MCEDD

DEEPWATER DEVELOPMENT

28 - 30 March 2023 | Millennium Gloucester Hotel | London, UK

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MCEDD 2023

Multilateral Technology:

Access Marginal Reserves and Extend Life of Deepwater Fields

Tom Fanchin

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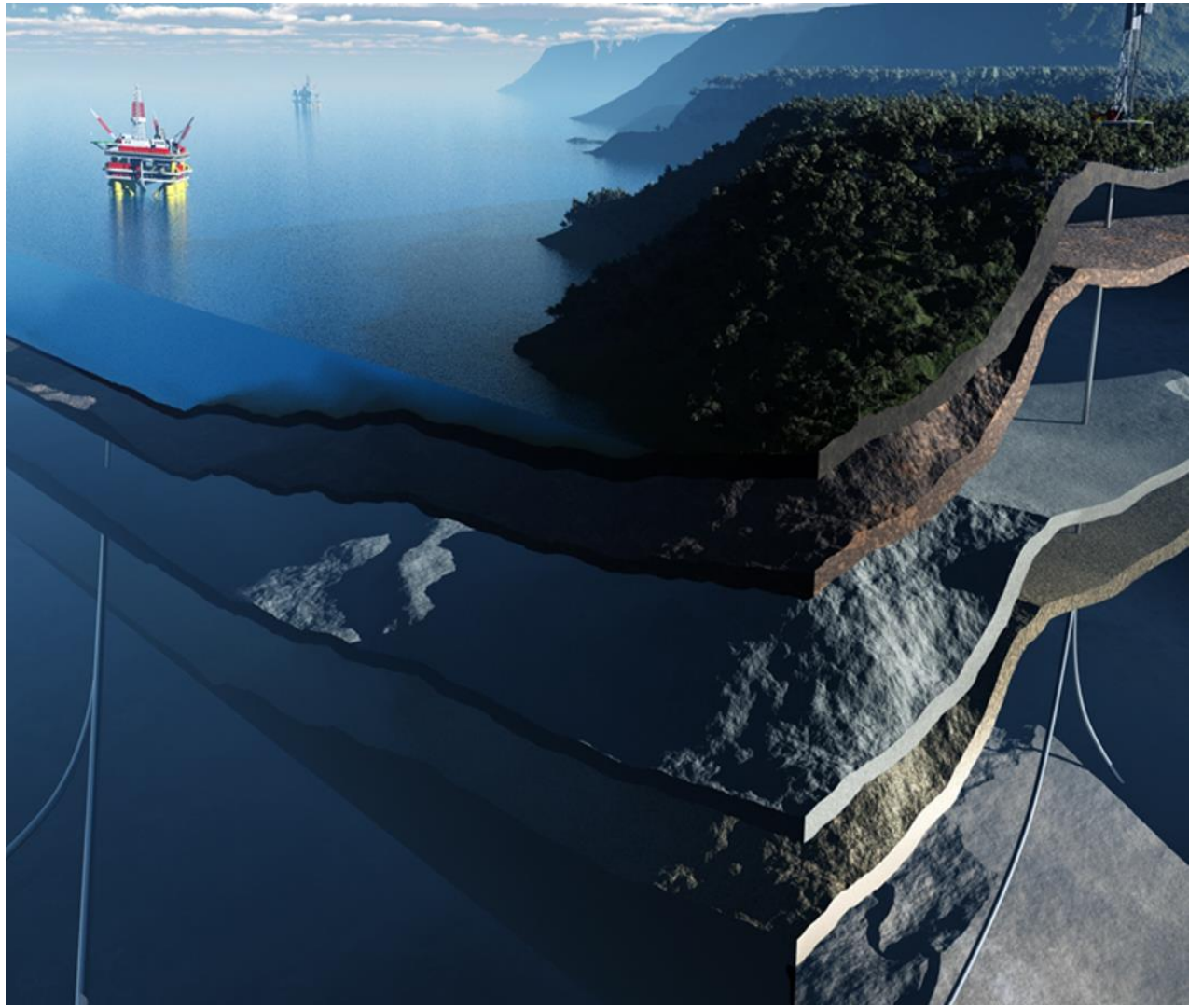
Agenda

- Multilateral Wells and Multilateral Technology
- Reservoir Contact
- Slot Optimization
- Marginal Targets
- Operational Efficiency
- Environmental Impact
- Summary

What is a Multilateral Well?

- One main well bore with attached lateral well bores
- All wellbores communicate with the main well bore individually, or by commingling production.



