SPE Hydraulic Fracturing Technology Conference and Exhibition

5–7 February 2019
The Woodlands Waterway Marriott
Hotel and Convention Center,
The Woodlands, Texas, USA

go.spe.org/HFTC

Conference Program
A wide range of solutions for all well environments.

Built through the merging of two top organizations, Covia is the leading provider of mineral solutions for the Oil & Gas industry. Stop by our booth to view our broad array of high-quality products, learn about our distinctive technical capabilities, and navigate the industry’s most comprehensive distribution network.

COME GET YOUR HANDS ON OUR SANDS AT BOOTH #605
On behalf of the program committee, I welcome you to the SPE Hydraulic Fracturing Technology Conference and Exhibition. This conference has become one of SPE’s most popular events, and I am confident that you will gain new knowledge and skills to advance your professional goals.

This year we have more than 50 technical papers, a sold-out exhibition with more than 100 companies, several training courses, and multiple networking opportunities with thousands of E&P professionals.

Technical highlights include the latest developments in fracture applications, fracture surveillance and interpretation, and economic optimization in fracturing.

Don’t miss the Tuesday morning Plenary Session on “Frac Hits,” Well Spacing, and the Science (and Art) of Infill Drilling in Unconventionals. Key industry experts will discuss the intricacies and challenges from interactions between infill wells and existing wells.

Take advantage of all of the learning and knowledge sharing available over the three days.

Thank you for attending and enjoy the conference!

Sincerely,

Martin Rylance
Program Committee Chairperson
BP Exploration

About the Society of Petroleum Engineers

The Society of Petroleum Engineers (SPE) is a not-for-profit professional association. Income from this event helps provide opportunities for industry professionals to enhance their technical and professional competence. Scholarships, certification, the Distinguished Lecturer program, and SPE’s energy education program Energy4me are just a few examples of programs that are supported by SPE at www.spe.org.
Program Committee

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Martin Rylance, BP Exploration

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Kathryn Briggs, Pioneer Natural Resources
Craig Cipolla, Hess Corporation
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Access Conference Information Easily with the HFTC App

The HFTC app is easy to use! Once downloaded, the app does not require Wi-Fi or data connectivity.

You can view the technical program, create your own agenda or schedule, select exhibitors to visit, connect with colleagues, and much more.

For Apple and Android devices, visit the App Store or Google Play on your device and search for “SPE HFTC.”
Unconventional services you want. Efficiency you need.

From discrete to integrated well completions services, OneStim helps operators working in North America land maximize returns, no matter the scale or basin. Through vertical integration of services and centralized operations management, we help you remove bottlenecks from traditional workflows — streamlining the completion-to-production cycle. This saves you money and enables consistent delivery of every well, every time.

Find out more at
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Thank You to Our Sponsors (as of 8 January 2019)

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- **Schlumberger**: Conference Sponsor, Trailer, Lanyards, Bags
- **AFGlobal**: Outdoor Rig
- **Evolution Well Services**: Outdoor Rig
- **HiCrush**: Tuesday Night Reception
- **Baker Hughes**: Platinum and Hotel Key Cards
- **Solvay**: Carpet Stickers
- **Saudi Aramco**: Platinum Sponsor
- **coilChem**: Wednesday Morning Coffee Break
- **Liberty**: Escalator Runner
- **COVIA**: Hotel Bar Napkins
- **Wanli Propellant**: Pens and Notepads
- **AIRIS**: Sky Bridge Window Clings
- **EKU Power Drives**: Sticky Notes
- **Drill 2 Frac**: Hanging Sign
GKPI Frac MSE™

for effective fracturing design

Take cost effective insurance on your Frac Design!!

GK Plus Innovations LLC, with their deep understanding of drilling processes and tools, has perfected a methodology to minimize effect of drilling efficiency on MSE to generate an advanced GKPI Frac MSE™ that provides a better picture of the formation for lateral sections and thus added confidence in your frac design.

We use advanced techniques to handle distortions observed in drilling data due to connections, faulty zeroing, inadvertent changes in Flow, SPP or RPM, downlinks, sliding, controlled drilling, motor/bit wear.

With quick turnaround of just 3-5 business days, we can support your completion design team with timely and high quality MSE using already existing drilling data.

GK Plus Innovations, LLC.
Your Destination for Creative Solutions
## Schedule of Events (as of 02 February 2019)

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<tr>
<th>Time</th>
<th>Waterway 1 Foyer</th>
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Event Information

Registration and Badge Pick-Up
Registration will be available in the Waterway 1 Foyer on Level 3, starting Monday, 4 February.

Registration Hours
- Monday, 4 February: 1300–1700
- Tuesday, 5 February: 0700–1800
- Wednesday, 6 February: 0730–1800
- Thursday, 7 February: 0730–1000

Exhibition
The exhibition is located in Town Center/Town Center Foyer, Level 1 and open to conference registrants on Tuesday and Wednesday.

Exhibition Hours
- Tuesday, 5 February: 0900–1800
- Wednesday, 6 February: 0900–1830

Speaker Check-In
Speaker check-in and Speaker Ready is located in Cochran’s Crossing, Level 3. Speakers are requested to check in prior to reporting to their assigned session room.

Speaker Check-In Hours
- Monday, 4 February: 1600–1700
- Tuesday, 5 February: 0730–1700
- Wednesday, 6 February: 0730–1730
- Thursday, 7 February: 0730–1215

Coffee Breaks
Tuesday, 5 February
- 0900–0930 (Town Center/Town Center Foyer)
- 1500–1545 (Town Center/Town Center Foyer)

Wednesday, 6 February
- 1030–1115 (Town Center/Town Center Foyer)
- 1535–1615 (Town Center/Town Center Foyer)

Thursday, 7 February
- 1005–1035 (Waterway Foyer)

Knowledge Sharing ePosters
Tuesday, 5 February
- 1500–1545 (College Park and Creekside Park, Level 3)

Wednesday, 6 February
- 1030–1115 (College Park and Creekside Park, Level 3)
- 1535–1605 (College Park, Level 3)

Networking Luncheons
Tuesday, 5 February
- 1130–1245 (Montgomery Ballroom/Town Center Foyer)

Wednesday, 6 February
- 1230–1330 (Montgomery Ballroom/Town Center Foyer)

Networking Receptions
Tuesday, 5 February
- 1700–1800 (Town Center/Town Center Foyer)

Wednesday, 6 February
- 1730–1830 (Town Center/Town Center Foyer)

Wi-Fi Available in Session Rooms and Lobby Space:
SSID: Marriott_CONFERENCE
Password: 19HFTC

The networking luncheons and receptions are included with full conference registration. Attendees must present their ticket (provided with their badge) to enter the luncheons.

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**Kemira AMA® biocides** preserve reservoir and well integrity through long-term control of sulfate-reducing and acid-producing bacteria.

**Kemira KemGuard® scale inhibitors** maintain flow and operational efficiency through economic control of inorganic oilfield scale.

