

SOURCE ROCKS OF THE MIDDLE EAST: A WORLD CLASS RESOURCE FOR UNCONVENTIONAL?



WHAT TO EXPECT FROM THE AAPG EXPERIENCE

The American Association of Petroleum Geologists (AAPG) and our suppliers, venues and services partners are committed to providing a clean and safe environment and experience for all our event participants. We remain alert to COVID-19 risks and are closely following and adapting to all applicable health and safety guidelines. While conditions vary between countries, cities, municipalities, and facilities, safeguarding measures you may encounter at AAPG events include physical distancing and masking, readily available hand sanitizer, enhanced cleaning and disinfecting protocols, temperature health checks and screenings, minimized touchpoints and cashless payment options.

As personal safety is a shared responsibility, we ask that all participants ensure that they are feeling well and in good health, with no fever or other symptoms related to COVID-19, before showing up at an AAPG event. Any specific delegate obligations will be published in pre-event communications and clearly displayed on signage throughout our venues.

Given the ever-changing nature of the pandemic recovery, registrants will receive regular updates and instructions concerning the latest health and safety requirements.

TECHNICAL PROGRAM COMMITTEE

Saad Al Shehri
(Co-Chair)
Saudi Aramco

Abdulkarim AlAli
(Co-Chair)
Tatweer Petroleum

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ADNOC

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KOC

Aimen Amer
Schlumberger

Sherif Ghadiry
Schlumberger

Johannes Wendebourg
TotalEnergies

Safdar Ali
WDVG

WORKSHOP OUTLINE

With the recent shale oil boom in North America, source rocks became a subject of great interest and importance to oil and gas companies worldwide. There is a wealth of data available in the public domain to describe and characterise these prolific source rocks in the different American basins. In the Middle East, the unconventional resources are yet to prosper, hence the need to properly understand the hydrocarbon generators of this region.

The AAPG Geosciences Technology Workshop titled “Source Rocks of the Middle East: A World Class Resource for Unconventional?” will focus on the geological aspects of the unconventional revolution which is vital to ensure successful exploration, appraisal and subsequently development of the basins in the region. The technical program of the workshop will cover a wide range of topics, specifically relevant to the Middle East Region, from the basinal scale down to the cores level. The titles of the sessions are as follows:

Session 1: Stratigraphy and Sedimentology of Source Rocks in the Middle East Region

Session 2: Existing Practices and Advances in Basin Modeling

Session 3: Source Rocks Geochemistry

Session 4: Petrophysics and Geomechanics Evaluation of Source Rocks

In addition to the technical sessions, the event will offer an interactive core workshop. This session will link the ideas and concepts discussed during the oral presentations throughout the workshop to the core specimens on display, thus enhancing the knowledge and experience of the attendees.

One of the main distinguishers of this workshop is that it is based and focused on the geology of the source rocks rather than hydraulic fracturing. Another key distinguisher is that it is dedicated to improving the understanding of regional source rocks rather than sharing the North American experience.

Workshop objectives

The workshop aims to provide a comprehensive understanding of the source rocks in the Middle East. The technical program is developed in a way that covers the depositional environments and transport processes, basin modeling and detailed rock characterisation including geochemistry, geomechanics and petrophysics. The sessions are focused on the existing best practices and the recent advances in each domain.

WORKSHOP GUIDELINES

FORMAT

The workshop will be 3 days, consisting of oral presentations, poster presentations and breakout sessions where participants can discuss and investigate a specific theme that is of mutual interest. The first day will feature an inaugural keynote speech by a high-profile professional from the industry.

ATTENDANCE

Registrations are invited from all relevant disciplines with experience and/or knowledge of the subject areas being addressed in the workshop. Registrations will be accepted on a first-come, first-served basis.

CALL FOR POSTERS

You are invited to prepare a poster for presentation at the workshop. If you are interested in participating, please send a short abstract to cnavarro@aapg.org by **25 August 2022**. All posters will be produced as pull-up banners and delivered by AAPG. There will not be any other format available for poster display.

REGISTRATION TYPES & FEES

Fees are inclusive of onsite documentation, coffee breaks and luncheons.

\$1,550 AAPG Member
\$1,750 AAPG Non-Member
\$1,750 Join & Save
\$850 AAPG Young Professional Non-Member
\$500 Academia
\$350 AAPG Student Non-Member (Masters)

***To avail a member rate you must be an active member of AAPG.**

****To register as a young professional you must be under the age of 35 with less than 10 years of work experience.**

REGISTRATION DEADLINE

To guarantee your seat, please make sure to register by **19 September 2022**.

