



# Deepwater Drilling and Well Control

Lillehammer 2009

MatthewsDaniel

# Deepwater Drilling and Well Control

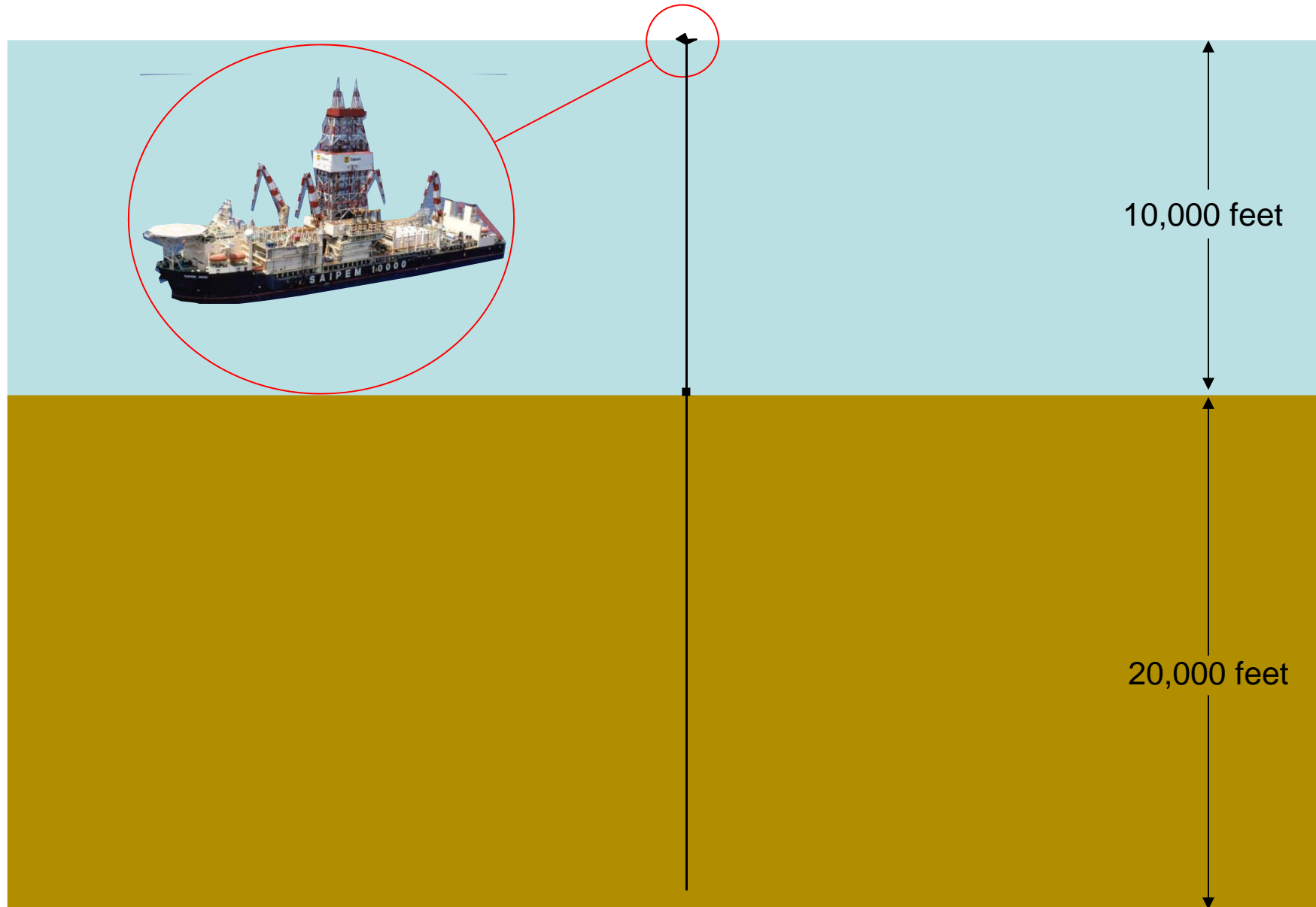
**A presentation by Andrew Rees**

**Lillehammer Energy Claims Conference 2009**

## Deepwater Drilling

- Why does it cost so much to drill wells in deep water?
- What makes it more difficult than conventional drilling?
- What technological advances are being employed?
- Well control considerations
- What does it mean for the market?

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## Deepwater Drilling

- Why does it cost so much to drill wells in deep water?
- It's difficult and takes a long time.

