

ND Pipeline Authority Web Presentation

Bakken Well Economics



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Please view replay video on the Pipeline Authority website for full commentary of the following slides

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Objective

Define where the Bakken/Three Forks system is economic in a lower oil price environment.

Method

Analyze past well performance across the region and estimate well economics for various production levels.

Disclaimer

The goal of this work is not to imply individual company actions or intentions. All view expressed are strictly that of Justin J. Kringstad.

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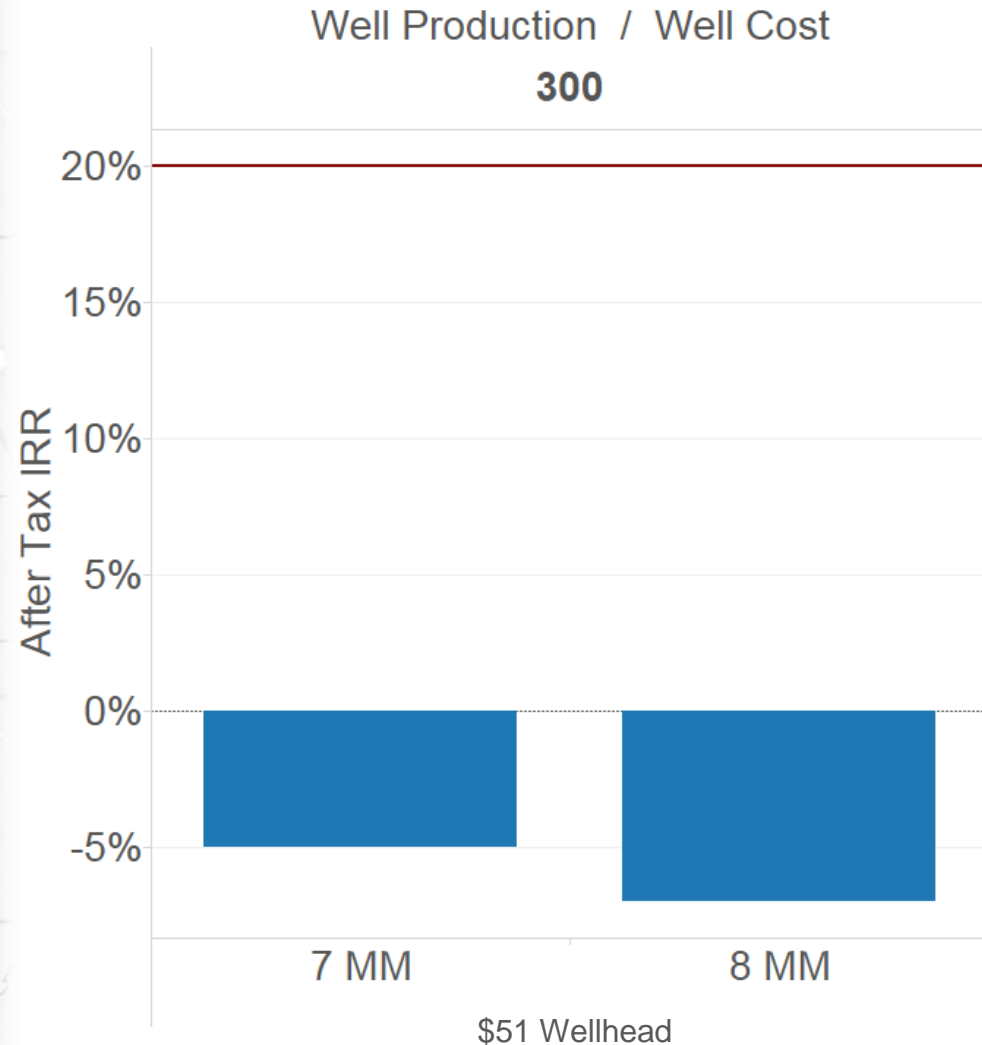
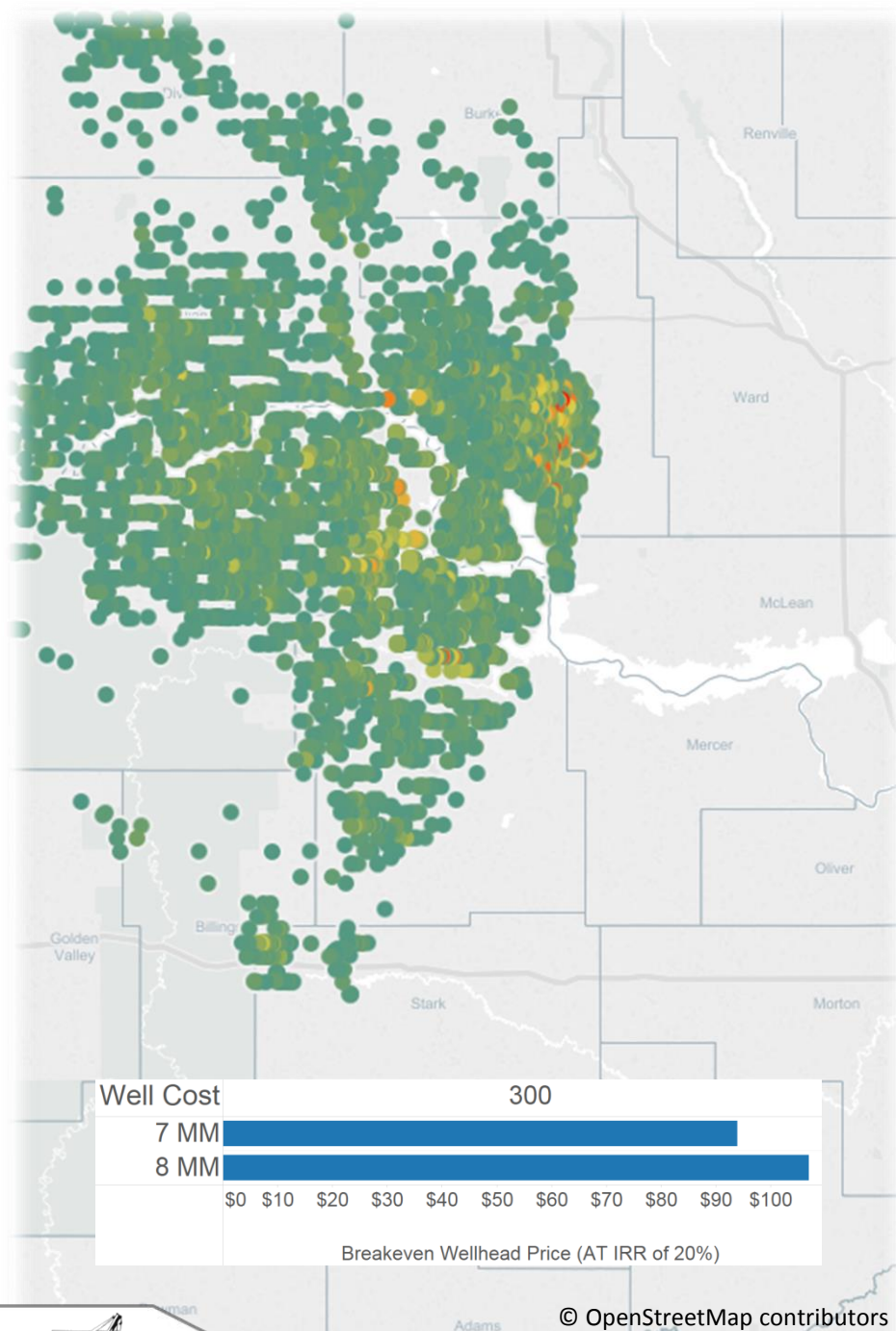