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afglobalcorp.com/NRG
Training Courses

**Pre-Conference Training Courses**

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<tr>
<td>Shale Hydraulic Fracturing: Design and Analysis</td>
<td>Steve Hennings</td>
<td>Monday, 4 February</td>
<td>0800–1700</td>
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<tr>
<td>Fracturing Fundamentals for Non-Fracers</td>
<td>Carl Montgomery</td>
<td>Monday, 4 February</td>
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<td>Critical Geomechanics Concepts and Applications to Unconventionals Completions</td>
<td>Neal Nagel, Marisela Sanchez-Nagel</td>
<td>Monday, 4 February</td>
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<td>Design of Fiber-Optic DTS and DAS Well Installations</td>
<td>Dennis Dria, Bill Shroyer</td>
<td>Monday, 4 February</td>
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<td>Multistage Completions, Fracturing, and Refracturing in Shales</td>
<td>W. Aaron Burton, Sergey Kotov</td>
<td>Monday, 4 February</td>
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**Post-Conference Training Courses**

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<td>Shale Selection, Completions, Fracturing and Production</td>
<td>George King</td>
<td>Friday–Saturday, 8–9 February</td>
<td>0800–1700</td>
<td>Montgomery C</td>
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<tr>
<td>Hydraulic Fracturing – Design and Treatment</td>
<td>Carl Montgomery</td>
<td>Friday–Saturday, 8–9 February</td>
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<td>Water Treating for Shale Operations</td>
<td>John Walsh, Krishan Bansal, Ken Martins</td>
<td>Friday–Saturday, 8–9 February</td>
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In case you missed the training courses, SPE offers a multitude of learning opportunities in convenient locations around the world. Courses are held in conjunction with SPE conferences, workshops, local sections, and at SPE training centers in Calgary and Houston.

Register for SPE Training Courses online at go.spe.org/SPETraining or send an email to trainingcourses@spe.org.

SPE Training Courses are not included with conference registration, but are separated ticketed items. Sign up for a training course at the Registration desk in the Waterway 1 Foyer on Level 3.
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RUGGED
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Precision Peflo-Efficient Stages

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Harmony Enterprise enables you to conduct better oil and gas well performance analysis and estimate reserves. Through efficiently organizing and connecting well data to rich, integrated, reservoir engineering analysis, you can drive significant efficiencies, uncovering unrecognized value.

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Learn More: ihsmarkit.com/energyengineering
Plenary Session: “Frac Hits”, Well Spacing, and the Science (and Art) of Infill Drilling in Unconventionals

Significant advancements have been made in industry understanding, execution, and optimization of multi-fractured completions, but significantly more complexity and uncertainty results from interactions between infill wells and existing wells due to depletion and connectivity. This session explores the intricacies and additional challenges brought by such scenarios and examines the task of integrating data to accelerate learning and optimize overall economics.

Tuesday, 5 February | 0930–1130 | Waterway 1–8

**Moderator**

Stephen Holditch
Texas A&M University

**Speakers**

George King
GEK Engineering

Ripudaman Manchanda
The University of Texas at Austin

Piyush Pankaj
Schlumberger

Brendan Elliott
Devon Energy Production Co. LP
The strength of hydraulic fracturing as a technology has been its ability to adapt, change, and improve incrementally based on case history and field results. The papers in this session will provide the attendees some excellent examples and the learnings to help develop the insight and understanding, with a view to building improvements into their own operations.

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<td><strong>Trends in the North American Frac Industry: Invention through the Shale Revolution</strong></td>
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<td>L. Weijers, C.A. Wright, M.J. Mayerhofer, Liberty Oilfield Services; C.M. Pearson, L.G. Griffin, P.M. Weddle, Liberty Resources LLC</td>
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<td>1345</td>
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<td><strong>Using Land Controlled Source Electromagnetics to Identify the Effects of Geologic Controls During a Zipper Frac Operation - A Case Study From the Anadarko Basin</strong></td>
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<td>1410</td>
<td>194333</td>
<td><strong>Fracture Geometry Control Technology Prevents Well Interference in the Bakken</strong></td>
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<td>K. Vidma, P. Abivin, Schlumberger; D.J. Fox, M. Reid, Lime Rock Resources; F.O. Ajisafe, A. Marquez, W. Yip, J.W. Still, Schlumberger</td>
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<td>1435</td>
<td>194365</td>
<td><strong>Nine Plus Years of Production Show Value of Proper Design in Oil Window of Barnett Shale</strong></td>
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<td>1545</td>
<td>194374</td>
<td><strong>An Eagle Ford Case Study: Improving an Infill Well Completion Through Optimized Refracturing Treatment of the Offset Parent Wells</strong></td>
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<td>1610</td>
<td>194330</td>
<td><strong>Determining the Most Effective Diversion Strategy Using Pressure Based Fracture Maps : A Meramec (STACK) Case Study</strong></td>
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<td>J. Kopp, C. Kahn, Reveal Energy Services; C. Allen, J. Huchton, C. Robinson, Chaparral Energy, Inc.; E. Coenen, Reveal Energy Services</td>
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<td>1635</td>
<td>194369</td>
<td><strong>Developing an Evaluation Method for Casing Connections used in Hydraulically Fractured Wells</strong></td>
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<td>K.A. Hamilton, C-FER Technologies; P.D. Pattillo II, Anadarko Petroleum Corporation</td>
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<td>Alternate</td>
<td>194357</td>
<td><strong>Improving Hydraulic Fracturing Performance and Interpreting Fracture Geometry Based on Drilling Measurements</strong></td>
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<td>R.C. Downie, Drill2Frac; D. Daves, Legacy Reserves LP</td>
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<td>Alternate</td>
<td>194315</td>
<td><strong>Solving the Hydraulic Fracturing Puzzle in the HPHT KG Basin of India with Geomechanics-Enabled Design and Execution</strong></td>
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</table>
02 Fracture Modeling

Session Chairpersons: Michael Smith, NSI Technologies LLC; Mukul Sharma, The University of Texas at Austin

Different approaches to modeling fracture propagation are presented in this session. These models provide a basis for a better understanding of field observations.

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| 1300  | 194321  | Multi-Disciplinary Data Gathering to Characterize Hydraulic Fracture Performance and Evaluate Well-Spacing in the Bakken  
| 1345  | 194359  | Apparent Toughness Anisotropy Induced by Roughness of In Situ Stress: A Mechanism that Hinders Vertical Growth of Hydraulic Fractures and Its Simplified Modeling  
P. Fu, J. Huang, R.R. Settgast, J.P. Morris, F.J. Ryerson, Lawrence Livermore National Laboratory |
| 1410  | 194335  | Three-Dimensional Analysis of Interactions Between Hydraulic and Natural Fractures  
A. Daneshy, Daneshy Consultants Intl. |
| 1435  | 194328  | Simulation and Analysis of Fracture Swarms Observed in the Eagle Ford Field Experiment  
V.K. Sesetty, A. Ghassemi, University of Oklahoma |
| 1545  | 194327  | Barriers to Hydraulic Fracture Height Growth: A New Model for Sliding Interfaces  
W. Xu, Schlumberger-Doll Research; R. Prioul, T. Berard, X. Weng, O. Kresse, Schlumberger |
| 1610  | 194353  | Case Study of a Landing Location Optimization within a Depleted Stacked Reservoir in the Midland Basin  
C.W. Defeu, R. Williams, D. Shan, Schlumberger; J. Martin, D. Cannon, K. Clifton, C. Lollar, Diamondback Energy |
| 1635  | 194307  | Bridging Geomechanical and Geophysical Numerical Modeling: Evaluation of Seismic Efficiency and Rupture Velocity with Application to Estimating the Fractured Network Generated by Hydraulic Fracturing  
F. Sheibani, Massachusetts Institute of Technology; B. Hager, MIT, Department of Earth, Atmospheric and Planetary Sciences |
| Alternate | 194323 | Integrated Analysis of the Coupling Between Geomechanics and Operational Parameters to Optimize Hydraulic Fracture Propagation and Proppant Distribution  
A. Singh, S. Xu, M.D. Zoback, Stanford University; M.W. McClure, ResFrac Corporation |
| Alternate | 194361 | Effect of Shear Slippage on the Interaction of Hydraulic Fractures with Natural Fractures  
S. Agrawal, K. Shrivastava, M.M. Sharma, The University of Texas at Austin |
### 03 Case Histories II

**Session Chairpersons:** Craig Cipolla, Hess Corp.; Paul Weddle, Liberty Resources LLC

This session includes data-rich case studies by operators, service companies, and a university. Key development challenges operators are facing regarding infill drilling, completion activities, evolving completion designs and results will be covered. Presentations will also include potential cutting-edge completion technology advancements.

