



Reliable Technology: What's New?

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What is Reliable Technology?

- Introduced by SEC in 2008 reserves reporting rules modernization
- “Reliable technology is a grouping of one or more technologies (including computational methods) that has been field tested and has been demonstrated to provide reasonably certain results with consistency and repeatability in the formation being evaluated or in an analogous formation.”

Why Should We Care About Reliable Technology?

- Provides opportunity to legally disclose larger reserves volumes to SEC
- Allows much greater flexibility in methodology used to satisfy criteria for reserves, particularly proved reserves than allowed by pre-modernized rules

Is Anybody Using Reliable Technology?

- Yes, indeed!
- Examples follow ...

What Are Examples of Reliable Technology in Practice?

- Oil-water contact from cross-plotting oil and water pressure gradients in reservoir
- Hydrocarbon-water contact from seismic
- Reservoir simulation for production forecasting
- Transformation of long and erratic production histories into equivalent constant-rate reservoir limits tests

What Can I Do to Qualify My Bright New Idea as Reliable Technology?

- Validate the proposed technology as leading to correct conclusion much more often than not on the basis of
 - Sound underlying scientific and engineering principles
 - Repeated successful applications in the field under certain conditions
 - Thorough and persuasive documentation of field results, including failures and reasons for success and failure (conditions not satisfied?)

Is There a Way to Do This Systematically?

- Yes – an adaptation of the scientific method (Sidle and Lee, SPE 129689)
 - State how technology can contribute to reserves estimation (hypothesis)
 - Determine how well supporting science works in ideal situations
 - Test technology in field to validate, determine limits ... or invalidate
 - Document results completely

What's a More Recent Example of Reliable Technology?

- Extension of SPEE Monograph 3 technology (SPE 179991, Sidle and Lee)
- Monograph 3 technology provides basis for establishing PUDs in resource plays
 - Identifies areas with consistent geological conditions (geologic subset)
 - Supplemented with outline of economically producible wells
 - Result: identification of area with high confidence of encountering geological conditions sufficient for economic producibility

How Can SPEE Monograph 3 Be “Extended”?

- Questions arise
 - Do all areas within geologic subset have similar productivity?
 - Is there spatial correlation of productivity, e.g., “sweet spots”?
- *Monograph 3 promises only identification of area with economic production, not area with identical productivity statistics*

Are We Restricted to a Single EUR Distribution When We Apply Monograph 3?

