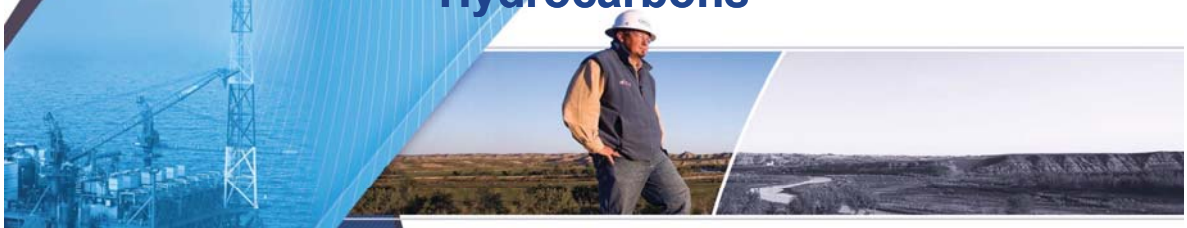
Primer: The Law, Science and Finance of International Energy Projects Part 3: Petroleum Engineering: Conventional Hydrocarbons



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The opinions contained in the presentations are those of the author and are not intended to be an expression of the opinions of Anadarko Petroleum Corporation.

Primer Outline

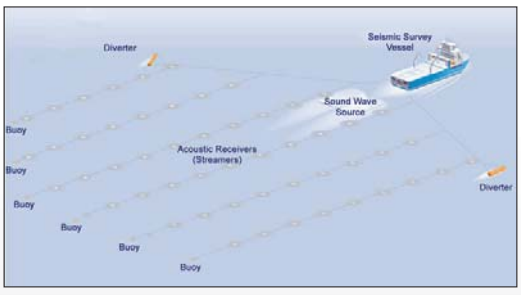
1. Introduction
2. Energy, Geology and Geophysics: Conventional (Potter)
3. Petroleum Engineering: Conventional (Troutman)
4. Unconventional Hydrocarbon Resources (Potter & Troutman)
5. Host Country Instruments (HCI's) (Wagner) (LUNCH)
6. International Energy Project Economics (Troutman)
7. Co-Venture Formation and Agreements (Wagner)
8. Co-Venture Economics: The Power of Leverage (Troutman)
9. Co-Venture Operations (Wagner)
10. Summary and Q&A (Troutman, Potter and Wagner)

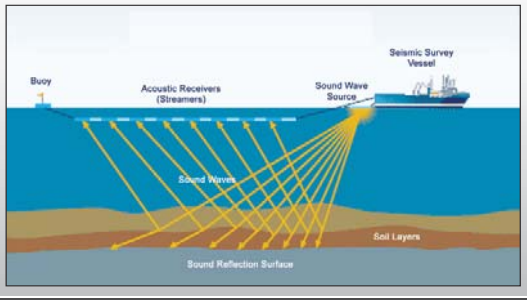
Exploration

Exploration | Appraisal | Development | Production | Decommissioning

Seismic

- **Dominant exploration tool in the industry.**
- **Helps identify:**
  - Prospects
  - Quantify size, shape and depth of prospect
  - Reservoir thickness, quality and fluid type in many situations





- *Offshore Seismic Acquisition*

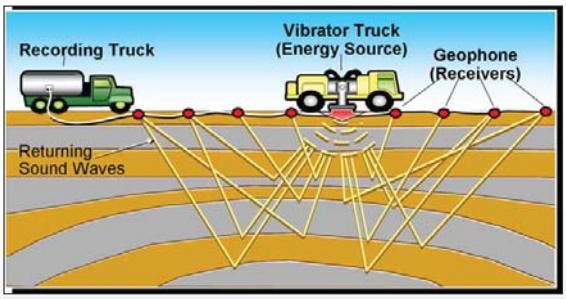
Exploration

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Knowing Where to Drill Is Very Important

- Seismic can be used in a variety of projects, from field development projects such as reservoir characterization, and time lapse monitoring, to regional and play projects which involve putting the earth model together for hydrocarbon charge and trap timing.
- Changes in seismic theory and technology have led the industry to lower finding costs, reduced uncertainty, and increased the chance of success.

- Onshore Seismic (Algeria)





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Exploration

Why spend money on seismic?

- Some large seismic projects can cost $50-75 million
- Some wells can cost $75- 100 million
- In some case the prospect chance of success can be increased from around 10% to 30%
- Multiple wells can be drilled from the data in one seismic project.

If you drill without 3D Seismic …

- 9 out of 10 wells are dry holes or more than $675 million in potential dry hole costs

If you drill with 3D Seismic …

- 7 out of 10 wells are dry holes or around $525 million in potential dry hole costs

The difference is more than the cost of a well in some cases

Very few wells are drilled without 3D seismic anymore!

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2015 Primer: The Law, Science and Finance of International Energy Projects session
"Petroleum Engineering: Conventional Hydrocarbons"