



**39<sup>th</sup> Gas-Lift Workshop**  
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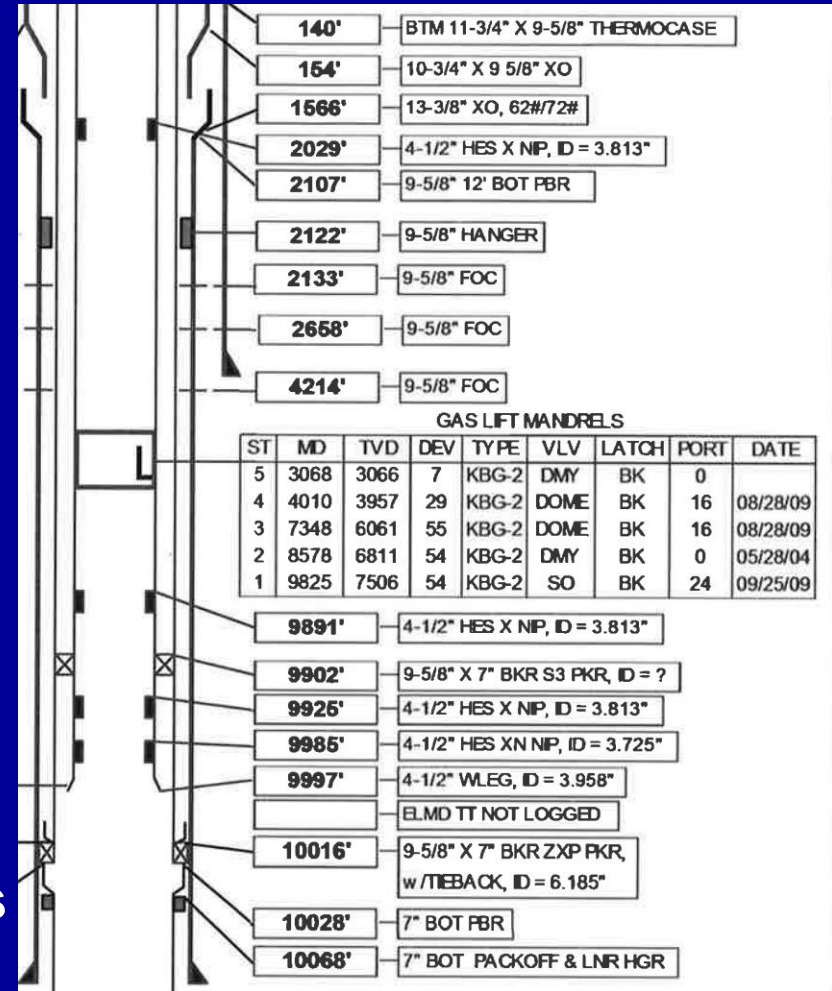
# **1” Barrier Gas Lift Field Trial in Alaska**

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- Jennifer Julian, Sr. Wells Advisor, BP Alaska**
- John Paul Kenda, Gas Lift Design Eng, Arctic Lift Systems**

# Background

## Typical North Slope Well Design

- Brown Field, Almost 45+ years.
- 4-1/2" Completions in 7" 26-ppf casing (Slimhole mandrels)
- Wide range of production rates, typically high W.C. or GOR.
- High Injection Rates, 2.5 to 4 mmcf/d
- Top Mandrel for freeze protection.
- Freeze protect every time the well is shut in for any length of time.



# Other Field Considerations

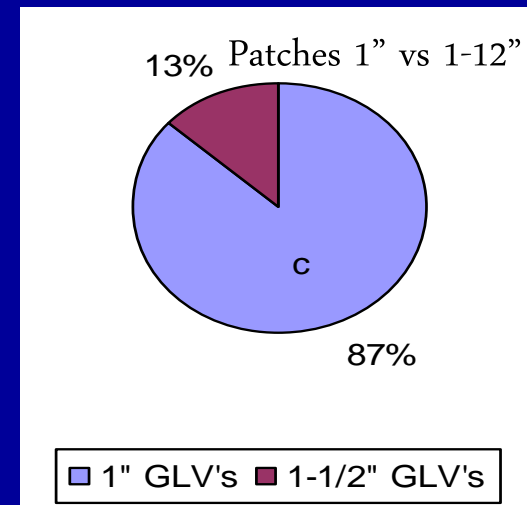
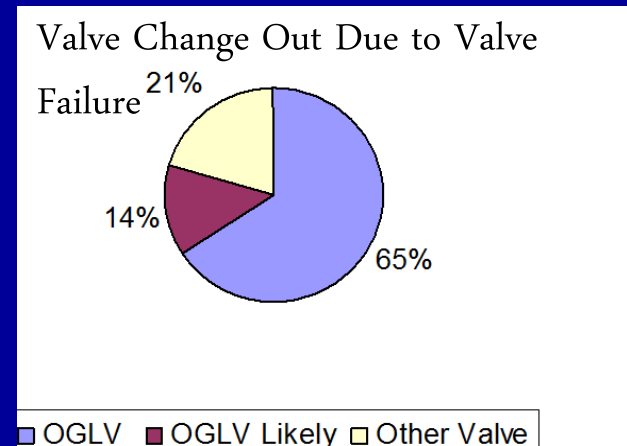
- **Some temporary Direct Injection gas lifted wells.**
- **Surface de-watering not always feasible**
- **Integrity issues not immediately discovered, lead to flow cut checks, valves, and even mandrels.**
- **Expensive and High risk operations to change out valves in Arctic conditions**