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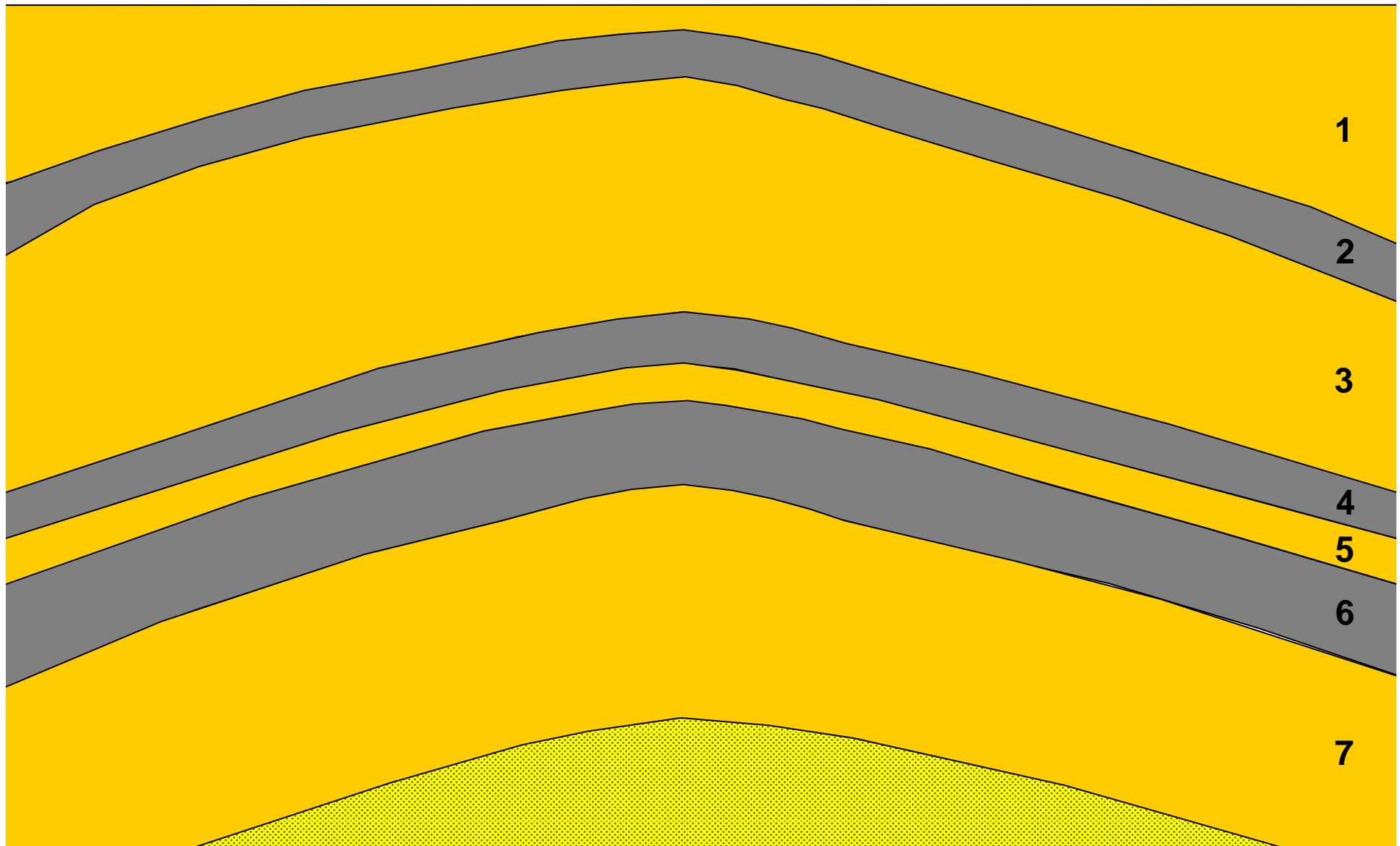
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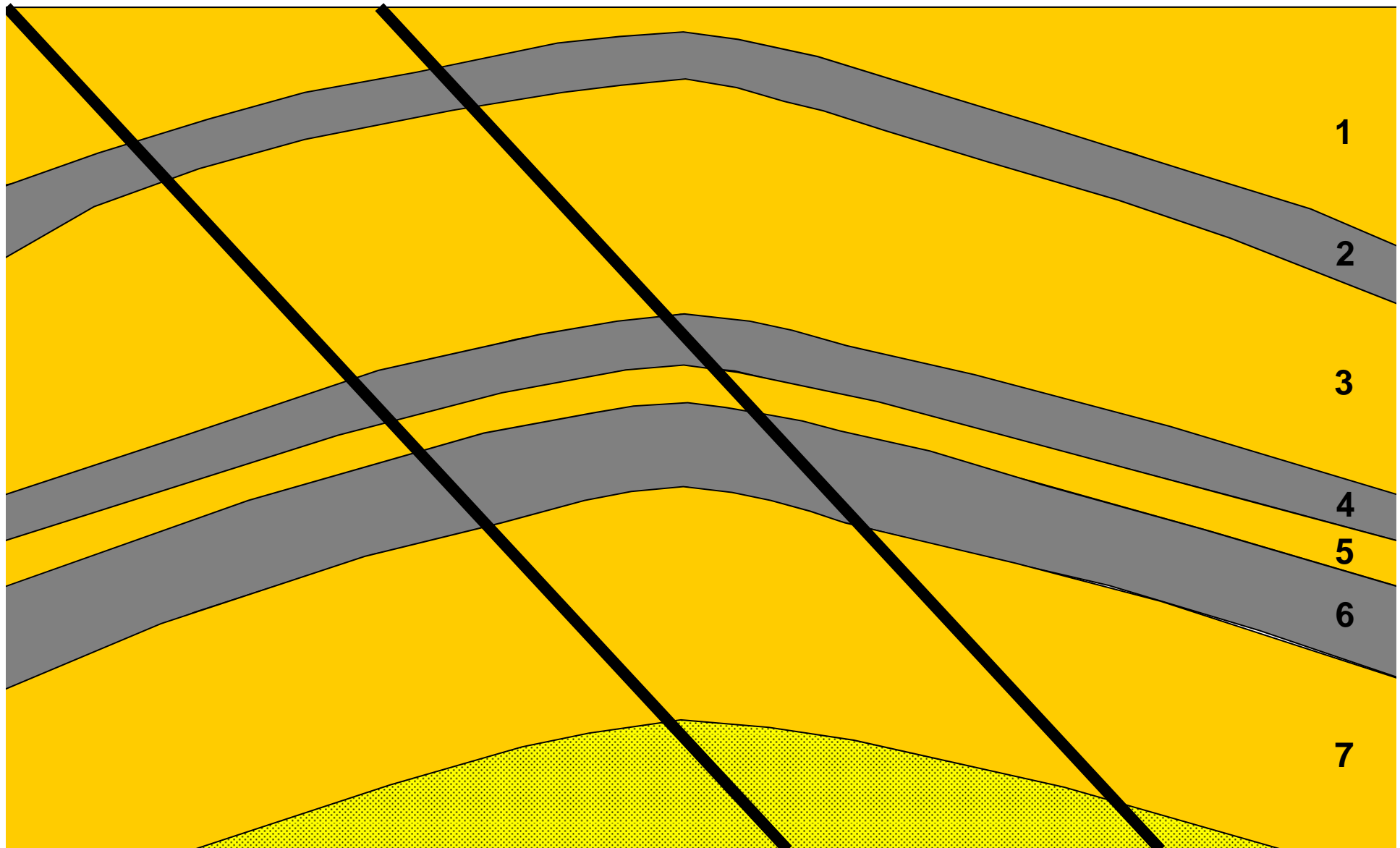
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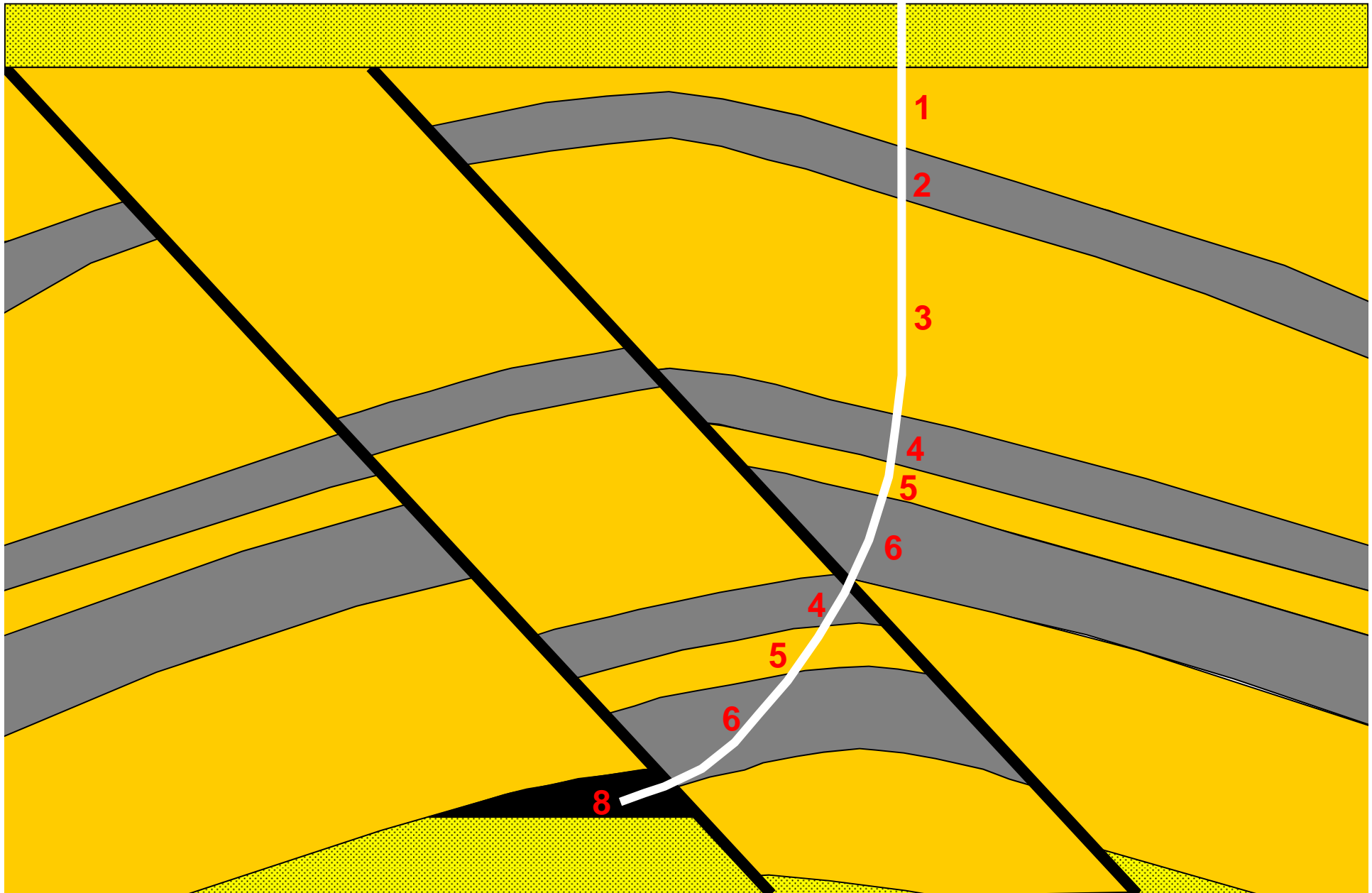
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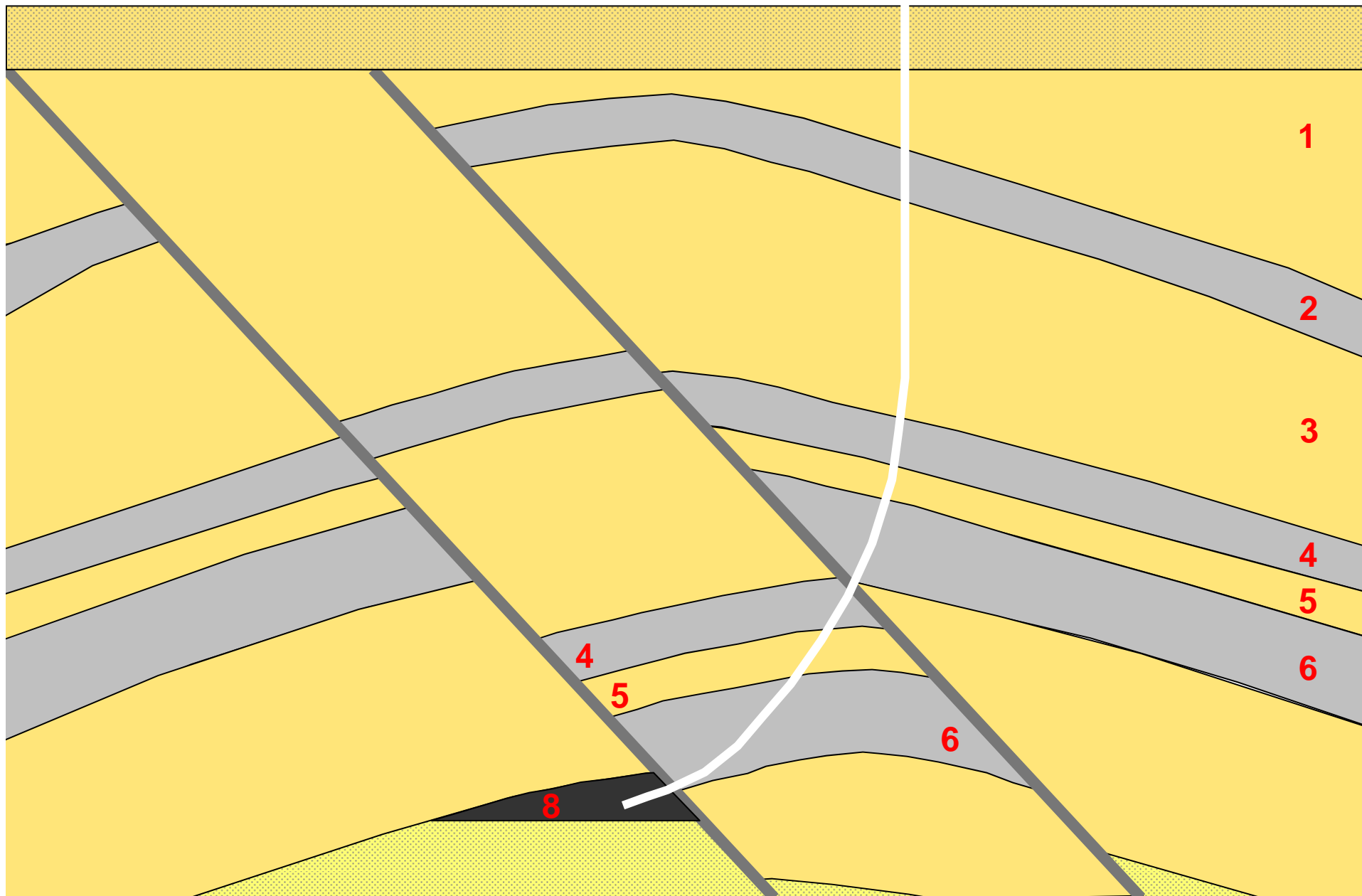
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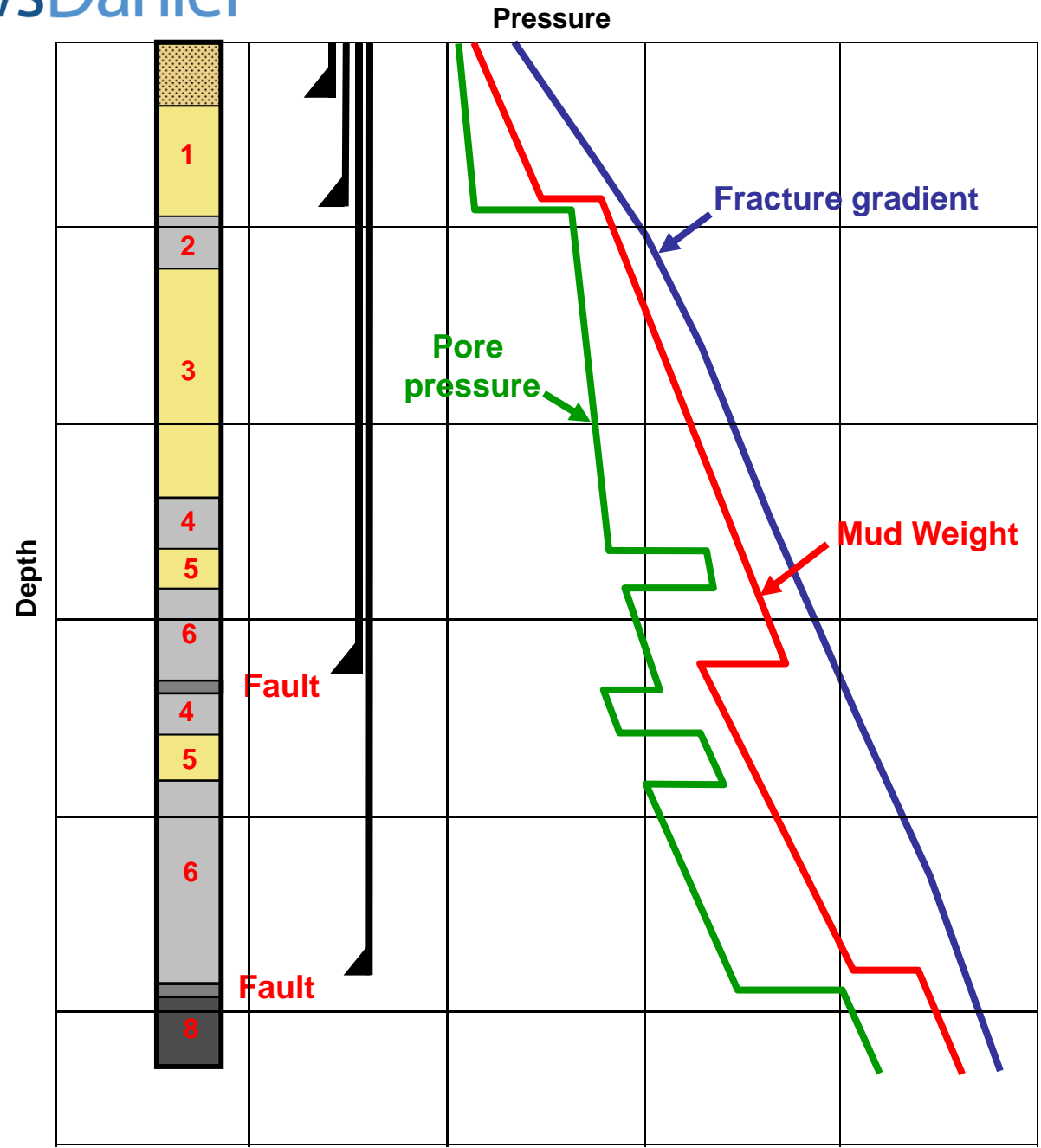
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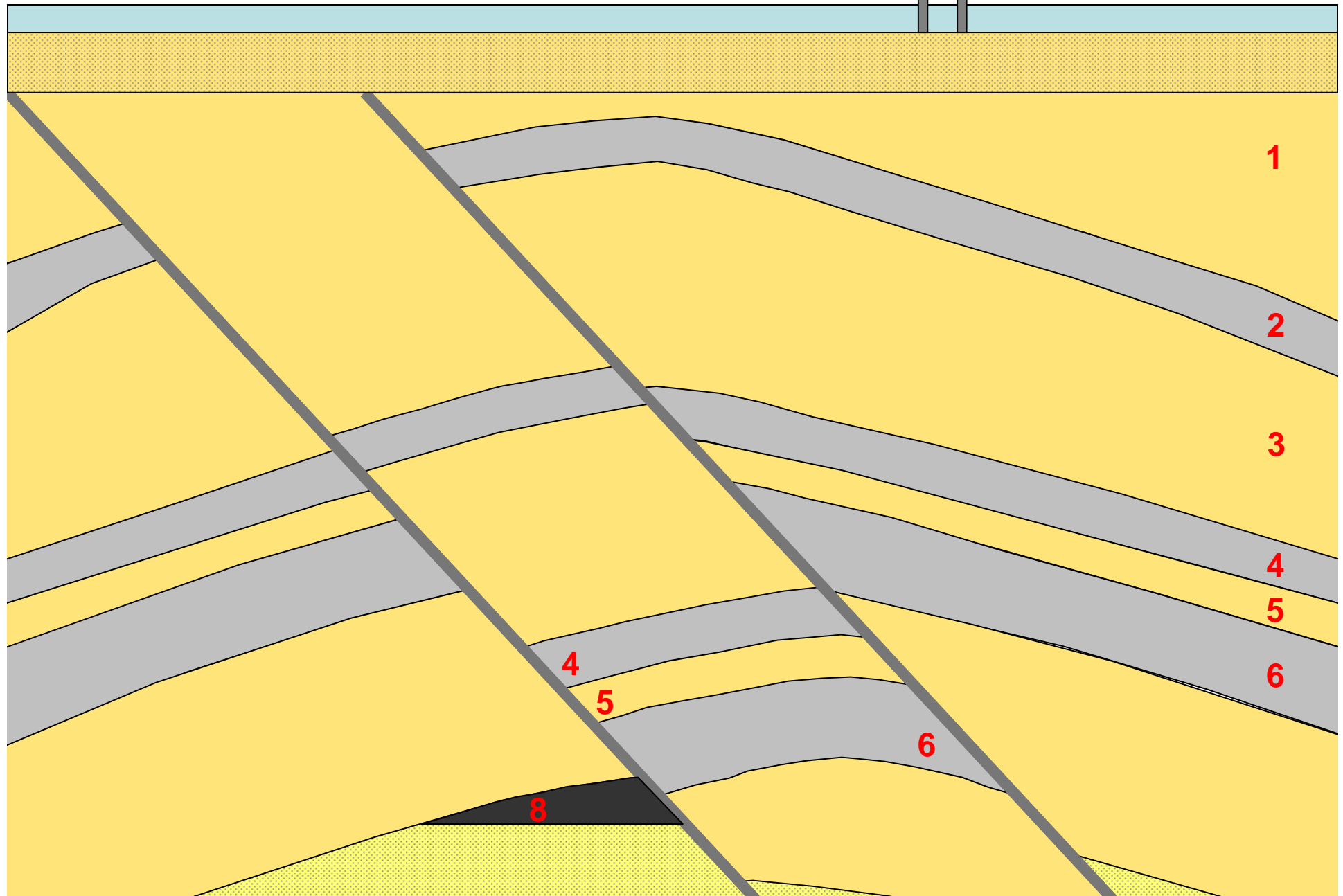
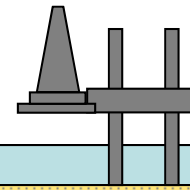
