



Chairman of PTTC National Board of Directors

Brook Phifer, President of NICO Resources LLC, of Littleton Colorado has been elected Chairman of PTTC's national board. Since 1994 when he joined the Rocky Mountain Region Producer Advisory Group (PAG) he has dedicated considerable time and effort into PTTC. He has also served as chairman of the Rocky Mountain PAG and most recently was chairman of the National PTTC Management and Budget Committee. Read Mr. Phifer's interview in the PTTC Network News, www.pttc.org as well as an interview in the 1999 Fourth Quarter PTTC Rockies Newsletter <http://www.mines.edu/Research/PTTC/newsletters/>



North Dakota CO2 Miscible Flooding Potential

In a paper presented at the 12th Williston Basin Horizontal Well and Petroleum Conference May 3-4, 2004 in Minot, North Dakota, authors Ralph L. Nelms, Westport Oil and Gas Company and Randolph B. Burke, North Dakota Geological Survey presented the results of their evaluation of carbon dioxide (CO2) flooding potential in North Dakota. The authors began with a review of the standardized CO2 reservoir screening methodology and a summary of the results of successful carbonate CO2 miscible flooding projects in West Texas. They compare North Dakota reservoir characteristics to those of ongoing CO2 miscible floods in both West Texas and the Weyburn Unit in Southeast Saskatchewan. The reservoir characteristics of 97 North Dakota oil reservoirs unitized for water flooding before January 2004 were evaluated. Their evaluation included the use of a spreadsheet to summarize the key reservoir characteristics of a majority of the 97 unitized North Dakota oil reservoirs and assess CO2 their miscible flooding potential. The authors applied a simple empirical screening methodology to determine the

best North Dakota fields and reservoirs for application of CO2 flooding. They conclude that the most likely candidates for future CO2 miscible flooding potential are reservoirs that have more than 2 MMbo. North Dakota has probable recoverable CO2 miscible oil reserves of 181 million barrels of oil (MMbo) with possible recoverable CO2 miscible oil reserves of 106 MMbo. The spreadsheet is available for download on the North Dakota Geological Survey website <http://www.state.nd.us/ndgs/>. To view the entire paper, with a link to the spreadsheet, visit www.ptticrockies.org.

Internet-Accessible Electronic Filing Cabinet

Developed by iReservoir.com Inc., iProject is a secure internet-accessible, electronic, central file cabinet. Its data storage, update, retrieval, audit, archive and notification capabilities allow users to manage, view, update, and share electronic data from any loca-

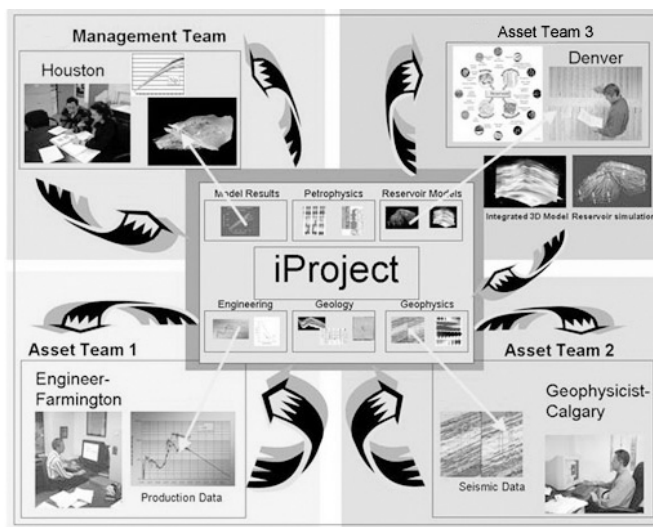


Figure 1, diagram illustrating some of the potential of remote collaboration with i-project.

tion, intra-office to world wide. At the most basic level, an internet accessible central file storage system like iProject insures that users, regardless of location, will be notified of data updates and can easily find and use the most up-to-date electronic data. Beyond this, iProject can be used to efficiently manage the exchange of electronic data for projects ranging from intra-office integrated studies to work done by remotely

located teams (Figure 1), partners, consultants, or other 3rd parties. For a detailed discussion of how internet based project management can reduce project cost, improve efficiency and produce a better quality final product see SPE paper 77673 titled "Integrated Reservoir characterization and Simulation for Reservoir Management using a Web-Based collaborative Technical Workflow Manager."

iProject stores data in folders and files arranged in a familiar hierarchical tree structure. Any electronic data such as logs, spread sheets, morning reports from remote areas, lithology, presentations, and model output can be stored, accessed, and shared with iProject. The software is Java based, so access to iProject is platform independent and can be accessed by any Java-enabled web browser. iProject includes viewers for files such as LAS and SEG Y so there is no need for expensive software to view and QC data files stored on iProject.