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<th>Time</th>
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| 0830  | 194329   | **Utilization of Far Field Diverters to Mitigate Parent and Infill Well Fracture Interaction in Shale Formations**
| 0915  | 194350   | **Evolving Completion Designs to Optimize Well Productivity from a Low Permeability Oil Sandstone (Turner) Reservoir in the Powder River Basin: One Operator’s Experience**
| 0940  | 194324   | **The World’s First Offshore Multilateral Well Completed with Multistage Proppant Fracturing: A Case Study from Offshore Black Sea**
A. Tomlins, OMV Petrom SA; J.O. Conrad, Packers Plus Energy Services Inc; B. Bocaneala, OPECs |
| 1005  | 194354   | **Child Well Analysis from Poroelastic Pressure Responses on Parent Wells in the Eagle Ford**
P. Das, Reveal Energy Services; O. Solaja, J. Cabrera, R. Scofield, SM Energy; E. Coenen, S. Kashikar, C. Kahn, Reveal Energy Services |
| 1115  | 194349   | **Evaluating the Impact of Frac Communication between Parent, Child, and Vertical Wells in the Midland Basin Lower Spraberry and Wolfcamp Reservoirs**
| 1140  | 194340   | **The Role of Micro-proppants in Conductive Fracture Network Development**
D. Kumar, R.A. Gonzalez, The University of Oklahoma; A. Ghassemi, The University of Oklahoma |
| 1205  | 194351   | **Real Time Analysis of Formation Face Pressures in Acid Fracturing Treatments**
V.J. Pandey, R.C. Burton, ConocoPhillips Co; K.S. Capps, CAPSHER Technology Inc. |
| Alternate | 194366 | **Well Trajectory, Completion and Fracture Design Changes Improve Execution for Deep Unconventional Tight Gas Targets in the Cooper Basin, Australia**
R.L. Johnson, Jr., R. Zhong, The University of Queensland; L. Nguyen, Real Energy Corporation Ltd |
Completion optimization plays a key role in improving well performance and economics. In this session we discuss various ways to enhance completion designs and methods to understand the completion effectiveness on well performance. A case study from the DJ Basin will discuss a workflow to identify the right size completion. The Permian Basin completion evolution and parent/child relationships on type curves will be discussed for Wolfbone and Wolfberry. Various experimental results and other notable papers focused on multi-cluster design efficiency, proppant selection, and mechanical diversion will be presented.

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<td>0830</td>
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<td>Right-Sized Completions: Data and Physics-Based Design for Stacked Pay Horizontal Well Development K.V. Tanner, W.C. Dobbs, S.D. Nash, Anadarko Petroleum Corp.</td>
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<td>0915</td>
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<td>Dynamic Fracture Volume Estimation using Flowback Data Analysis and its Correlation to Completion-Design Parameters T.M. Moussa, H. Dehghanpour, Y. Fu, O. Ezulike, University of Alberta</td>
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<td>0940</td>
<td>194360</td>
<td>Optimization of Plug-and-Perf Completions for Balanced Treatment Distribution and Improved Reservoir Contact S.S. Yi, C. Wu, M.M. Sharma, The University of Texas at Austin</td>
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<td>1140</td>
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<td>Experimental and Numerical Studies of EOR for the Wolfcamp Formation by Surfactant Enriched Completion Fluids and Multi-Cycle Surfactant Injection F. Zhang, I. Saputra, S.G. Parsegov, I. Adel Abdelraouf, D.S. Schechter, Texas A&amp;M University</td>
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<td>1205</td>
<td>194367</td>
<td>Optimize Completion Design and Well Spacing with the Latest Complex Fracture Modeling &amp; Reservoir Simulation Technologies - A Permian Basin Case Study with Seven Wells H. Xiong, S. Liu, University Lands/Texas Oil &amp; Gas Institute, F. Feng, S. Liu, Texas A&amp;M University; K. Yue, The University of Texas at Austin</td>
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05 Pressure Analysis Diagnostics
Session Chairpersons: Eric Davis, ConocoPhillips Co; Kyle Haustveit, Devon Energy Production Co. LP

This session includes a variety of pressure diagnostic techniques commonly applied in unconventional reservoirs. Topics include Diagnostic Fracture Injection Test (DFIT), advanced Pressure Transient Analysis (PTA) techniques, as well as a look at poroelastic pressure response interpretations. The session also includes a poroelastic case study evaluating the effectiveness of diverters, a case study integrating pressure modeling with DAS to determine diversion success real-time and an integrated look how DFIT data can calibrate geomechanical simulators to better estimate the Dynamic Stimulated Reservoir Volume.

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<td>Numerical Simulation of DFITs Within a Coupled Flow and Geomechanical Simulator - Insights Into Completions Optimization</td>
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<td>L. Ji, V. Sen, K.S. Min, R.B. Sullivan, Anadarko Petroleum Corp</td>
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<td>1445</td>
<td>194336</td>
<td>Got Diversion? Real Time Analysis to Identify Success or Failure</td>
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<td>M. Trumble, M.J. Sinkey, J. Meehleib, Calfrac Well Services</td>
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<td>1510</td>
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<td>Close Encounters in the 3rd Dimension: Using Diagnostic Fracture Injection Tests (DFITs) From the Alberta Duvernay Shale Formation to Quantify Simultaneous Horizontal- &amp; Vertical-Plane Hydraulic Fracture Growth</td>
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<td>A.K. Nicholson, Perpetual Energy Inc; R.V. Hawkes, Trican Well Service Ltd.; R.C. Bachman, CGG</td>
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<td>Poroelastic Pressure Transient Analysis: A New Method for Interpretation of Pressure Communication between Wells during Hydraulic Fracturing</td>
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<td>P. Seth, R. Manchanda, S. Zheng, D.P. Gala, M.M. Sharma, The University of Texas at Austin</td>
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<td>1640</td>
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<td>Wavelet Analysis of DFIT Data to Identify Fracture Closure Parameters</td>
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<td>Investigation of Non-Ideal Diagnostic Fracture Injection Tests Behavior in Unconventional Reservoirs</td>
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<td>M.I. Mohamed, Colorado School of Mines; M. Salah, Khalda Petroleum; Y. Coskuner, Colorado School of Mines; C. Pieprzica, M. Ibrahim, Apache Corp; E. Ozkan, Colorado School of Mines</td>
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<td>DFIT Considering Complex Interactions of Hydraulic and Natural Fractures</td>
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<td>A. Kamali, A. Ghassemi, University of Oklahoma</td>
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06 Fluids, Proppants, and Transport
Session Chairpersons: Jennifer Miskimins, Colorado School of Mines; Junjing Zhang, ConocoPhillips Co

This session includes studies on proppant transport and fracture conductivity. The impact of fluid viscosity on proppant transport, as well as proppant distribution in slickwater-created fractures will be discussed. Novel concepts regarding proppant and fluid development will be presented. Attendees will come away with insights on the current understanding of proppant transport, conductivity, and associated effects on production.

