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2011-2012

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# SPWLA - Houston Chapter News

## February, 2012

### Luncheon Meetings

**Northside**  
Monday, Feb 6, 2012  
The Greenspoint Club

**Comparative Study of Formation Evaluation Methods for Unconventional Shale Gas Reservoirs: Application to the Haynesville Shale (Texas)**  
*by Thaimar Ramirez, Apache Corp.*

**Westside**  
Wednesday, Feb 8, 2012  
BP Plaza Terrace Room

**Revisiting Log-Inject-Log NMR For Remaining Oil Determination: A Field Application of T2-D NMR in the Permian Basin**  
*by Emmanuel Toumelin, Chevron*

**Downtown**  
Wednesday, Feb 22, 2012  
Chevron Auditorium

**Correcting LWD Propagation Resistivity logs in Horizontal Sinusoidal Wells for Better Sw Estimation: Case Study in a Deepwater, Channelized Turbidite Reservoir**  
*by Hanming Wang, Chevron*

### Local SPWLA Upcoming Events

**Golf Tournament**  
16<sup>th</sup> March, 2012  
Event Sponsors required, contact [Rob Hengel](mailto:Rob Hengel)

**Spring Topical Conference**  
16<sup>th</sup> May, 2012 (topic to be confirmed)  
Chevron Auditorium, 1500 Louisiana St, Houston, 77002

**53<sup>rd</sup> Annual SPWLA Symposium**  
16<sup>th</sup> to 20<sup>th</sup> June  
Cartagena, Columbia

[Complete Calendar of Events](#)



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Put your Company here

## President's Corner

February, 2012

Dear Chapter Members,

As I write this, I find our industry in a price climate where natural gas prices per MCF now start with a "2", and oil prices are once again 3-digit per barrel. On an energy equivalent basis, I don't recall a disparity this large in my career. For most companies, this has re-emphasized the trending focus on liquids-rich production streams. We see this manifested in the shale/mudrock plays, and in the renewed interest in EOR applications in conventional reservoir rocks. For our discipline of formation evaluation, it has reminded us of the need for breadth; we need to develop and maintain expertise in areas like source rock evaluation, geochemistry, geomechanics, phase behavior, fluid flow, and classic enhanced recovery methods. Your Chapter Vice Presidents continue to respond to these needs by finding speakers who address these topics. Attendance has grown this year at each of our three Section locations – you are responding to the broadening opportunities, and it is gratifying to see that as your Chapter President.

As a reminder, we have on the horizon the upcoming Golf Tournament on March 16<sup>th</sup> at the BlackHorse Golf Club in Cypress, and our Spring Topical Conference on May 16<sup>th</sup> at the Chevron auditorium downtown. Sponsorship of Golf Tournament activities can be arranged through Randy Mitchell ([ramitchell@hess.com](mailto:ramitchell@hess.com)) or Rob Hengel ([Robert.Hengel@bakerhughes.com](mailto:Robert.Hengel@bakerhughes.com)).

In closing, I also encourage you to consider serving the Chapter Members in the coming year by running for office on the Chapter Board. Elections are coming around, so please give it some thought!

Paul Connolly  
Houston Chapter President

*Want to contribute to the SPWLA Houston Chapter Newsletter?*  
Contact: [Simon Clinch](#)

## Northside Luncheon Meeting

**Date:** Monday, Feb 6, 2012  
**Lunch:** 11:30 **Talk:** 12:00  
**Place:** The Greenspoint Club  
16925 Northchase Drive,  
Houston, TX 77060  
[Map](#)

**Comparative Study of Formation Evaluation Methods for Unconventional Shale Gas Reservoirs: Application to the Haynesville Shale (Texas)**  
*by Thaimar Ramirez, Apache Corp.*

**RSVP before 9:00 a.m. Thursday, Feb 2**  
E-mail: [Jack Douglas](#)

**Cost: Pre-payment. Please, use [PayPal](#)**

\$35 (lunch\* if paying at the door)

\$32 (lunch\* if using PayPal)

\$20 (venue charge without lunch)

Cash, Check or Credit Card is acceptable for payment. Receipts will be provided.

\*This is a fixed meal package including Chef's choice of salad, chicken entrée served with vegetable and starch, dinner rolls, dessert, iced tea, and coffee. The salads, desserts and beverages will be pre-set menu.

**Directions:** [Map](#)

From I-45, go East on Greens Rd. Turn right at 3rd light, onto Northchase Drive. The Greenspoint club is 1/4 mile on the right.

From Beltway 8 (going West), Exit Imperial Valley and turn right. Turn left at first light onto Benmar. Stay on Benmar to Northchase. Turn right onto Northchase Drive. The Greenspoint club is on the left.

From Beltway 8 (going East), Exit and turn left on Greenspoint Drive. Go right at first light onto Benmar. Turn left at next light onto Northchase Drive. The Greenspoint club is on the left.

