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"Valuing Natural Fractures!"

Abstract

Highlights from 20 years' experience with hydraulic fracture stimulation and natural fractures will be presented to provide the foundation for 20 years of enhanced process monitoring confirming refined oil recovery practices. After focusing on SW Wyoming fracture stimulation for tight gas development a shift to naturally fractured sandstone and carbonate reservoirs of Wyoming and west Texas provided an initial opportunity to dewater natural fractures by adjusting waterflood injection rates leading to conversion of waterflood injection wells to production. Rapid oil rate recovery at water injection well conversions to production confirmed poor waterflood displacement efficiency. The next step of fracture dewatering was assisting the process by gas injection. The process transition can rapidly shift wells' performance; warranting improved pressure and fluid contact monitoring methods, examples are provided (at Yates Field total oil rate increased 33% while shutting in half of the wells during a four-year period). After refining performance, pressure, and contact monitoring and refining completion design; applications were initiated in Nevada where rifting of basin and range extension provides an ideal setting for enhancing fracture utility. Naturally fractured reservoirs provide unique value opportunities!

Our Presenter

Eugene (Gene) Wadleigh

Eugene Wadleigh is currently a Managing Member of Full-Spectrum Monitoring, LLC (FSM), Grant Canyon Oil & Gas, LLC, and Saddle Rim Energy (TX), LLC. Mr. Wadleigh was instrumental in providing target selection for EOR projects presently operated by Grant Canyon. Technical services are provided through FSM for reservoir evaluation constrained by monitoring data.

Mr. Wadleigh is a registered Petroleum Engineer with 40 years' experience in exploration and production (20 years with Marathon Oil). His responsibilities over the years have included reservoir management, technical management, project management, completion engineering, reservoir engineering and production engineering roles. He served as engineering liaison for Marathon-DOE funded projects during six years working with Golder Associates and MIT that improved tools to assess fractured reservoir oil recovery. Mr. Wadleigh has also spearheaded several CO2 and nitrogen EOR projects.

In addition to initiating lean gas-based and other EOR techniques at Marathon, Mr. Wadleigh was also on the advisory team for a 35 billion BBL OOIP field which has consulted on Lean Gas Processing in Mexico and advised Aramco on gas injection into some of the world's largest fields in the Middle East (served as gas injection EOR discussion group leader at the SPE Forum of the Middle East in Alexandria, Egypt). Gene has authored numerous articles and presentations on oil recovery and holds several patents in this area. He holds degrees in both geology and geological engineering from South Dakota School of Mines.