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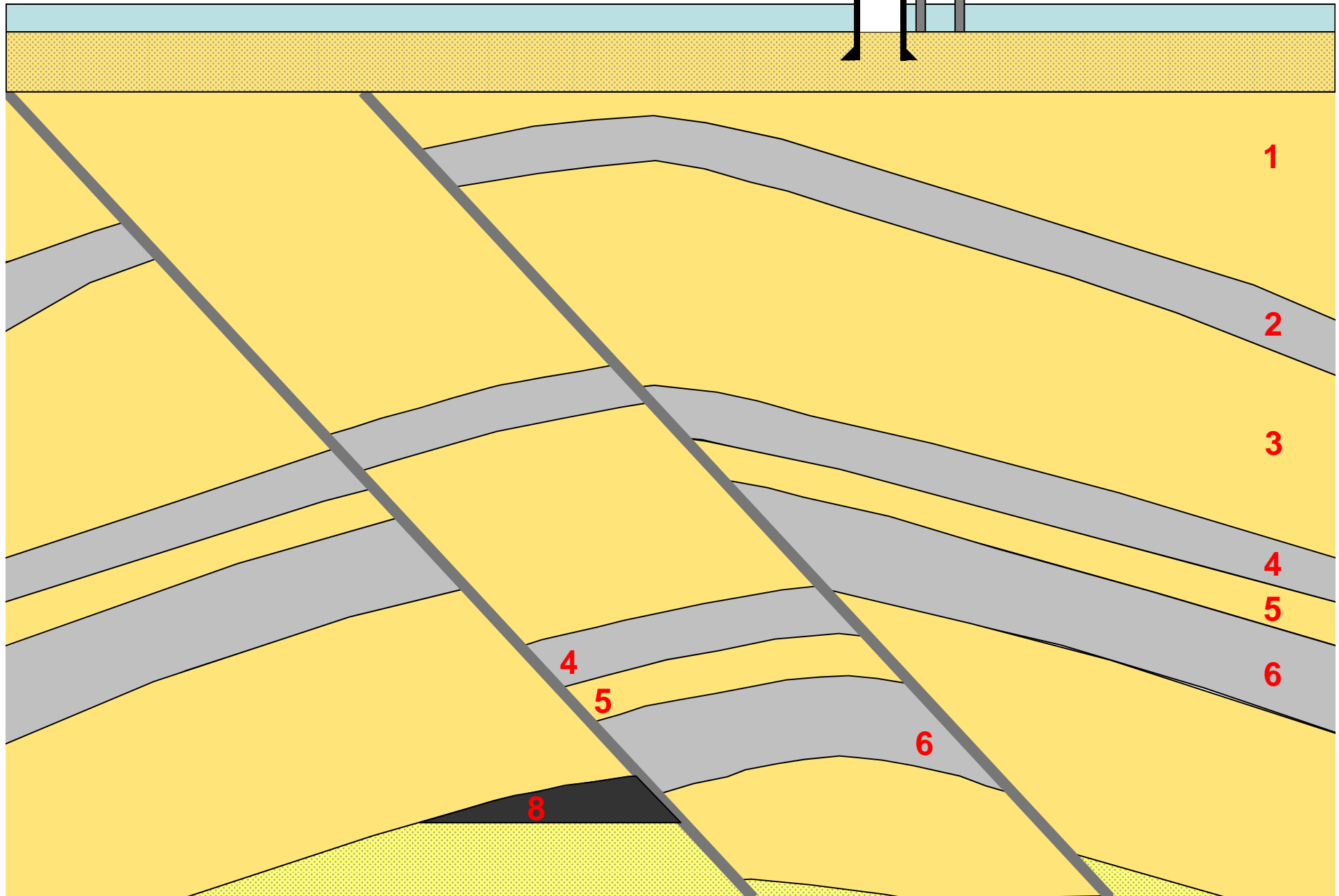
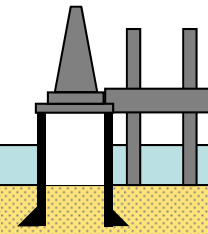
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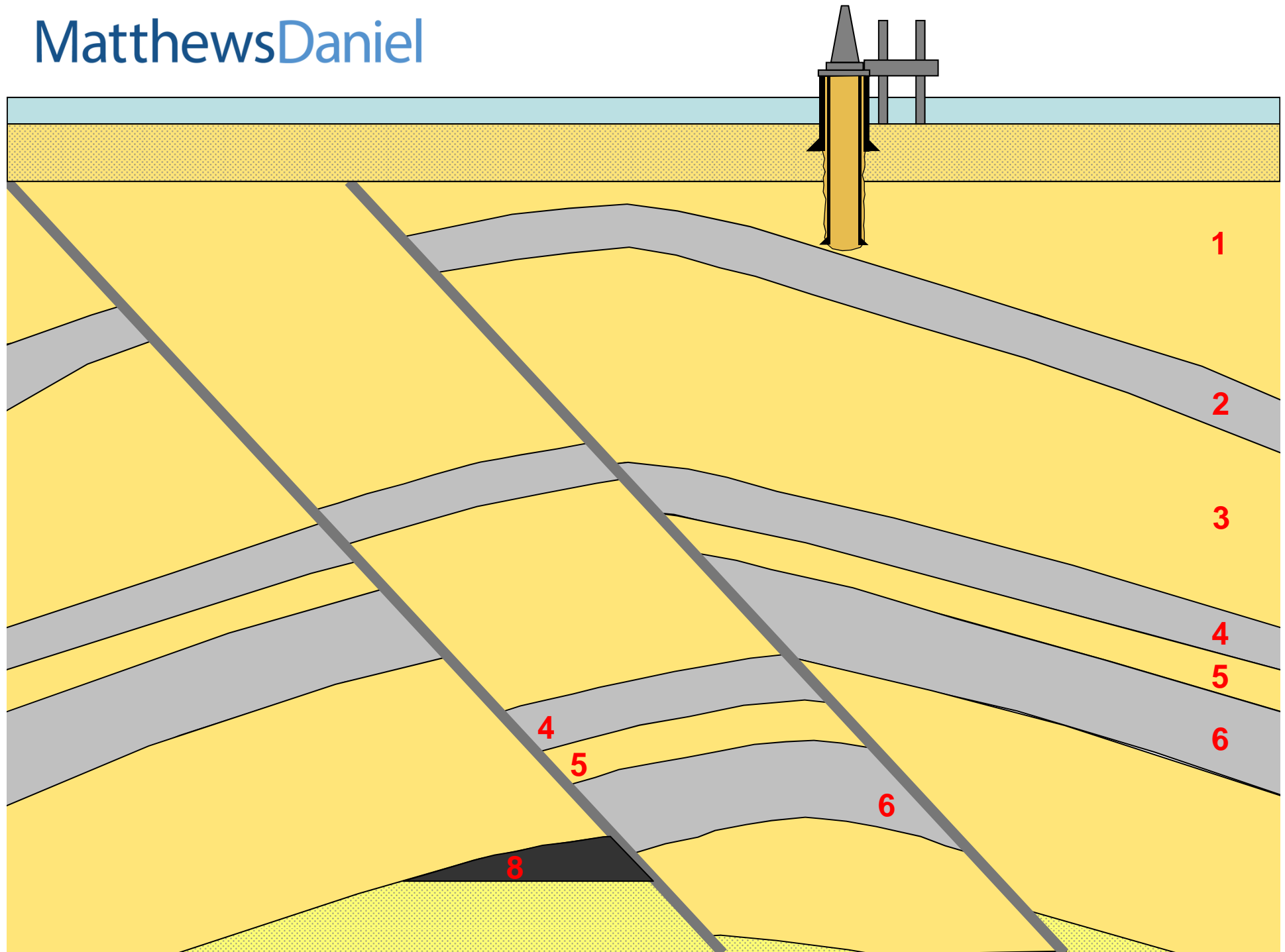
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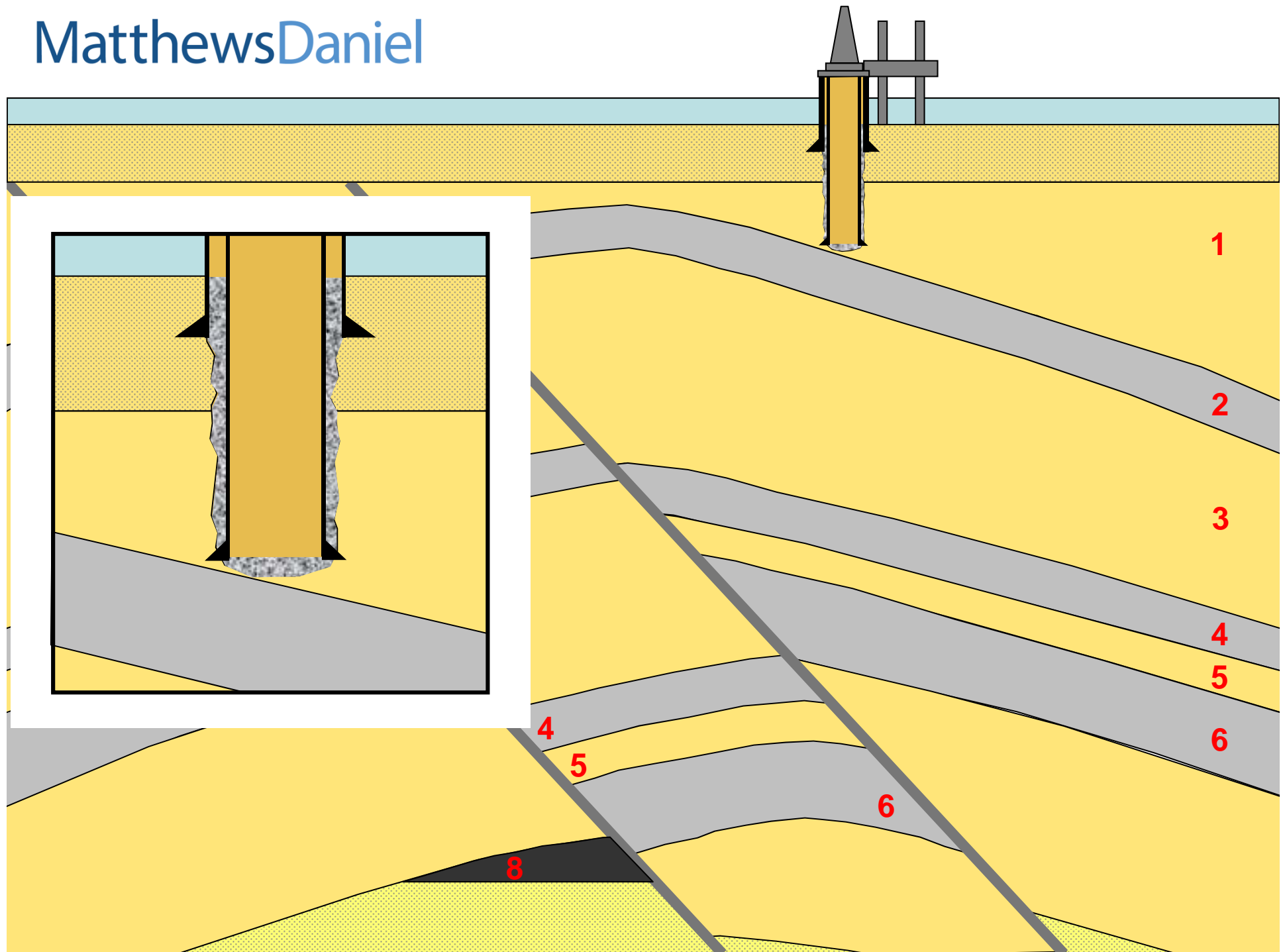
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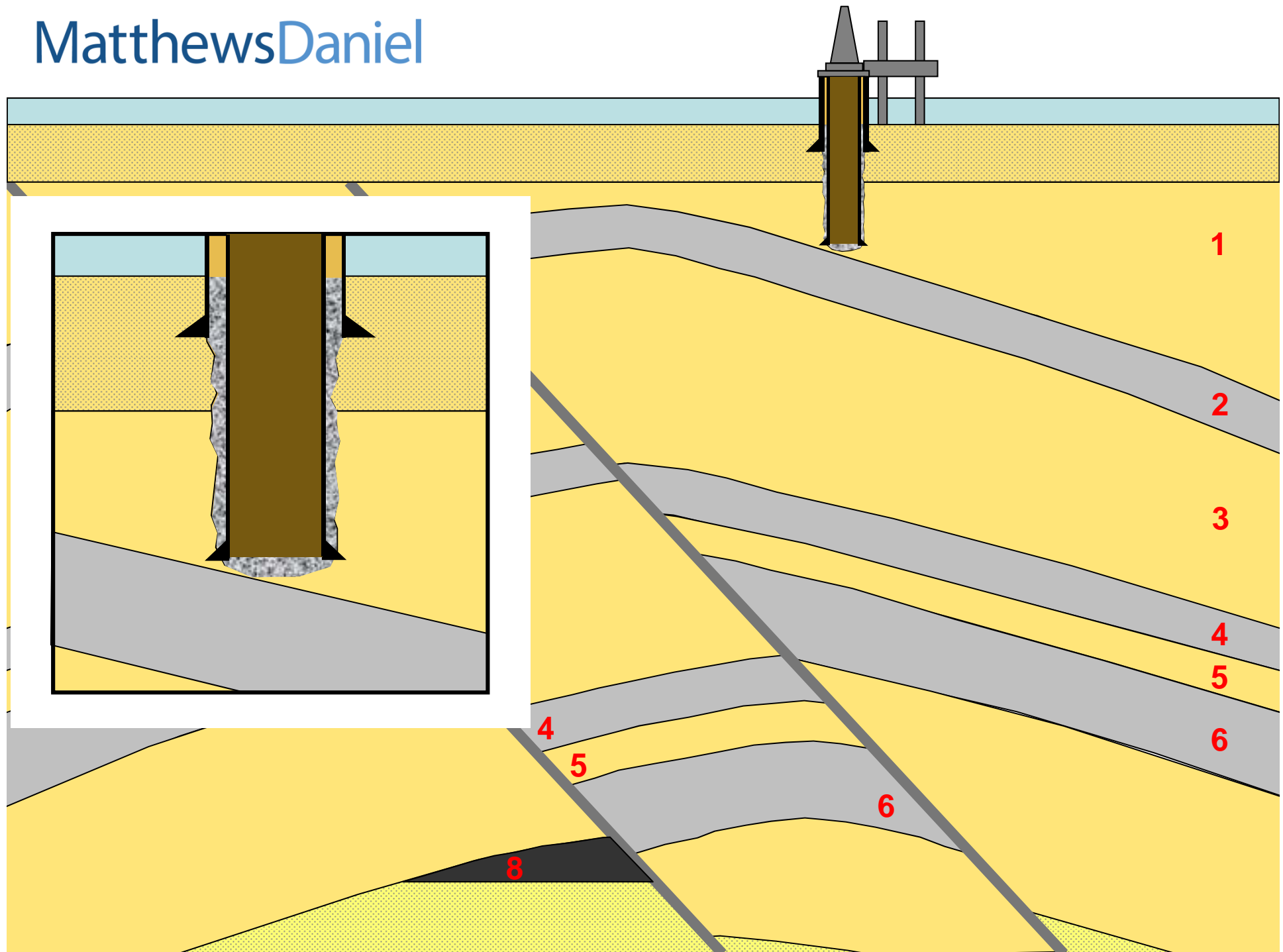
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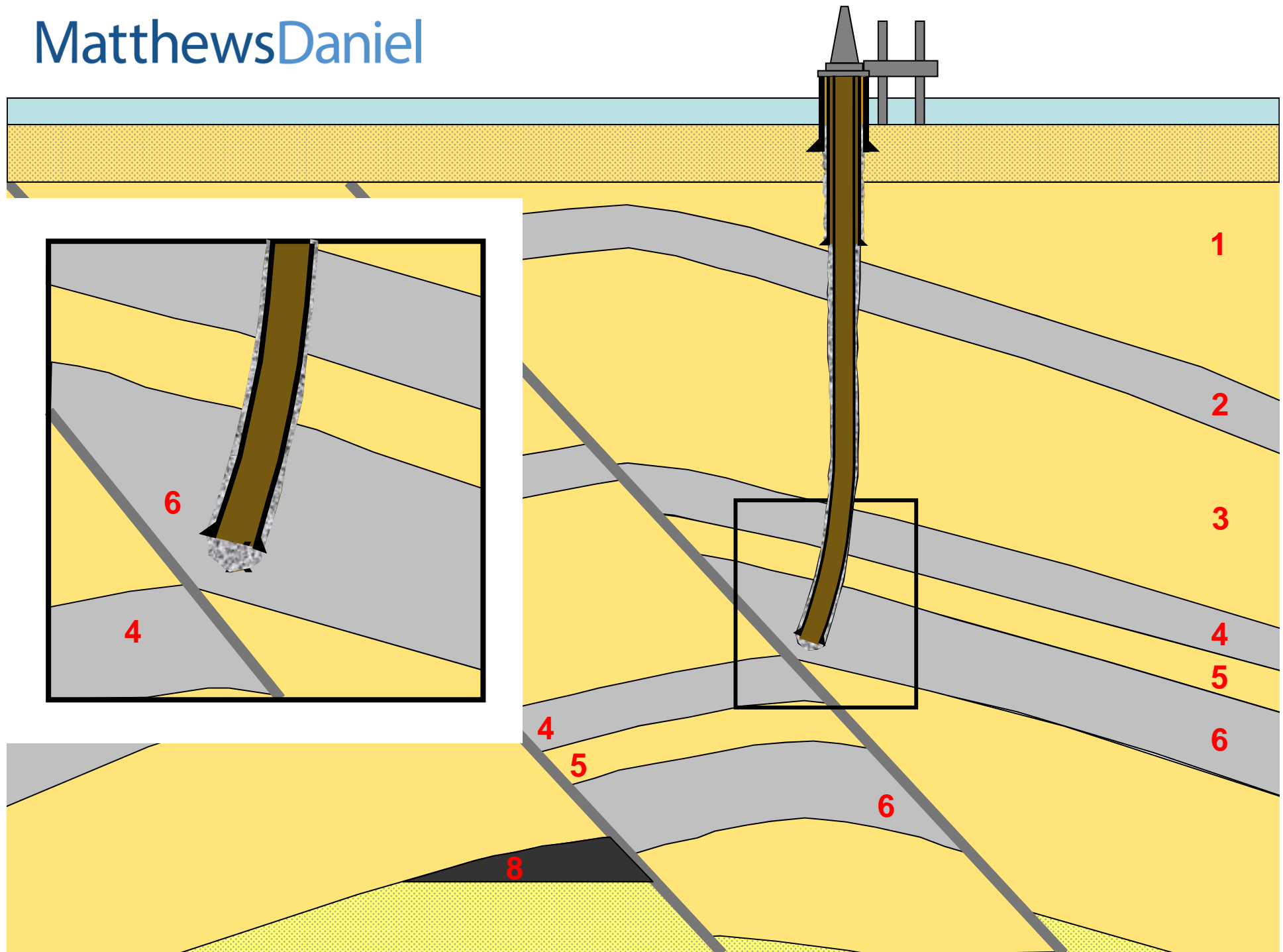
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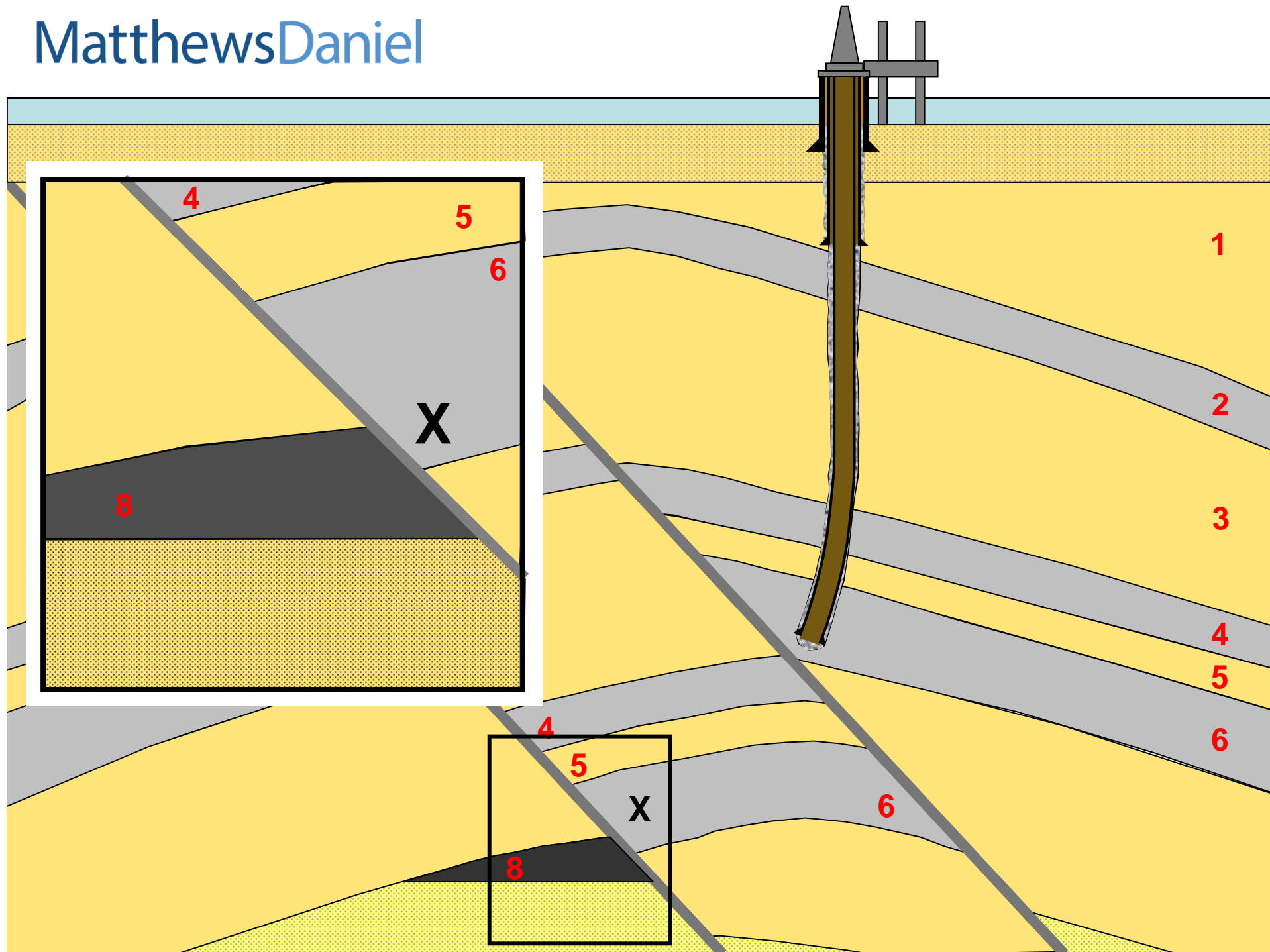