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<td>Proppant Sieve Distribution - What Really Matters?</td>
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<td>Can Proppant Transport be Negatively Affected by Too Much Viscosity?</td>
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<td>Proppant Transport and Behavior in Horizontal Wellbores Using Low Viscosity Fluids</td>
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<td>F.A. Ahmad, J.L. Miskimins, Colorado School of Mines</td>
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<td>Generation of in-situ Proppant through Hydro-Thermal Reactions</td>
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<td>S. Tong, C.S. Miller, K.K. Mohanty, The University of Texas at Austin</td>
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<td>1640</td>
<td>194309</td>
<td>Power Law Correlation For Slickwater Proppant Dune Height Prediction</td>
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<td>M.A. Al-Otaibi, Saudi Aramco; J.L. Miskimins, Colorado School of Mines</td>
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<td>1705</td>
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<td>Bridging Criteria and Distribution Correlation for Proppant Transport in Primary and Secondary Fracture</td>
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<td>R. Kou, G.J. Moridis, T.A. Blasingame, Texas A&amp;M University</td>
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<td>194363</td>
<td>The Role of Microemulsion and Shut-in on Well Performance: From Field Scale to Laboratory Scale</td>
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<td>T. Soleiman Asl, A. Habibi, O.D. Ezulike, M. Eghbalvala, H. Dehghanpour, University of Alberta</td>
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<td>Effects of Heterogeneity in Mineralogy Distribution on Acid Fracturing Efficiency</td>
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<td>X. Jin, D. Zhu, A.D. Hill, Texas A&amp;M University; D. McDuff, Chevron ETC</td>
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07 Downhole Diagnostics

Session Chairpersons: Joseph Frantz, Range Resources Corp.; Paul Huckabee, Shell Exploration & Production Co

This session will discuss applications and new technologies or analysis methods for evaluating stimulation distribution effectiveness, fracture geometry characteristics, and well performance. Diagnostics presented include: optic fiber distributed sensing (acoustic & temperature), downhole video camera imaging, acoustic imaging tools, proppant & chemical fluid tracers, and production logs. Several authors emphasize the value of integration of complementary diagnostic methods to accelerate the optimization process, including potential for “real-time” decision making.

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<td>0915</td>
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<td>New Near-Wellbore Insights from Fiber Optics and Downhole Pressure Gauge Data&lt;br&gt;G.A. Ugueto, P.T. Huckabee, M. Wojtaszek, T. Daredia, A. Reynolds, Shell</td>
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<td>0940</td>
<td>194331</td>
<td>Continuous Use of Fiber Optics-Enabled Coiled Tubing Used to Accelerate the Optimization of Completions Aimed at Improved Recovery and Reduced Cost of Development&lt;br&gt;N.H. Natareno, M.J. Thelen, J. Charbonneau, Oasis Petroleum; N. Sahdeb, Halliburton Energy Svcs (SO); P.F. Cook, Halliburton</td>
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<td>1100</td>
<td>194373</td>
<td>A Novel Technology for Hydraulic Fracture Diagnostic in the Vicinity and Beyond the Wellbore&lt;br&gt;S.M. Stolyarov, E.A. Cazeneuve, K. Sabaa, D.A. Katz, J. Yang, Baker Hughes, a GE company</td>
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<td>1125</td>
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<td>Tying Horizontal Measurements to Well Performance Using Production Logs and Chemical Tracers in Multiple Wolfcamp Shale Wells, Delaware Basin&lt;br&gt;L. Green, D. Entzminger, D. Tovar, A. Alimahomed, MDC Texas Energy; F. Alimahomed, C.W. Defeu, R. Malpani, Schlumberger</td>
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<td>Wellbore Placement Optimization Using Particulate Oil-Soluble Tracers&lt;br&gt;M.H. Jones, MHJ Consulting LLC; J.L. LaRue, NCS Multistage Tracer Diagnostics</td>
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<td>Understanding Frac Fluid Distribution of an Individual Frac Stage from Chemical Tracer Flowback Data&lt;br&gt;W. Tian, A. Darnley, ResMetrics; T. Mohle IV, K. Johns, Contango Oil &amp; Gas; C. Dempsey, ResMetrics</td>
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08 Well Performance and Re-Frac
Session Chairpersons: **Francisco Fragachan**, Weatherford; **Joram Hadden**, Sierra Resources, LLC

Traditionally, to replace declining production in unconventional wells, operators would drill more wells. Current economics however, have enabled the industry to explore cost-effective ways to sustain and enhance production. Well performance and re-fracturing have become much discussed topics in unconventional reservoirs. This session presents an opportunity to review and brainstorm on these efforts to enhance fracture optimization, re-fracturing, and optimize production.

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| 0830  | 194364  | **Empirical Links Between Sub-surface ‘Drivers’ and Engineering ‘Levers’ for Hydraulic Fracture Treatments and the Implications for Well Performance**  
B. Stephenson, Shell Canada; T. Bai, P.T. Huckabee, J. Tolle, R. Li, SEPCO; J. Macdonald, L. Acosta, Shell Canada |
| 0915  | 194355  | **The Limits of Fluid Flow in Propped Fractures- the Disparity between Effective Flowing and Created Fracture Lengths**  
R.D. Barree, Barree & Assocs. LLC; R.J. Duenckel, B.T. Hlidek, Stim-Lab |
| 0940  | 194346  | **Three-dimensional Effects of Reservoir Depletion on Hydraulic Fracture Propagation**  
J. Huang, P. Fu, Y. Hao, J.P. Morris, R. Settgast, F. Ryerson, Lawrence Livermore National Laboratory |
| 1035  | 194372  | **Refracturing Technology Restores Profitability of Older Unconventional Wells in Southeast New Mexico**  
| 1100  | 194338  | **Validating Refrac Effectiveness with Carbon Rod Conveyed Distributed Fiber Optics in the Barnett Shale for Devon Energy**  
A.A. Attia, Ziebel; J.W. Brady, Devon Energy Production Co. LP; M. Lawrence, P. Robert, Ziebel |
| 1125  | 194341  | **Preventing Heel Dominated Fractures in Horizontal Well Refracturing**  
S.S. Yi, R. Manchanda, M.M. Sharma, The University of Texas at Austin; N.P. Roussel, ConocoPhillips |
| Alternate | 194381 | **A Big Data Study: Correlations between EUR and Petrophysics/Engineering/Production Parameters in Shale Formations by Data Regression and Interpolation Analysis**  
Y. Liang, The University of Texas at Austin; L. Liao, Sinopec Research Institute of Petroleum Engineering; Y. Guo, University of Houston |
| Alternate | 194368 | **Simplification and Simulation of Fracture Network Using Fast Marching Method and Spectral Clustering For Embedded Discrete Fracture Model**  
X. Xue, Texas A&M University; A. Rey, P. Muron, G. Dufour, X. Wen, Chevron Corporation |
| Alternate | 194311 | **Choosing the Right Treatment for Bakken: Slickwater vs. Hybrid**  
L. Shen, D. Fu, BJ Services |
Knowledge Sharing ePosters

Knowledge Sharing ePosters allow one-on-one interactions with presenters and opportunities to study a particular concept at an appropriate level of detail. Subject matter varies, but topics are consistent with the other technical sessions.

**Knowledge Sharing ePoster I**

**Session Chairperson: Eric Davis, ConocoPhillips Co**

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**Knowledge Sharing ePoster II**

**Session Chairperson: Francisco Fragachan, Weatherford**

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### Knowledge Sharing ePoster III
**Session Chairperson:** Michael Smith, NSI Technologies LLC

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### Knowledge Sharing ePoster IV
**Session Chairperson:** Steve Mathis, Chevron ETC

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### Knowledge Sharing ePoster V
**Session Chairperson:** Martin Rylance, BP

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Phone: 713-260-1067
Fax: 713-840-8585
www.epmag.com

E&P is a print and digital publication, covering the latest technology in exploration and reservoir characterization; well construction; production optimization; marine technology and operations, information technology, and industry news and analysis. Hart Energy provides energy news through its DUG™ conferences, customized supplements and maps.