Key Economic Assumptions

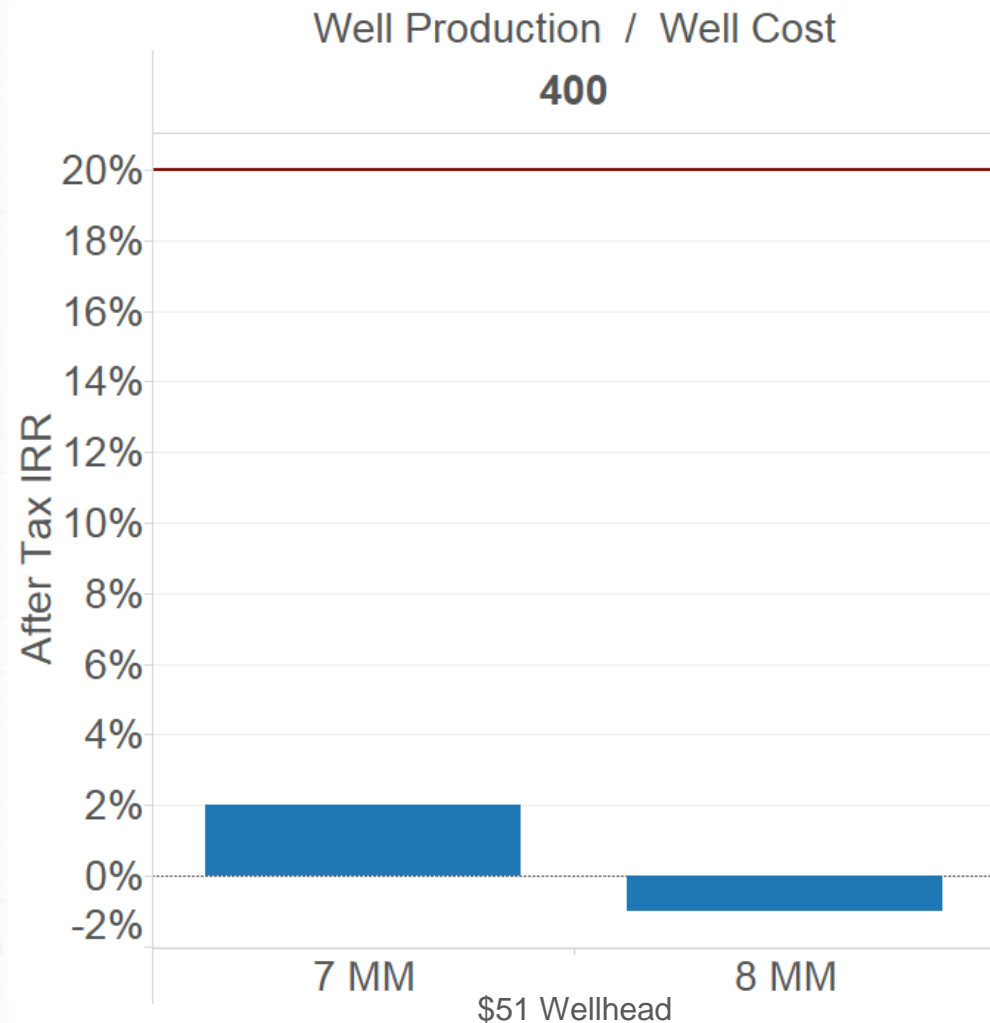
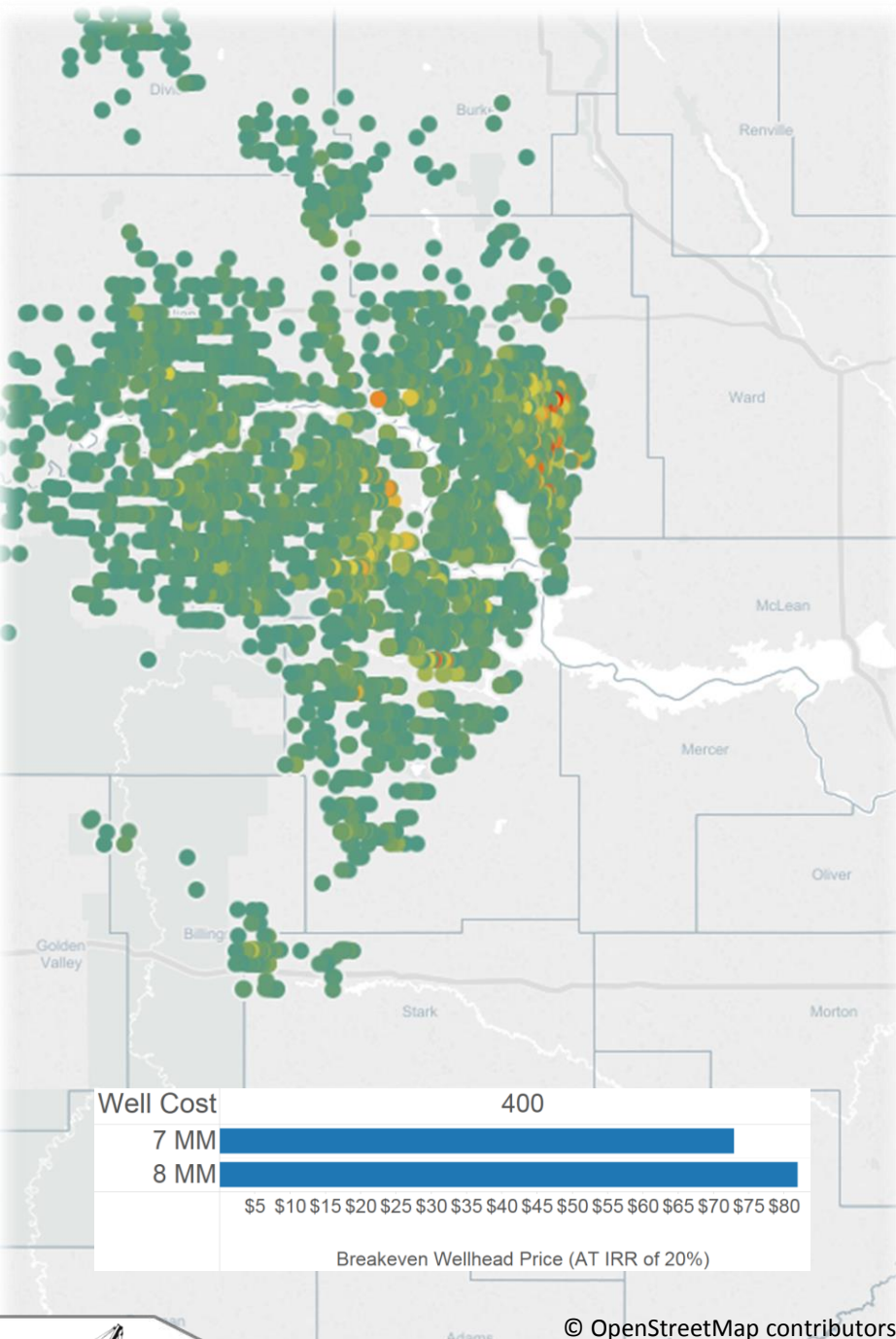
- \$7 & \$8 Million Well Cost
- \$51/BBL Wellhead Pricing
- 1/8 Royalty
- Zero Flaring
- Minimum 20% IRR to drill (calculated after production taxes and royalties)
- Production rate is 30-day average