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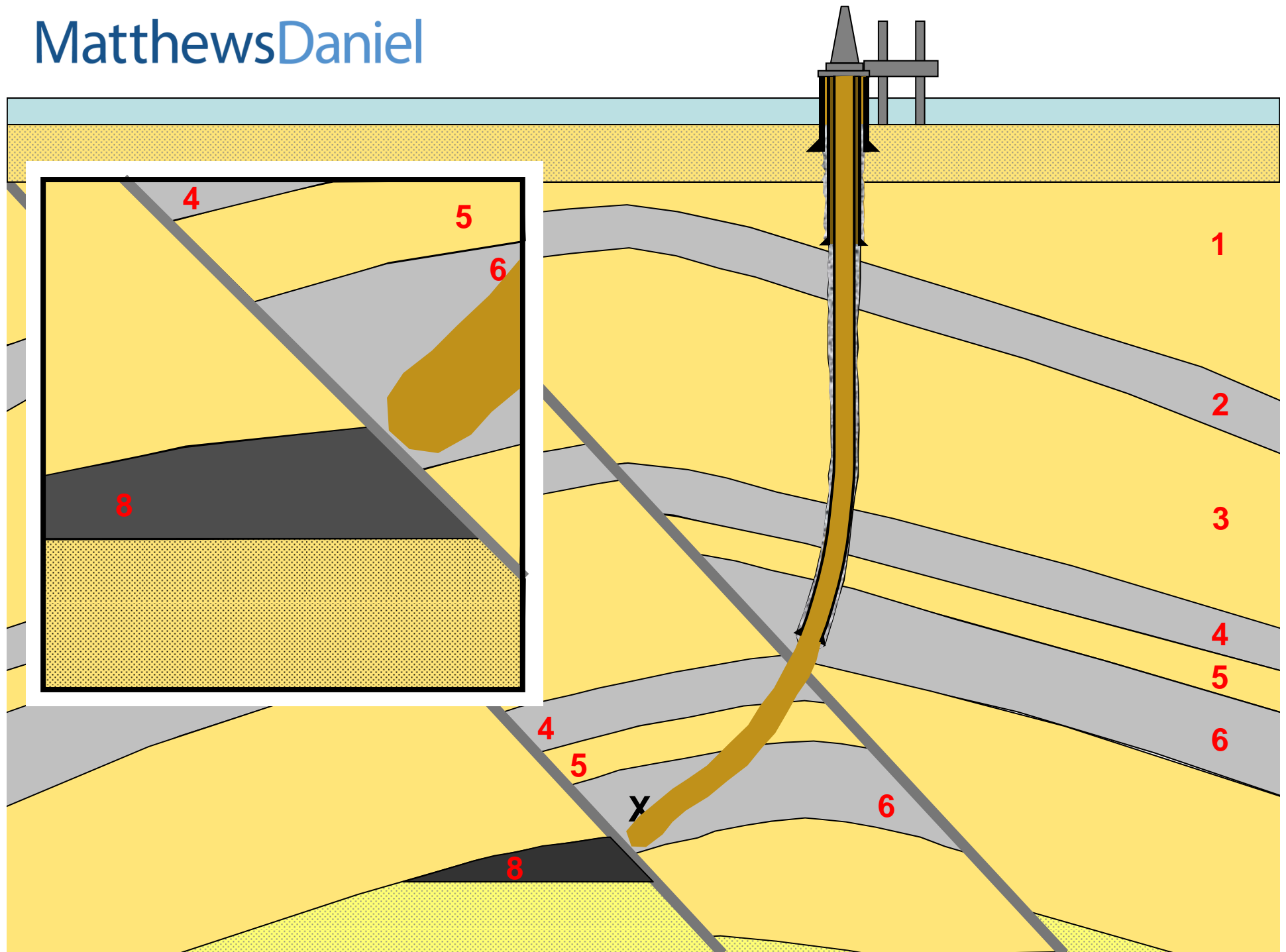
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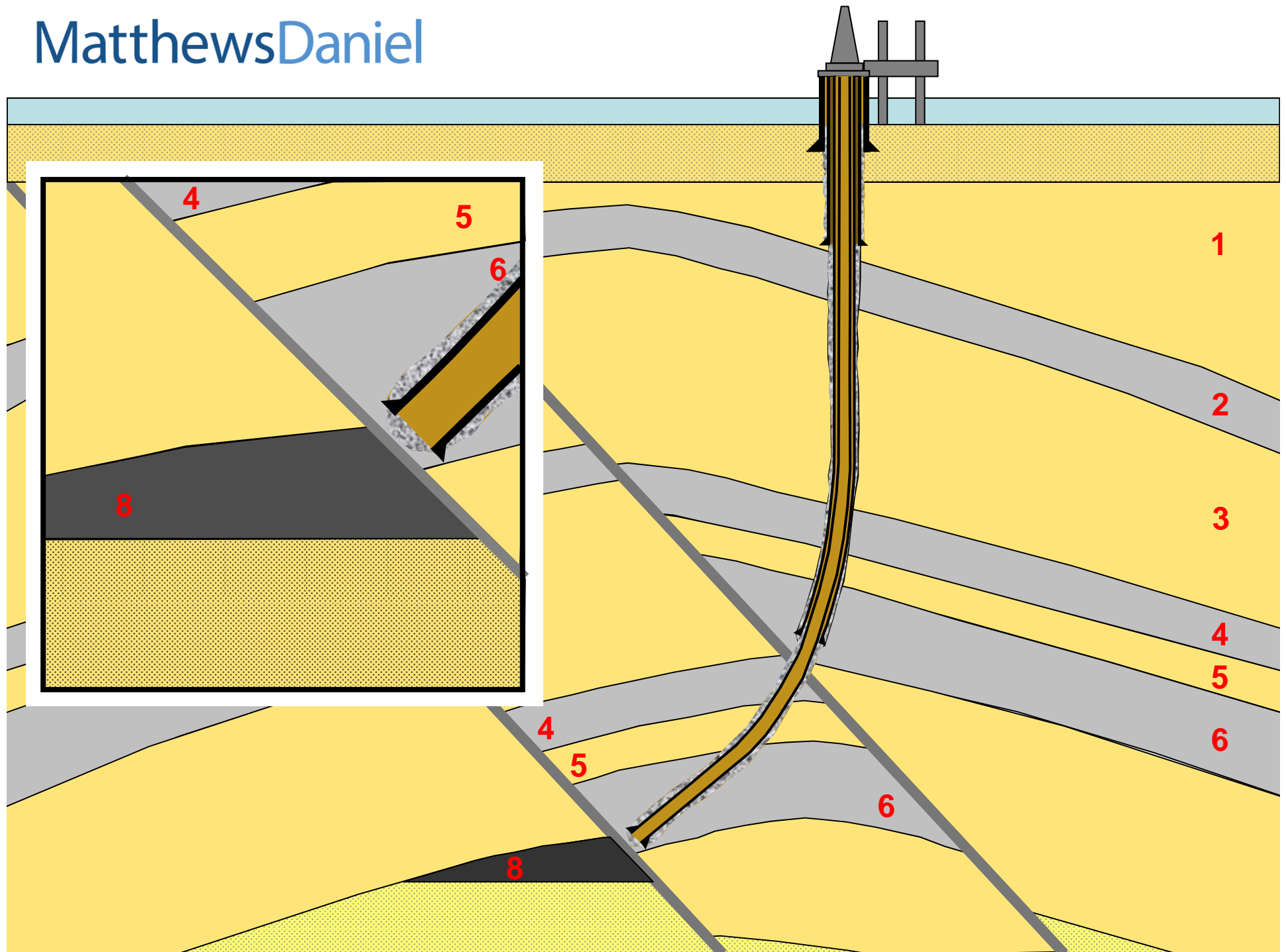
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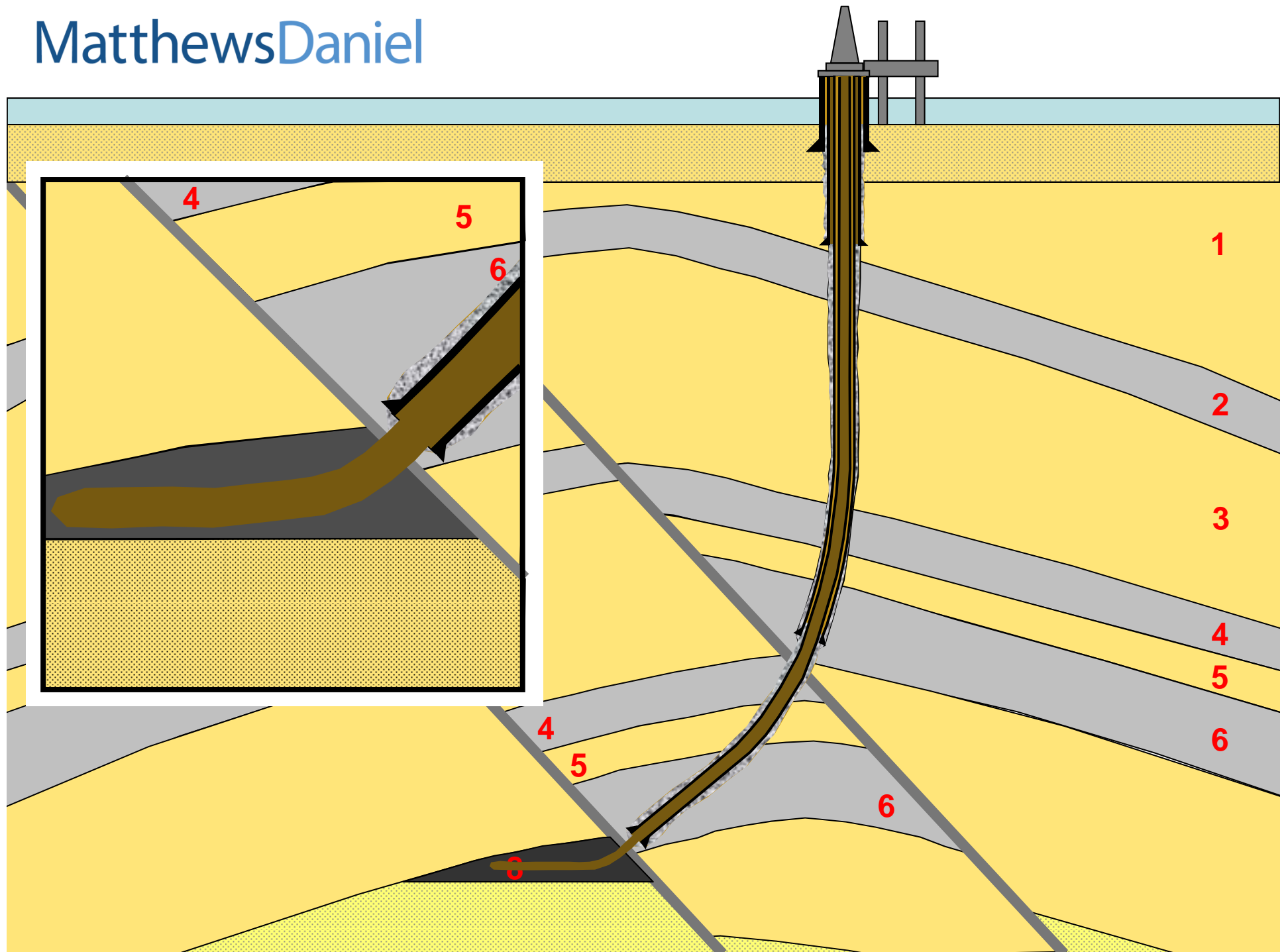
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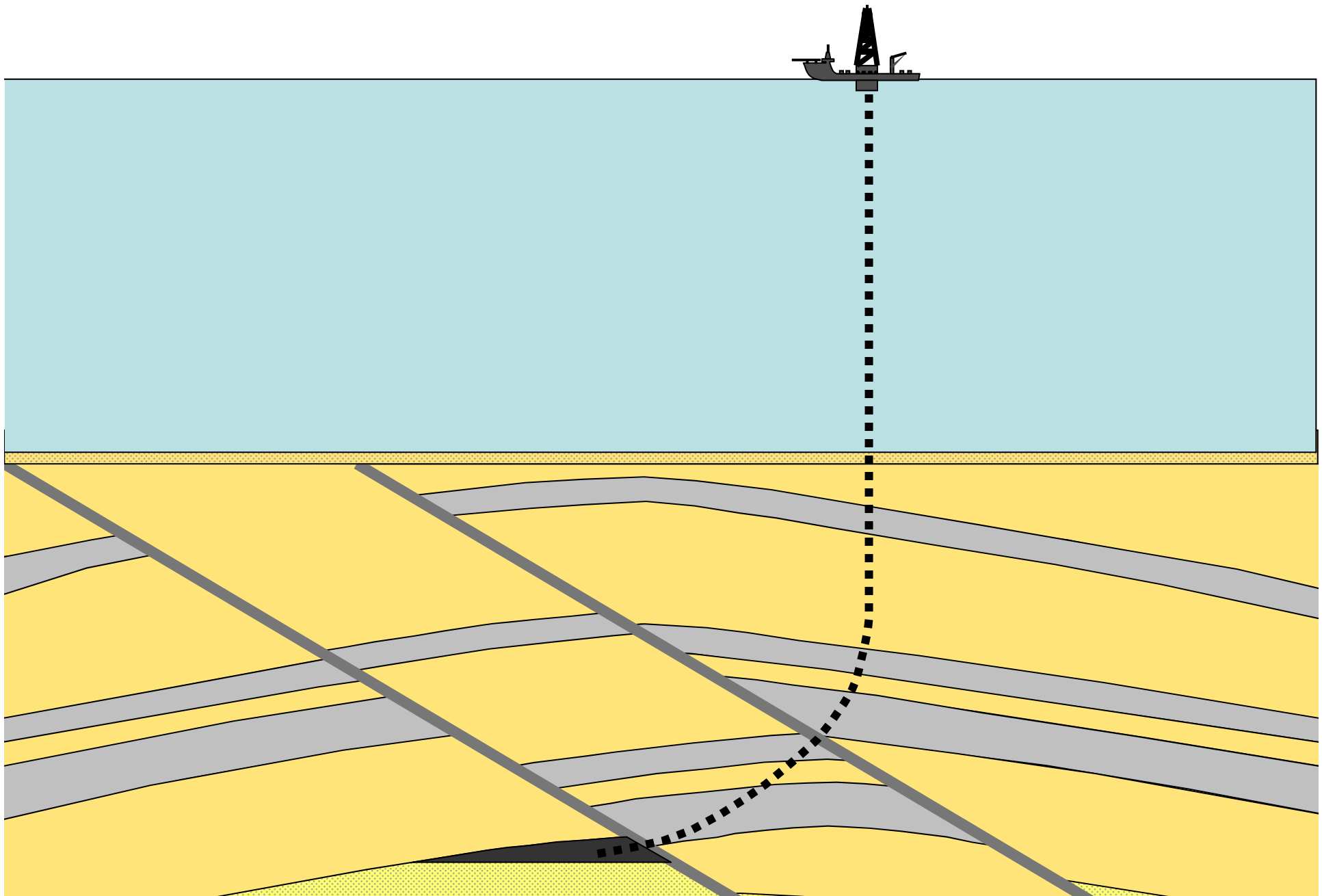
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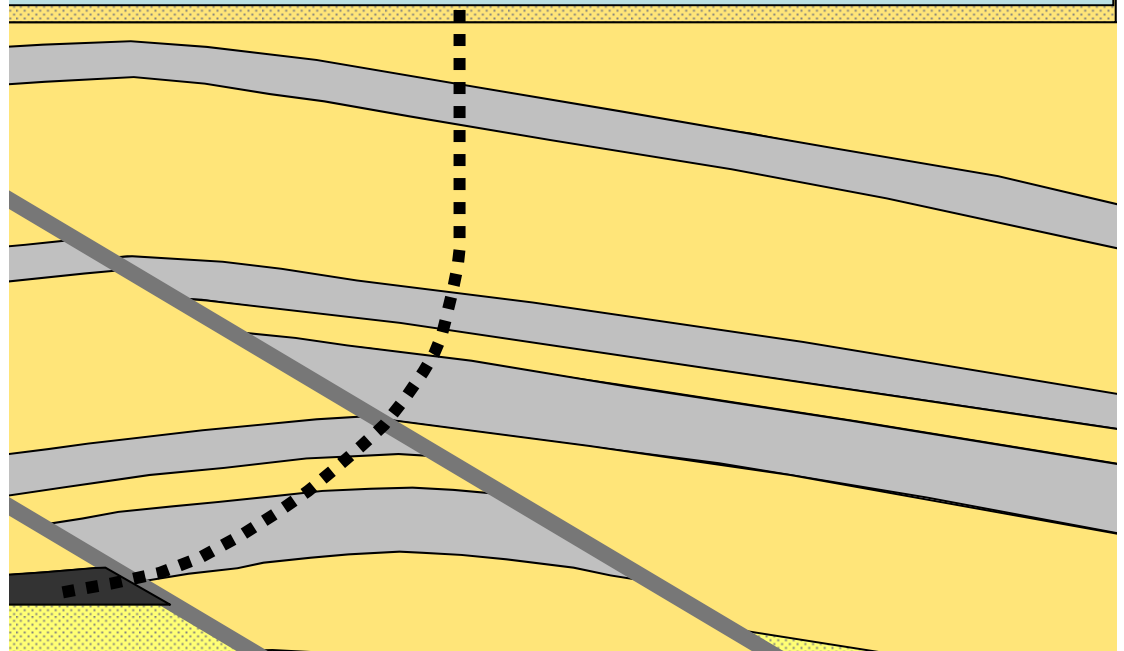
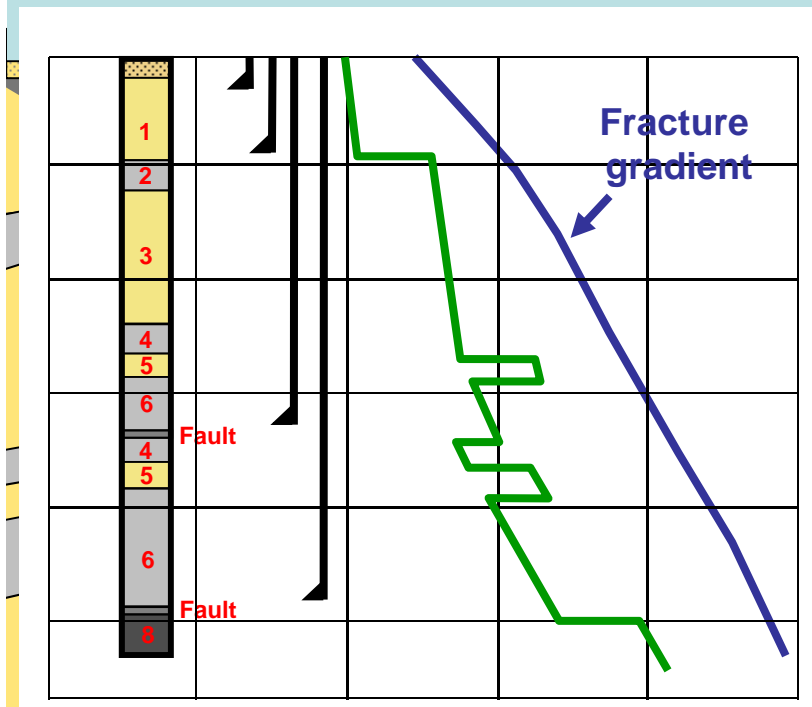
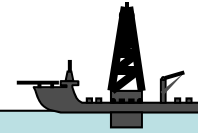
## Deepwater Drilling