**Parking:** Ground, 4th and 5th Levels. To access the 4th & 5th levels, pull up to the contract parking gates. There is a call box on the left-hand side. Press the button, release and gates will open. Follow park signs to the 4th and 5th level. The Greenspoint Club is located on the 5th Floor.

### Abstract

Petrophysical evaluation methods for shale-gas plays include mineral-based workflows that use traditional nuclear, electrical, and acoustic measurements in combination with advanced geochemical logs. This approach seems to offer the most comprehensive petrophysical analysis for unconventional reservoirs as it seeks an integrated characterization of mineralogy, organic content, porous volume, and fluid distribution. However, this method requires a significant input data set and key model parameters that may not be well known e.g. mineral elemental weight fraction end points. We anticipate variability in geochemical modeling results may arise between operators and service companies, using different model(s) and parameters, or where cross-validation with core data is not possible. The role of geochemical modeling must also be understood in the context of field-wide application, as these data are only infrequently acquired.

We discuss results from three interpretation techniques applied in a Haynesville well (Texas) that were calibrated to core analyses from crushed-rock (GRI) methods. First, a multi-mineral approach that includes the standard logging suite and geochemical logs shows that independent petrophysical assessments from two vendors and those from in-house analysis are not in agreement. Second, a petrophysical model that uses resistivity and a combination of two porosity logs is proposed when only these log measurements are available. This model is readily extended to many wells with a common logging suite and may be applied in horizontal boreholes. Third, given sufficient core data across multiple wells, we apply a cluster analysis technique that provides robust results suitable for large regional studies. We compare results from each method to available core measurements and provide recommendations for further applications.

In this paper, we also study the role of laboratory NMR measurements to support reservoir characterization of shale gas. Laboratory NMR measurements on preserved core samples are performed in the as-received state. Core NMR porosity and water saturation values are significantly different from those of the crushed-core analysis. This observation suggests that additional laboratory NMR measurements may be required for log calibration.

The work described here provides an independent and critical analysis of multiple formation evaluation techniques applied to a Haynesville shale well with core and extensive log measurements. Results highlight the difficulty in developing a mineralbased model using geochemical logs that is consistent with both core and vendor deliverables. Interpretation of NMR data remains an elusive opportunity requiring mostly unknown formation-specific evaluation parameters.

### Biography

**Thaimar Ramirez** is a Petrophysical Engineer in the Exploration and Production Technology Department with Apache Corporation in Houston, TX. Previously, Thaimar worked for ConocoPhillips, where she gained experience as a petrophysicist in both business units and technology, including Alaska exploration, domestic and international production projects, and global unconventional resource play formation evaluation. Thaimar received a Master's degree in Petroleum Engineering from The University of Texas at Austin in 2004. She was elected 2010-2011 editor of the SPWLA Houston Chapter and she is currently the VP Westside. She is a member of the SPWLA technology committee and served as secretary of the SPWLA Unconventional Resources special-interest-group. Thaimar is also a member of the SPE, AAPG, and SEG.

## Westside Luncheon Meeting

**Date:** Wed, Feb 8, 2011

**Lunch:** 11:30 **Talk:** 12:00

**Place:** BP Plaza Terrace Room,  
1<sup>st</sup> floor, next to cafeteria  
501 Westlake Park Boulevard,  
Houston, TX 77079

[Map](#)

**Revisiting Log-Inject-Log NMR For Remaining Oil  
Determination: A Field Application of T2-D NMR in the  
Permian Basin**

**by Emmanuel Toumelin, Chevron**

**RSVP Thaimar Ramirez before 3:00 p.m. Tuesday, Feb 9**

E-mail: [Thaimar Ramirez](#)

**Cost: Free.**

*Lunch is not provided, bring your own or purchase in the BP cafeteria.*

**Parking:** BP Plaza Garage (4200 Westlake Park Boulevard, Houston, TX 77079).

**Sign In Process:**

- 1) Sign in at the Terrace Room (no need to go to BP's main lobby)
- 2) Find your visitor badge at the Terrace Room and wear it during the meeting
- 3) Return badge to Thaimar Ramirez before leaving the meeting room

### Abstract

As in many mature carbonate reservoirs, determination of remaining oil and oil-water contact in the Grayburg-San Andres dolomite formation at Vacuum Field (Permian Basin) is challenged by unknown salinity (due to decades of water flood) and variable electrical rock properties (due to the presence of anhydrite nodules, vugs, and possibly variable wettability). To address these shortcomings, a new protocol combining Log-Inject-Log (LIL) NMR and Relaxation-Diffusion (T2-D) NMR was tested to improve accuracy in remaining oil estimation. In classic LIL-NMR, manganese mud doping is used to decrease the T2 relaxation time of water between two successive NMR T2 log passes. The difference between the two NMR T2 logs is attributed to water, while the NMR signal remaining after doping is attributed to oil. However, it becomes very difficult to correctly differentiate oil from water if doping fails. Because oil signal develops along the D dimension in T2-D logging, while water does not, T2-D NMR makes it possible to identify whether mud doping was successful. In turn, unflushed oil saturation and wettability can be interpreted with more reliability, which was verified against sponge core measurements. Using only one T2-D NMR pass after manganese mud doping also alleviates the need for a pre-doping log pass. The new protocol therefore improves the quality control and simplifies the data acquisition of traditional LIL NMR method.