116 Hexion
15366 Park Row
Houston, TX 77084 USA
Phone: 281-646-2831
Fax: 281-646-2898
www.hexion.com/oilfield

Hexion’s advanced chemistries improve well economics from drilling through production. Our portfolio includes resin coated proppants, proppant enhancement technologies and formation water control chemicals. Hexion was the first to develop and deploy mobile resin coating technology, offering efficient in-basin proppant coating in any location.

323 Hi-Crush
1330 Post Oak Blvd Suite 600
Houston, TX 77056 USA
Phone: 713-980-6225
www.hicrush.com

Hi-Crush is a premier provider of proppant and logistics solutions to the North American petroleum industry. Our purpose-built production facilities can produce 16.4 million tons per year of high-quality frac sand. Our innovative PropStream™ solution provides the highest level of flexibility, safety and efficiency in managing proppant supply.

14 High Resolution Data, LLC
3435 South Inca St STE C
Englewood, CO 80110 USA
Phone: 720-663-8944
www.highresdata.com

The DFIT and offset well monitoring system consists of a precision quartz surface pressure sensor, pump in turbine flow and a cloud connected recording system. Data are pushed to a secure IOT Web-based server for real time viewing and storage. Equipment is available for purchase, rental, or use our services for on-site installation and training.

225 High Roller Sand LLC
310 W. Wall st Suite 550
Midland, TX 79701 USA
Phone: 844-695-7263
highrollersand.com

High Roller Sand, has 2 new state-of-the-art, hydraulic fracturing sand facilities. HRSand 115 is located north of Kermit, Texas and HRSand Penwell is located in Crane county between Monahans and Odessa. We can supply the entire Delaware and Midland Basins and are well positioned for Northern Delaware Basin.
**608  Hoover Ferguson**

2135 Hwy 6 South  
Houston, TX 77077 USA  
Phone: 832-295-6275  
www.hooverferguson.com

Hoover Ferguson is a global leader in packaging solutions for the energy, petrochemical and general industrial markets. We provide our customers with innovative solutions centered on safety, quality and cost effective strategies. We have a strength and depth of capabilities that is unrivalled by our competitors. ISO Containers & Bulk Delivery Unit.

**920  Innospec Oilfield Services**

2600 Technology Forest Blvd  
The Woodlands, TX 77381 USA  
Phone: 832-730-4801  
www.innospecinc.com

Innospec Oilfield Services is a leading provider of chemicals and services for hydraulic fracturing operations. As a technology-driven company, we focus on providing budget-conscious solutions that includes proprietary tracking systems and chemical inventory management services proven to provide effective, economical answers to our clients.

**701  Interra Energy Services, Ltd.**

1111 North Loop West Suite 705  
Houston, TX 77008 USA  
Phone: 832-477-2720  
Fax: 403-263-8883  
www.interraenergy.com

Interra Energy Services increases stimulation efficiency, while reducing costs and enhancing production; through innovative completion tool technology. With a solution for every Hydraulic Fracturing Environment in the world, Interra tools are sure to benefit your completion process.

**220  IOT-eq**

11922 Cutten Rd  
Houston, TX 77066 USA  
Phone: 281-781-7858  
www.iot-eq.com

At IOT-eq, we offer a full service model for the Internet of Things. From electronic technicians who can install the sensors and configure software to custom dashboard development and electronic manufacturing, IOT-eq is your one stop shop for the Internet of Things.

**817  Italmatch Chemicals**

5544 Oakdale Rd Se  
Smyrna, GA 30082 USA  
Phone: 412-352-8574  
www.italmatch.com

Italmatch manufactures, in the USA, a full range of phosphonates (the “Mayoquest/Briquest/Dequest” product line). Other products manufactured by Italmatch include dispersants, polymers, acids, agricultural products, biocides and esters.

**201  Keane Group**

5825 North Sam Houston Pkwy W  
Houston, TX 77086 USA  
Phone: 281-929-0370  
www.keanegrp.com

Keane Group is one of the largest providers of integrated well completion services in the US, with a focus on complex, technically demanding solutions. Keane’s primary service offerings include horizontal and vertical fracturing, wireline perforation and logging, engineered solutions, and cementing, as well as other value-added service offerings.
HYDRAULIC FRACTURING IS NOT BLACK & WHITE

CHOOSE CATALYST FOR YOUR COLORFULLY COMPLEX FRAC NEEDS

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705  Kemira

2050 W. Sam Houston Parkwat S. Suite 800
Houston, TX 77043 USA
Phone: 678-819-4615
www.kemira.com

We work together with our customers to improve their oilfield operations’ profitability and resource efficiency, as well as reduce the environmental risk through chemical technology. Our products and expertise help you lower your energy costs, increase your efficiency, preserve your reservoir, maintain flow and reuse oilfield water.

208  Keystone Engineering

6310 Sidney St.
Houston, TX 77221 USA
Phone: 713-747-1478
www.keystoneeng.com

Composite Frac plugs, Bridge plugs, Frac tools, Wireline, MWD. Keystone Engineering is a versatile made-to-order manufacturing Co capable of producing all machined parts and also turnkey assemblies. Experts in composite, rubber and metal material with rigorous electrical, pressure, and high temperature performance specs for downhole applications.

115  Kureha Energy Solutions

3151 Briarpark Drive Suite 1050
Houston, TX 77042 USA
Phone: 713-893-0730
kureha-energy-solutions.com

Kureha Energy Solutions is honored to introduce our fresh-water degradable KDP (Kureha Degradable Plug) suitable for BHT in range of 125-325°F. “Integrated Innovation” makes us special as we start from own raw material “PGA” to its finished products with our own engineers, lab and R&D. Please visit us and see our latest products at booth #115.

219  Liberty Oilfield Services

950 17th St Suite 2400
Denver, CO 80202 USA
Phone: 303-515-2858
www.libertyfrac.com

Liberty Oilfield Services (LOS) is an innovative oilfield service company providing specialized stimulation services. We focus on offering safe, efficient and high-quality hydraulic fracturing services, aiming to become the vendor of choice for operators in the Williston, Powder River, DJ, Eagleford and Permian Basins.

223  LUXFER MEL Technologies

2571 Otter Ct.
Lafayette, CO 80026 USA
Phone: 303-589-3189
www.luxfermeltechnologies.com

Luxfer MEL Technologies, world leader in functional magnesium alloy development, produces SoluMag Magnesium Alloys for oil & gas downhole tools and applications. SoluMag is a high strength magnesium alloy that corrodes predictably in aq. brine fluids. Tools and components made from SoluMag dissolve after use, eliminating the need for drill-out.

8  MGB Oilfield Solutions

20018 Chateau Bend Drive
Katy, TX 77450 USA
Phone: 281-769-4244
mgb-oilfield.com

MGB is a pressure-pumping engineering and manufacturing company that helps customers manage costs and maximize the efficiency of their surface frac equipment. The MGB innovative systems designs and attention to detail, improve reliability and performance, while reducing total costs and making frac sites as safe as possible.
MicroSeismic, Inc. provides microseismic-based Completions Evaluation Services, particularly quantitative assessments of stimulation treatment effectiveness and well productivity. We are the leading provider of microseismic monitoring utilizing surface, near-surface, and downhole arrays. We operate in 18 countries and hold over 33 patents.

Nalco Champion, an Ecolab company, provides safe, sustainable chemistry programs and services to the upstream and midstream oil and gas industry, refineries and petrochemical operations. Through the application of innovative technologies, we maximize production, optimize water use and overcome challenges in the world’s toughest energy frontiers.