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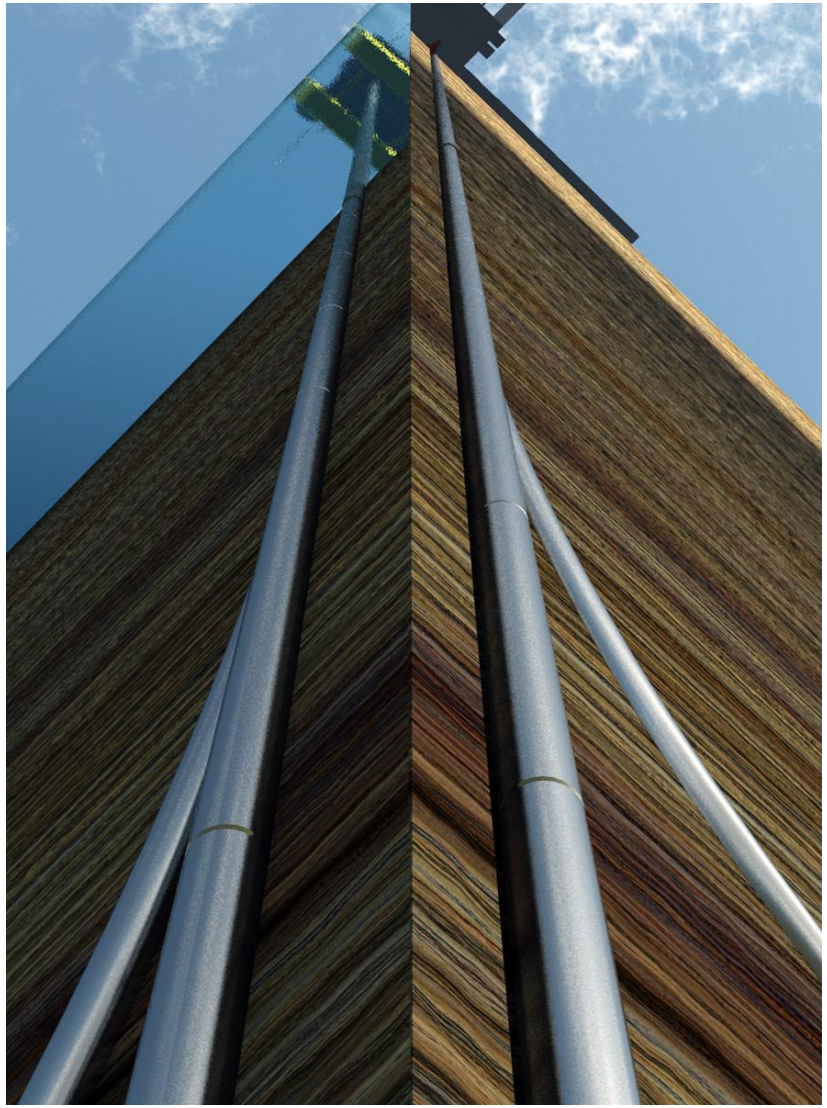
What is Multilateral Technology

- Technology used to construct the junction
  - Mill window
  - Access lateral for drilling and completion
  - Complete junction
  - Tie in upper completion

Extend Field Life

Maximize	Reservoir Contact
Optimize	Slot Usage
Access	Marginal Reserves



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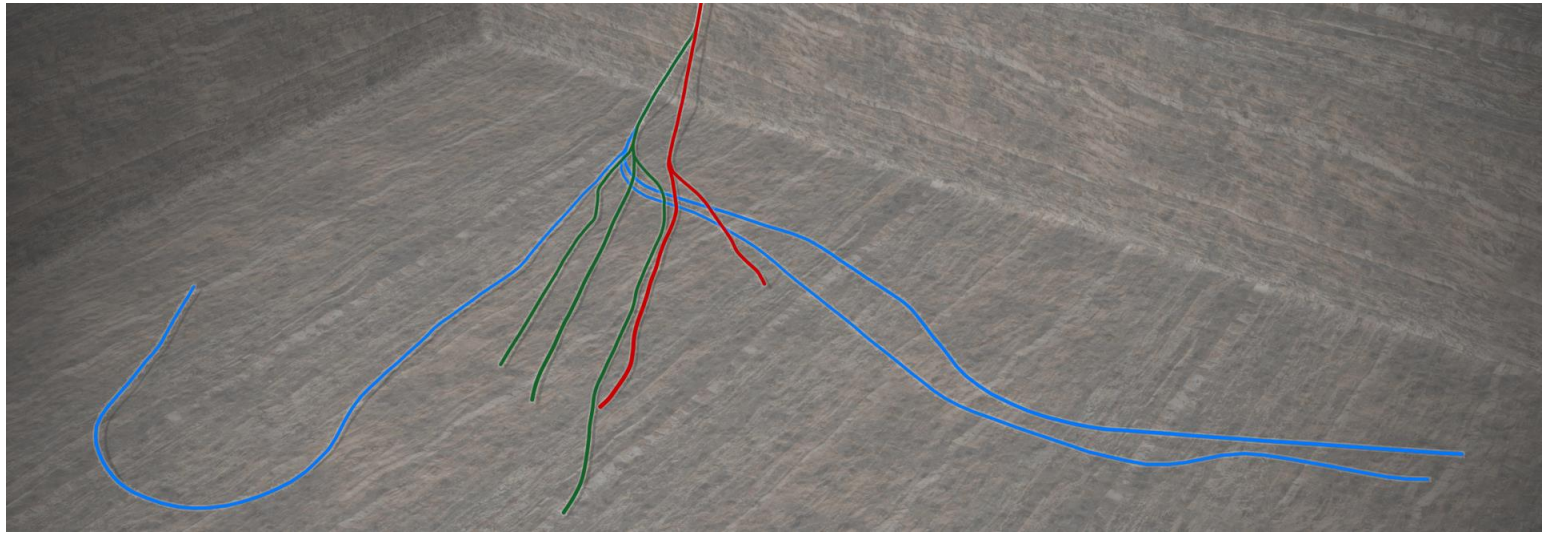
Maximize Reservoir Contact