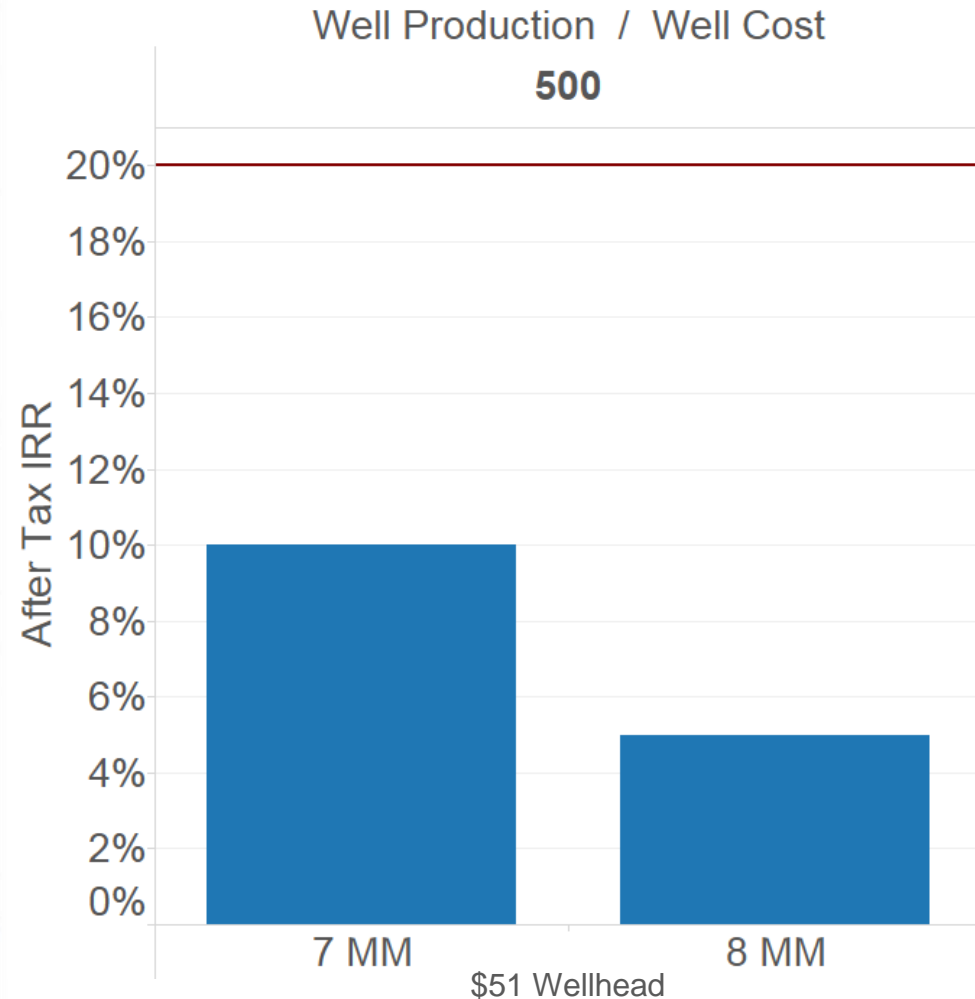
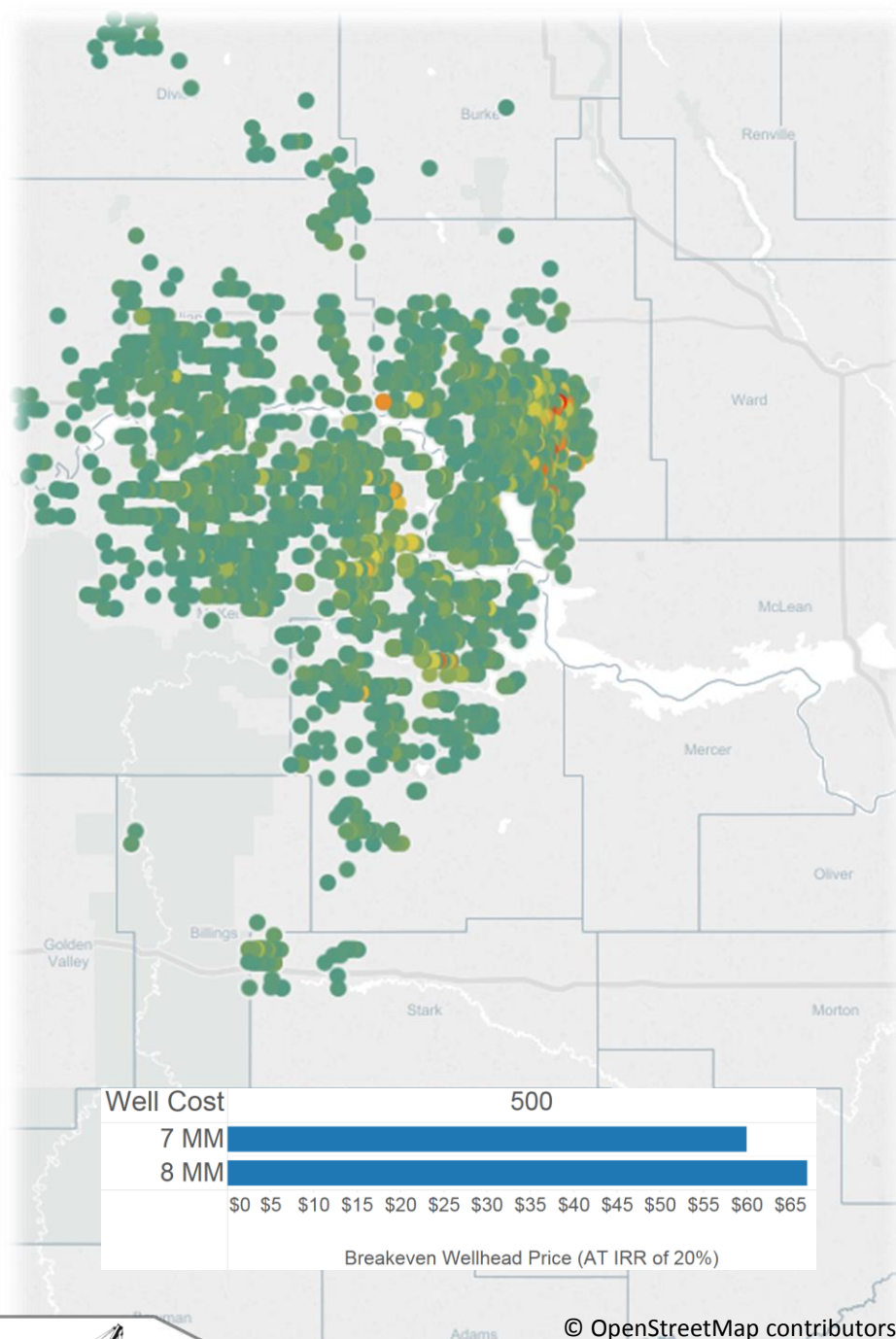
Peak Month Min. 300 BOPD



