

SPE Argentina Exploration and Production of Unconventional Resources Symposium 2023

Buenos Aires, Argentina
20 - 22 March 2023

ISBN: 978-1-7138-7205-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2023) by Society of Petroleum Engineers
All rights reserved.

Printed with permission by Curran Associates, Inc. (2023)

For permission requests, please contact Society of Petroleum Engineers
at the address below.

Society of Petroleum Engineers
P. O. Box 833836
Richardson, Texas 75083-3836

Phone: (800) 456-6863

Fax: (972) 952-9435

books@spe.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

TECHNICAL SESSION 1

Vaca Muerta: Improved Fracture Width Distribution and Classification of Natural Fracture Widths Based on Outcrops, Cores, and Micro-Resistivity Images Data.....	1
<i>Rahimah Abd Karim, Roberto Aguilera, Gustavo Flores Montilla, Hector Biglia</i>	
Multi-Resolution Graph-Based Analysis for Fissility Evaluation in the Vaca Muerta Formation (Neuquén Basin, Argentina)	29
<i>Lucía Inés Martín, Denis Andre Marchal, Claudio Hugo Naidés, Silvia Patricia Barredo</i>	
Vaca Muerta Characterization in the Parva Negra Oeste Block, Neuquén, Argentina	43
<i>Alejandro Enrique Nawratil, Gabriela Inés Bustos Crescentino, Fernando Adrián Serra</i>	
Deep Learning Approaches in Tight Gas Field Pay Zone Classification.....	57
<i>Zijian Hu, Fengjun Bai, Huajie Wang, Chuanhui Sun, Pinwei Li, Haoyan Li, Yunlong Fu, Jie Zhang, Yin Luo</i>	

TECHNICAL SESSION 2

Development of Unique, Non-Damaging, Non-Crosslinked Solids Cleanout Fluid System with Enhanced Solids Suspension Capacity	71
<i>John E. Busted, Francisco E. Fragachan</i>	
From Exploration to Development: The Completion Evolution in Vaca Muerta	92
<i>Juan Carlos Bonapace, Luis Atilio Riolfo, Rodrigo Zrain, Facundo Gabriel Alric, Mohamed Lamine Moussi, Jorge Nicolas Santander</i>	
Study of the Effect of the Use of Flowback Aids in Brines and Fracturing Gel	111
<i>Roberta Kamei Rodrigues, Roger Pezzuol Dallaqua, Polyana Medeiros de Menezes, Luis Gustavo Fornereto, Vanina Lorena Karpenkopf, Lucia Magdalena, Jean Vicente Ferrari, Rodrigo Balloni Rabelo</i>	
Tailoring the Frac Fluid's Paradigm in Vaca Muerta. A Complete Review from Traditional Guar to New High Viscosity Friction Reducer Systems – Case History	123
<i>Juan Carlos Bonapace, Luis Atilio Riolfo, Fabio German Borgogno, Rodrigo Zrain, Jorge Nicolás Santander, Mohamed Lamine Moussi</i>	

TECHNICAL SESSION 3

Understanding Well Spacing and Stacking in Vaca Muerta Fm. Using Interference Tests and Tracers	143
<i>Verónica Laura Irazuzta, Belén Klix, Diego Solís, Francisco Herrero Clar, Matias Guillermo Alvarez</i>	
Depressurization Methodology of Annular With High-Pressure Equipment in Unconventional Resources	157
<i>Rosmary Duran, Fernando Martin Villagra</i>	

TECHNICAL SESSION 4

Multiphase Choke Correlation Improving Matching Field Data on Vaca Muerta Formation	175
<i>Nicolas Gabriel Bellini Aragon, Fernando Martin Villagra</i>	
Gas Lift Optimization in Unconventional Wells – Vaca Muerta Case Study	190
<i>Luciana Masud, Verónica Lorena Cortez, Mario Antonio Ottulich, María Paz Valderrama, Julia Ghilardi, Leonardo Andres Sanchez Graff, José Biondi, Fernando Sapag</i>	
Quantification of Fluid Production Distribution in Deviated Wells with High Gas-Liquid Ratio Using a Flow Array Sensing Tool.....	211
<i>José Wilfredo González, Alejandro Jose Linares, Diego Armando Rodriguez, Gerson Orlando Rivera, Virginie M Schoepf, Linda Abbassi</i>	