- What makes it more difficult than conventional drilling?
  - The fracture gradient is lower.

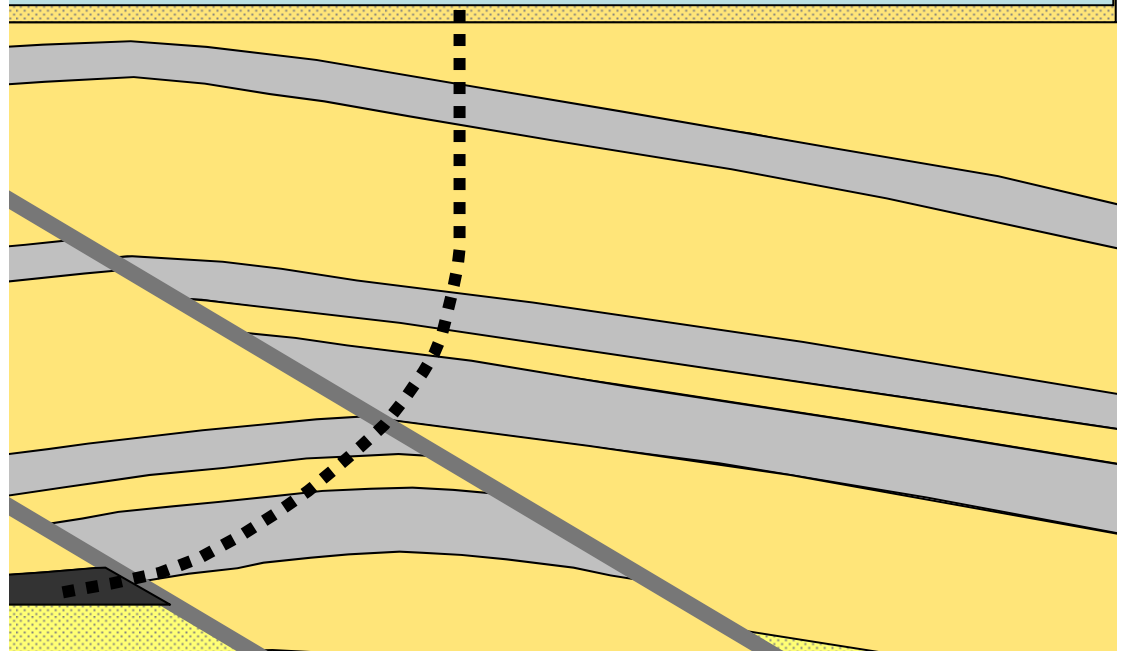
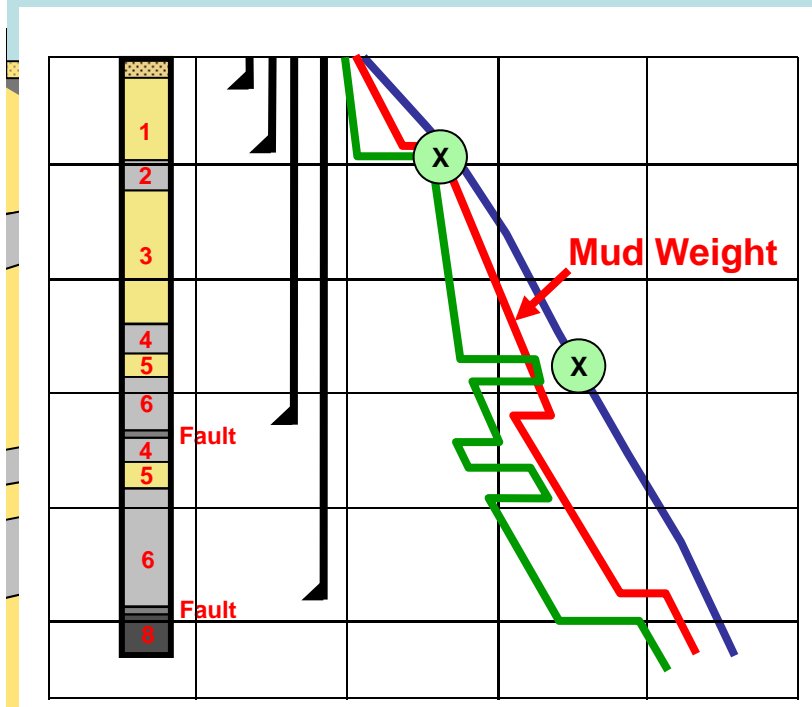
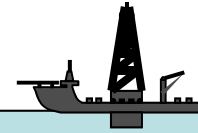
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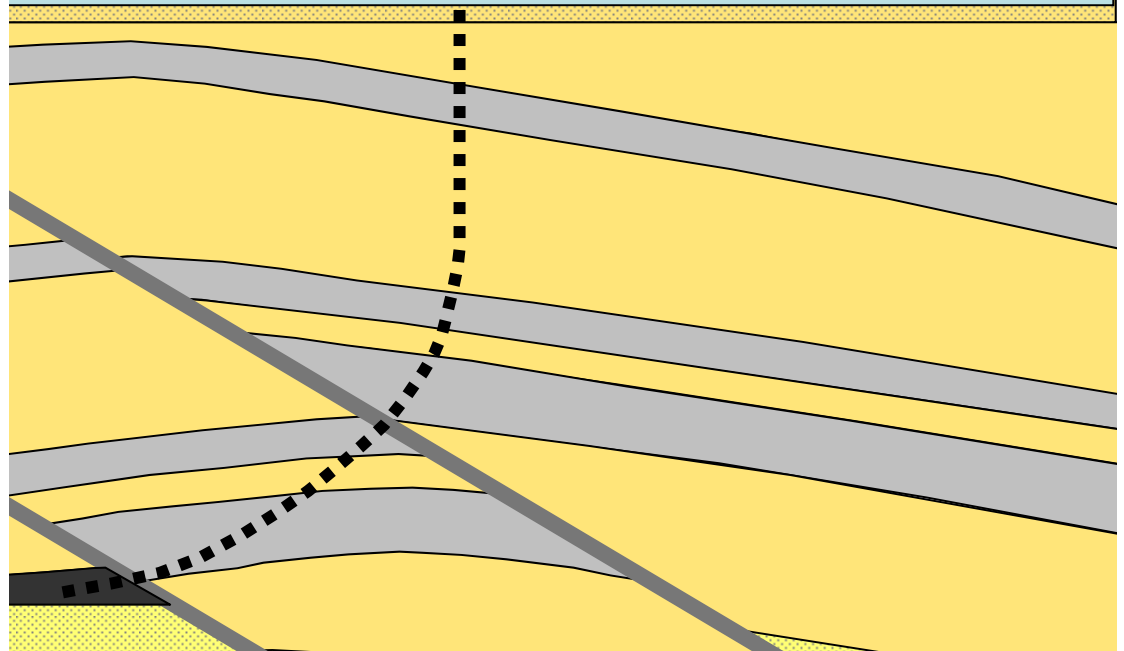
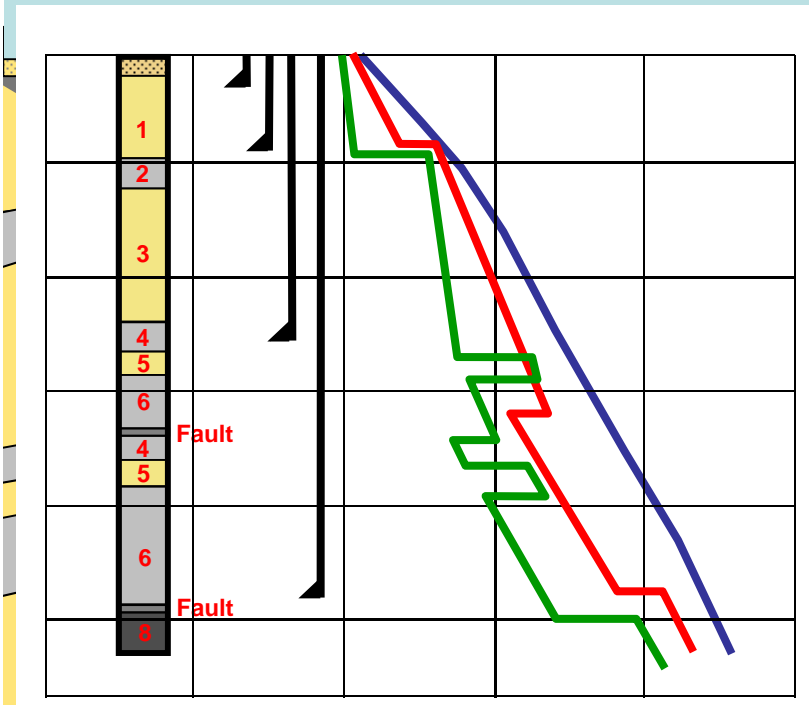
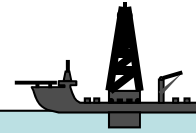
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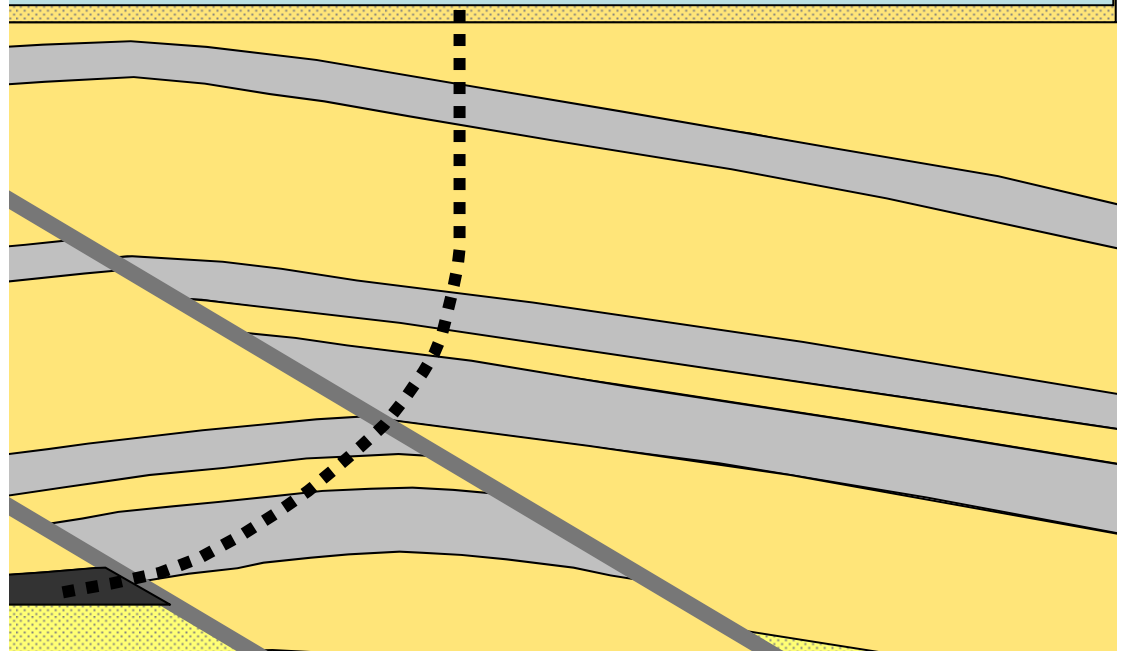
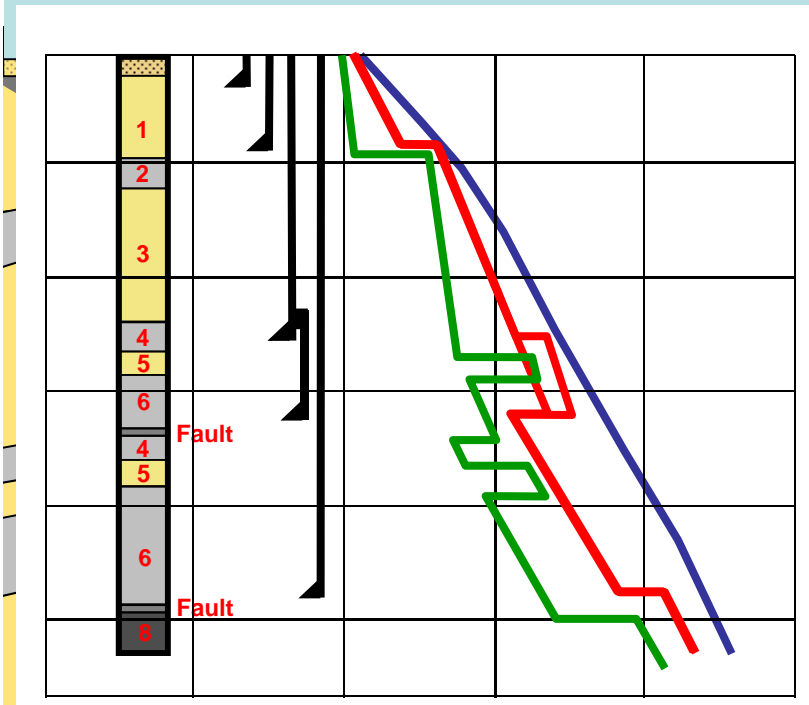
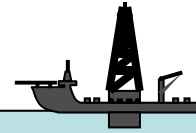
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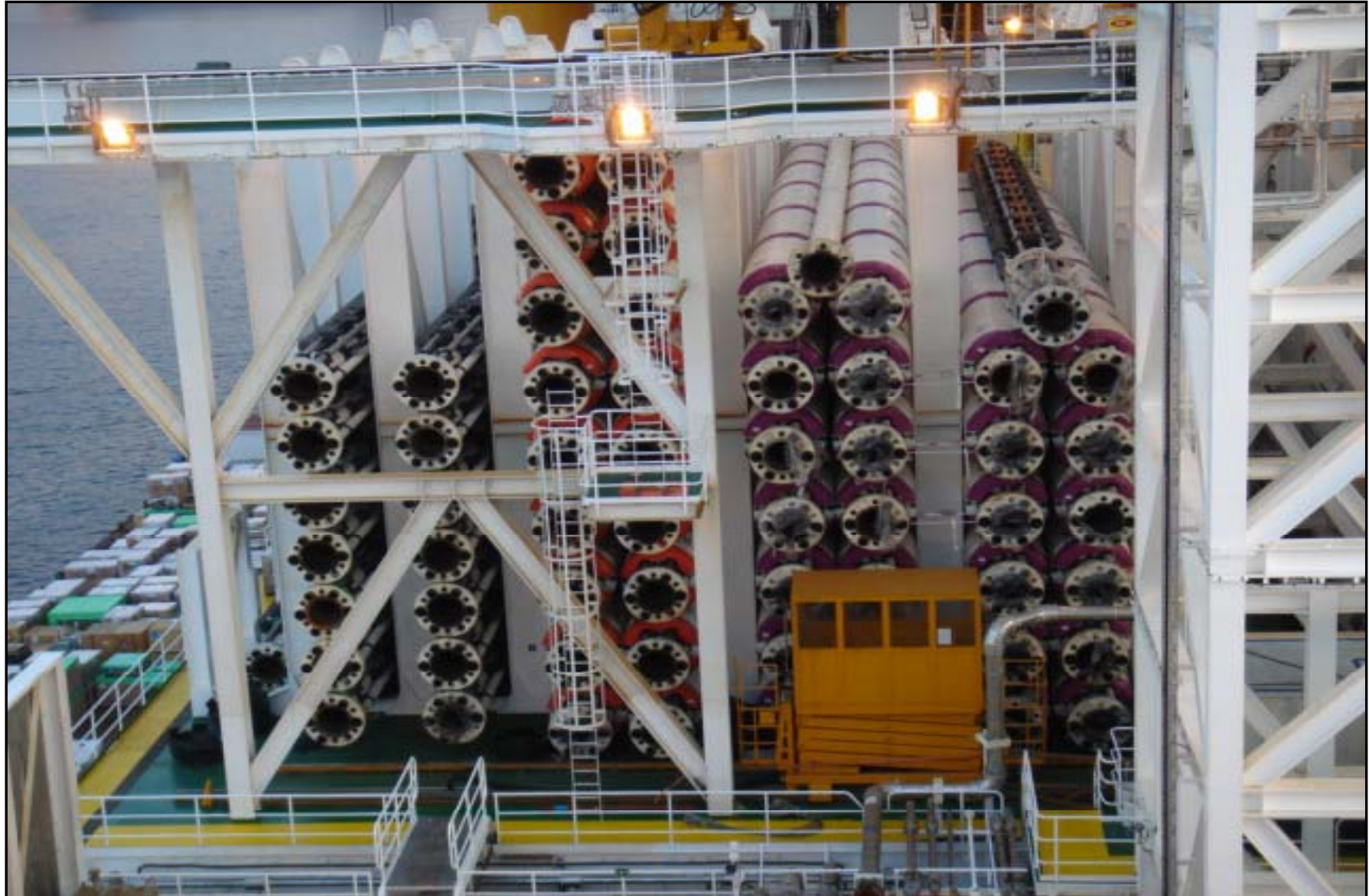
## Deepwater Drilling