CANCELLATION POLICY

AAPG will refund the tuition, less a \$100 processing fee, if the request is received no later than 30 days prior to the workshop. Cancellations must be made in writing. The registrar will accept cancellation notices by telephone, but all such notices must be followed up by fax or e-mail. No refund will be made for cancellations received less than 30 days prior to a workshop being given. Nonpayment of tuition does not constitute automatic cancellation. If no cancellation notice is received by 30 days prior to a workshop, participants are liable for full tuition. AAPG reserves the right to cancel a workshop if enrollment is insufficient to ensure proper effectiveness. Substitutions for individuals can be made at any time. A paid enrollment may be transferred one time to a future workshop if the request is received prior to the 30-day cut-off date.

SOURCE ROCKS OF THE MIDDLE EAST: A WORLD CLASS RESOURCE FOR UNCONVENTIONAL?

26-28 SEPTEMBER 2022

DAY 1 MONDAY 26 SEPTEMBER

07.00-08.30	Workshop Registration
08.30-08.40	Workshop Chair's Welcome and Introduction
08.40-08.55	INAUGURAL KEYNOTE Omar Kharouf, Chief Explorationist, Saudi Aramco
08.55-09.25	TECHNICAL KEYNOTE Andrew Pepper, This is Petroleum Systems LLC Source Rocks as Reservoirs: Lessons from Two Decades of North American Experience
SESSION 1: STRATIGRAPHY AND SEDIMENTOLOGY OF SOURCE ROCKS IN THE MIDDLE EAST REGION	
Session Chairs	Ainul Abedeem, Halliburton & Saad Al Shehri, Saudi Aramco
09.25-09.50	Septriandi Chan, KFUPM Sedimentology, Chemostratigraphy, and Sequence Stratigraphy of Kimmeridgian Organic-Rich Carbonate Mudstone, Western Neo-Tethys
09.50-10.15	Mohammad Alrowaie, Saudi Aramco Stable Carbon Isotope Geochemistry of Natural Gas and its Application for the Assessment of Organofacies in Petroleum Source Rocks
10.15-10.40	Samer Bou Daher, Beicip-Franlab Upper Cretaceous Source Rocks of the Offshore Levant Basin: Insights from Forward Stratigraphic Modeling
10.40-10.55	Coffee Break & Posters
10.55-12.00	Breakout Session
12.00-13.00	Lunch
13.00-17.00	Unconventional Core Workshop

DAY 2 TUESDAY 27 SEPTEMBER

08.30-09.00	TECHNICAL KEYNOTE Creties Jenkins, Rose & Associates Transforming Source Rocks into Reservoirs: A Paradigm Shift for the Middle East
SESSION 2: EXISTING PRACTICES AND ADVANCES IN BASIN MODELING	
Session Chairs	Oluwaseun Fadipe, ADNOC & Johannes Wendebourg, TotalEnergies
09.00-09.25	Harald Karg, Saudi Aramco Aspects of Modern Basin Modeling in Unconventional Play Assessments
09.25-09.50	Thomas Levy, InRange Geology Using Petroleum System 1D Modeling to "Pre-Drill" Wells in an Unconventional Play
09.50-10.15	Bandar Ghassal, Saudi Aramco Practical Guide for Evaluating Petroleum Source Rocks in Shallow Marine Carbonate Settings

10.15-10.30	Coffee Break & Posters
10.30-10.55	Pierre van Laer, ADNOC Challenges in the Use of Basin Models for Unconventional "Shale Oil and Gas" in the UAE
10.55-12.20	Samer Bou Daher, Beicip-Franlab Estimating the Unconventional Potential with Petroleum System Modelling Approach: Example of a Deformed Basin
12.20-13.00	Core Viewing Session
13.00-14.00	Lunch
SESSION 3: SOURCE ROCKS GEOCHEMISTRY	
Session Chairs	Mubarak Al-Hajeri, KOC & Safdar Ali, WVDG
14.00-14.25	Muhammad Usman, KAUST Source Rock Characterization of Late Jurassic (Early Kimmeridgian) Carbonate Mudrocks in the Western Neo-Tethys: A Potential Resource or a Dilemma
14.25-14.50	Mubarak Al-Hajeri, KOC Raman-Based Thermal Maturity for Type II-S KEROGEN – Developed and Validated on the Jurassic Najmah and Cretaceous Makhul Formations in Kuwait
14.50-15.15	Norka Marciano Balliache, Schlumberger Source Rocks and Asphaltenes: What can we Learn?
15.15-15.30	Coffee Break & Posters
15.30-15.55	Francois Gelin, TotalEnergies Evidence of TSR-Enhanced Petroleum Fluid Alteration in the Diyab Unconventional Formation
15.55-16.20	Tatiana Milena Juliao Lemus, Ecopetrol Potential Generation of Cretaceous Source Rock in the Middle Magdalena Valley Basin of Colombia: A Case of Study
16.20-16.45	Mohamed Al Ghamhari, Shell Q Source Rocks in Oman: Their Geochemistry, Age and Stratigraphic Position
16.45-17.45	Breakout Session