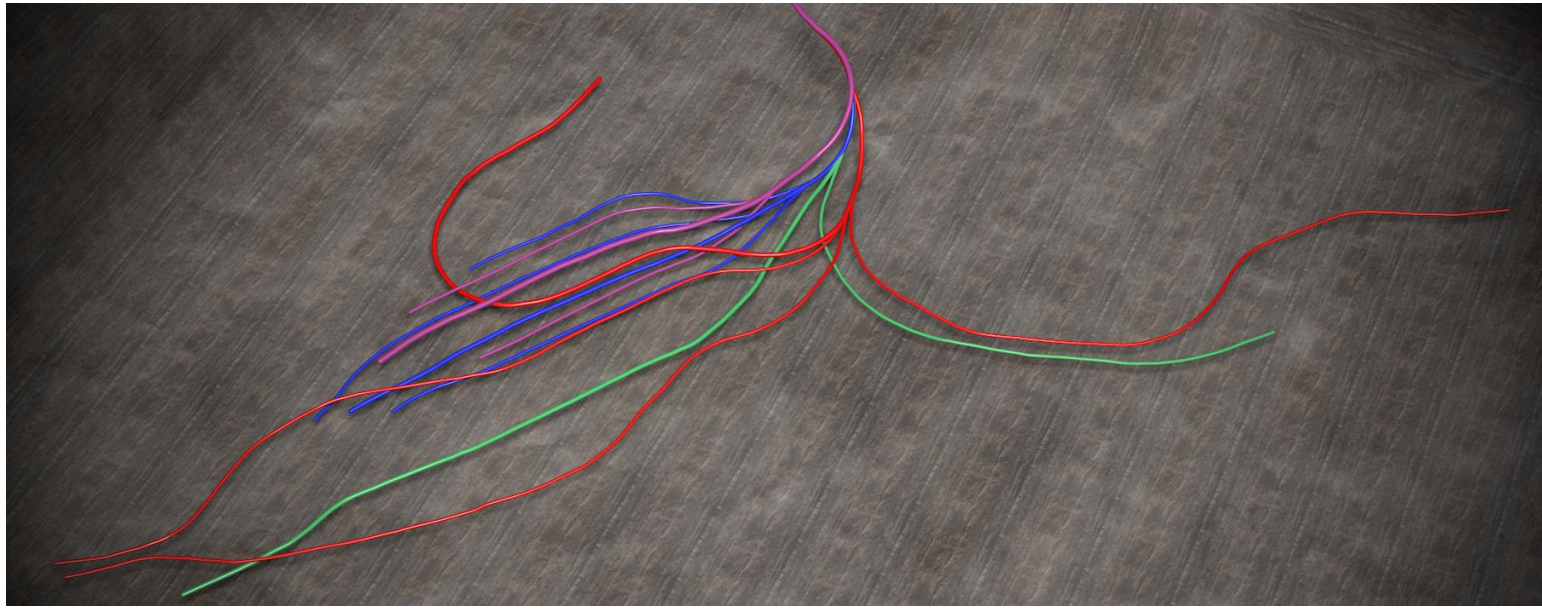
Slot 1 Reservoir Contact

- Dual-Lateral 15,685 ft
- Tri-Lateral 31,499 ft
- Tri-Lateral 64,564 ft
- **Total 111,748 ft**



Slot 2 Reservoir Contact

- Tri-Lateral 24,373 ft
- Quad-Lateral 37,897 ft
- Dual-Lateral 28,189 ft
- Quad-Lateral 65,965 ft
- **Total 156,424 ft**