The system uses 128-bit SSL encryption to securely store and transmit data. Access to stored folders and files is by password protected user account. View, read, and write permission for each folder and file can be set specifically for each user. In this way stored company proprietary data is secure and available only to authorized users while appropriate data needed for

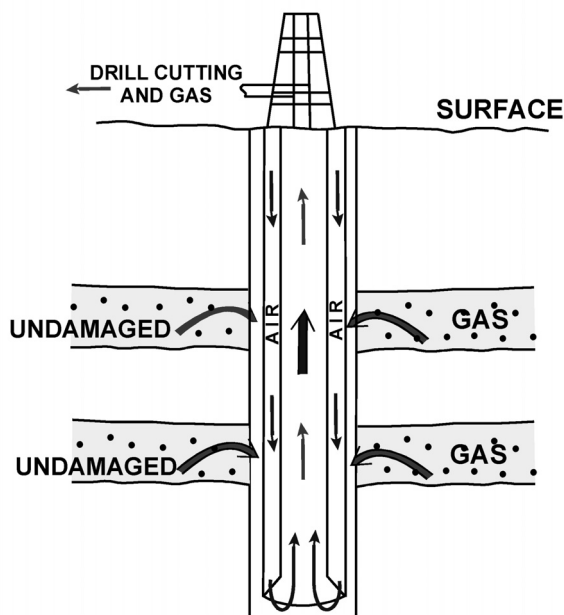


Figure 1, illustration of RCCD fluid circulation.

collaboration is available to partners or 3rd parties. An audit trail documents work progression by maintaining the; user, modification, and the time of file and folder access. Message threads to data files and folders can be set to automatically notify users by email when files in their access areas are changed.

iProject runs on a Linux platform server. Setting up a local server for iProject is as simple as formatting the drive of a Pentium4 PC (possibly that obsolete machine that you don't know what to do with) and install-

ing the Linux operating system and the iProject Server software. The iProject client software for the individual user can then be installed on users local PC using the familiar install shield interface.

For more information about iProject visit <http://www.ireservoir.com> or contact Mike Uland, 303.713.1112 or uland@ireservoir.com

Developments in Reverse Circulation Center Discharge Drilling (RCCD)

RCCD drilling prevents formation damage that can result from, fluid hydrostatic pressure, pump pulses, or high pressure air and cuttings invasion because drilling fluids and cuttings that would otherwise be in contact with the formation are returned to the surface in the inner pipe (Figure 1). RCCD also provides an uncontaminated cuttings sample (comparable to core) because cuttings and drill fluid travel to the surface in the drill pipe; they are not exposed to loss and contamination that would occur if they traveled up the pipe formation annulus. In addition, because the formation is only subjected to very low pressure, shows that may be otherwise have gone undetected will be apparent in the returning fluid. To adapt reverse circulation technology to the oil patch PresSol Ltd. of Calgary, Alberta developed a patent applied for down-hole blowout preventer/shutoff valve, a surface blowout preventer, a surface kill valve-diverter and bleed line that meets oil field safety requirements.

The application of RCCD drilling to a low pressure tight reservoir in the Bow Island Formation on the Blackfeet Indian Reservation in Montana was the subject of a case study published in the March 2003 issue of World Oil http://www.worldoil.com/magazine/MAGAZINE_DETAIL.asp?ART_ID=1970. In the case study, RCCD drilling was done by Midnight Sun Drilling, White Horse, Yukon Territory http://www.midnightsundrilling.com/shallow_gas.html, with a conventional rig. Since the article was published, PresSol has continued to develop the RCCD drilling technology. Working with TorqueLock of Conroe, Texas <http://www.torqueunlock.com/>, PresSol has developed a drill pipe with a wired rubber center tube that allows the use of down hole tools for steering, logging and pressure measurement. PresSol is also working with American Augers Inc., West Salem, Ohio <http://www.american-augers.com/products/default.htm>, to adapt American Augers rigs to RCCD technology to provide directional as well as horizontal drilling. For more information on RCCD drilling, email Jim Livingstone, PressTec Ltd. presstec@shaw.ca.