DAY 3 WEDNESDAY 28 SEPTEMBER

SESSION 4: PETROPHYSICS AND GEOMECHANICS EVALUATION OF SOURCE ROCKS	
Session Chairs	Saad Al Shehr, Saudi Aramco & Abdulkarim AlAli, Tatweer Petroleum
09.00-09.25	Mohammed Boudjatit, Saudi Aramco NMR Imaging of Spontaneous Oil Imbibition in Source Rocks: Insights into Fluids Flow Mechanisms and Hydrocarbon Recovery
09.25-09.50	Alberto Ortiz, Net Zero Carbon Solutions Critical Aspects to Take into Account When Carrying out a Formation Evaluation in an Unconventional Reservoir. Vaca Muerta Formation Case Study

09.50-10.15	Angelica Rios, Saudi Aramco Managing Uncertainty and Complexity in Unconventional Geomechanics
10.15-10.30	Coffee Break & Posters
10.30-10.55	Abdulmohsen Ali, Saudi Aramco Analysis of Seismic Weakness Zones
10.55-11.20	Johannes Wendebourg, TotalEnergies New Coupled Basin Geomechanics Modeling Applied to Unconventional Plays: An Example of the Vaca Muerta Source System, Argentina
11.20-11.45	Yazeed K Altowairqi, Saudi Aramco Maximizing the Value of Quantitative Seismic Interpretation Applications in Unconventional Resources: A New Workflow for Sweet Spotting
11.45-12.45	Breakout Session
12.45-13.00	Workshop Wrap Up & Adjournment
13.00-14.00	Lunch

UNCONVENTIONAL CORE WORKSHOP

26th September • 13.00-17.00

Workshop Leaders:

Ahmad Nahwi, Saudi Aramco
Saeed Tofaif, Saudi Aramco
Anindya Ghosh, Tatweer Petroleum
Abdulkarim AlAli, Tatweer Petroleum
Elham AlSharif, Tatweer Petroleum

Description:

The core description session will allow participants to examine organic-rich mudrocks and synchronous conventional rocks. Different core sections from various stratigraphic locations of the basin will be available to conduct this rock-based workshop. Core examination will provide data for stratigraphic correlation and environmental interpretation based on depositional, and sedimentological observations.

The core description is expected to cover Hanifa, Tuwaiq and possibly a small section of Dhurma formation. It will include different carbonate facies in this stratigraphy and would have some supporting thin section petrography.

Learning Outcomes:

- Characterize mudrocks and their age-equivalent conventional rocks
- Identify sedimentary structures, porosity, grain types, etc.
- Conduct stratigraphic correlation and environmental interpretation
- Summarize findings and outline a simplified gross depositional environment map
- Exercise Details:
- Examine the various cored sections
- Make your own observations
- Assess the depositional environment for each cored section
- Use your interpretations to place the various cores on the provided map and name the different zones
- Sedimentological Aspects to Consider:
- Grain size and type
- Color
- Visual porosity
- Cyclicity and heterogeneity

POSTER PRESENTATIONS

Abrar Alabbad, Saudi Aramco

Digital Rock Physics Workflow for Unconventional Rock Samples

Pan Luo, Saudi Aramco

Source Rock Kinetics: Uncertainty in Basin Modeling and Unconventional Resource Assessment