- What makes it more difficult than conventional drilling?
  - The fracture gradient is lower.
- What technological advances are being employed?
  - Bi centre bits
  - Expandable casing / liners

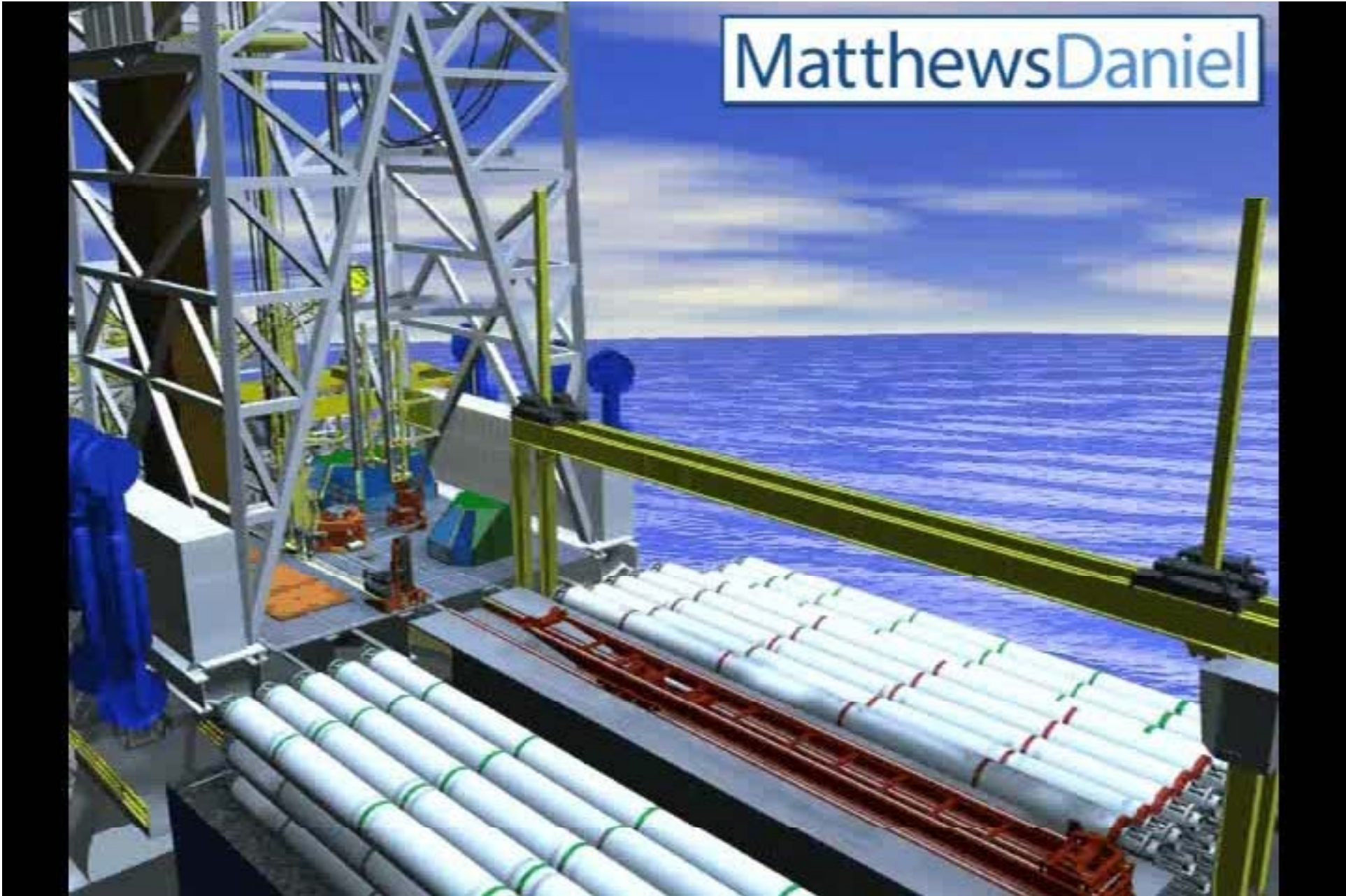
## Deepwater Drilling

- What makes it more difficult than conventional drilling?
  - The marine riser is very long.
  - Large bore risers have a huge mud volume capacity.
- What technological advances are being employed?
  - Automated liner running systems

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## Deepwater Drilling

- What makes it more difficult than conventional drilling?
  - The marine riser is very long.
  - Large bore risers (>21 inches) have a huge mud volume capacity.
- What technological advances are being employed?
  - Automated liner running systems
  - Dual derrick drilling units