Free Software from Echometer

QRod-PC is a free predictive sucker rod beam pumping system design program. It uses a wave equa-

tion to calculate and display the effect of changing beam pump parameters. For any pump depth and desired production rate, QRod will calculate and display the surface and pump dynamometer loads, in-balance gearbox torque, and plunger velocity for a stroke. A variety of input variables are available so a wide range of surface and down hole geometry and hardware can be accommodated. Choice of surface unit geometry such as conventional, Mark, Reverse Mark, or air-balanced units may be selected. Additional input variables include tubing anchor, stroke length, stroke rate, and pump diameter. Calculated output includes pump displacement, rod string loading, surface unit and motor size requirements. Tapered steel rod strings and fiberglass/steel combination strings are accommodated.

AWP2000 is free software that helps a user calculate a well's inflow performance and is intended for wells with an open annulus from the casing head to the perforations. It provides an automated procedure to organize, analyze, and visualize the data that is used to calculate bottom hole pressure. This allows the calculation of bottom hole pressure to be based on addition of a measured casing head pressure plus the calculated gas column pressure and the fluid column pressure. Output is summarized on a wellbore diagram that will help visualize the wellbore conditions. The calculation depends on entry of an accurate description of the wellbore and artificial lift system: depths, sizes, completion hardware, operational parameters, etc.

Both QRod-PC and AWP2000 software can be downloaded from <http://www.echometer.com/software/index.html>

Paradox Basin Leadville Limestone Study Begins

Since 1993, the Utah Geological Survey (UGS) has undertaken six government-industry cooperative programs to evaluate and enhance hydrocarbon production in Utah. The investigations are partially funded through the U.S. Department of Energy /National Energy Technology Laboratory (NETL) <http://www.netl.doe.gov/>. The work is conducted by multidisciplinary teams from petroleum companies, petroleum service companies, universities, and state agencies. A listing of Utah cooperative projects and progress reports can be found by visiting <http://geology.utah.gov/emp/empproj.htm#petroleum>

The UGS recently began a 3 year cooperative project titled "The Mississippian Leadville Limestone Exploration Play, Utah and Colorado: Exploration Techniques and Studies for Independents." Information about the study and progress reports are available at <http://geology.utah.gov/emp/leadville/index.htm>. The area of study is the Paradox Basin in Utah and Colorado where the Leadville Limestone has produced

over 826 BCF of gas and 53 million barrels of oil from six fields. The 7,500-mi² area is relatively unexplored; only about 100 wells penetrate the Leadville (less than one well per township.) The project will be done in two phases. Phase 1 (1 year) will characterize the Leadville Limestone reservoir in the Lisbon Field where there is a wealth of data. The final product will include type core and geophysical logs, field maps, correlations, diagenetic analysis, and reservoir characterization. Phase 1 work to date will be reported at several venues during the year including; a paper to be given August 10, 2004 at the Rocky Mountain Natural Gas 2004 AAPG/COGA section meeting in Denver Colorado www.rmag.org, at the Hydrothermal Dolomite Conference at the Colorado School of Mines November 15, 2004, and at the Fort Worth Geologic Society Meeting in January 2005 at the Fort Worth Geologic Society Meeting.

Phase 2 (years 2 and 3) will apply the findings of Phase 1 to develop and field demonstrate low-cost exploration technologies to identify potential Leadville oil migration directions, surface geochemical anomalies, determine regional facies framework, and identify potential oil-prone areas based on shows. This information will be used target areas for Leadville exploration.

UGS Publications of Note

The UGS has published two CD's with detailed field data from a cooperative study of two fields producing from the Paradox Formation:

Reservoir modeling and composition simulation of primary depletion, waterflooding, and carbon dioxide flooding of a small Pennsylvanian carbonate mound complex, Anasazi Field, Paradox Basin, Utah, Volume I, by Wilber E. Culham and Douglas M. Lorenz, 1 CDROM (540 p.), 10/03, OFR-420.

Reservoir modeling and composition simulation of primary depletion and carbon dioxide flooding of a small Pennsylvanian carbonate mound complex, Runway Field, Paradox Basin, Utah, Volume I, by Wilber E. Culham and Douglas M. Lorenz, 1 CD-ROM (420 p.), 10/03, OFR-421.

The CD's are available by calling the UGS Natural Resources Book Store, 801.537.3320 or email geostore@utah.gov.