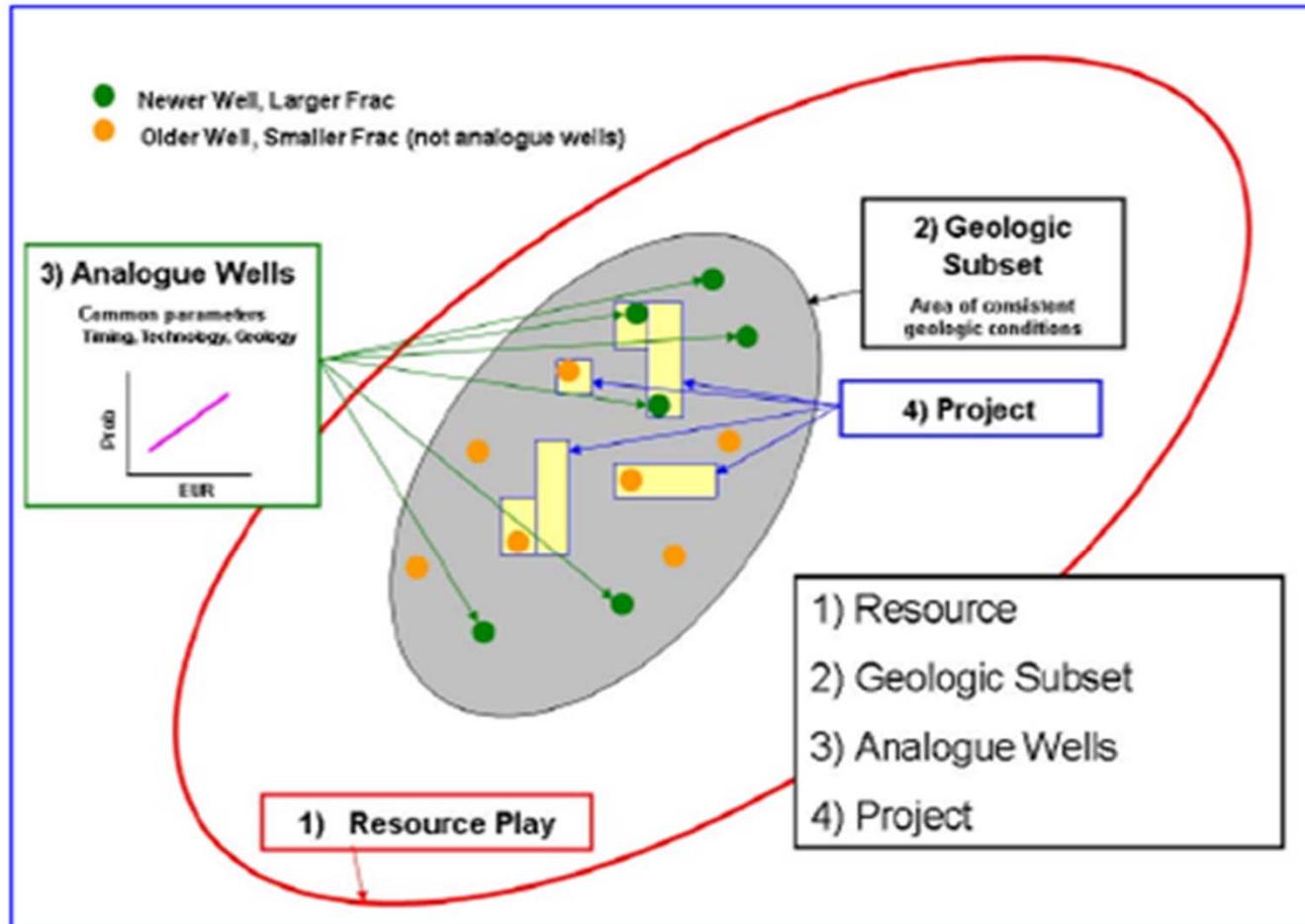
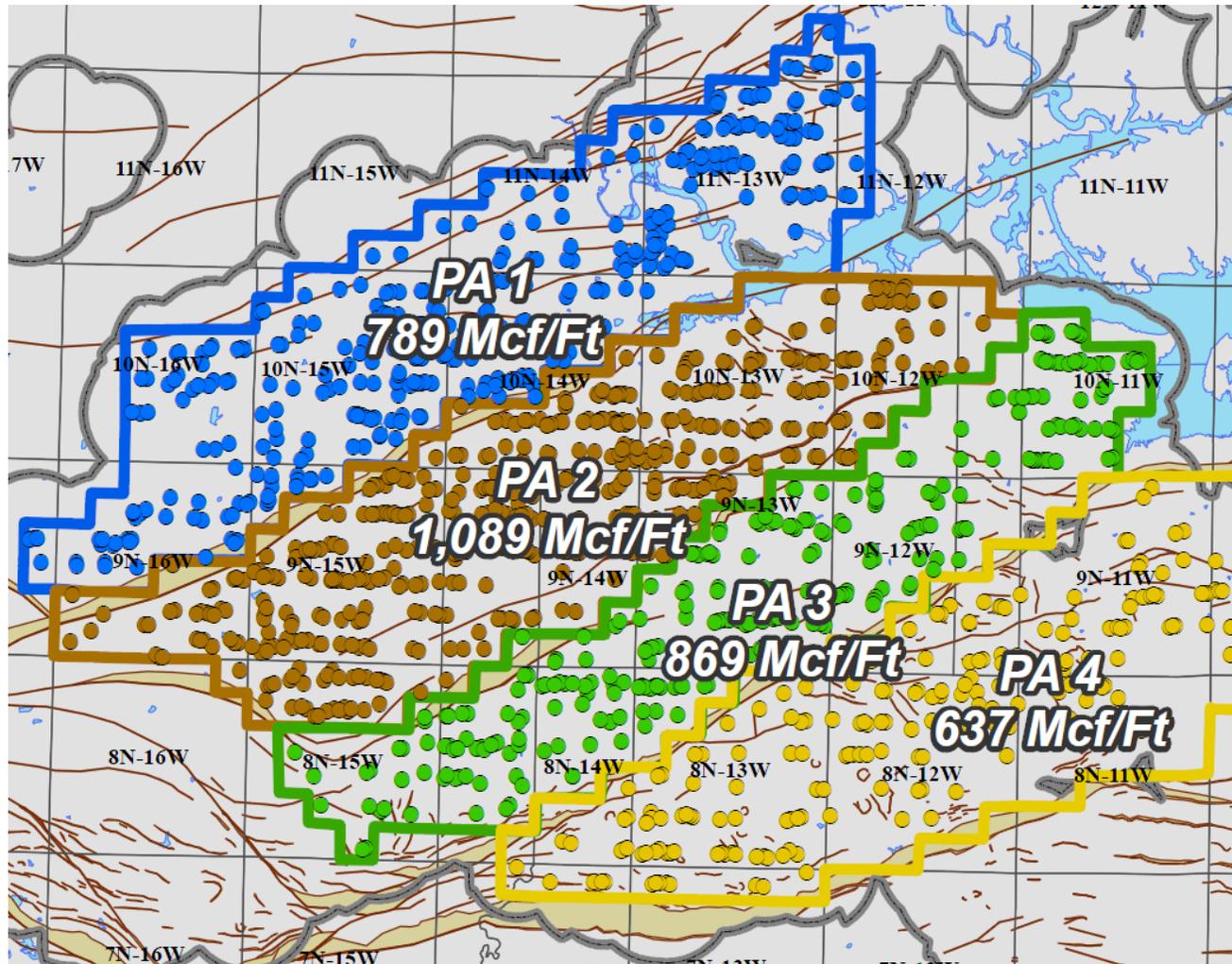