Reference SPE-210399-MS, OTC-38155-MS

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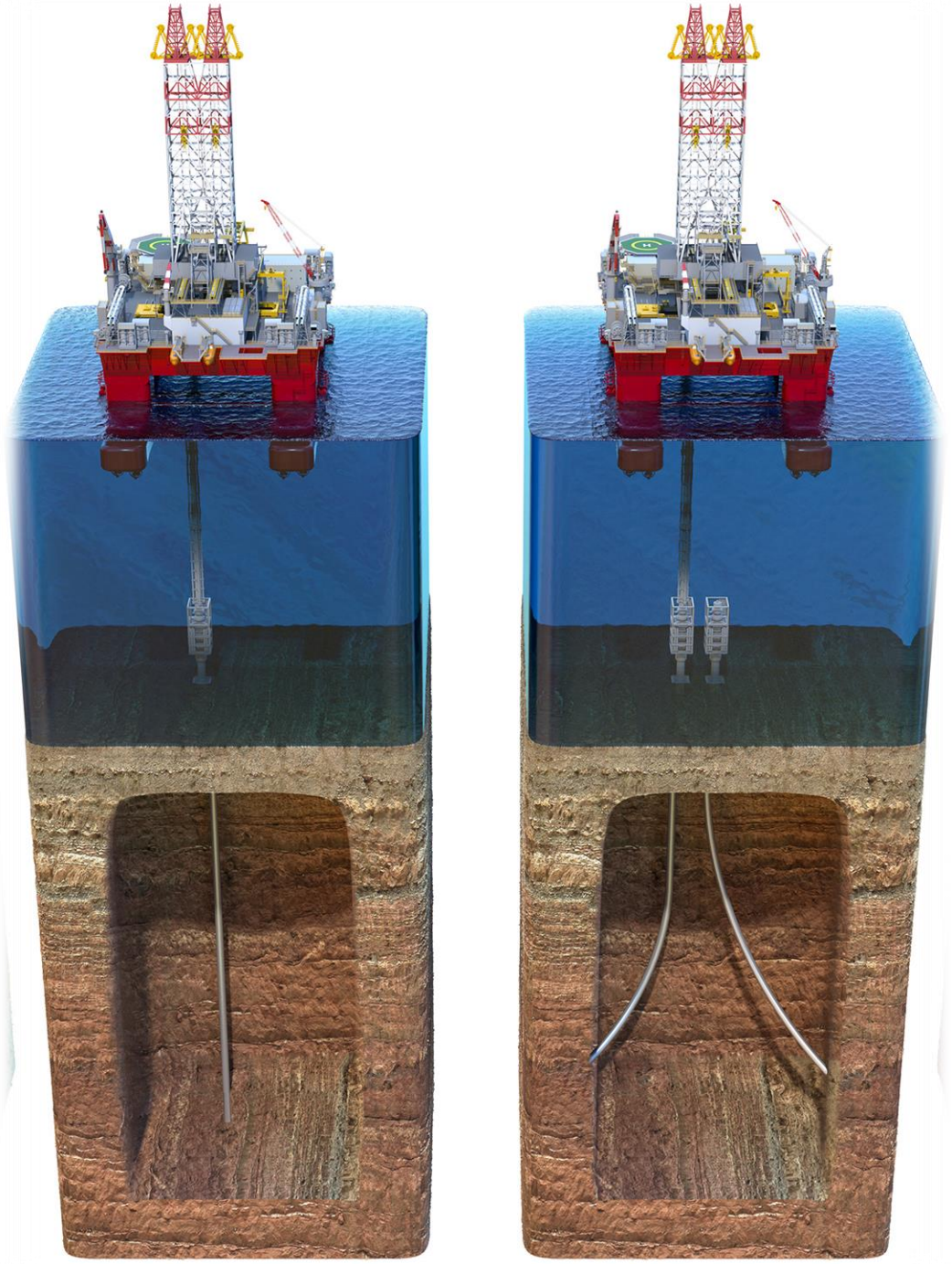
Optimize Slot Usage

- Reentry Multilateral
  - Side track (deep or shallow) where the previous well is abandoned
  - A multilateral well is constructed
- Retrofit Multilateral
  - Previous wellbore is temporarily plugged
  - New lateral wellbore(s) is constructed
  - The plug is removed and production from the new lateral(s) and previous wellbore are brought online