Unique, Colorful Oil and Gas Map of the Rockies

Petro Data Source and ENERmap are offering a unique 36 by 55 inch laminated wall map of the Rocky Mountain region. The full color map displays 150,000 gas and oil well spots, gas and oil pipelines, plugged wells, major highways, towns and cities on a shaded color 3-D topography base. For more information visit <http://www.PetroDataSource.com>.

Microbial Reservoir Characterization (MRC)

The Microbial Oil Survey Technique (MOST) was developed by Phillips Oil Company more than 30 years ago and has been refined by Geo-Microbial Technologies to quantify hydrocarbon micro-seepage from oil and gas reservoirs. It uses the principle that a reservoir can be delineated by the distribution of buoyancy driven C-1 to C-4 in soil above the reservoir. Seepage distribution of light hydrocarbons respond quickly to production-induced changes in reservoir pressure. Mapping the aerial distribution of vertical seepage over a field (within geologic parameters) can be used to characterize field development and locate field boundaries. In addition, it has the potential to locate flood fronts, injection barriers, faults, by-passed production, offset well sites, infill drill sites, and step-out potential of a reservoir that is being produced.

MRC defines the aerial extent and relative quantity of C-1 to C-4 seepage by mapping the distribution of microbes dependent on the presence of C-1 to C-4 in the soil. Using microbe populations allows the delineation of C-1 to C-4 hydrocarbon distributions that are below the detection limit of conventional soil gas surveys. For more information on Geo-Microbial Technologies visit www.gmtgeochem.com or email info@gmtgeochem.com

PTTC PAG Member Interview

To insure that PTTC provides technological training that is timely, appropriate, and useful to the petroleum industry, National PTTC and each PTTC region rely on the experience of Producer Advisory Groups (PAGs) for direction. The PAGs are made up of industry volunteers that contribute their time and insight directing PTTC. The following is an interview with PTTC Rockies PAG member Fred Meissner.

Fred Meissner

Mr. Meissner is the author of over 45 publications, oral papers and poster sessions primarily on hydrocarbon generation, migration and accumulation. He is a member of and has held leadership positions in



numerous professional societies. The following is a brief summary of his honors; the American Association of Petroleum Geologists (AAPG) awarded him the A.L.

Levorson Award for the Rocky Mountain Section in 1976 and he was awarded an honorary AAPG membership in 2001. He is a member of the Geological Society of America and was elected a fellow in 1988. He was named Scientist of the Year by Rocky Mountain Association of Geologists (RMAG) in 1976, presented with the RMAG's Distinguished Service Award in 1991, served as president of RMAG in 1997, and is an honorary member. In 1986 he received a Distinguished Service Medal for career achievement from Colorado School of Mines and was awarded the Mines Medal for unusual and exemplary service to the School in 2000. His 48 years of industry experience include 16 years with Shell Oil Company working the Permian Basin, Gulf Coast, Rocky Mountain and Mid-Continent areas. He has over 20 years cumulative experience with several independents that "found oil and were sold" including Trend Exploration, Filon Exploration, Webb Resources, and Bird Oil. He was a principle in all, with professional responsibilities ranging from exploration manager to vice president. Since leaving Bird Oil in 1991 he has been an independent consultant and an adjunct professor of geology at the Colorado School of Mines where he sits on thesis committees, teaches a graduate course in Advanced Petroleum Geology, and is a guest lecturer. Self-described as an explorationist, he is recognized internationally for his expertise in understanding and predicting the behavior of petroleum systems, including aspects of hydrocarbon generation and migration, basin-wide hydrodynamics, abnormal pressure, and the occurrence of fractured reservoirs, especially as they relate to "basin-center" oil and gas accumulations. His consultancy, Fred F. Meissner and Associates, has undertaken investigations for clients in several domestic U.S. areas as well as in West Africa, South America, Europe, Asia and Canada. He also provides public and private instruction on subsurface fluid pressures and their relation to patterns of petroleum generation, migration and accumulation world wide, and has taught several short courses for the Rocky Mountain Region of PTTC.

Interview of Fred Meissner

Mr. Meissner was born in Denver Colorado and graduated from South High School. Both of his parents were the first generation in their families that was not involved in the extraction of Western U.S. natural resources. He developed an interest in rocks and mining and attended the Colorado School of Mines, graduating with the degree of Geological Engineer in 1953. He was an ROTC cadet at Mines and received a commission upon graduation, but deferred his call to Korean War era service for 1 year in order to complete his masters degree, graduating in 1954. Funded by a Shell fellowship, his masters thesis concerned the geology of the Doctor Mine, a lead zinc replacement deposit in the Leadville Limestone, in

Gunnison County, Colorado. After completing a tour of duty with the U.S. Army Corps of Engineers in 1956 he began a 16 year career with Shell Oil Co.

