Resources: Yesterday, Today and Tomorrow
- 8:30 **R. Hartman:** Recent Advances in the Analytical Methods Used for Shale Gas Reservoir Gas-In-Place Assessment
- 8:50 **M. Dolan, A. Grau, K. Ferworn, S. Brown:** Calibrating Stable Carbon Isotopes of Reservoir Fluids as a Thermal Maturity Indicator
- 9:10 *Break*
- 9:20 **M. Tobey, D. Schmude, R. Newhart:** Trace Gas in Archived Tight Shale Cores as a Tool for Maturation Assessment
- 9:40 **S. Schamel:** Shale Gas Potential of the Paradox Basin, Colorado and Utah

- 10:00 **E. Gustason, M. Tobey:** Shale Gas Potential of Fine-Grained Cretaceous Source Rocks, Raton Basin, South-Central Colorado and Northeastern New Mexico
- 10:20 **M. Mullen, M. Blauch, R. Rickman, B. Grieser, E. Petre:** A Practical Use of Shale Petrophysics for Stimulation Design Optimization
- 10:40 **R. Suarez-Rivera:** Effect of Layered Heterogeneity on Fracture Initiation and Containment in Tight Gas Shales

## Relevance of Sedimentology and Stratigraphy to Hydrocarbon Plays

*Chair: M. Sonnenfeld*

- 8:00 *Introductory Remarks*
- 8:10 **L. Banfield, W. Hill, J. Vaitl:** The Wamsutter Tight Gas Reservoir – The Role of Stratigraphy and Sedimentology in a Tight Gas Field Study
- 8:30 **R. Cole, M. Pranter:** Stratigraphic Variability of Sandstone-Body Dimensions in the Williams Fork Formation: Outcrop Data from the Southwest Piceance Basin, Colorado
- 8:50 **N. Sommer, M. Pranter, R. Cole:** Sandstone-Body Connectivity in a Meandering-Fluvial System: an Example from the Williams Fork Formation, Piceance Basin, Colorado
- 9:10 *Break*
- 9:20 **E. Gustason:** Sequence Stratigraphy and Reservoir Architecture of the Lower Cretaceous J Sandstone, Wattenberg Field, DJ Basin, Colorado
- 9:40 **D. Tabet, J. Quick, B. Hucka:** Distribution, Amount, and Maturity of Coal Resources in the Sego Coalfield, Grand County, Utah
- 10:00 **M. Maslyn:** Late-Mississippian Paleokarst Features and Related Porosity Creation and Destruction in the Aspen, Colorado Area

## Relevance of Structural Geology to Hydrocarbon Plays

*Co-Chairs: N. Sterne and D. Stone*

- 8:00 *Introductory Remarks*
- 8:10 **D. Stone:** The Wyoming Transect: What, Where, How, and Why
- 8:30 **C. Kluth, J. Lilligraven, A. Snoke, E. Sterne:** Triangle Zones in Front of Basement-Cored Uplifts in the Rocky Mountain Region
- 8:50 **G. Dodson:** A Tectonic Context for Basement Linears in Northeast Wyoming
- 9:10 *Break*
- 9:20 **M. Caldwell:** Gravity Fault Controlled Structural Traps, North-Central Montana

- 9:40 **B. Davis, H. Harper, D. Nelson, J. Kmeck, C. Pollock:** The Use of Modern 3D Seismic for Interpretation of a Structural and Stratigraphic Framework in the Main Canyon Area of the Northern Uncompahgre Uplift, Uintah County, Utah
- 10:00 **J. Scheevel, M. McCaskey, J. Byl:** Modern 3D Interpretation of a Mature, Structurally-Complex Oil Field, Los Angeles Basin, California.
- 10:20 **D. Richards, T. Murray, M. Kleven, G. Christie:** Probabilistic Analysis of Fault Seal Capacity in Compressional Settings: Risking Prospects and Fields in Exploration and Production
- 10:40 **D. Bate, J. Barraud, M. Davies, P. Versnel:** Covenant Field BlueQube Interpretation Results: Central Utah Hinge Line Exploration Strategy