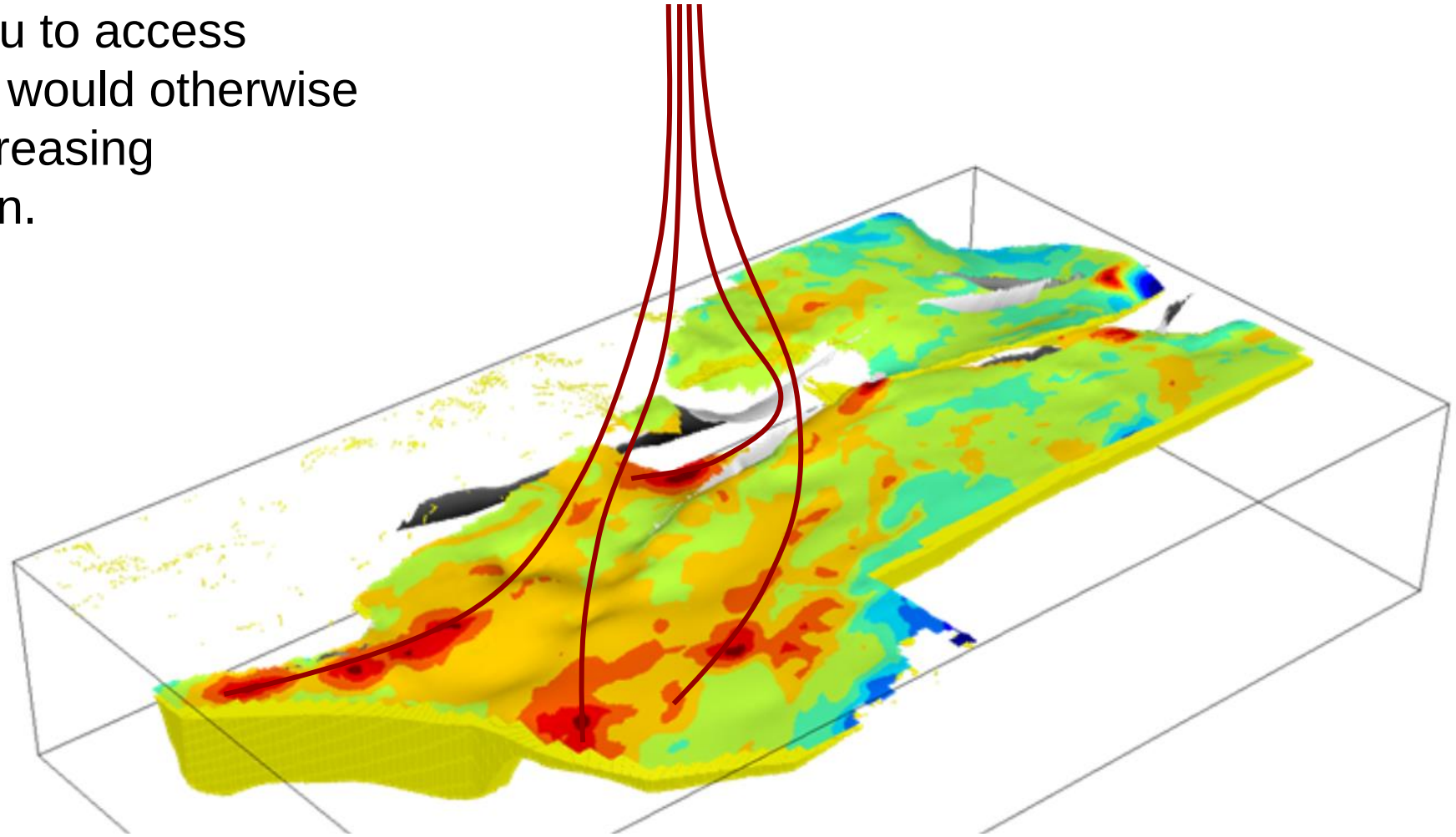


Optimize Slot Usage

- Voice of the operator
  - Use of retrofit MLT should increase the number of available slots for deep sidetracks
    - Will reduce P&A and drilling cost since more optimal wells can be sidetracked to new targets
    - More targets will become economical
    - Predictable drilling schedule can be maintained
  - Retrofit multilateral solutions will be important for future infill drilling in mature fields in order to maintain current production levels
  - Will enable planning of deep sidetracks from the most optimal wells relative to the targets to be drilled
  - Will reduce the well cost and allow for drilling and producing less economical reserves in mature fields
  - There is a potential for further development of the retrofit MLT equipment and capabilities to make this solution even more attractive and thus provide for a broader use

Access Marginal Reserves

- Multilaterals allow you to access marginal targets that would otherwise be uneconomical increasing cumulative production.