While enrolled in Advanced Petroleum Geology as a graduate student (a course Mr. Meissner currently teaches at Mines) he studied the hydrodynamic work of Dr. M. King Hubbard and recognized it as a key to certain aspects of petroleum migration and trapping. While with Shell he was able to apply hydrodynamic concepts to the occurrence of oil accumulations in deep-water turbidite channels that he identified and mapped in the Delaware Basin of west Texas and southeastern New Mexico Recognizing the presence and potential of tilted oil water contacts in the turbidities, he presented his ideas to management. The manager derided them, refusing to recognize that water contacts could be anything other than horizontal. Shortly after this, the manager retired and Shell brought in a new manager that recognized the potential of the concept and encouraged Mr. Meissner to pursue his ideas. As a result, he developed several prospects, three of which subsequently "found oil fields." In recognition of Mr. Meissner's potential, in 1965 he was transferred to Shell Development Company in Houston where he conducted basic research on hydrocarbon origin, migration and accumulation. In Houston Mr. Meissner refined his understanding of the fundamental controls on the existence of petroleum systems. This has evolved into a macro-framework understanding of hydrocarbon systems produced as a result of source rock maturity and the existence of fluid potential energy fields in a basin. This has provided a key to understanding the creation of overpressured and underpressured "basin centered" or "deep basin" oil and gas accumulations currently being exploited in the Rockies.

Trends in the Rockies over the next 5 to 10 years

The next 10 years of development in the Rockies will build on the results of last 10 years. Referring to the resource pyramid, Mr. Meissner states that as technology develops and product price increases, "larger-volume lower-grade" resources become exploitable. Much of the new production in the Rockies will come from re-discovery and exploitation of "old discoveries" [whether depleted or previously un-economic.] In a paper Mr. Meissner co-authored with Ray Thomasson, of Thomasson Partner Associates

<http://www.mines.edu/academic/geology/newstuff/rockymtngiants.html> titled "Rocky Mountain Giants," he and Dr. Thomasson describe how the application of new technologies has brought about re-discovery and successful exploitation of previously un-economic fields.

These technologies include horizontal and under-balanced drilling, down hole motors, 3D seismic, and hydraulic fracturing. Many Rocky Mountain reservoirs were initially explored with overbalanced mud systems that may have masked shows or damaged the reservoir. Damage and masking can be minimized by drilling with under balanced mud and flow control drilling systems [or even reverse circulation:

<http://www.pttc.org/news/1qtr2003/v9n1p13.htm>)

Down hole motors and slim hole drilling have lowered drilling cost increased profits in the areas like the Denver Basin, where some uneconomic reservoirs have become viable development targets. The ability to interpret depositional and structural features has been improved with formation imaging logs and 3D seismic, and this, combined with geologic and engineering concepts of reservoir compartmentalization, has greatly increased understanding of reservoir behavior. All this, combined with modern techniques of hydraulic fracturing [such as slick water and large volume propped fracs,] applied to low permeability reservoirs in the Rocky Mountain area has allowed economic production from tight sandstone formations and has also proven successful in coalbed methane development. Application of this combination of technologies is exemplified in the Piceance Basin and has allowed the re-discovery and production from the Williams Fork formation. Better understanding of log behavior in low resistivity as well as low contrast formations has led to improved evaluation of potentially productive intervals in new or existing wells. In coal bed methane exploitation, cavity enlargement ("cavitation") has been successfully applied and resulted in significantly higher production rates. An example of the potential of the Rockies that is not currently technologically exploitable is the CBM resource of the Green River Basin at depths greater than 4000 to 6000 feet. At these depths, the cleats are closed, which greatly decreases permeability and makes production rates uneconomic. However, with an in-place resource of approximately 314 TCF (D. Hill, SPE distinguished lecturer series) and stable gas prices, the technology necessary to exploit these resources will be developed. Jonah field in the Greater Green River Basin is an excellent example of the re-discovery of a large gas field. The presence of gas in the Pinedale area was known from the late 1930's but attempts at production were uneconomic. Gas was discovered at Jonah in Davis Oil Co, 1 Wardell Federal, but with an initial flow rate of 303 Mcfd of gas and 2 b/d of oil was uneconomic. Jonah was successfully re-discovered in 1993 when the McMurtry Oil Co. drilled and completed 1-5 Jonah Federal that tested 3.7 MMcfd and 40 b/d. Continued improvements in completion technology applied to

field development have resulted in production rates today that are as high as 10 to 12 MMcfd from a pay section similar to that found in the McMurry 1-5 Jonah Federal.