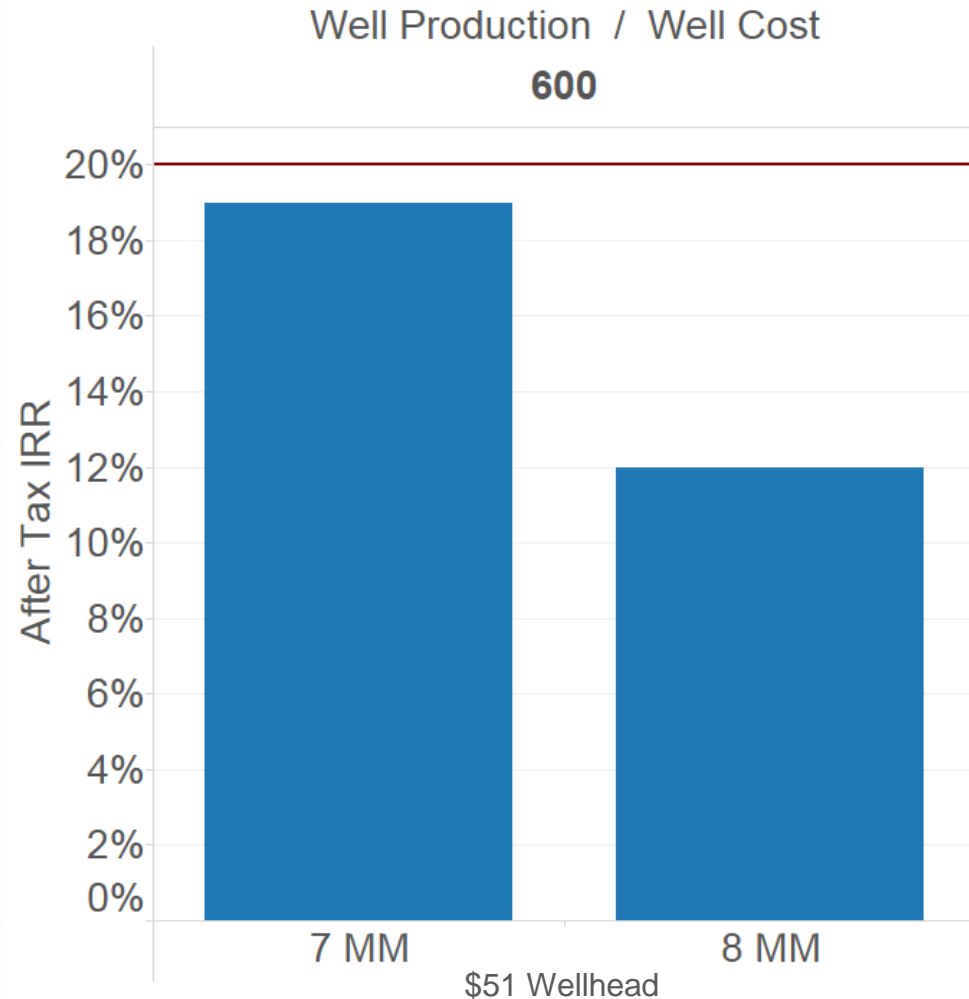
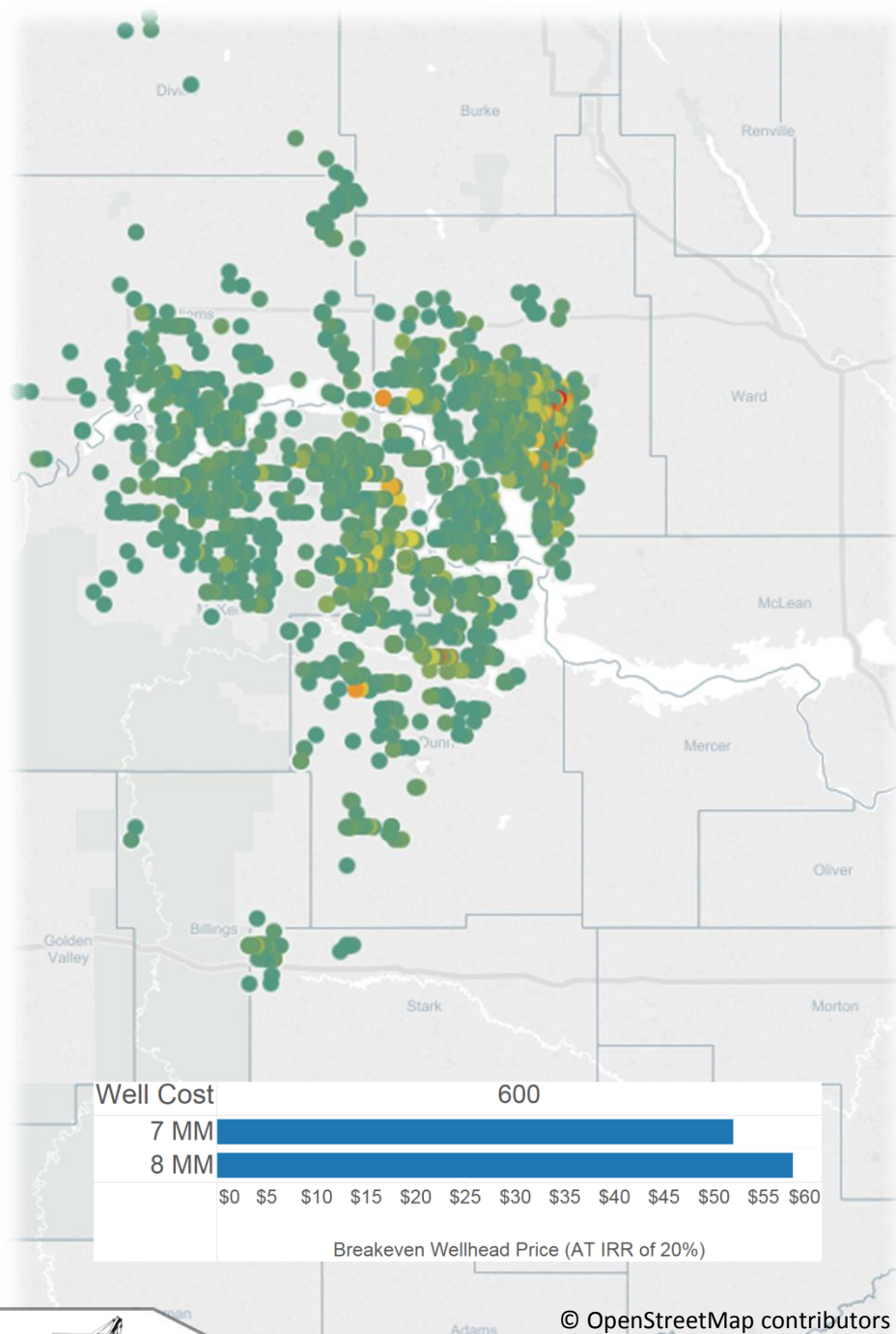
Peak Month Min. 400 BOPD



