Unconventional Thinking*

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Abstract

The unconventional revolution in exploration and production has changed more than just our drilling density and completion procedures. As upstream professionals, we have the opportunity to aid the success of our projects by including business principles within our interpretation and recommendations. Failure to do so erodes value and threatens competitive advantage. Companies are typically successful when they take material interests in material plays and implement prioritized learning plans. Pilot configuration with respect to decision thresholds is critical. Ultimately, it becomes more important to achieve confidence that the prospect held by a company is greater than what is needed to proceed, rather than strive for precision on what is present. Earth Scientists have the ability to create and maintain competitive advantage.

Reference Cited

Unconventional Thinking
AAPG Calgary Playmakers

Bill Haskett
Senior Principal – Energy Strategy
Above All...

You have to have good rock.

Nothing can save you if you don’t…
Think Strategy From The Beginning
(the four arena strategy model)

Competitive Advantage

People and Skills

Factory Efficiency

Financial Capability

Image and Communication

Control Your Own Destiny

SYSTEM

STRUCTURE
Success demands efficiency and advantage

Success
- Profitability
- Control of your own destiny
- Competitive Advantage

Early ID of “Business Pinch-Points”

Manufacturing Efficiency

Leaning About What Matters

Unfortunately, most technical teams don’t think “Business”
Three Essential Elements for Unconventional Value

Ultimately, companies strive for material interest in material plays.

This is what you are trying to assess early in an opportunity!
There is no “I” in Shale!
An Integrated Multi-disciplinary Approach is Critical

Beware of silos

- Earth Science
- Engineering
- Drilling Technology
- Finance & Planning
- Stimulation Technology
- Land Personnel
Internal team

Lease us 300,000 acres and don’t spend over $150,000.

What happened??

• 350,000 ac were leased for $100,000

• The land was cheap because it had no production potential
Shale
While there may be no “i” in Shale... it does average “i”
Feeling Cheated? Think I’m a Stats Nerd?

Welcome to the world of the **AVERAGE**.

- Everybody wants a number.
  - When we communicate what we expect, we anchor people.
  - Decisions aren’t made at the expected result.
- Never expect the expected... yet... that is what we communicate

Real Uncertainty Rapidly Becomes A Trust Issue
All plays move through three unique “frenzies” of activity with different types of new entrants along the way.

1. **Frenzy 1**
   - **Recognition of the Potential**
     - Beetaloo
   - **Proof of Concept**
     - Duvernay

2. **Frenzy 2**
   - **“Land Cliff”**
   - Montney

3. **Frenzy 3**
   - **Access Shortage**
     - Eagle Ford
   - **Over-spending common**
Example: Jonah Field Wyoming – (Majority vertical wells)
Jonah Well Density Superimposed on Pittsburgh
Human Bias: Before the Decision is Made…

- Perceived threat of Pain is stronger for failed action than it is for failed inaction.

- People tend to hold even more tightly to their beliefs when confronted with contradictory evidence.

  (Teamwork and an integrated decision management approach provide clarity and direction)
“Regret for the things we did can be tempered by time; it is regret for the things we did not do that is inconsolable.”

Sidney J. Harris
It is all just **FUD**, and FUD sells!

The Energy Industry is mired in FUD. FUD is reinforced by HSE failures.
Know what it takes to EXIT an opportunity

“Off-Ramp” Planning
Downside Identification and Mitigation

4 Principal Phases of Unconventional Plays

- Exploration
- Evaluation
- Delineation
- Development

- Simple reservoir failure
- Pilot / Productivity failure
- Elimination of Pilot false positive

Value
Conventional Mindset

Drill the “BEST” location

The Container
- Reservoir
- Vertical Seal
- Trap or Lateral Seal

The Contents
- Source
- Timely Migration

[Diagram showing geological structure with labeled components: Reservoir, Vertical Seal, Trap or Lateral Seal, Source, Timely Migration]
There are Two types of Learnings

**Discrete** - chance events that are either present or not present for a given area...
- Productivity
- Thermal maturity

**Population based** - A result that becomes more reliable with sampling...
Usually pertains to averages such as
- Porosity
- Pseudo-Field Thickness
- IP

Go or No Go

Efficiency & Profit
Holdovers from a Conventional Mindset

Drill the best place first

Drill the best place first

Drill the best place first
What is a Sweet Spot?

- Limited area of increased inherent production and recovery

- Typically making up the top 10 to 20 percent of the well distribution.

- Often, but not always, indicated... allegedly... by specific geophysical signatures... theories... guesses... Ouija boards...

... and expensive products.
A Sweet Spot is NOT...

- A general region of favorable conditions...
- That is a “Part Play”.
  In significantly dispersed plays, use real data on thickness, composition, effective organics, maturity...
- Or take the easy way and use the Sales-Indicator, or inverse FI-Indicator
Sweet Spot Exploration is Value Destructive

- Unreliable and Biased assessment

- Leads to improper sampling

- Impedes learning and operational efficiency, “Engineers stop working”

- Subject to materiality concerns

- Sweet spot exploration is a destructive holdover from a “conventional” mindset.
Sweet Spot Methods... Promotion of Bias

- Seldom mentions reliability of the product being sold
- Advocacy approach eliminates alternate hypotheses
- Poor use of analogues
- Reward conflicts... self interest
The “Obvious” Place isn’t Always the Best

Reliability?
Exception…

Where the sweet spot area itself provides a material play extent

  Large enough to be able to contribute completion and production learning

  Large enough to be able to apply the learnings to deliver profit

When you are in the Development Phase
What’s the Purpose of a Pilot Project?

Need to determine how many wells must be drilled before we are confident that the average development well will exceed the commerciality threshold.
The Purpose of a Pilot…

... Is to determine with an acceptable level of confidence that what you have is at least as much as what you need to have in order to create/sustain a viable project.

Precision is unwarranted
Thresholds have both discrete and population learning

• As the sample population increases, confidence in the decision increases…

• Usually.

• Pilots will never provide 100% confidence.

• They only teach you about what you plan to learn

How much confidence do you need?
How Many Pilot Wells Do I Need?

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Early wells are most critical... incremental learning should diminish with additional drilling

Optimal Number of Wells

False results!
You are exploring for a family of wells within a distribution of families.

You may not know if you are correct for many wells.

Haskett and Brown, SPE 96879
Sweet Spotting distorts play comparison

Play Alpha
- Lower value,
- Low margin wells
- Moderate downside risk,
- Responds well to scale and learning

Play Beta
- Lower value,
- Low margin wells
- Moderate to high downside risk,
- Responds well to scale and learning

Play Z (Green)
- High value project,
- Good margin wells
- Low downside risk given access to transportation

Play Z (Dry Gas)
- 10,000 acre stage

New Albany Thermogenic
- Negative value,
- Requires high price to be marginal
- Limited upside potential

Average EUR / Well
6 Simple Rules For Value in Unconventional

• Enter with Purpose, fairly sample
• Embrace Uncertainty, you only know what you know
• Seek to understand your Material Interest in Material Plays
• Create, Maintain, your real Competitive Advantage
• Have an Exit Plan, but don’t give up too early

Nothing can make up for bad rock!
The Three-Level Deliverability Screen

- Geology
- Engineering
- Enterprise Thinking

Sub-surface
Flow
Materiality

Without all three, competitors will receive the value.
To succeed in unconventional, strive for a material interest in a material Play.
Unconventional Thinking

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