TECHNICAL SESSION 5

Geomechanical Characterization of the Parva Negra Oeste Block (Neuquina Basin).....	239
<i>Martin Paris, Alejandro Nawratil, Jesus Quintero</i>	
Optimization of Drilling Parameters During Drilling with Casing in Unconventionals.....	250
<i>Cristian Bahl, Rodrigo Martin, Juan Muzzio, Dario Codega, Nicolás Rebas, Federico Mercado</i>	

TECHNICAL SESSION 6

Pre-Operational Environmental Baseline in a Tight Gas Reservoir: Hydrochemical Assessment and GeoChemical Background of Surface Water in São Francisco Basin (Brazil)	260
<i>Gustavo Filemon Costa Lima, Jussara Da Silva Diniz Lima, Joyce Castro de Menezes Duarte, Vinicius Gonçalves Ferreira, Carlos Alberto De Carvalho Filho, Ana Cecilia Dufilho, Rubens Martins Moreira, Renato Ribeiro Ciminelli</i>	
Regional Evaluation of the Natural Radionuclides Behavior at the Middle Magdalena Valley Basin (Colombia).....	272
<i>Reinel Andres Echavez, Hernan Dario Villamil, Jose Carlos Cardenas, Edgar Ricardo Perez</i>	
Synergistic Hydrate Inhibition by Red Seaweed Extract K-Carrageenan With Kinetic Hydrate Inhibitors	282
<i>Ankur Singh, Ajay Suri, Eduardo Edmundo Mamani, Akshay Mishra</i>	

TECHNICAL SESSION 7

Determining a Flow Zone Indicator in Conventional and Unconventional Reservoirs Using Resistivity Logs.....	297
<i>José Wilfredo González, Alejandro Jose Linares, Diego Armando Rodriguez, Alexander Castro Chacon, Jose Vasquez</i>	
Oil Production and CCUS Potential in La Luna Shale in Colombia	314
<i>Claudia Marcela Herrera Tellez, Alfonso Fragoso, Roberto Aguilera</i>	
Laboratory and Digital Petrophysical Multiscale Analysis of Porosity Types in Vaca Muerta Formation in El Mangrullo Field.....	348
<i>Claudio Hugo Naidés, Denis Andre Marchal</i>	

TECHNICAL SESSION 8

Enhancing Stimulation Efficiency in a Highly Fractured Open-Hole Carbonate Reservoir Section by Diversion Design Using Advanced Modelling Techniques	372
<i>Mohammed Omer, Diana L. Velazquez, Carmen J. Ramirez, Francisco E. Fragachan, Juan Briceno</i>	
A State-Of-The-Art Methodology in Live Measuring of Stimulated Reservoir Volume (SRV)	385
<i>Ahmed Assem, Ahmed Farid Ibrahim, Matt Sinkey, Tom Johnston, Shabnam Marouf</i>	
Numerical Simulation of Proppant Transport in Complex Fracture Network	397
<i>Nilzon Aguirre, Hu Xiaodong</i>	
Sustained Anulus Pressure in NoC Wells. Prevention and Remediation Using Polymeric Isolating Materials	410
<i>Sofia Rivelli Lavallen, Luciana Martina Garcia Eiler, Marcela Zaira Mucci, Lucas Martin Arribillaga Jofre, José Gimutky, Walter Morris</i>	

TECHNICAL SESSION 9

Flowback and Well Testing Operational Learnings During an Early Production Stage in a Vaca Muerta Field	423
<i>Pablo Nicolás Cano, Verónica Laura Irazuzta, Miguel Andrés Curtti, Matias Guillermo Álvarez</i>	
Vaca Muerta Corrosiveness and Its Impact in Production Strategy	439
<i>Lelio Alberto Gawantka da Silva, Roberto Toro Padilla, Mariano Sebastián Molina, Claudio Fabián Benedetto, Pedro Olivo, Ramiro Mazzina</i>	

TECHNICAL SESSION 10

Vaca Muerta: Naturally Fractured and Oil-Wet Shale Characteristics Revealed by Water Saturation (Sw) Modeling Using Archie's Equation and Pickett Plot	454
<i>Rahimah Abd Karim, Roberto Aguilera, Carolina Bernhardt, Julia Elena Bouhier</i>	
Increasing Infill Recovery by Drilling Extended Lateral Wells in Vaca Muerta Unconventional Reservoir	474
<i>Nicolas Calejari, Leonel Vera, Cristian Bahl, Tarcisio Aparicio, Jhonny Cabanilla</i>	
Design and Drilling Performance of Two Exploratory Wells in Argentinean Parva Negra Oeste Shale Gas Field from the Vaca Muerta Formation. Experiences and Lessons Learnt.	487
<i>Martin Matesanz, Santiago Alejandro Bodini, Jesus Quintero Ramirez, Raul Diz, Luis Pablo Forni, Nicolas Alberto Fumagalli</i>	