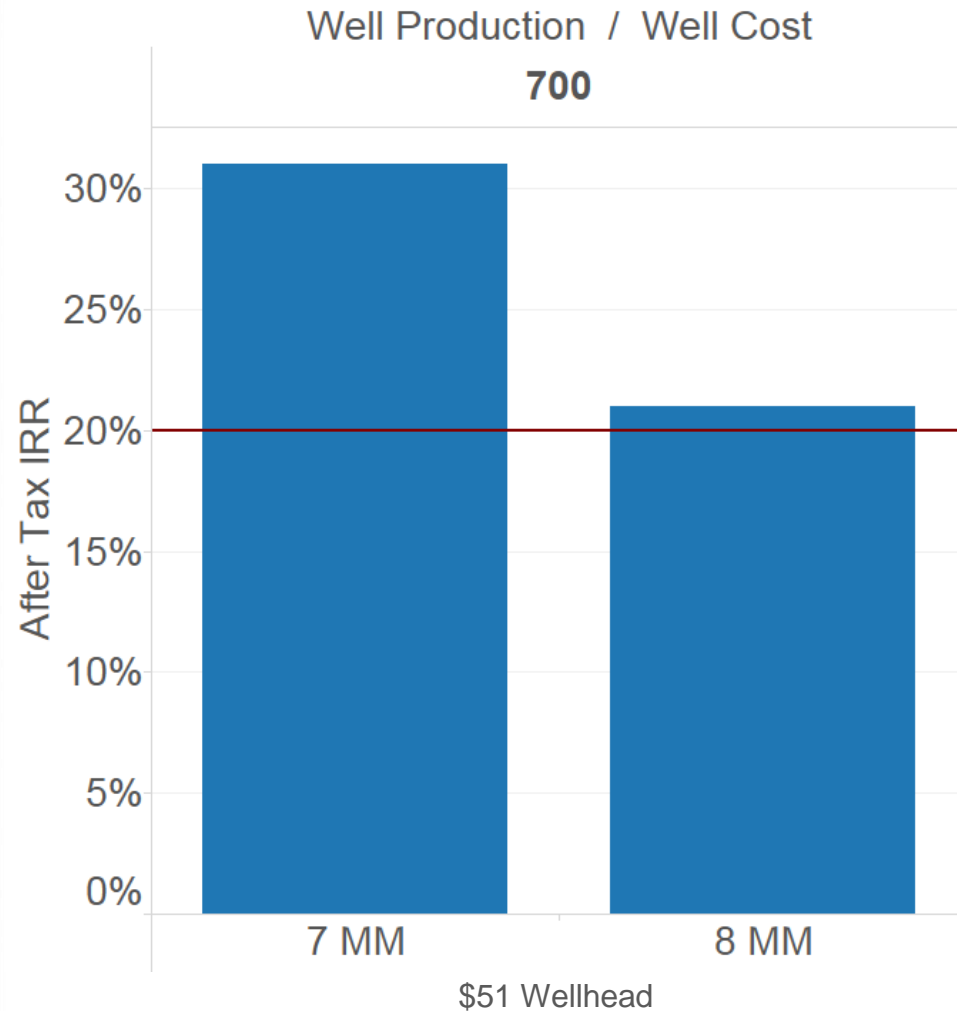
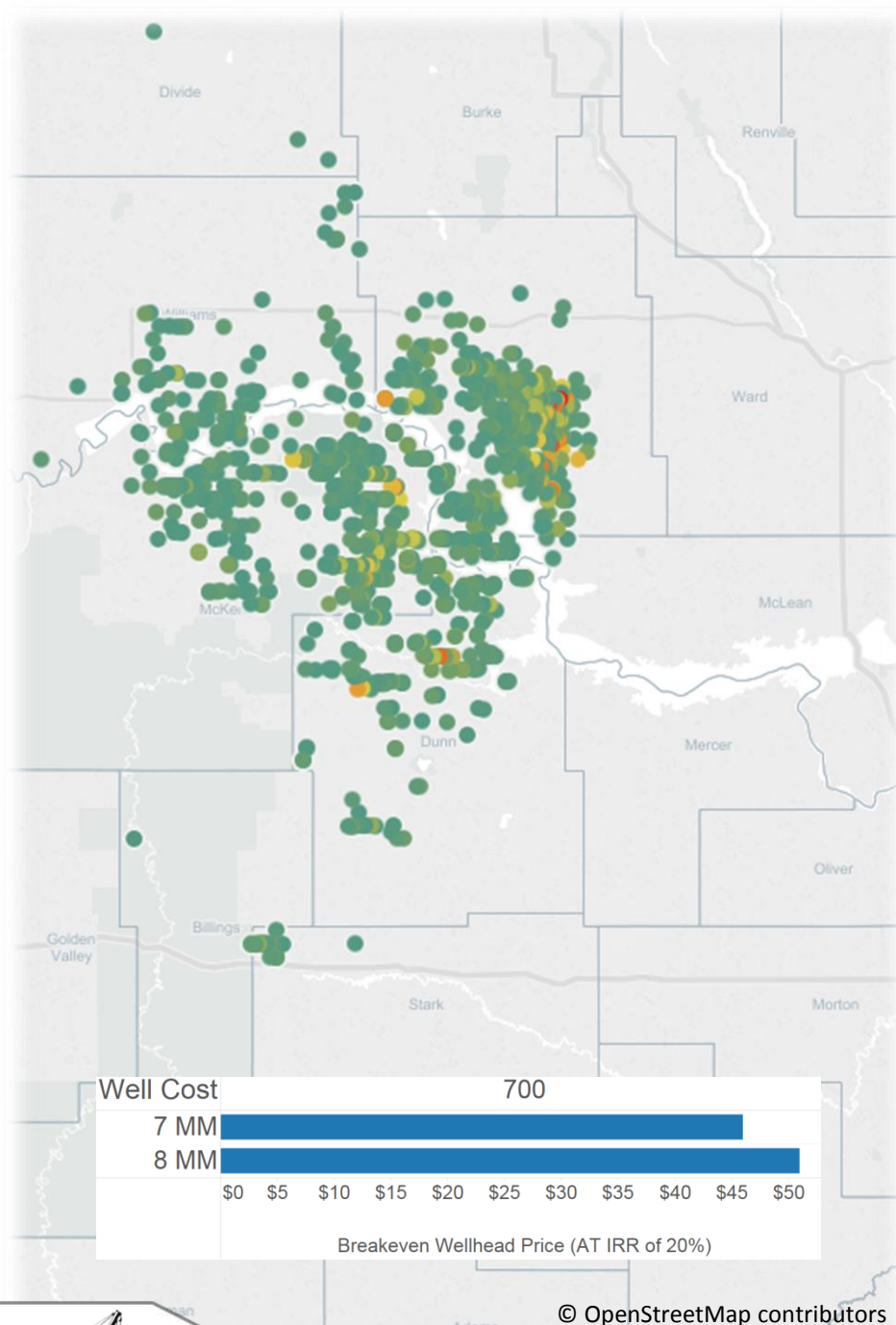
Peak Month Min. 500 BOPD



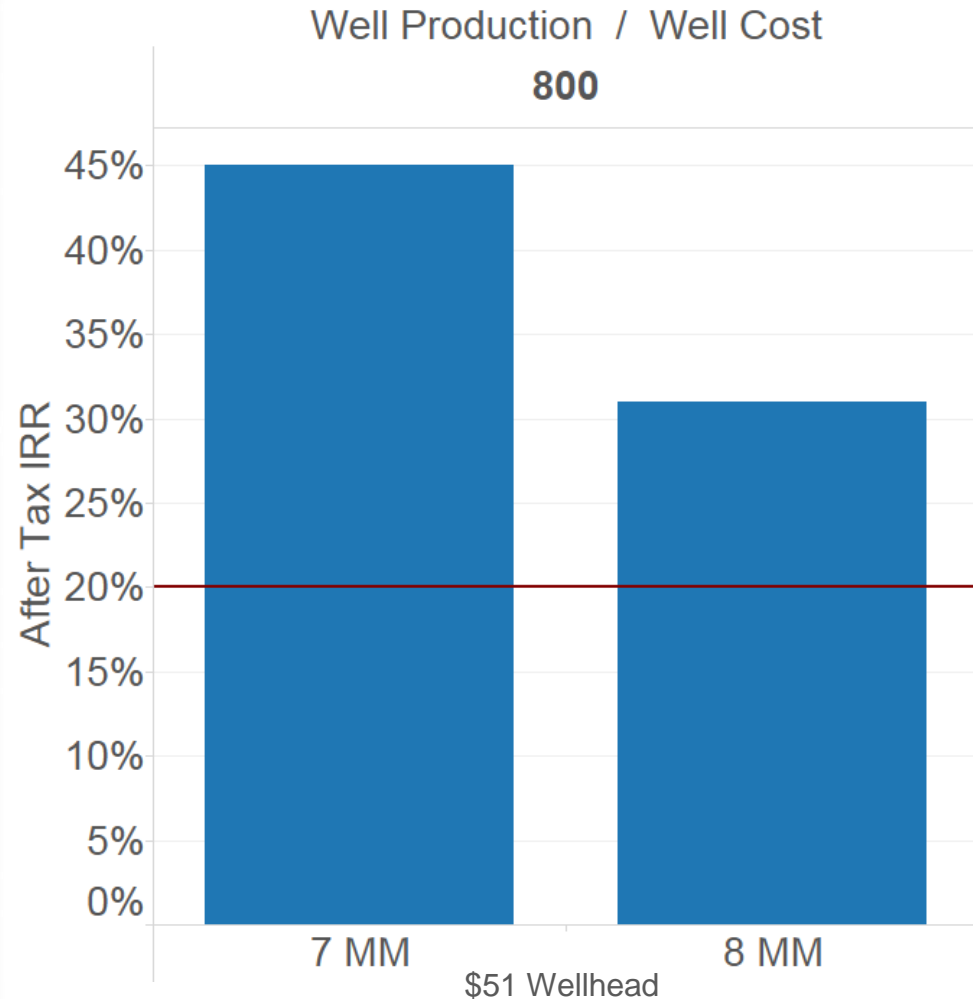
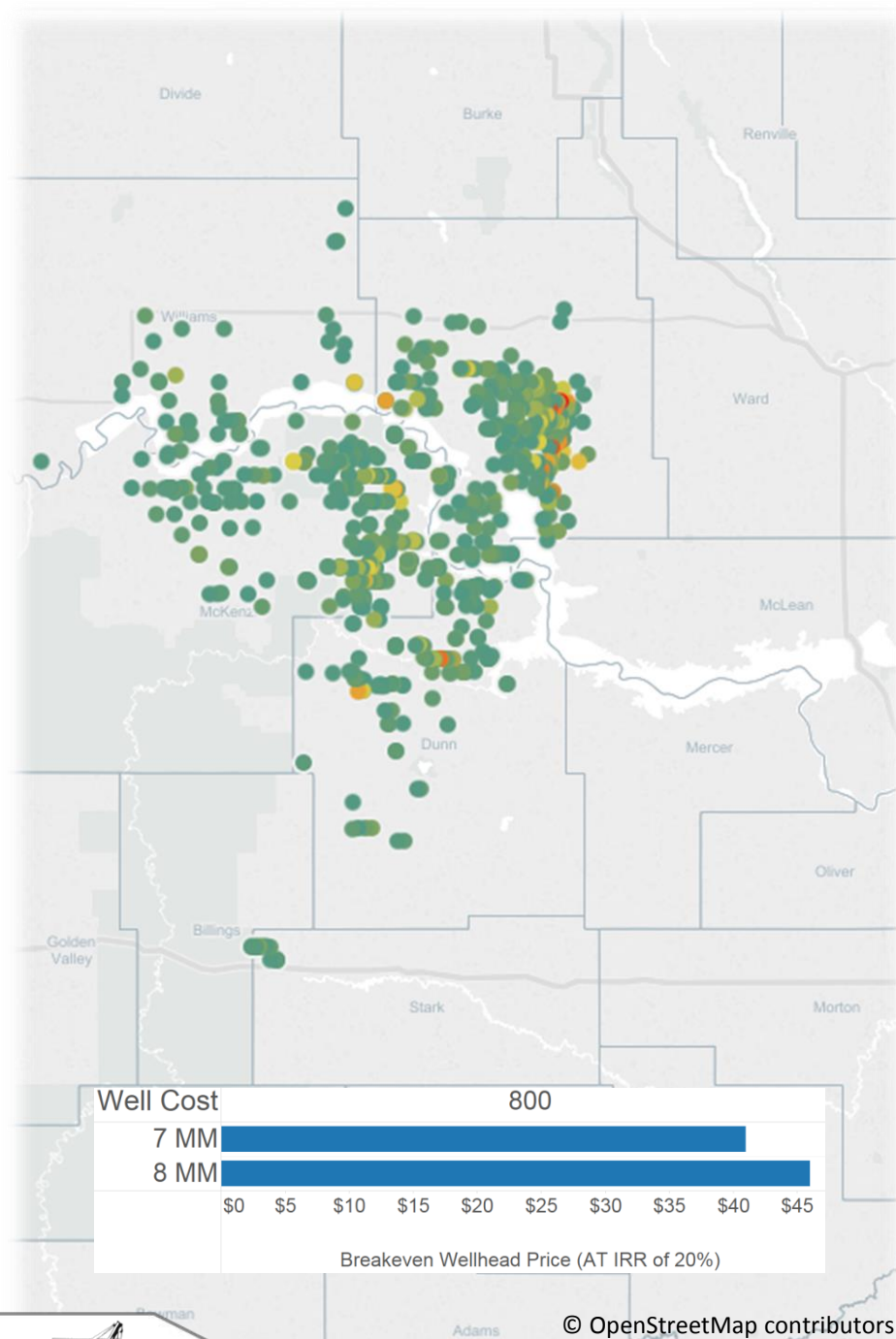
Peak Month Min. 600 BOPD