Pan Luo, Saudi Aramco

A Novel Method to Assess Thermal Reactivities of Source Rocks

Hakim Saibi, UAE University

Inhibition of Asphaltene Precipitation by Al₂O₃ - Fe₂O₃ Nanocomposites



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26-28 SEPTEMBER 2022

SHORT COURSE

PETROPHYSICS OF UNCONVENTIONAL SHALE PLAYS. FROM BASIC CONCEPTS TO LATEST TECHNIQUES

COURSE DETAILS

Date	25th September 2022
Time	8.30am – 4.30pm
Course Instructor	Alberto Ortiz, Net Zero Carbon Solutions
Venue	InterContinental Hotel, Bahrain
Registration Fee	\$530
Registration Deadline	25th August 2022



INSTRUCTOR BIO

Alberto Ortiz is a geologist graduated from the Universidad Nacional de Córdoba, Argentina in 1999. He worked in large oil and oil services companies (Schlumberger, Total, YPF). He started as a petrophysicist after finishing the Schlumberger's Log Analyst Training School in 2000 (LAT). At the beginning of his career, his activity was concentrated in Argentina and Brazil in the latter, providing support to the petrophysical characterization of both clastic and pre-salt carbonates offshore reservoirs. He was temporarily assigned in Qatar in 2004. In 2011 he joined YPF and two years later he was part of the team dedicated to the unconventional reservoir development project of Vaca Muerta.

During 8 years he actively participated in the evaluation and development of this type of reservoir in a multidisciplinary team, providing technical support & training, publishing technical articles and interacting with the different disciplines involved such as engineering, geomechanics and geophysics between others. He also coordinated research projects with the YPF research center and laboratories outside of Argentina. He was a distinguished speaker for 3 consecutive years for the SPWLA related to the petrophysical evaluation of the Vaca Muerta formation and is the first author of the AAPG Vaca Muerta memoirs. He has recently formed the Net Zero Carbon Solutions company. He is a teacher at universities in Argentina and Colombia and coordinator of the formation evaluation team at Argentinean Congress CONEXPLO 2022.

COURSE ABSTRACT

The petrophysical characterization of unconventional shale-type reservoirs has been one of the most approached and relevant issues in the oil and gas industry in the last 8 years. This is because after several years, the operating companies comprehended the impact that an appropriate characterization of the reservoir has on their project economics.

Another reason for this were the technical obstacles encountered in the measurement of petrophysical properties such as porosity, saturation and permeability due to the complexity of this type of reservoir. Obstacles and limitations not only relate to laboratory measurements but also to electrical logging tools.

As a consequence of this, nowadays, petrophysical evaluations in this type of reservoir do not have standardized workflows established and accepted worldwide as is the case for conventional reservoirs. This motivates the professionals involved in the study of this type of rocks to dedicate a lot of effort in the validation of the technologies used, and sometimes it is difficult for them to understand the results, the evaluation of uncertainties and the construction of petrophysical models with results and representative parameters of the subsurface conditions.

The proposed course focuses on providing key knowledge for a better characterization of the rock both in the aspects related to the matrix represented by mineralogy and kerogen as well as the fluids present. The approach will be based on the convergence of different technologies that support and give robustness to the results.

The contents that will be provided will include laboratory testing techniques and petrophysical evaluation of electrical well logs for unconventional shale-type reservoirs. The contents provided will cover a variety of studies based on the most diverse physical principles that will include the latest advances and techniques used in the industry such as Nuclear Magnetic Resonance, Spectroscopy, Dielectric, Computed axial tomography and SEM images, among others.

As a result of this, attendees will have tools that allow a more comprehensive understanding of this type of rocks, a better assessment of the uncertainty of the model used and the necessary steps to improve its precision, accelerating the learning curve. The contents provided will also allow knowing the critical parameters that must be taken into account for the definition of areas to be drilled.

COURSE OBJECTIVE

Understand the complexity of this type of reservoir and provide tools and concepts that allow the interpreter to resolve the main uncertainties of petrophysical characterization including the latest technological advances.

COURSE TOPICS

- Reservoir heterogeneity characterization from outcrops to lab data and electrical logging.
- Most relevant unconventional plays of the world. Main characteristics.
- The petrophysical model. Components and definitions, construction, uncertainties, strengths and weakness.
- Lab studies: porosity, saturation, mineralogy, organic geochemistry and permeability.
- Electrical logging response on unconventional shale plays: triple combo, NMR, NMR T1T2, nuclear spectroscopy, spectral GR, dielectric.
- The effect of maturity on kerogen.
- Challenges on water saturation calculation.
- Data integration. Interpretation workflows and core calibration.
- Course closure

WHO SHOULD ATTEND

Petrophysicists, geologists, geophysicists, geochemists, geomechanical engineers, reservoir engineers.



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