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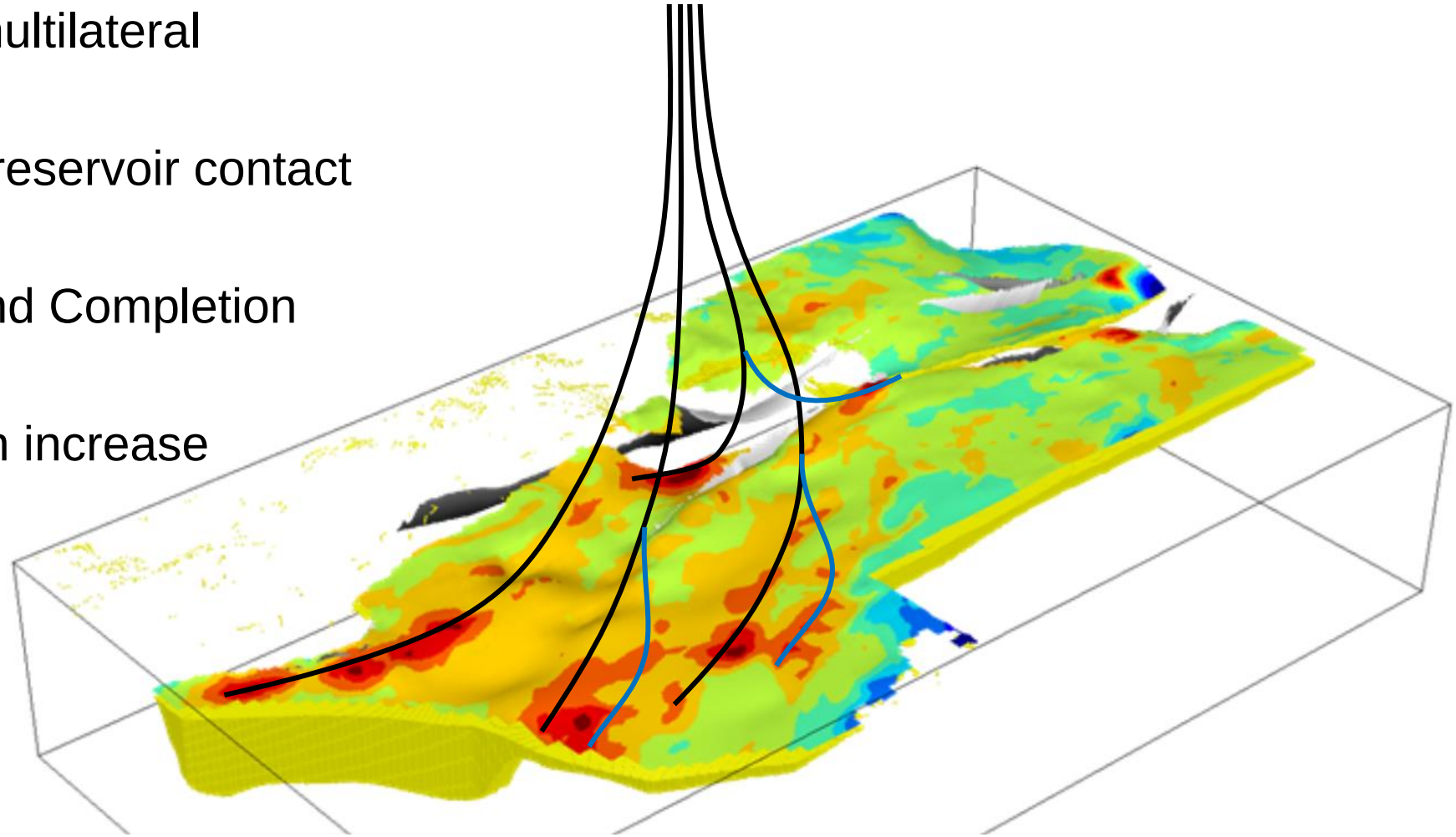
Access Marginal Reserves

- By implementing a multilateral strategy
  - ~75% increase in reservoir contact was achieve
  - ~20% in Drilling and Completion costs
  - 10-15% production increase



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Increase Operational Efficiency