NatureWorks is an advanced materials company offering a broad portfolio of renewably-sourced Ingeo™ polymers and Vercet™ chemicals that can have a wide range of uses downhole. Diverting agents, fibers, and other products produced from Ingeo PLA polymers provide tunable hydrolysis that leaves no residuals or byproducts downhole upon job completion.

NCS Multistage is the world leader in pinpoint fracturing technology, which delivers controlled frac placement that lowers the risk of frac hits during infill completions and facilitates completion optimization. NCS also offers tracer diagnostics, reservoir engineering support, and well construction products, including the AirLock® buoyancy system.
711  **OFI Testing Equipment, Inc.**
11302 Steeplecrest Drive
Houston, TX 77065 USA
Phone: 832-320-7311
Fax: 713-880-9886
[www.ofite.com](http://www.ofite.com)

Since 1982, OFI Testing Equipment (OFITE) has designed instruments and reagents for testing drilling fluids, frac fluids, completion fluids, oil well cements, core samples, and wastewater. From our manufacturing center in Houston, Texas, we support businesses worldwide with top quality products and extensive repair and custom engineering services.

520  **PCG**
110 Veterans Blvd. Suite 535
Metairie, LA 70005 USA
Phone: 504-581-7800
Fax: 504-568-1222
[www.pcgla.com](http://www.pcgla.com)

PCG is a New Orleans based professional search firm, founded in 1969. Our recruitment focus is the domestic and international hydraulic fracturing sector as well as other down hole service segments of Oil and Gas. Engineering, Operations, Sales, Accounting, Information Technology and Human Resources are the professions for which we recruit.

425  **OptaSense**
12709 Haynes Rd.
Houston, TX 77066 USA
Phone: 713-493-2136
[www.optasense.com](http://www.optasense.com)

OptaSense delivers real-time, actionable information that improves reservoir management and ultimate recovery, with an offering that includes Distributed Acoustic Sensing (DAS), processing and imaging and real-time visualization.

325  **Prop Tester, Inc.**
17222 Huffmeister Road, Ste. B
Cypress, TX 77429 USA
Phone: 713-352-3718
Fax: 281-758-3136
[www.proptester.com](http://www.proptester.com)

PropTester®, Inc. is an independent “Quality Control” Company that performs laboratory and field research and testing on proppants, fracturing fluids and cementing products utilized in the Oil and Gas Industry.

409  **Packers Plus Energy Services**
11415 Spell Rd
Tomball, TX 77375 USA
Phone: 403-263-7587
[www.packersplus.com](http://www.packersplus.com)

Packers Plus is an innovator of multi-stage completion systems, and an industry leader in designing and manufacturing solutions for a variety of technically challenging applications. The company has operations in Canada, the United States, and internationally to maintain an influential role in key markets.

218  **PropX**
950 17th st suite 1350
denver, CO 80202 USA
Phone: 303-317-8906
[www.propx.com](http://www.propx.com)

PropX is a patented containerized solution for Last-Mile proppant delivery for hydraulic fracturing operations. We are focused on building a partnership that first and foremost saves our customers money while dramatically decreasing Silica exposure for personnel on location.
**505  ProTechnics, Div of Core Laboratories**

6510 W. Sam Houston Parkway N  
Houston, TX 77041 USA  
Phone: 713-328-2357  
Fax: 713-328-2161  
www.corelab.com

ProTechnics brings 30+ years of experience partnering with operators to address industry challenges and solve problems through Completions & Reservoir diagnostics. Our team of engineers align our technology with our customers’ business initiatives, helping guide them to get the most oil and gas out of the ground in the most efficient way possible.

**518  Renegade Wireline Services, LLC**

1937 West Ave  
Levelland, TX 79336  
Phone: 806-897-0735  
www.renegadewls.com

Renegade Wireline Services, LLC, was founded in 2009 by a service-minded group of wireline experts. Renegade prides itself on the quality of its employees and the quality of its service. Our single-minded goal is, “To be the best!” We are the largest and most diverse privately-owned wireline company in the United States.

**815  Repeat Precision**

19450 State Highway 249, Suite 200  
Houston, TX 77070 USA  
Phone: 281-953-4327  
www.repeatprecision.com

Repeat Precision manufactures and markets PurpleSeal composite frac plugs, which offer premium design and performance at a competitive price. Compact PurpleSeal plugs deliver consistently fast drill-out times of 8 minutes or less. We also offer the PurpleSeal Express frac-plug deployment system delivered to the wellsite assembled and ready-to-run.

**10  Reservoir Group**

6360 W. Sam Houston Pkwy N  
Houston, TX 77041 USA  
Phone: 713-766-7400  
Fax: 281-653-0808  
www.reservoirgroup.com

Reservoir Group is a world-class niche oilfield services company that has been addressing customer challenges for more than 30 years. We partner with E&P operators and large service companies to provide tools and expertise during drilling, completions and production operations.

**15  Resource Well Completion Technologies**

156825 76th Ave SE  
Calgary, AB T2C 5L9 Canada  
Phone: 587-390-0016  
www.resourcewct.com

An industry leader in the design, manufacture and service of multi-stage completions systems, conventional completion systems and wellbore construction equipment. Resource’s products and systems have revolutionized many aspects of the completion industry and have created a step change in economics for our customers.

**125  Reveal Energy Services**

1500 Citywest Blvd Suite 741  
Houston, TX 77494 USA  
Phone: 832-529-1895  
www.reveal-energy.com

Simple, accurate, affordable pressure-based fracture maps let you make informed, better completion decisions with minimum operational risk and cost. Is a stimulation treatment producing the planned fracture dimensions? Now you can quickly decide if varying geology requires a treatment change with our patented, award-winning fracture maps.
Robertson Petroleum Group
2405 20th street
Lubbock, TX 79411 USA
Phone: 806-771-9529
www.rpetrogroup.com

Robertson Petroleum Group is a firm of consulting services dedicated to the enhancement and execution of petroleum industry operations throughout the United States. Our expertise and experience in every domestic basin allows us to provide operators with unmatched consulting services from the planning to post-execution phases of our operations.

Rockwater Energy Solutions
2800 Post Oak Blvd, Suite 4500
Houston, TX 77056 USA
Phone: 713-986-2587
Fax: 713-235-9501
rockwaterenergy.com

Rockwater Energy Solutions is a technology leader in the development, manufacturing, and supply of Completion, Production and Specialty Chemicals to the oilfield. Rockwater develops and delivers a wide range of field-ready products including friction reducers, surfactants, crosslinkers, polymers and other chemicals to optimize production.

Safoco
11421 Todd St.
Houston, TX 77055 USA
Phone: 713-956-1595
Fax: 713-956-2449
www.safococontrols.com

Recognizing the need for a more simple & reliable way to remotely trigger the Emergency Shut Down (ESD) system at a wellhead, we began to design a solution that became the SAMI. SAMI systems are available both as fully automated & remotely controlled units – communicating via satellite, cellular, or radio connectivity.

Schlumberger
4646 W. Sam Houston Pkwy. N.
Houston, TX 77041 USA
Phone: 713-939-2843
Fax: 713-939-2735
www.slb.com

Schlumberger is the world’s leading supplier of technology, integrated project management and information solutions to customers working in the oil and gas industry worldwide. Schlumberger provides the industry’s widest range of products and services from exploration through production.

Sichuan Guangya Polymer Chemical Co., Ltd
4731 Fisher Drive
Richmond, V6X3V4 Canada
Phone: 6046551949
www.scgy.com

Sichuan Guangya Polymer Chemical Co., Ltd (SCGY) is the biggest associative polymer manufacturer with strong R&D ability for more than 28 years in China. Our products are widely used in the Chemical EOR, Reservoir Deep Profile Control & Plugging, Non-crosslinked Fracturing fluids. Guangya is always to provide the best products and technical solution.