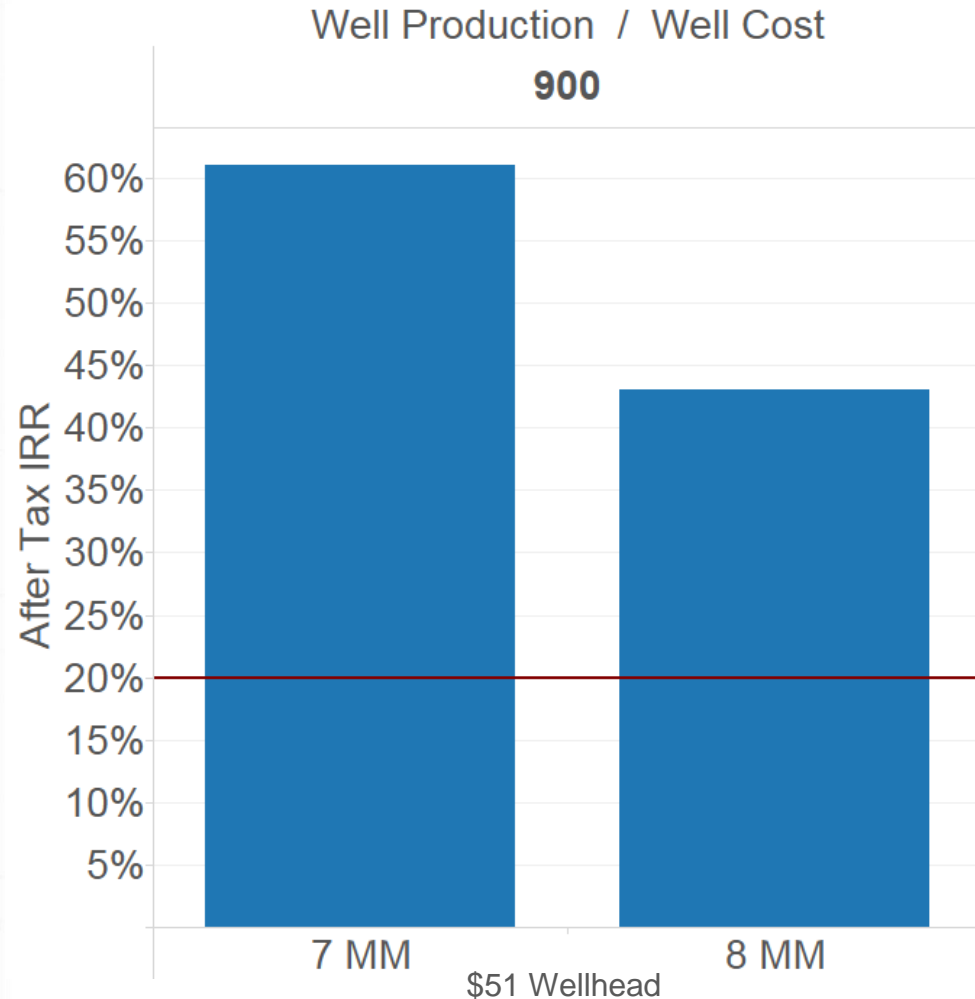
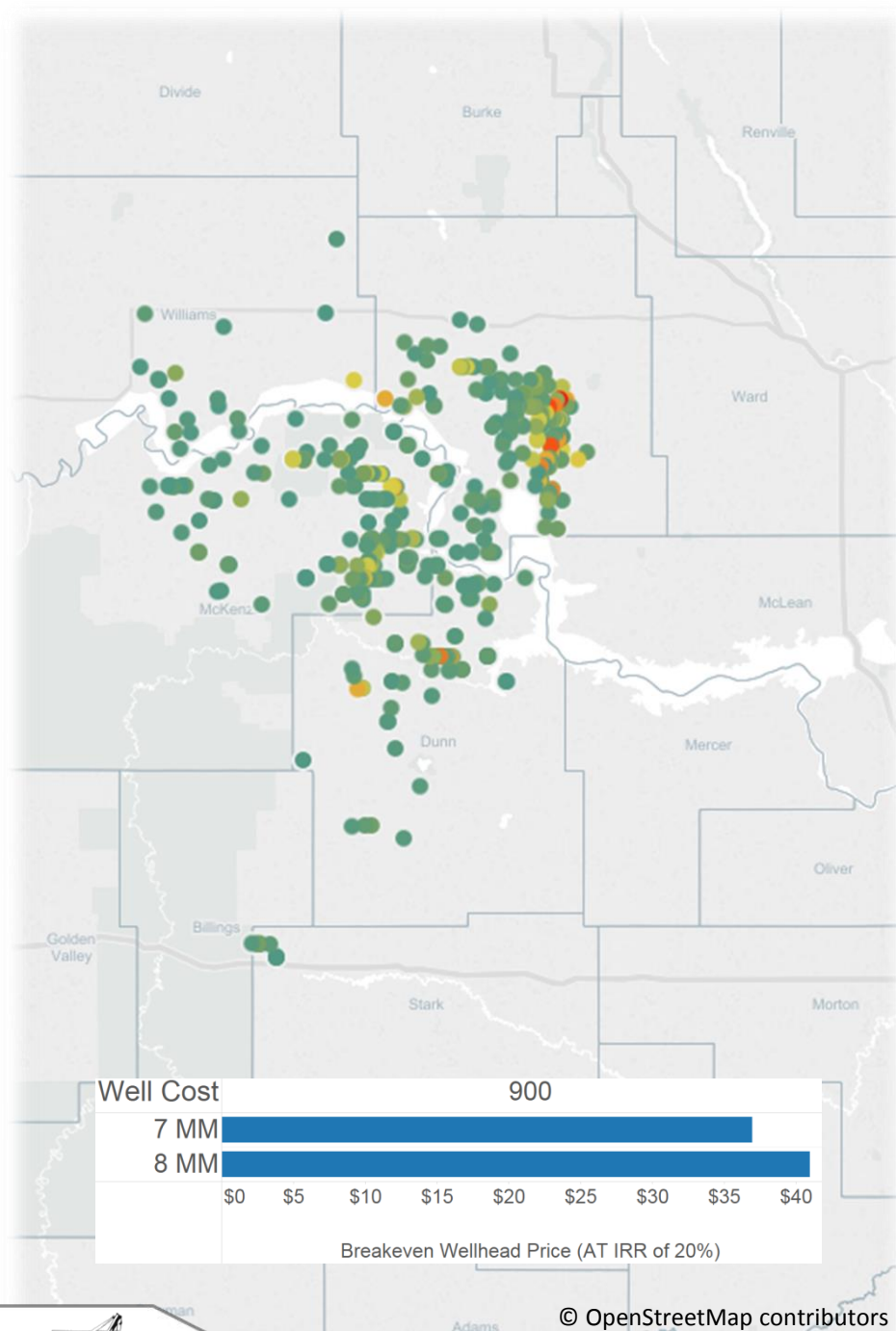
Peak Month Min. 700 BOPD



