Hitting the Accelerator on Development

University Lands Partner Forum

Nitin Chowdhury
Shell
Shell Position in Delaware Basin

- Permian position acquired in 2012 from Chesapeake Energy
- Approximately 250K net acres in Delaware basin
- Operatorship split between Shell and Anadarko
- University Lands ~ 32K gross acres, with Shell as the operator
Shell Operated Permian Production from 2015 – Present

100+% increase in 1 year
From 2015 to 2017, activity moved from leasehold and appraisal to development

- Higher emphasis on near-term cashflow
- Organizational focus on well delivery process, execution learning curves, savings from repeatability etc.
Drivers to Production Growth - Better wells and Higher Activity

- Proppant intensity increasing with time
- Inline with majority of the industry
- Trials ongoing at higher proppant intensity

Bigger Completions

- Steady growth in EUR/well
  - Longer average lateral length
  - Shift to higher proppant intensity completion
  - Better estimate of well performance with longer term data

Higher EUR/well

- Increasing activity levels over the last couple of years as the asset has moved into development

Increasing Rig Count
Lower Cost Structure & Better Wells Over Time

- Drilling efficiencies
- Benchmarking and learning from partners/peers
- More predictability & repeatability with move to development

- Longer laterals, bigger completions
- Focus on high graded acreage
- Debottlenecking of surface constraints
Balancing Derisking with Development

- Development focus on 3rd Bone Spring, Wolfcamp X/Y and Wolfcamp A intervals
- Need to think of all targets with small vertical separation as part of a package
- Continuing to de-risk other targets at a measured pace through drill bit and through industry data

*Formations not drawn to scale.*
Balancing Technical & Economic Drivers for Well Spacing

- Reduction in individual well EUR’s as well density increases
- Well spacing interdependency between different benches
- Interference effects may not be apparent early in the production history
- Finding the “right” answer takes too long and changes with external factors
- Multiple well spacing trials planned in early development to further our understanding of well to well interactions
Technology Application Efforts Ongoing

Instrumentation

Completions Optimization

Landing Depth Optimization

Modeling
Infrastructure Being Built Ahead of Production to Minimize Trucking

- Big focus on reducing trucking to minimize HSE exposure and reduce costs
- 95% + water production piped from overall operations
- Major Infrastructure already operational on University Lands
- Trucking only used during initial flowback period and as contingency on University Lands
University Lands – Surface Infrastructure

- **SWD Infrastructure**
  - Currently have 3 SWD facilities & 5 SWD injection wells
  - Plans for additional 3 SWD facilities and 6 SWD injection wells

- **Central Processing Facilities**
  - One CPF currently operational
  - Another CPF expected online end Q2 2018

- **Water Recycle Facility Plans**
  - Expected online end Q3 2018