Sierra Frac Sand, LLC
1155 E. Johnson St
Tatum, TX 75691 USA
Phone: 903-836-4642
Fax: 903-836-4643
www.sierrafracsand.com

Sierra Frac Sand is a proppant and specialty sand supplier. A Texas based corporation, Sierra prides itself on working well under pressure and consistently meeting the needs of the growing hydraulic fracturing industry.
921 Silixa LLC
16203 Park Row Suite 185
Houston, TX 77084 USA
Phone: 832-772-3333
www.silixa.com
Silixa improves performance, reduces operational costs and extends the lifespan of any asset by delivering distributed fibre optic monitoring solutions on both new and existing fibre cable installations with the highest levels of accuracy in the industry. We have completed hundreds of fibre optic distributed sensing installations worldwide.

101 Sintex Minerals & Services, Inc.
29810 Southwest Freeway
Rosenberg, TX 77471 USA
Phone: 903-520-6693
Fax: 281-605-5490
www.sintexminerals.com
Sintex Minerals and Services is the Exclusive distributor for Curimbaba Proppants. We control the largest known high-grade bauxite ore reserves in the world. Our Global distribution points are located in Rosenberg, TX, Slaton, Tx,, Casper, WY, and Stanton, ND. Aliquippa, Pa., Jebel Ali, UAE. Esbjerg, Dk. Barka, Oman, Alexandria, Egypt, Neuquen, Arg.

500 SNF Oil & Gas
1 Chemical Plant Road
Riceboro, GA 31323 USA
Phone: 912-880-2061
Fax: 912-884-5031
www.snf.us
SNF provides friction reducers, scale inhibitors, clay stabilizers, drilling fluid additives and conformance polymers to the upstream oil & gas industry. The SNF Powder Frab brand provides hydration systems for application of powder friction reducers. Our products are provided through 3 manufacturing plants and 14 hubs across North America.

917 Soarus LLC
3930 N VENTURA DR Suite 300
ARLINGTON HEIGHTS, IL 60004 USA
Phone: 847-255-1211-120
www.soarus.com

106 SOLVAY Group
2645 Technology Forest Blvd
The Woodlands, TX 77381 USA
Phone: 609-860-3536
go.to.solvay.com/OilfieldChemicals
SOLVAY offers the industry’s largest range of Oilfield Chemicals and is a leader in Friction Reducers, Gelling Agents, Surfactants, Inhibitors and Biocides. Locations in every basin provide world-class service and our team of experts work closely with customers to develop tailor-made additives and solutions to meet their most difficult challenges.

121 Stage Completions Inc
90 Madison St, Suite 502
Denver, CO 80206 USA
Phone: 210-861-3619
www.stagecompletions.com
Stage Completions is a highly innovative completion technology company with a focus on multistage completions. The company’s proprietary technology utilizes single-point entry fracturing to increase well productivity and reduce well cost.

20 Stepan Oilfield Solutions
2901 W Sam Houston Parkway N Suite E-350
Houston, TX 77043 USA
Phone: 713-955-8100
www.stepan.com/oilfield
Stepan Oilfield Solutions is a leader in surfactants for unconventional and conventional oil and gas recovery. Our Center of Excellence in Houston has a dedicated team to support the global energy market. We offer components and formulations to aid in hydraulic fracturing, drilling, cementing, completions, production and IOR/EOR technologies.
516  Stewart & Stevenson

8631 East Fwy
Houston, TX 77029 USA
Phone: 713-671-6320
www.stewartandstevenson.com/markets/oil-gas/frac-well-stim-equipment

Stewart & Stevenson, a leader in hydraulic fracturing equipment, manufactures frac pumpers, blenders, acidizers, chemical additive & hydration units, data acquisition & control centers and support equipment. Our oilfield equipment includes cementing, pumping, coiled tubing, nitrogen & industrial gas systems, controls and power generation.

919  Sun Specialty Products

503 Main St
Belle Chasse, LA 70037 USA
Phone: 713-690-3939
www.sunspecialtyproducts.com

SUN is a technology-driven company actively serving the needs of the exploration and production industry by providing solutions that enhance their overall performance. We feature a full line of high quality, specialty drilling fluid additives, coil tubing fluid additives and advanced Ultra Lightweight (ULW) proppants and gravel pack material.

209  Sunita Hydrocolloids Inc

5444 Westheimer Rd Suite 1425
Houston, TX 77056 USA
Phone: 832-581-2156
www.sunitahydrocolloids.com

Sunita Hydrocolloids Inc is a full line Chemical provider offering a complete solution for Fracturing chemicals with a presence in all Major US basins.

119  Superior Tank Company Inc.

1700 Bamore Road
Rosenberg, TX 77471 USA
Phone: 281-342-0750
Superiortank.com

Superior Tank manufactures & erects oil storage tanks featuring powder coating & the API 12B monogram. We also offer water storage tanks for fire protection and our bolted steel tanks are available in capacities up to 59,000 bbls. We service the Gulf Coast Region through our Manufacturing and Operations Center in Houston.

12  Synalloy Chemicals

36 Turkey Trot Drive
Rocky Face, GA 30720 Georgia
Phone: 706-313-5893
Fax: 423-473-7284
www.manufacturerschemicals.com

Synalloy Chemicals offers contract manufacturing and intermediates such as Imidazolines, Quats, Safe Acids, Defoamers & Antifoams, Sulfated Castor Lubricant, phosphate esters, surfactants, and other chemicals & intermediates used in oil and gas.

525  TAM International

4620 Southerland Rd.
Houston, TX 77092 USA
Phone: 713-462-7617
Fax: 713-462-1536
www.tamintl.com

TAM is an independent oilfield services company headquartered in Houston, with regional offices in Aberdeen, Perth, Calgary, Bogota, and Dubai. TAM inflatable & swellable packers, and associated downhole products/services are available globally from offices in North America, Europe, the Middle East, Latin America, Asia Pacific, Africa, and Russia.
604  TBC-BRINADD, LLC
4800 San Felipe
Houston, TX 77056 USA
Phone: 713-877-2758
www.tbc-brinadd.com

TBC-BRINADD is a global provider of fracturing fluid additives which include polymer cross linkers, polymer breakers and stimulation additives. TBC-BRINADD (ISO 9001:2008 certified) is committed to providing effective fracturing and stimulation additives with Elevated Environmental Standards.

905  TETRA Technologies
24955 Interstate 45 North
The Woodlands, TX 77380 USA
Phone: 281-364-2264
Fax: 361-668-0853
www.tetratec.com

Founded in 1981, TETRA Technologies is a geographically diversified oil and gas services company, with approximately 4,800 employees in over 15 countries. We focus on completion fluids and associated products and services, comprehensive water management solutions, frac flowback, production well testing, and compression services and equipment.

123  Tek USA Composites
567 Elm Ridge Ave
Canal Fulton, OH 44614 USA
Phone: 330-212-1770
Fax: 330-706-0002
www.tekusa.com

TEK Composites; A world leader in engineered composite products for the fracking industry. Featuring ZPoxy and ZCore technologies, we are raising the bar with composite capabilities. Valvetek seats and valves, our newest product additions. Valvetek P4 and P5 cement seat assemblies provide extended wear life from standard pump valves. Valvetek!

824  Thru Tubing Solutions
11515 S. Portland
Oklahoma City, OK 73170 USA
Phone: 405-692-1900
www.thrutubing.com

Since 1997, Thru Tubing Solutions has been providing specialized downhole services and equipment to customers worldwide. Forged from the experience and expertise of our seasoned field professionals and engineering staff, we’ve become the leading provider of thru tubing tools and services in the industry today.