# Past Issues with Standard GL Equipment

Observed Damage to standard GL Valve checks lead to:

- Fluid swapping in annulus
- Wellbore Integrity Issues
  - Since 2003, 271 valve change outs on 227 wells.
  - Spend is \$650K/year for GLV replacement
- Damage to Mandrels if not repaired
  - 22 straddles since 2011.
  - Change out every 2-1/2 to 3-1/2 years



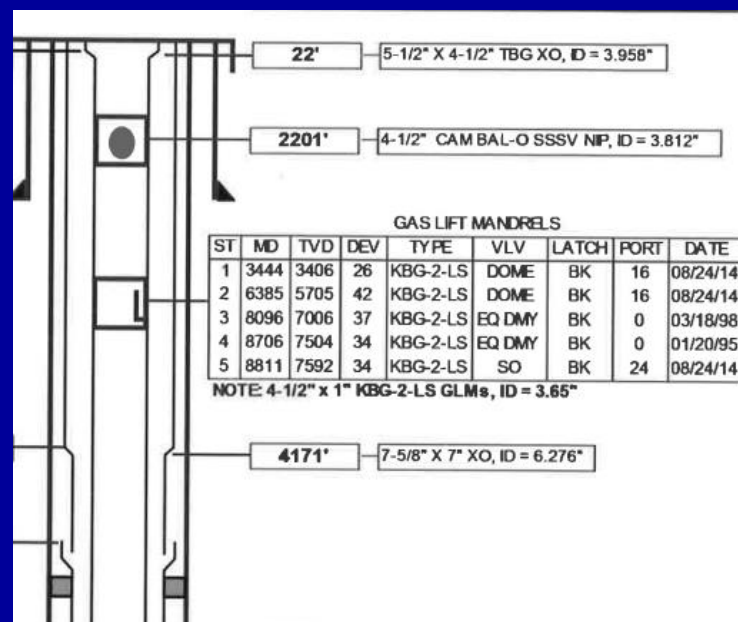
# Scope

- **Field Test the 1" Gas lift Valves for Commercialization**
- **Determine if Barrier GL Technology can reduce frequency of Wellbore Integrity issues related to GL Equipment**
- **Determine if Barrier GL Technology can significantly increase valve life in high injection installations.**



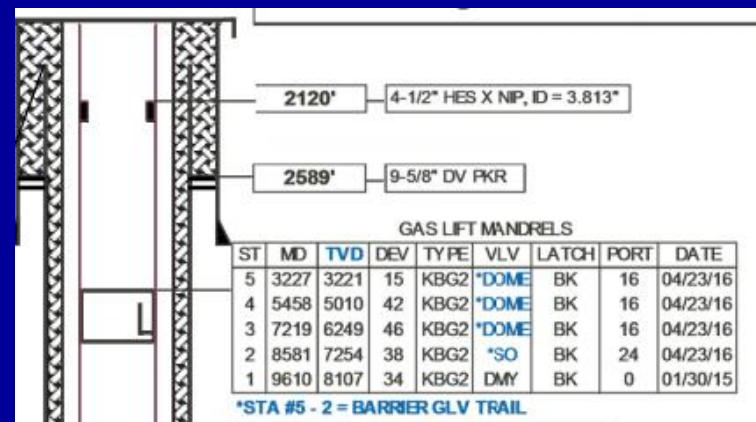
# Field Trial; Well A

- Pressure: 2960-psi
- Temperature: 219F
- Flow Rate: 897BFPD, 91%WC
- Gas Injection Rate: 2.5 MMSCFD (dry)
- 12% CO<sub>2</sub>, 120-ppm H<sub>2</sub>S
- Scale/Paraffin History: None
- Field trial successfully completed



# Field Trial; Well B

- Pressure: 2960-psi
- Temperature: 219F
- Flow Rate: 2350BFPD, 0.8 MMSCFPD Form gas, Flowing tubing pressure= 250psi
- Gas Injection Rate: 1600-psi, 3.2 MMSCFD (dry)
- 120-ppm H2S
- Scale/Paraffin History: None
- Field trial still in Process.



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