While evaluation and production technology has made Jonah field economically profitable, there is current debate about the origin of the gas and associated anomalous pressure phenomena within the reservoir currently being developed. This arises because, although the Lance reservoir is gas-bearing and overpressured, it is not sufficiently mature to have generated gas that might have created indigenous gas-generation overpressure. Understanding Jonah will provide insight that may guide the future discovery of analogs fields. Mr. Meissner speculates that Jonah is related to vertical gas migration through a "gas chimney" from an underlying primary source in the actively gas-generating and regionally overpressured Mesaverde formation. While the presence of gas chimneys has been well-documented by marine seismic techniques, such features have not been recognized in onshore settings involving rock types characteristic of the Rocky Mountain area. However, multi-component 4D seismic techniques may provide enhanced imaging that could lead to recognition. Jonah occupies a triangle located along the splay of a left lateral regional shear fault system. The opposing sense of movement on opposite sides of the splay resulted in the creation of extensional stress/strain across the triangle. Within the triangle the shallower Lance Formation has better porosity and permeability than the underlying Mesa Verde Formation. Overpressure created by active gas-generation within coal beds in the Mesaverde formation coupled with extensional stress related to fault-geometry has created a local fracture system extending upward from the Mesaverde into the Lance and has allowed the vertical transfer of both gas and its associated pressure into the Lance. The shear faults bounding the Jonah "triangle" apparently act as seals confining the both gas charge and associated pressure within the local area of the gas chimney.

Advice to Consultants

There is a personnel gap in the petroleum business, between those in their 20's entering the industry now and those with 30 or more years of experience. Those entering now have up-to-date skills but do not have the insight an experience that comes with 30 or 40 years in the business. This gap is an opportunity for older industry professionals to apply their knowledge. However, to take advantage of this opportunity the experienced people must have up-to-date skills. These can be gained through training like that offered by PTTC.

Advice to Independents in the Rockies

There are significant opportunities for discoveries and re-discoveries in the Rockies, but the biggest opportunities probably exist over seas. Small Rockies operators should not hesitate to diversify and seek overseas concessions or contract areas. Mr. Meissner notes that Trend, Filon, Webb, and Bird have operated in the Rockies as well as over seas. Because of the diversity in the style of oil and gas accumulations present in the Rockies, with the possible exception of rapidly deposited thick deltaic shelf edge sediment accumulations and associated growth faults, all world wide occurrences have analogs in the Rockies. Because of this, many Rockies operators have experience with analogs to almost all exploration and production opportunities they may encounter overseas.

Greatest challenge to independents

The biggest challenge faced by independents is governmental regulation and environmental impact. Decay in service company infrastructure is also a problem, but it may be reversing as more activity takes place in the Rockies. Another factor that is limiting development is a lack of pipeline connection.

Software that is most useful

Mr. Meissner does most work by hand because he is semi-retired and has not taken up the latest software. He was a Platt Rive Associates 1D modeling beta tester and would use proprietary Platt River Associates 2D and 3D modeling packages if they were available for his use.

Advice to PTTC

As a geologist and engineer, Mr. Meissner thinks that PTTC Rockies offers a good combination of engineering and geologic information. A complementary combination of the expertise from both disciplines is very important to be able to succeed in the Rockies. PTTC's co-sponsorship of meetings has allowed professional societies to undertake symposiums without worrying about the potential financial risk. An excellent example is the "Petroleum Systems and Reservoirs of Southwestern Wyoming" symposium last fall in Denver. It provided an excellent forum for discussion of all aspects of the occurrence and production of gas in Southwestern Wyoming, a forefront of re-discovery. Mr. Meissner thinks PTTC is doing a "great job"; however, he thinks it is not well enough known in the region and would like to see a comparison of the PTTC mailing list and membership lists of RMAG, AAPG and other professional societies to quantify its penetration in the Rockies. Many in geological ranks do not know PTTC and its recognition should be expanded.