Figure 1

Answer: No!



What If There is Spatial Correlation Within Even Smaller Areas?

- Suppose there is spatial correlation of wells in limited areas within proved area
 - Perhaps offset well performance is good indicator of PUD performance
- We can change the algorithm for PUD EUR to Attanasi's proposal **but continue to use Monograph 3 methodology to identify proved area**

What Does the SEC Advise for Reliable Technology?

From SEC Compliance and Disclosure Interpretation:

“An issuer has the **burden of establishing and documenting the technology** (or set of technologies) that **provides reliable results, consistent with the criteria set forth in Rule 4-10(a)(25) of Regulation S-X**. This information should be **made available to the Commission's staff upon request** in support of any reserves estimates that the staff may be reviewing.”

Insight from a Comment Letter

After a description of reliable technology employed was provided, the SEC asked a filer about results of recovery predictions :

“Please explain to us the **revision history due to performance** for proved reserves in your Barnett Shale play. Include a comparison between the **median values as of year-end 2009 with median initial values for proved Estimated Ultimate Recovery**, realized well cost and estimated well cost; **producing rate vs. time plot** and **associated decline curve parameters**, **producing rate vs. cumulative production plot** and **estimated future production projection representative of the two median EURs.**”

More Insight from a Comment Letter ...

The SEC asked a filer about Proved Area:

“In part, your response 10 indicates a significant portion of your proved undeveloped locations are 2 or more offsets removed from a producing well(s).

Tell us the statistics of your drilling history for such similarly situated locations, including the success rate by distance/location removed from production.”

Careful! SEC Provides Guidance on Interpretation of Comment Letters

“The staff’s comments are in response to a company’s disclosure and other public information and are based on the staff’s understanding of that company’s facts and circumstances...These letters set forth staff positions and do not constitute an official expression of the SEC’s views. The letters are limited to the specific facts of the filing in question and do not apply to other filings.”

Some Takeaways ...

- Establishing that an approach is a Reliable Technology offers a legitimate opportunity to disclose larger reserves volumes
- ‘List’ of Reliable Technologies not static; limited only by imagination of creative engineers and geoscientists
- Reliable Technologies not a free lunch ... must be well documented and are subject to SEC staff review



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