

Wednesday, May 23, 2018

Petroleum Club of Houston • 1201 Louisiana (Total Building)
Social Hour 11:15 a.m.
Luncheon 11:45 a.m.

Cost: \$35 Preregistered members; \$40 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.

Pre-registration without payment will not be accepted.

Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

HGS General Luncheon Meeting

*Gary Citron, Creties Jenkins
and Mark McLane
Rose and Associates*

Appraising and Developing Your Unconventionals: How to Avoid Squandering Billions of Dollars Next Time

Over the past three years, more than 100 oil and gas companies in North America with almost \$80B in debt have filed for bankruptcy. While these companies would like you to believe they were all victims of low commodity prices, many failed because of the way they approached appraising and developing opportunities. Two of the most common mistakes have been focusing on production attainment instead of value creation, and incorrectly thinking that enough was understood about a given reservoir to push ahead with development.

To mitigate these errors unconventional reservoirs must be evaluated in a series of stages. In each stage we need to; (1) identify the key uncertainties and risks, (2) collect the data needed to quantify these, and (3) generate a probabilistic assessment of potential outcomes and their associated values. A key aspect in this evaluation is not only using rock and fluid data to identify the area with the greatest potential, but drilling enough wells to understand the production variance (irreducible uncertainty) and whether the average well will be economic. This includes quantifying the range of the average well and the confidence of achieving some minimum rate.

This process requires discipline, including maintaining consistent drilling and completion practices so variations in reservoir quality can be understood. To help ensure this process is followed it is important to implement an assurance process consisting of; 1) guidelines and workflows, 2) peer reviews and assists, and 3) periodic performance lookbacks. The time to do this is NOW, before prices rise again and we revert to our destructive habits. ■

Biographical Sketch

During his twenty-year career at Amoco (in the 1980s and 1990s), Gary served as a geoscientist, exploration supervisor and asset

manager, as well as an internal consultant to executives and team leaders. While on Amoco's Prospect Quality Team, Dr. Citron actively reviewed prospects prior to and after drilling, and mentored younger geoscientists on prospect measurement. In 1999 Dr. Citron joined Pete Rose's consulting firm. He became Pete's first Partner in Rose & Associates in 2001 and held the role of Managing Partner from 2003 to 2014, leading Rose & Associates to multiple consecutive years of profitable growth.



In addition to his teaching and consulting obligations associated with conventional and unconventional resource opportunities, he coordinates a yearly gathering of risk team coordinators to share and compare best practices. In 2001, he received the best paper award from the AAPG's Division of Professional Affairs, and again in 2007 he was honored for delivering a 'Top Ten Oral Presentation' at the AAPG annual convention. Dr. Citron regularly donates his time to the AAPG's education curricula, teaching courses on prospect and play assessment. He has served in the AAPG House of Delegates and as an Associate Editor for the SPE's Economics and Management journal. He has authored or co-authored more than a dozen publications, and has been an honored speaker for the SIPES, Geological Society of London, AAPG, SPE, and SEG.

PhD Cornell University - Geology
MSc Cornell University - Geology
BSc University of Buffalo
Registered Professional Geoscientist (Texas)

Without Proper Staging of Investments, Companies can 'Squander Billions'

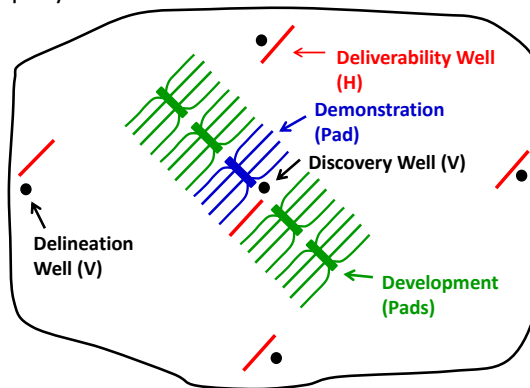
Reservoir	Wells Drilled	# Wells >12% ROR
Shale	307	53
Shale	96	40
Carbonate	52	39
Sandstone	57	28
Sandstone	104	24
Sandstone	86	19
Sandstone	115	11
Shale	18	2
Shale	10	1
Carbonate	15	1
Shale	79	1
Shale	80	1
Carbonate	2	0
Shale	16	0
Shale	6	0
Shale	6	0
Total	1049	220

A company's recent experience in low perm reservoirs

Project Risk Analysis Addresses The Challenge of Creating Value Through Staging

Project:

A "ring-fenced" area within a play segment where a company has planned **annual multi-well programs** on available acreage.



Staged Project Cash Flow Characterization

Discovery stage:

Locate a significant quantity (that is capable of commercial development) of producible hydrocarbons

If needed, local chance and mechanical success rate is applied beyond the discovery stage as the % of wells that will provide production