819  Terves Inc
24112 Rockwell Dr
Euclid, OH 44117-1252 USA
Phone: 216-404-0053-170
Fax: 216-404-0054
www.tervesinc.com

Terves’ family of patented dissolvable alloys and elastomers are the choice for cost and reliability for the manufacture of dissolvable frac plugs. Our patented TervAlloy(tm) alloys are the most widely used dissolvable metals in the industry. Mated with our Elementum(tm) dissolvable elastomer Terves provides assured, consistent performance.

9  Titan Liner
4100 International Plaze, Suite 538
Ft Worth, TX 76109 USA
Phone: 713-835-8642
www.titanliner.com

TitanLiner provides a full range of flexible, customizable secondary containment solutions for many industries. These solutions include permanent rigid containment systems, portable containment systems, and temporary containment systems. All are based on proven polyurea chemistry.
310  Tracerco
4106 New West Drive
Pasadena, TX 77507 USA
Phone: 281-291-7769
Fax: 281-291-7769
www.tracerco.com

Knowing what’s happening at the bottom keeps you on top... To assist oilfield professionals in maximizing hydrocarbon recovery from unconventional reservoirs, Tracerco has developed specialist tracer technology that allows measurement of relative hydrocarbon flow contribution from each stage following hydraulic fracturing.

227  Tubel Energy
25907 Oak Ridge Dr.
The Woodlands, TX 77380 USA
Phone: 713-504-3759
www.tubelenergy.com

TUBEL ENERGY PROVIDES WIRELESS DOWNHOLE GAUGES FOR SHORT HOP AND REAL TIME FOR FRAC, PRODUCTION AND ARTIFICIAL LIFT OPTIMIZATION. GAUGES ARE DEPLOYED AS PART OF THE CASING OR TUBING STRING AS A 3.5 FT PUP JOINT FOR THE SHORT HOP OR 6 FT PUP JOINT FOR THE REAL TIME GAUGE.

215  U.S. Silica Co.
24275 Katy Freeway 600
Katy, TX 77494 USA
Phone: 281-394-9614
www.ussilica.com

U.S. Silica is a leading producer of high purity silica used in the oil and gas industry. With a broad selection of products from an ever-growing number of mining and transload locations, we’re positioned to satisfy the market’s growing proppant demands and are committed to investing in resources to meet our customer needs.

19   US Well Services
11 Grandview Circle Suite 117
Canonsburg, PA 15317 USA
Phone: 724-871-3040
www.uswellservies.com

U.S. Well Services is an experienced provider of conventional and revolutionary electric hydraulic fracturing fleets (known as Clean Fleet*), and are among the most reliable and highest performing fleets in the industry with the capability to meet the demanding pressure and pump rate requirements associated with unconventional reservoirs.

624  Vantage Specialties, Inc
3938 Porett Dr.
Gurnee, IL 60031 USA
Phone: 847-903-2933
www.vantagespecialties.com

Vantage is a manufacturer of high-quality, naturally-derived specialty chemicals and intermediates. We offer Lubricity Additives, Emulsifiers, Wetting Agents, Surface Tension Reducers, Dispersants, Foamers, Solid Inhibitors as well as Coated Breakers and other encapsulated materials for the Oil & Gas market.

620  Wacker Chemical Corporation
3301 Sutton Road
Adrian, MI 49221 USA
Phone: 517-264-8400
Fax: 517-264-4068
www.wacker.com

WACKER offers a broad and comprehensive line of silicone-based products to enhance critical performance characteristics of a resin coating proppant. These characteristics include adhesion promoters, resin modifiers, and processing aids plus a complete product portfolio and global service & support geared to all phases of the oil & gas industry.
explore our opportunities

A career with Saudi Aramco is a career at the forefront of technology, where we are using cutting-edge innovations to assess, develop, and produce gas from shale and tight sand formations.

This is your opportunity to join a global leader in the energy industry, where your career can be as diverse as the assets we are exploring. Given the freedom to identify and deploy the latest technologies in over 1.2 million square kilometers of frontier basins, you will be working with source rocks and tight reservoirs associated with the largest oil and gas fields in the world.

We are seeking petroleum engineering professionals with experience in unconventional resources to join our team in Saudi Arabia.

To find out how you can make an impact and be part of one of our many multidisciplinary teams apply online at www.aramco.jobs/spe.
821  Water Lens LLC  
4265 San Felipe, Suite 1100  
Houston, TX 77027 USA  
Phone: 844-987-5367  
Fax: 281-352-1799  
www.waterlensusa.com  

Water Lens is a platform that provides a Frac Water Chemistry Analysis (FWCA) anywhere in just 10 minutes! Actionable data, on the job, that is as reliable and accurate as the data generated in the lab. The Water Lens platform is designed so that anyone can conduct a FWCA, and is rugged enough to suit any field environment. www.waterlensusa.com.

521  Weir Oil & Gas  
601 Weir Way  
Fort Worth, TX 76108 USA  
Phone: 817-935-7500  
www.global.weir  

Weir Oil & Gas is a dynamic engineering solutions and services division of The Weir Group. We are a market leader in the design and manufacture of pumps and high pressure flow control equipment for use in various applications. To provide superior post-sale service to our customers, Weir utilizes its network of strategically located service centers.

21  Well Data Labs, Inc.  
1675 LARIMER ST SUITE 700  
DENVER, CO 80202 USA  
Phone: 720-662-7771  
www.welldatalabs.com  

Well Data Labs, founded in 2014, is at the forefront of the digital transformation that is occurring in the oil and gas industry. The web-based platform captures high-frequency completions data and allows Operators to monitor and interpret frac data to improve completions efficiency while standardizing data integrations for data science teams.

210  World Oil  
2 Greenway Plaza Suite 1020  
Houston, TX 77046 USA  
Phone: 713-520-4463  
www.worldoil.com  

World Oil, established in 1916 as The Oil Weekly, is published monthly by Gulf Energy Information. For more than 100 years, World Oil has provided readers with coverage of the latest information and technological advances relating to the exploration, drilling, completion and production of offshore and onshore oil and gas.

204  Xinmi Wanli Industry Development Co. Ltd.  
808 Tower F Jianye Headquarters  
Zhengzhou, Henan 450000 China  
Phone: 86-371-60126628  
Fax: 86-371-60126629  
www.wlproppant.com  

Wanli was founded in 1994. With the main product of proppant, Wanli has been focusing on research, production, sales and distribution of proppant for more than 20 years. As the pilot of high quality fracturing proppant supplier, Wanli has sold proppant all over the world for more than 1,500,000 MT.
Upcoming Industry Events

To view these and other events, visit www.spe.org/events.

SPE Workshop: Complex Reservoir Fluids – Focus on New Developments
12–14 February 2019
Galveston, Texas

SPE/AAPG/SEG URTeC 1 Day Permian Basin Workshop
5 March 2019
Midland, Texas

SPE/ICoTA Well Intervention Conference and Exhibition
26–27 March 2019
The Woodlands, Texas

SPE International Conference on Oilfield Chemistry
8–9 April 2019
Galveston, Texas

SPE Oklahoma City Oil and Gas Symposium
9–10 April 2019
Oklahoma City, Oklahoma

9–11 April 2019
Huntington Beach, California

SPE Reservoir Simulation Conference
10–11 April 2019
Galveston, Texas

SPE Western Regional Meeting
23–26 April 2019
San Jose, California

Offshore Technology Conference
6–9 May 2019
Houston, Texas

Save the Date
SPE Hydraulic Fracturing Technology Conference and Exhibition
4–6 February 2020  |  The Woodlands, Texas, USA
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