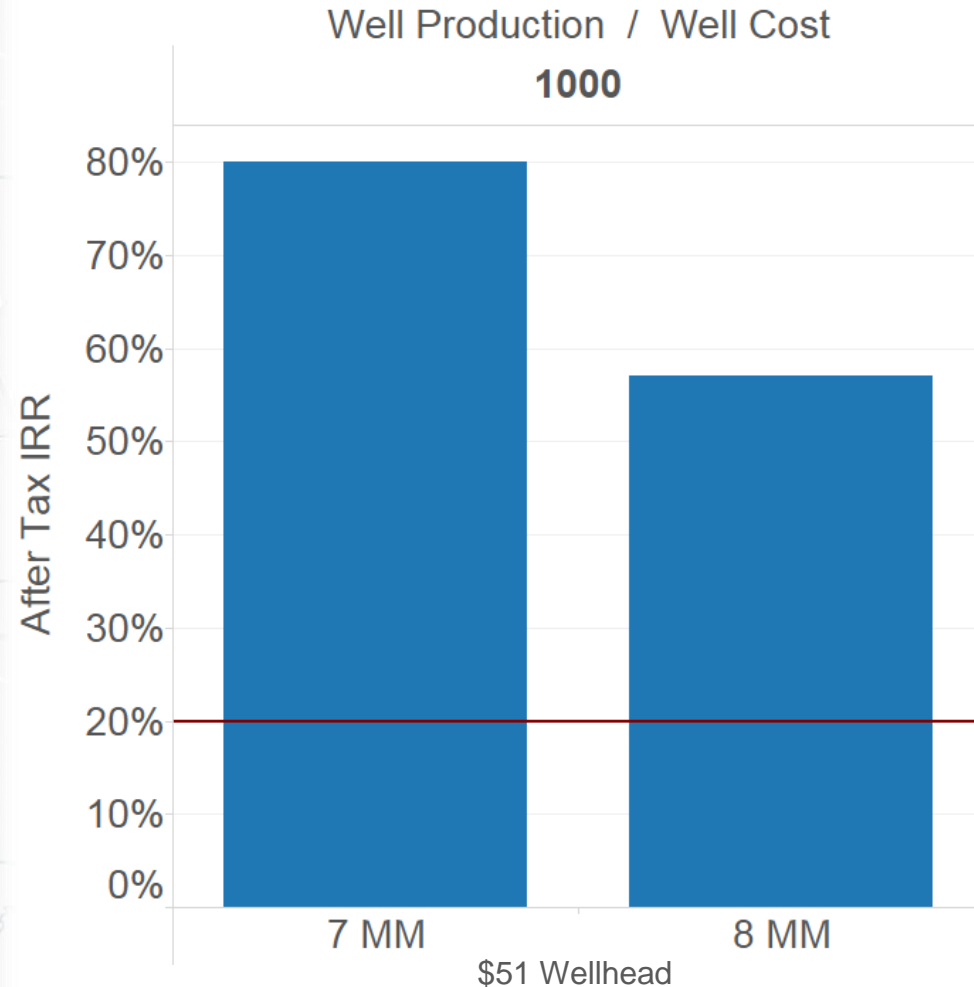
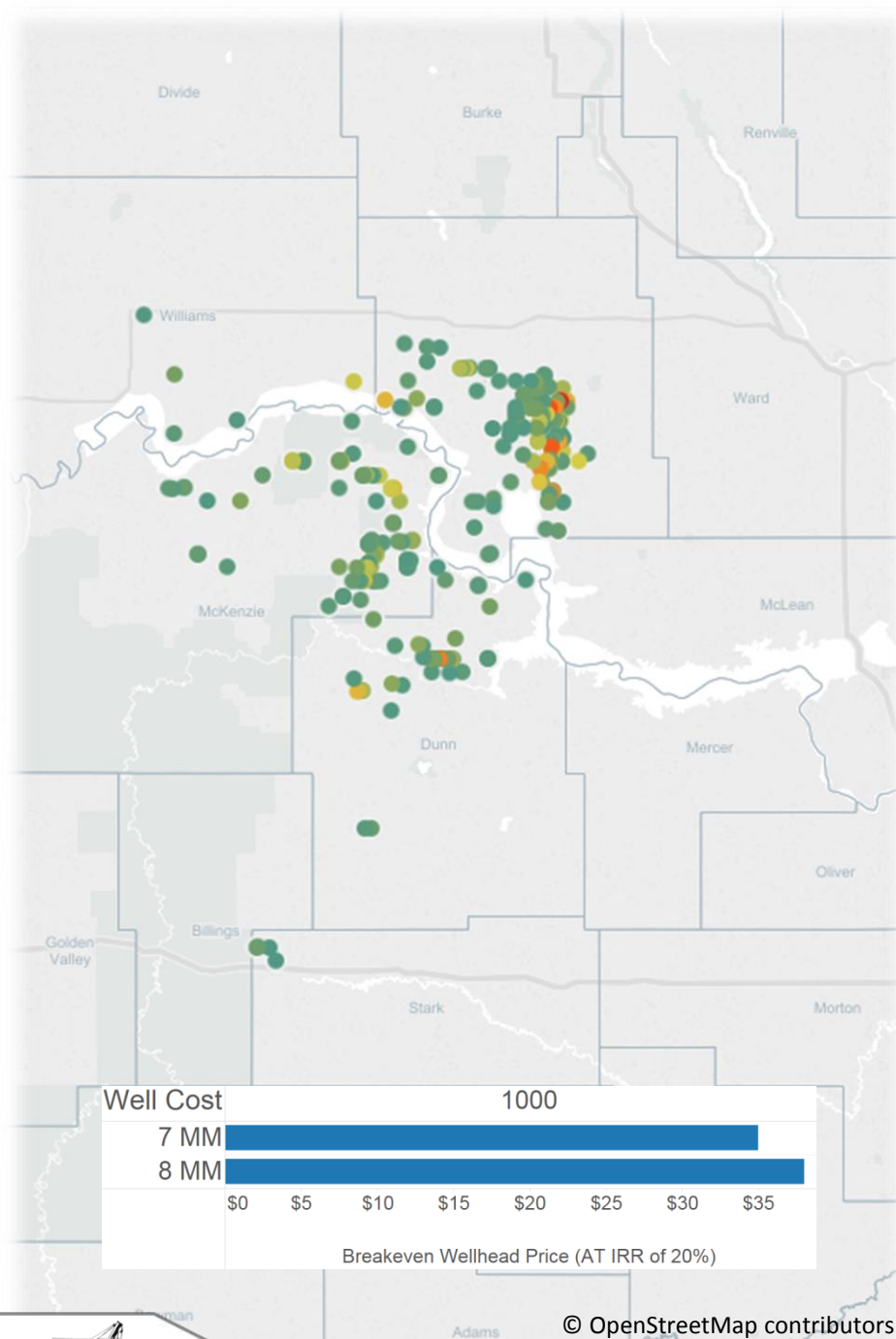
Peak Month Min. 800 BOPD