2002 Dual Lateral

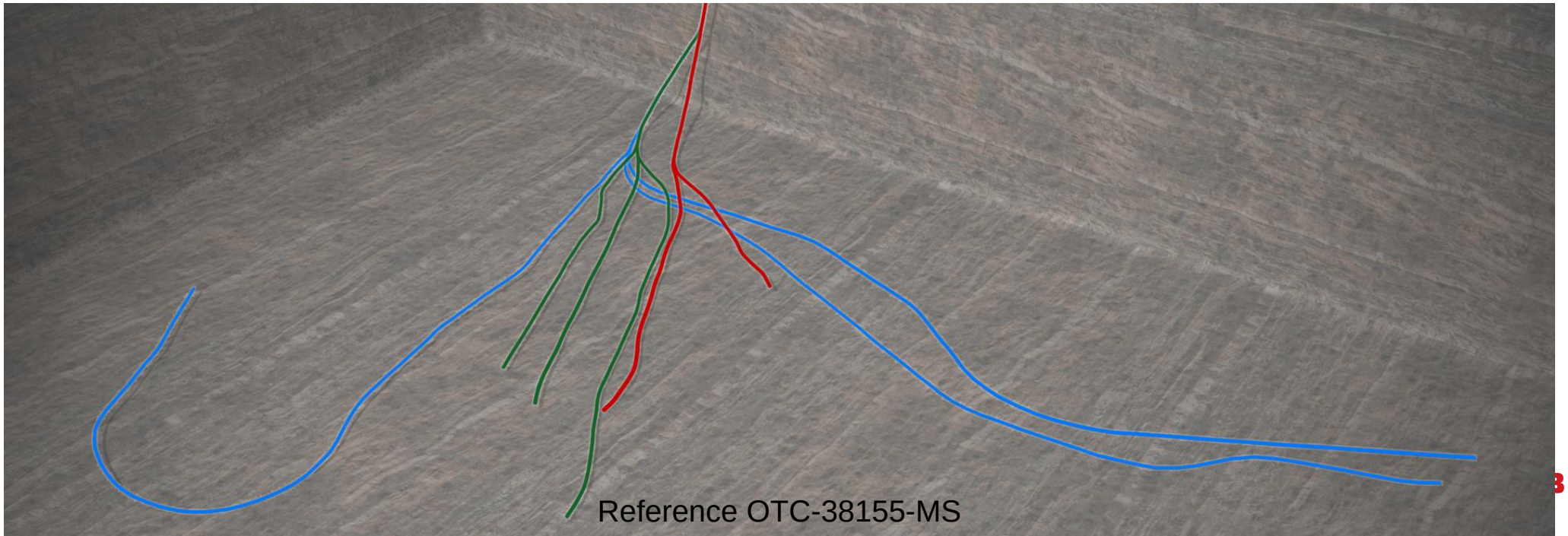
- 86 Operational Days
- 15+k ft of reservoir contact
- 180+ ft/day [+22%]

2014 Tri-Lateral Reentry

- 124 Operational Days
- 31+k ft of reservoir contact
- 253+ ft/day [+39%]

2020 Tri-Lateral TXT Reentry

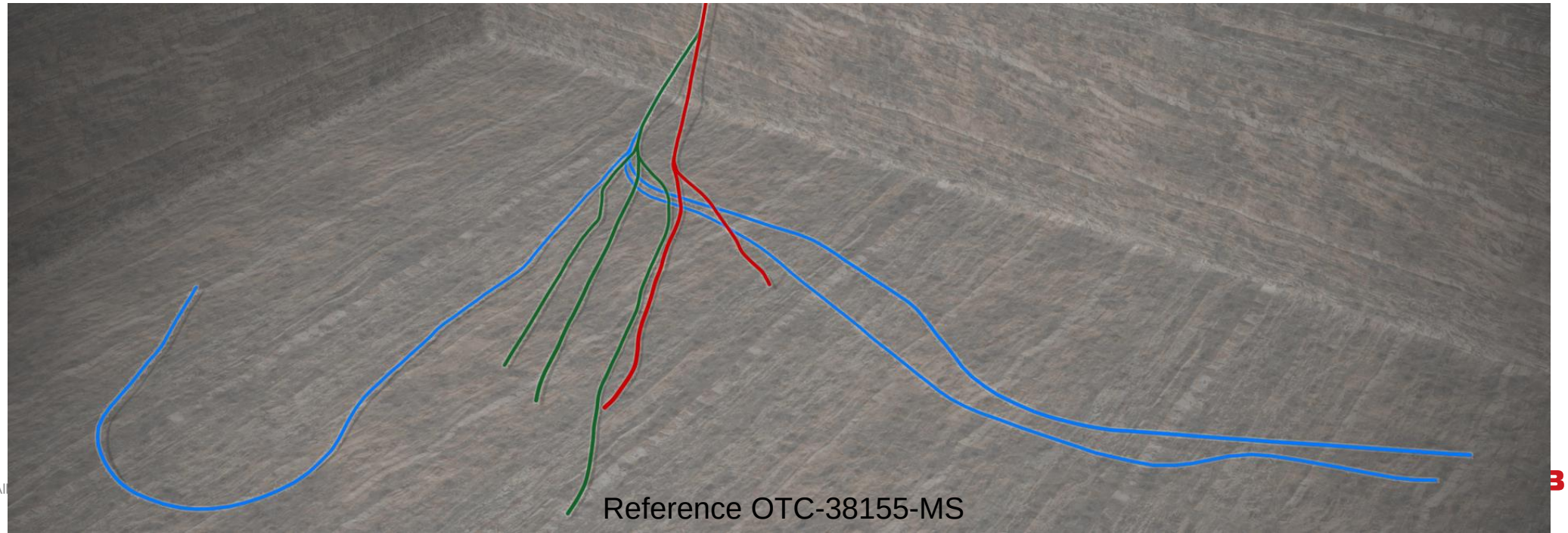
- 123 Operational Days
- 64+k ft of reservoir contact
- 523+ ft/day [+105%]