### Biography

**Emmanuel Toumelin** is currently a research petrophysicist with Chevron Energy Technology Co. after more than 5 years in the Midcontinent/Alaska business unit. He holds an engineering degree from the Ecole Centrale de Lille and a PhD in petroleum engineering from the Univ. of Texas at Austin, where his graduate research work focused on the pore-scale modeling of NMR and electromagnetic rock measurements. He is an associate editor for *Petrophysics* and a technical editor for *SPE* and *SEG* journals. He received two SPWLA best-paper awards for fundamental pore-scale work on shaly-sand conductivity in 2006-2007, and was a 2010 SPWLA Distinguished Speaker.

## Downtown Luncheon Meeting

**Date:** Wed, Feb 22, 2011  
**Lunch:** 11:30 **Talk:** 12:00  
**Place:** Chevron Auditorium  
Ground Floor  
1500 Louisiana St  
Houston, TX 77002

**Correcting LWD Propagation Resistivity logs in  
Horizontal Sinusoidal Wells for Better Sw Estimation:  
Case Study in a Deepwater, Channelized Turbidite  
Reservoir**  
*by Hanming Wang, Chevron*

**RSVP: before 4:00 p.m. Monday, Feb 20**

E-mail: [Tsoan Ma](mailto:Tsoan.Ma@chevron.com)

**Cost: \$20 Pre-payment** (includes lunch\*) **Please, use [PayPal](#)**

Cash, Check or Credit Card is acceptable for payment. Receipts will be provided.

\*Lunch will be a boxed sandwich, chips, cookie and soda or water.

**Parking:** Regency Parking, Allen Center Visitor Garage, various outdoor lots.

### Abstract

Nowadays, with the advance of drilling technologies, the high-angle, horizontal wells are common and routine. However, quantitative petrophysical analysis in such environment is still lagging mainly because of the complexities of tool response, lack of fast modeling capability and fit-for-purpose software. In the deepwater, channelized turbidite reservoir, Horizontal Sinusoidal Pilot (HSP) wells are often adopted to address lateral heterogeneity and reduce horizontal well placement risk. Petrophysical analysis faces great challenges when there are no offset vertical appraisal wells available. The high deviation angle between LWD tool axis and formation makes the resistivity logs could be far away from the true resistivity (particularly in the sequence of small layers). It is necessary to correct the well-deviation effect before petrophysical analysis.

In this presentation, we will present the workflow to correct well-deviation effect on LWD resistivity logs through an efficient, user-friendly software. The challenges and issues (beyond the repair/correction) will also be discussed. Several examples will be used for demonstration purpose. The well deviation is ranged from 80°-100°. The wells were drilled with OBM as wells as WBM with density image (or/and resistivity image) which provides necessary inputs (relative dip and bed boundary position/bed thickness) for the workflow. We will demonstrate the impact of corrected LWD resistivity logs on Sw estimation and OOIP calculation.

### Biography

**Hanming Wang** is currently a Staff Geophysicist and subject-matter-expert with Chevron Energy Technology Company. As a lead scientist for borehole resistivity/dielectric measurements within Chevron, his responsibility is to establish research directions and carry out this research in order to add value to Chevron's oil and gas assets by improving the ability to use resistivity/dielectric -based methods to manage reservoirs, quantify reserves, improve geosteering capability and reduce uncertainty. Beginning his oil-career in 1992, He worked at China Petroleum University as an assistant professor where he participated the research of studying resistivity tool response in high-angle, horizontal wells. He was a summer intern with ExxonMobil Upstream Research Company in 1997 and Schlumberger Sugar Land Product Center (now Houston Formation Evaluation Center) in 1998. From 1999 to 2008, he was a scientist of Schlumberger Sugar Land Product Center where he luckily involved the R&D of several new resistivity logging technologies ( both wireline and LWD). He holds a BS degree in Physics from Zhejiang Normal University of China and MS degree in earth science from China Petroleum University and PhD in electrical engineering from well logging laboratory of University of Houston. He has actively involved the activities in oil-related professional societies. He served as the co-chair of SPWLA resistivity SIG (2002-2003), Chair of steering committee of well logging industrial consortium of University of Houston and adjunct professor of University of Houston. He authored, co-authored more 20 papers and more than 10 patents in the area of electromagnetic logging.