TECHNICAL SESSION 11

Importance of Real-Time Data to Improve Operational Efficiency for Unconventional Drilling in Argentina	502
<i>Rui Fernandes, Manuel Adrian Orellana Natera, Carolina S M Barros, Alisson Nogueira, Dismas Bismo Tjitrosoemarto, Stian Skjævesland, Sanna Zainoune</i>	

Adapting Digital Environment to Sustain Operations Remotely.....	514
<i>Ali Abbasgholipour, Nitin Panwar, Chulakorn Yosakrai, Vera Krissetiawati Wibowo, Pham Nam Hieu, Sorawit Amranand</i>	

TECHNICAL SESSION 12

Development and Application of Layer Intensity Index Based on Image Logs in Lacustrine Shale Oil Formation-A Case Study from Sichuan Basin.....	526
<i>Jing Hao, Xin Luo, Dai Guo Yu, Shu Hong Liao, Ke Jun Hou, Yue Wang, Xian Ran Zhao, Bo Liu, Meng Zhao, Jin Long Wu, Jing Mo</i>	
Improved Total Organic Carbon (TOC) Prediction for Vaca Muerta Shale.....	534
<i>Rahimah Abd Karim, Roberto Aguilera, Camila Fraga, Laura Estela Toledo</i>	

TECHNICAL SESSION 13

Fracture Design Optimization Utilizing 3D Simulation Models & Sensitivity Analysis for Unconventional Reservoirs	552
<i>Esan Shoostari, Marshall C. Watson, Sheldon Burt Gorell, Yildirim Kocoglu, Ali Yousef Taqi, Hao Zhang</i>	
3D Integrated G&G Model-Driven Mitigation Workflow on Screenout, Frac Hits and Casing Deformation in Ultradeep Shale Hydraulic Fracturing.....	564
<i>Jianfa Wu, Bo Zeng, Lipeng Wang, HaoYong Huang, Yuanwei Pan, Yi Song, Herick Nunez, Qi Deng, Lizhi Wang, Haipeng Zhao</i>	
Using Advance Modelling Techniques to Design Diversion for Acidizing, Fracturing & Re-Fracturing	581
<i>Mohammed Omer, Francisco E. Fragachan</i>	

TECHNICAL SESSION 14

Fracture Identification and Classification Using the Resistivity Image Logs in Tight Conglomerate Reservoir: A Case Study from Junggar Basin.....	596
<i>Xin Meng, Zhen Yang, Jixin Gao, Bowen Liu, Leipeng Wei, Xu Zhang, Bo Liu, Meng Zhao, Wei Wang, Paola Delgado</i>	
Child-Child Fracture Driven Interactions Analysis and their Application with Field Case Studies	604
<i>Mauro Ivan Weimann, Yann Facundo d'Huteau, Cristian Abel Paladino</i>	

TECHNICAL SESSION 15

Agile Approach to Mitigate Corrosion and Scaling Issues in Unconventional Vaca Muerta Wells.....	626
<i>Maximiliano Giraldo, Maria Begoña Garcia, Magali Pasini, Juan Ignacio Sosa, Adrian Muñoz, Facundo Siviero, Andres Mazo</i>	

TECHNICAL SESSION 16

Proppant Screen-Out During Re-Fracturing Caused by Damage of Heavy Mud in Existing Fractures: Case Study and Solutions	641
<i>Huifeng Liu, Zhixiong Xu, Zebo Yuan, Haochen Han, Zhiming Wen, Jianbo Li, Guobin Yang, Zhangxin Chen</i>	

TECHNICAL SESSION 17

Application of Geo-Engineering Integrated Technologies for Ultradeep Longmaxi Shale Gas Life
Cycle Management, Sichuan Basin 658
*LiWei Jiang, Chunduan Zhao, Jun Peng, Lipeng Wang, Chenglin Liu, Qingshan Li, Yongjie
Huang, Bowen Cao, Hong Tian*

Author Index