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## Deepwater Drilling

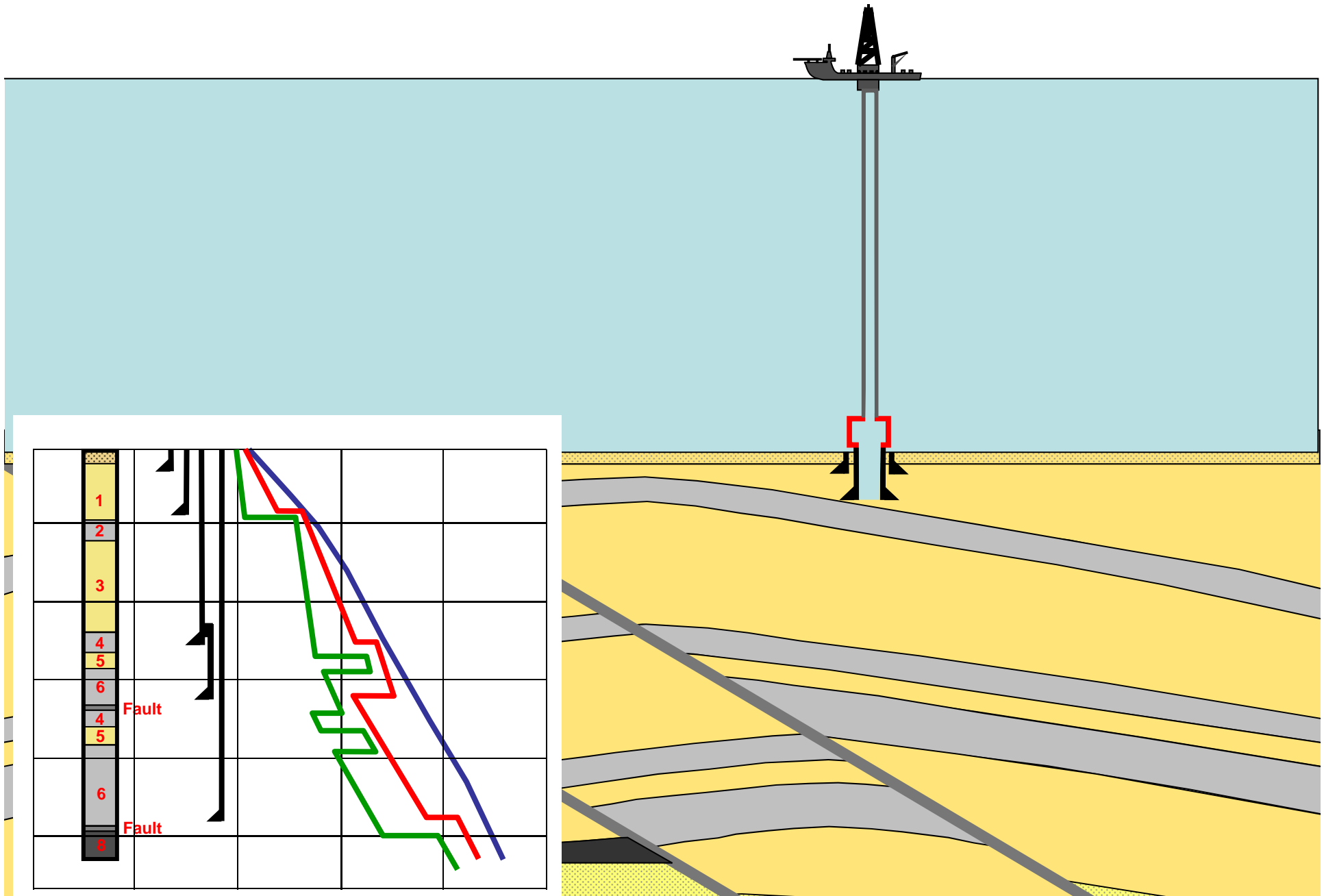
- What makes it more difficult than conventional drilling?
  - The marine riser is very long.
  - Large bore risers (>21 inches) have a huge mud volume capacity.
- What technological advances are being employed?
  - Automated liner running systems
  - Dual derrick drilling units
  - Riserless drilling of tophole sections



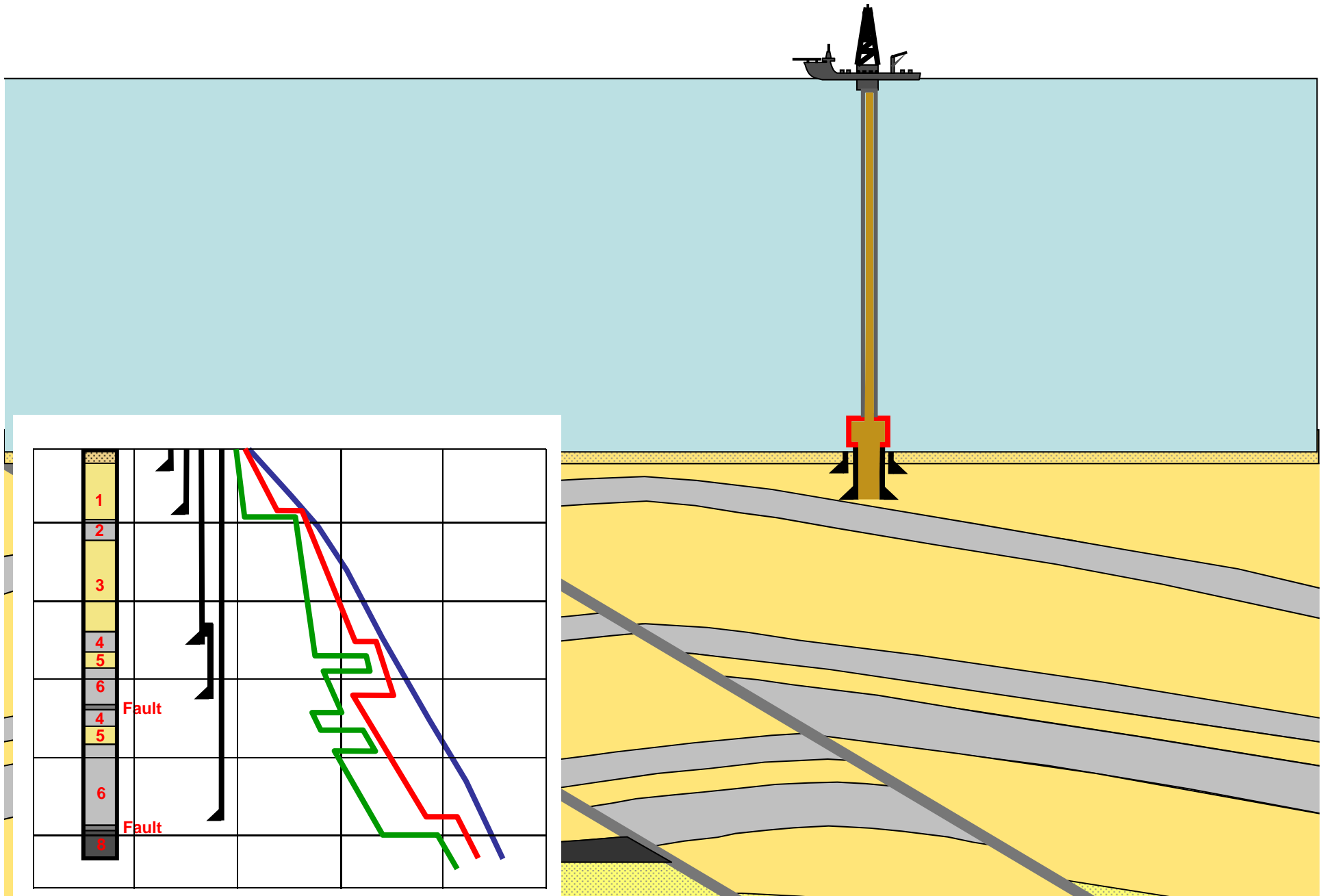
## Deepwater Drilling

- What makes it more difficult than conventional drilling?
  - Shallow water flows.
- What technological advances are being employed?
  - Geophysical detection.
  - The driving or jetting of structural casing.
  - Injecting refrigerant to freeze the SWF zone.
  - Dual gradient drilling.

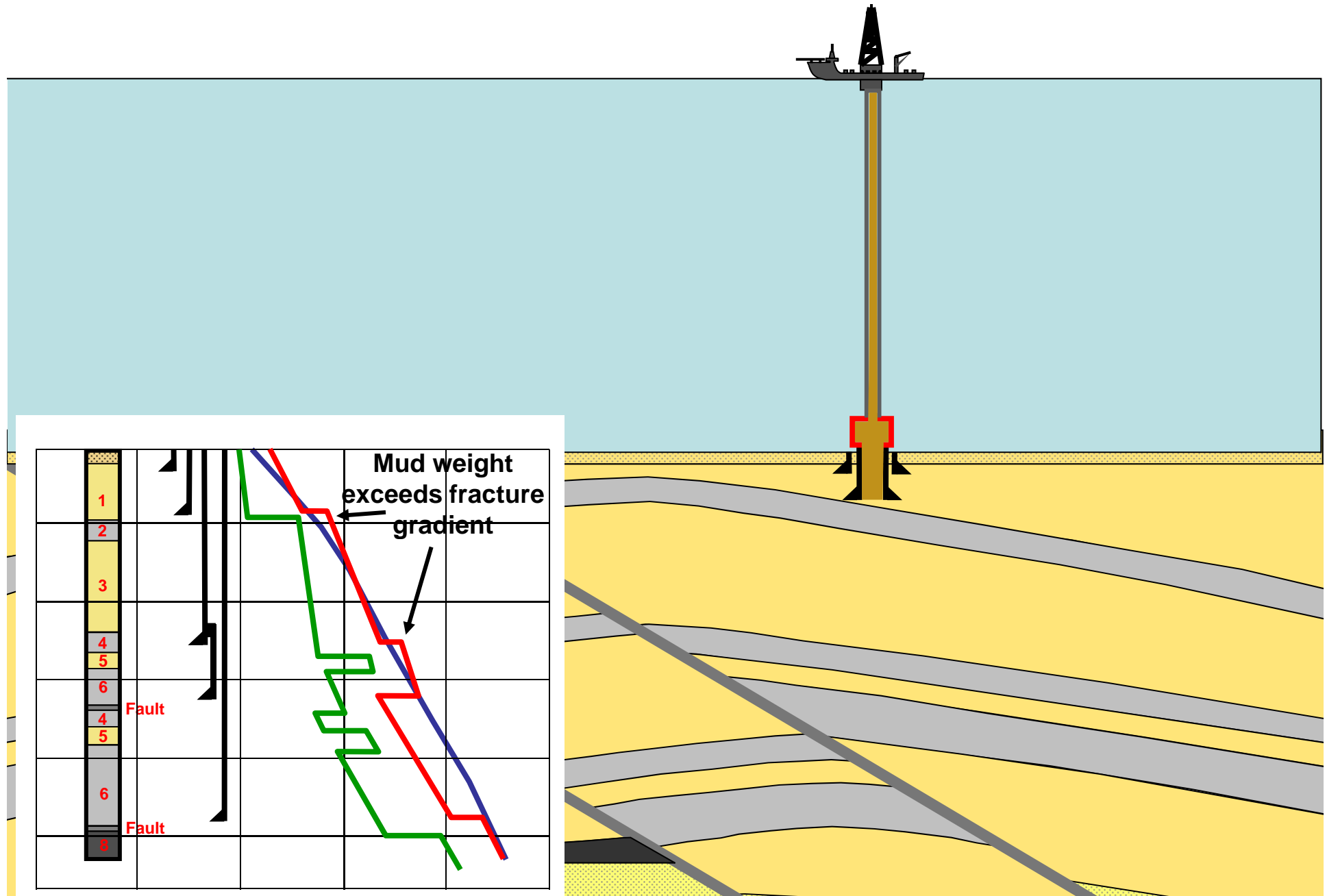
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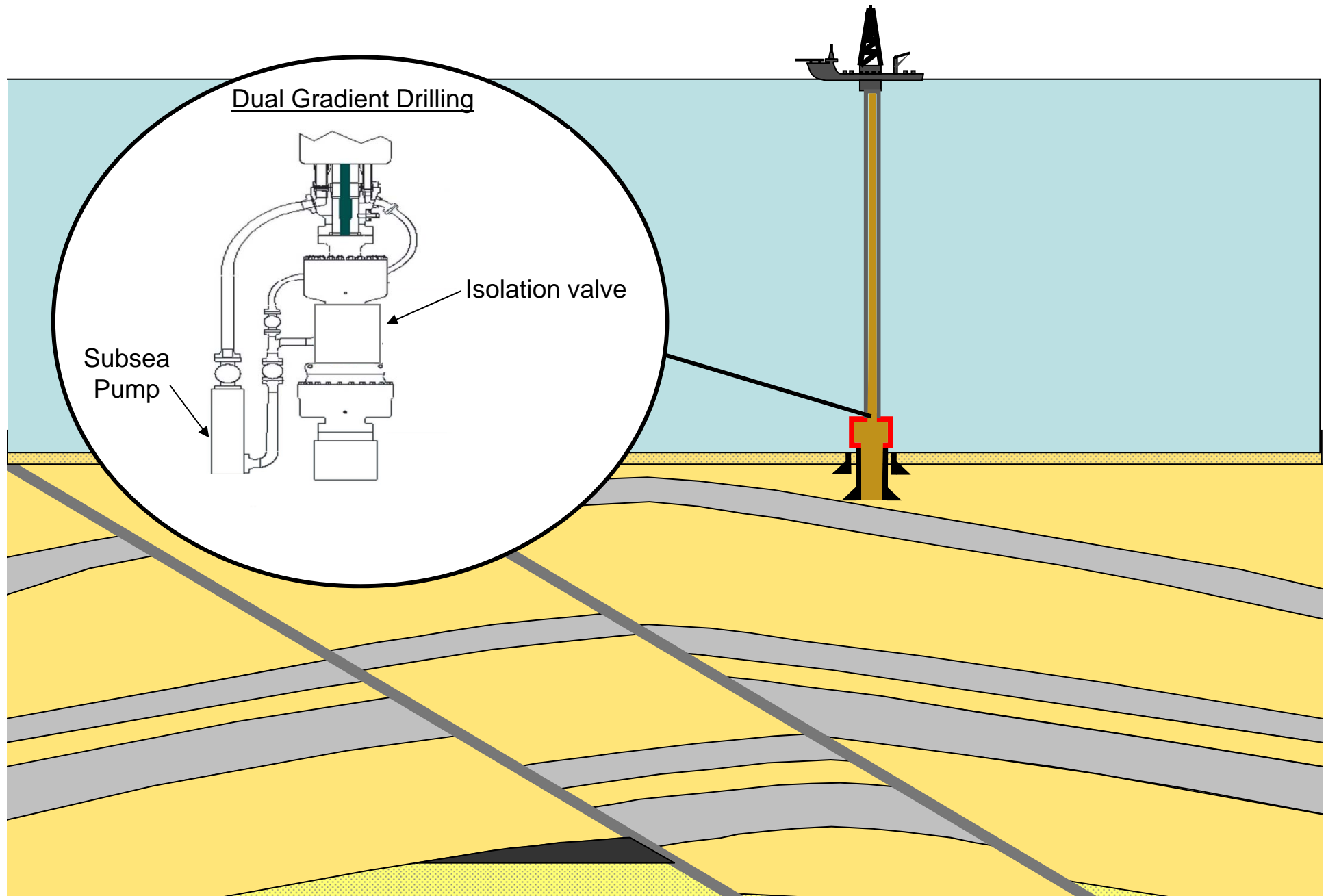
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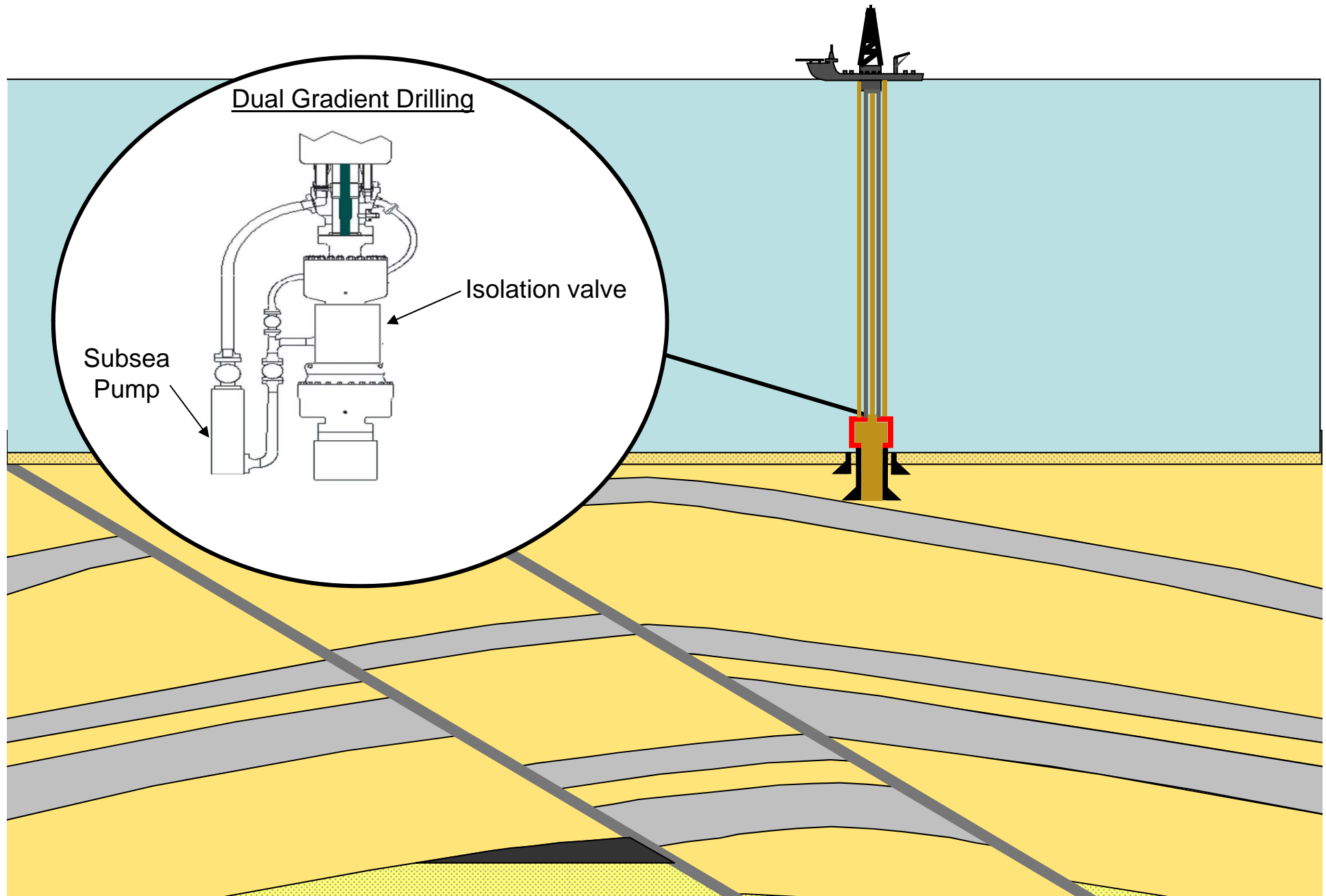
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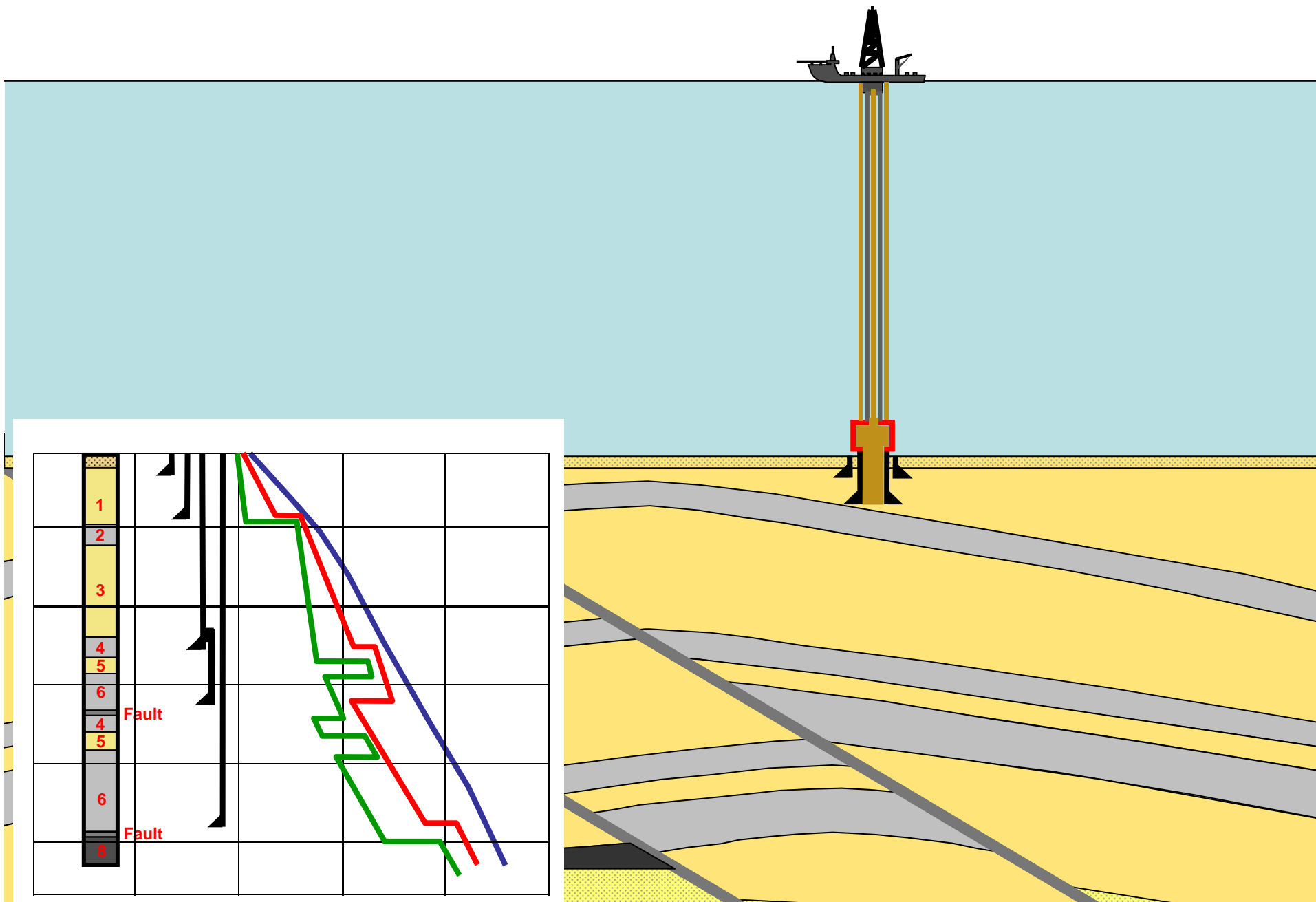