Reference OTC-38155-MS

Reduce Environmental Impact

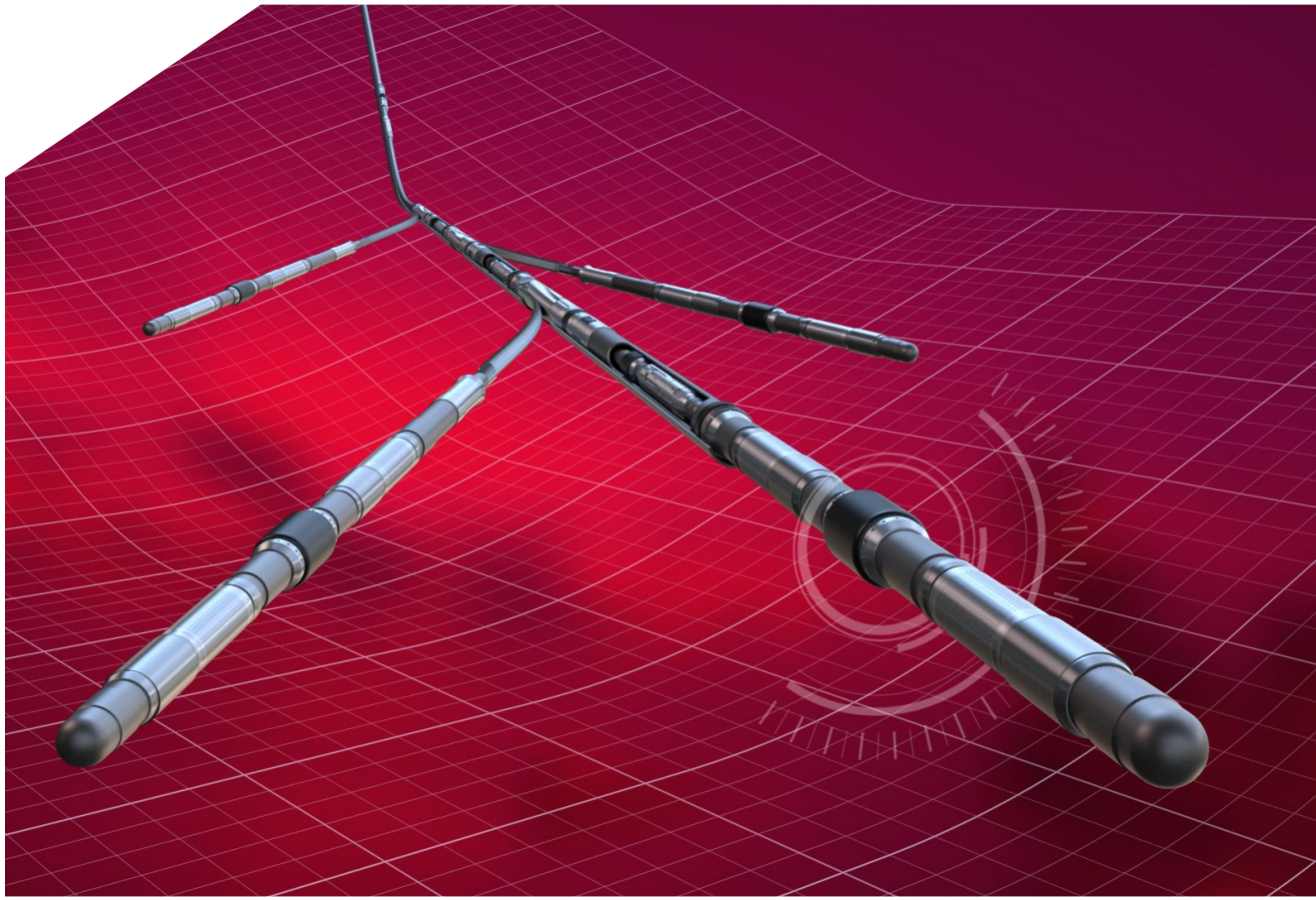
- Three multilaterals vs 8 Horizontal wells
- Eliminated
  - 100 Operational Days
  - 5 Million Pounds of Steel
  - 8 Thousand Barrels of Cement



Reference OTC-38155-MS

Multilateral Technology Capabilities

- Intelligent Completion Integration
- Lateral Flow Control
- Sand Control / Gravel packing
- Lateral stimulation
- Through-Completion Intervention
- Re-entry & Retrofit
- ERD Lateral Completions



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Summary

Multilateral Technology

- Mature and Field Proven
- Improves Asset Value
- Extends Field Life
- Maximizes Reservoir Contact
- Increases Operational Efficiency
- Optimizes Infrastructure
- Reduces Environmental Impact

Thank You

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