Upcoming Events Sponsored by PTTC



Hydraulic Fracturing— Measurement, Characterization, and Analysis

May 27, 2004, 8:30 am – 5 pm, Petroleum Club, Casper, Wyoming

Instructor: Dr. Jennifer Miskimins, PE, Colorado School of Mines

Fee: \$85, includes lunch

This one-day workshop will present recent advances in hydraulic fracturing techniques and demonstrate how they can be used to characterize the producing reservoir. After a discussion of the basics of hydraulic fracturing, the complexities associated with treatment design and analysis will be reviewed. Special issues such as non-Darcy flow, G-function analysis, and “mapping” techniques will be covered. Case studies demonstrating analysis and various fracturing practices (such as “slickwater” fracs) will be presented. The course content will appeal to a wide range of engineering and geoscience disciplines. Sponsors: Casper SPE and PTTC Rocky Mountain Region.

Improving Electrical Efficiency in E&P Operations

June 22, 2004, 9 am – 5 pm, Ramkota Hotel, Bismarck, North Dakota

Fee: \$50, includes lunch

This one day workshop will highlight strategies and opportunities for improving electrical energy efficiency in oil and gas operations throughout the Williston Basin, and will focus on technology advancement and opportunities in the following areas:

- Improved artificial lift technology
- Timers, pump-off control, and effective metering techniques
- Self-generated power
- Field automation

The workshop is designed for owners, operators, production engineers, well analysts, field foremen, and superintendents. Organized by the Energy & Environmental Research Center, University of North Dakota.

Software Training:

GeoGraphix Training: An Overview and Refresher Course

June 2, 2004, 8:30 am – 4 pm, Colorado School of Mines, Berthoud Hall Room 201, Golden

Fee: \$90, DISCOUNT for online registration, \$75

GeoPlus PETRA Basic Training

June 3-4, 2004, 8:30 am – 5 pm, Colorado School of Mines, Berthoud Hall Room 201, Golden

Fee: \$150

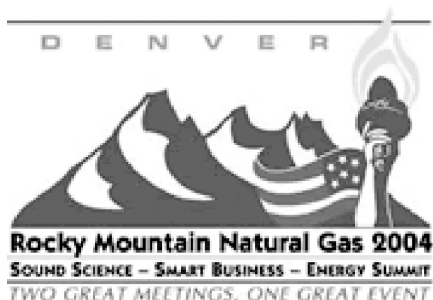
Log Correlation on a Computer Screen using A2D's smartSECTION

June 8, 2004, 9 am – 1 pm, Colorado School of Mines, Berthoud Hall Rm 204, Golden

Fee: \$50, includes lunch

Registration Information At: www.pttcrockies.org

Mark Your Calendar!



The August Rocky Mountain Natural Gas Conference will offer many vital short courses. Choose from topics such as CBM Reservoir Appraisal, Coal Stratigraphy Field Course, Horizontal Drilling, Gas Markets & Pricing, and much more.

Visit www.rmag.org for a complete list, and sign up early!

Disclaimer

Part of the mission of PTTC is to inform energy producers and explorers of the latest technological improvements and innovations. To accomplish this goal, each issue of the "Rockies Newsletter" includes articles and information about products and services that may be of interest to those in the energy business. Articles and information we publish are only intended to inform readers of the existence of products or services. Mention of a product or service in an article does not in any way constitute an endorsement or representation by PTTC or the "Rockies Newsletter" as to the efficacy of that product or service. The "Rockies Newsletter" provides contact information so interested readers can pursue their own inquiries and evaluations. Readers should make decisions about the usefulness, applicability and effectiveness of products and services based on their own evaluations with respect to their particular circumstances.

PTTC Funding

PTTC is an industry-directed 501-C-3 organization created to transfer exploration and production technology to U.S. producers. By accelerating the application of profitable technologies, PTTC enhances domestic oil and natural gas production. Please feel free to contact the following people about any issues or topics that may be of interest to you.

Chairman of the Rocky Mountain Region Producer Advisory Group: Bob McDougall, Phoenix Production, Co., phone: (307) 587-6440, bmcdougall@phoenixproduction.com Director: Sandra Mark, phone: 303.273.3107, smark.95@alum.mines.edu Webmaster: Noble Varughse phone: 303.273.3041, nvarughe@mines.edu, Newsletter Editor: Fred Mark, phone: 303.674.1682, fredmark@qwest.net

PTTC

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