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## Deepwater Drilling

- What makes it more difficult than conventional drilling?
  - Coping with gas hydrates.

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## Gas Hydrates

Can form in low  
temperature / high  
pressure environments



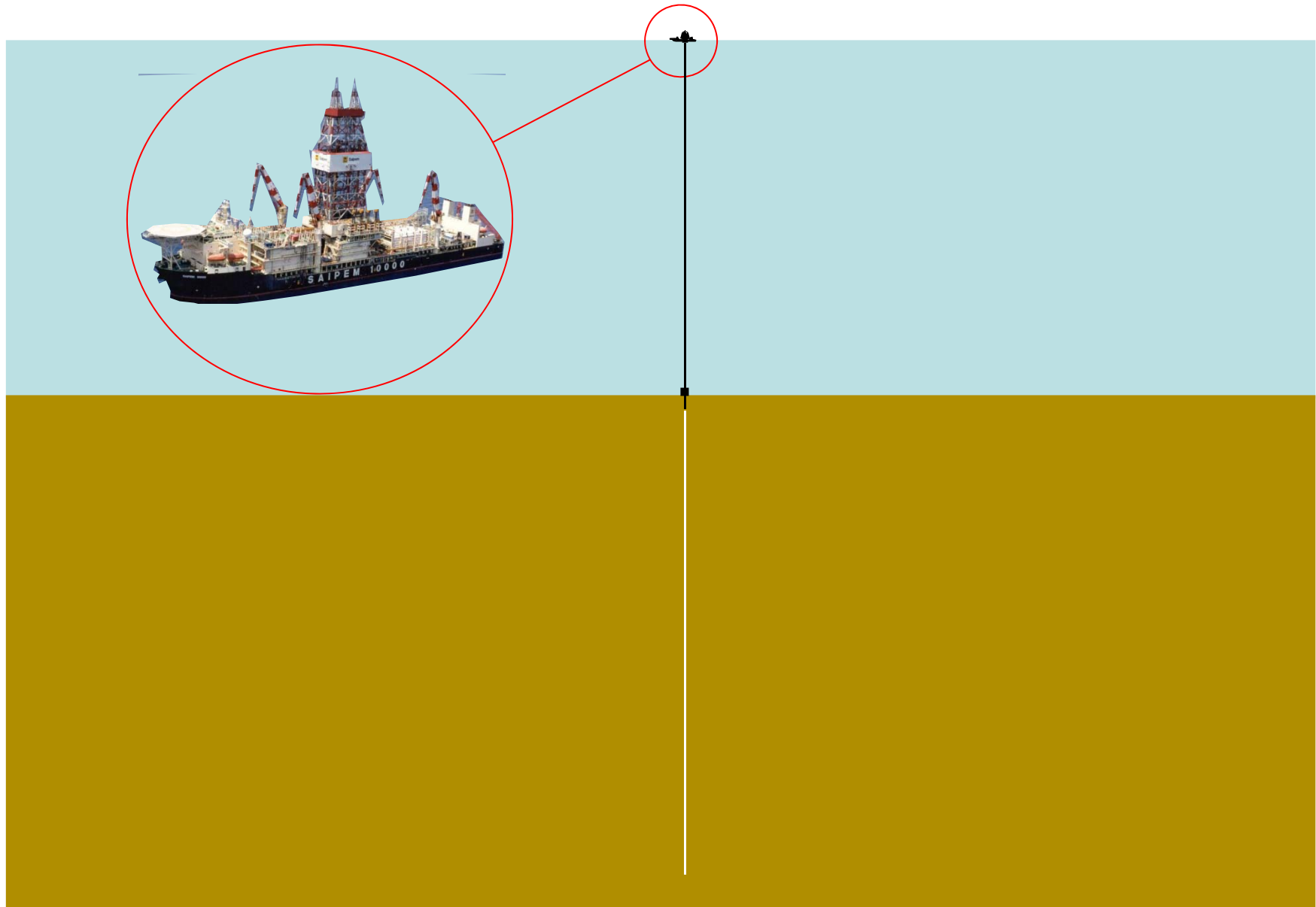
## Deepwater Drilling

- What makes it more difficult than conventional drilling?
  - Coping with gas hydrates.
    - Form in low temperature / high pressure environments.
    - Can block well control equipment and risers.
    - Can prevent emergency disconnection of the riser.
- What technological advances are being employed?
  - Use of an inhibitive mud system.
  - Spotting inhibitive fluids for planned downtime.
  - Improved design and engineering of equipment

## Deepwater Well Control Considerations

- Gas Hydrates.
- Shallow water flows.
- Trapped gas in the BOP.
- Relief rig availability.
- BOP technology.

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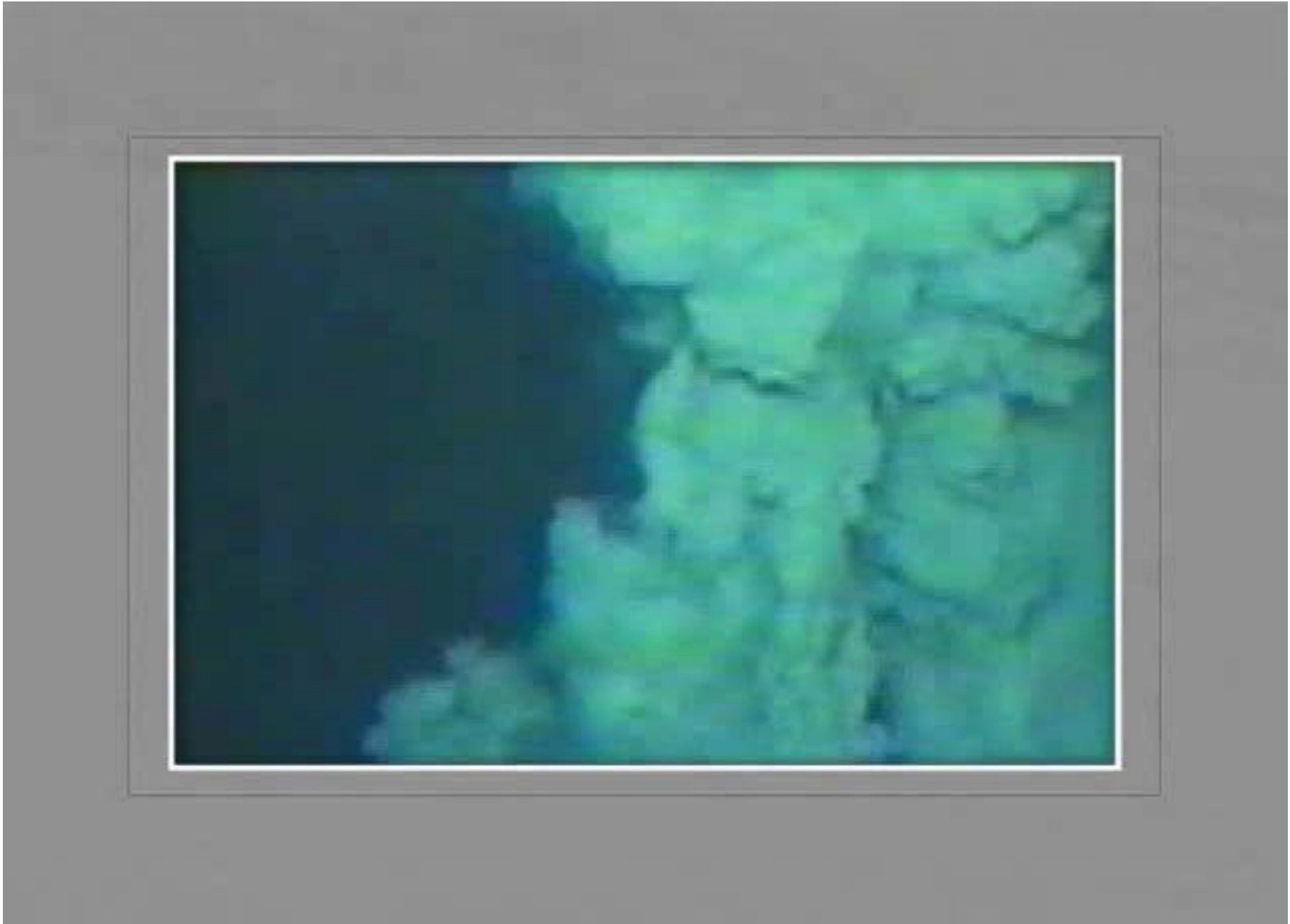
## What does it mean for the market?

- Time cannot be pushed back - deepwater drilling is here to stay.
- Whilst industry base line costs may soften, deepwater drilling costs show no sign of reducing.
- Drilling costs will remain the main influence on total claim quantum when considering large control of well claims.
- Well AFE's are the most accurate means available to set realistic limits and rates.

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The need to exploit resources will always drive the development of new technology and present new challenges for the insurance industry.

On that profound and deep note ....



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# Deepwater Drilling and Well Control

**A presentation by Andrew Rees**

**Lillehammer Energy Claims Conference 2009**