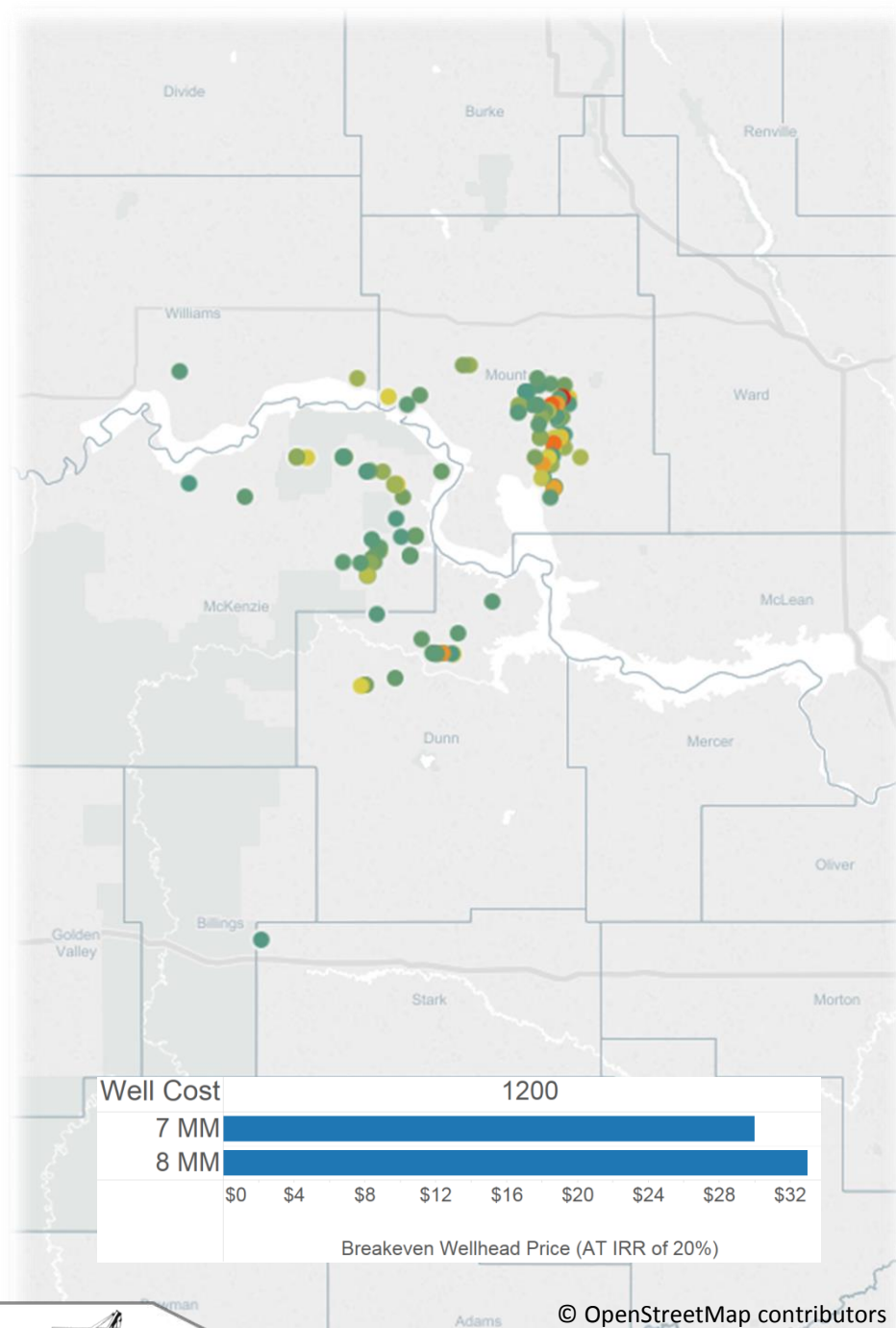
Peak Month Min. 900 BOPD



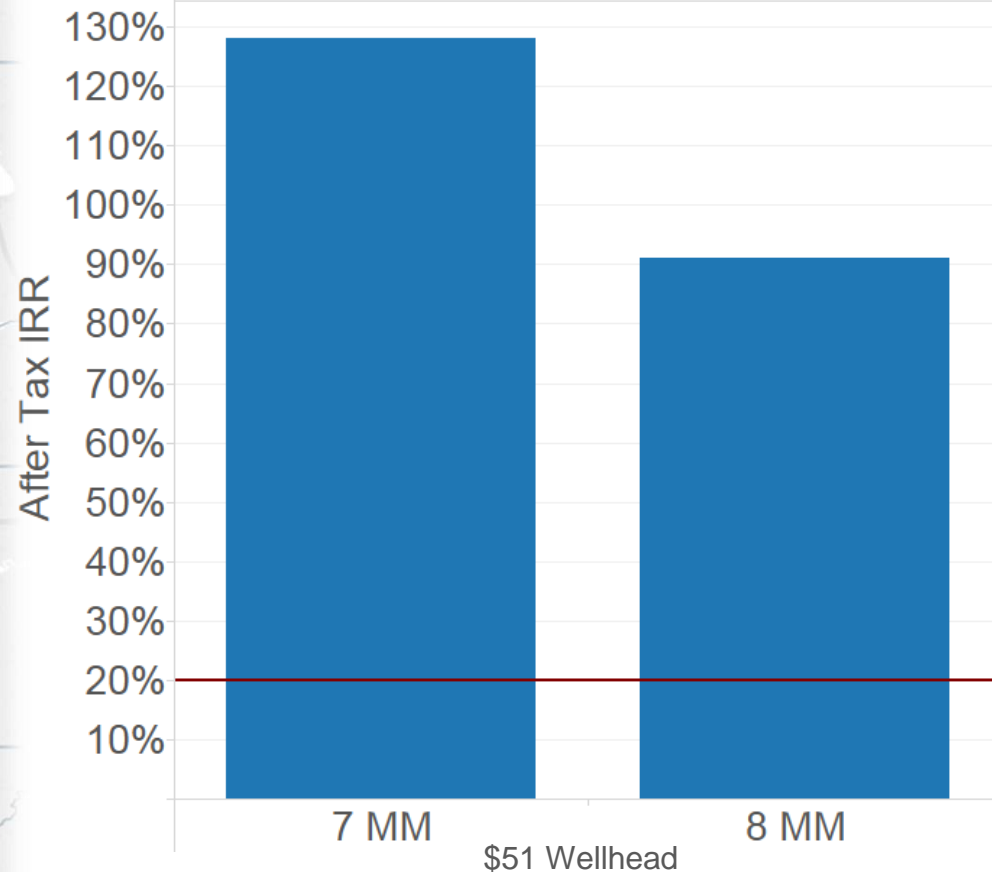
Peak Month Min. 1,000 BOPD



Peak Month Min. 1,200 BOPD



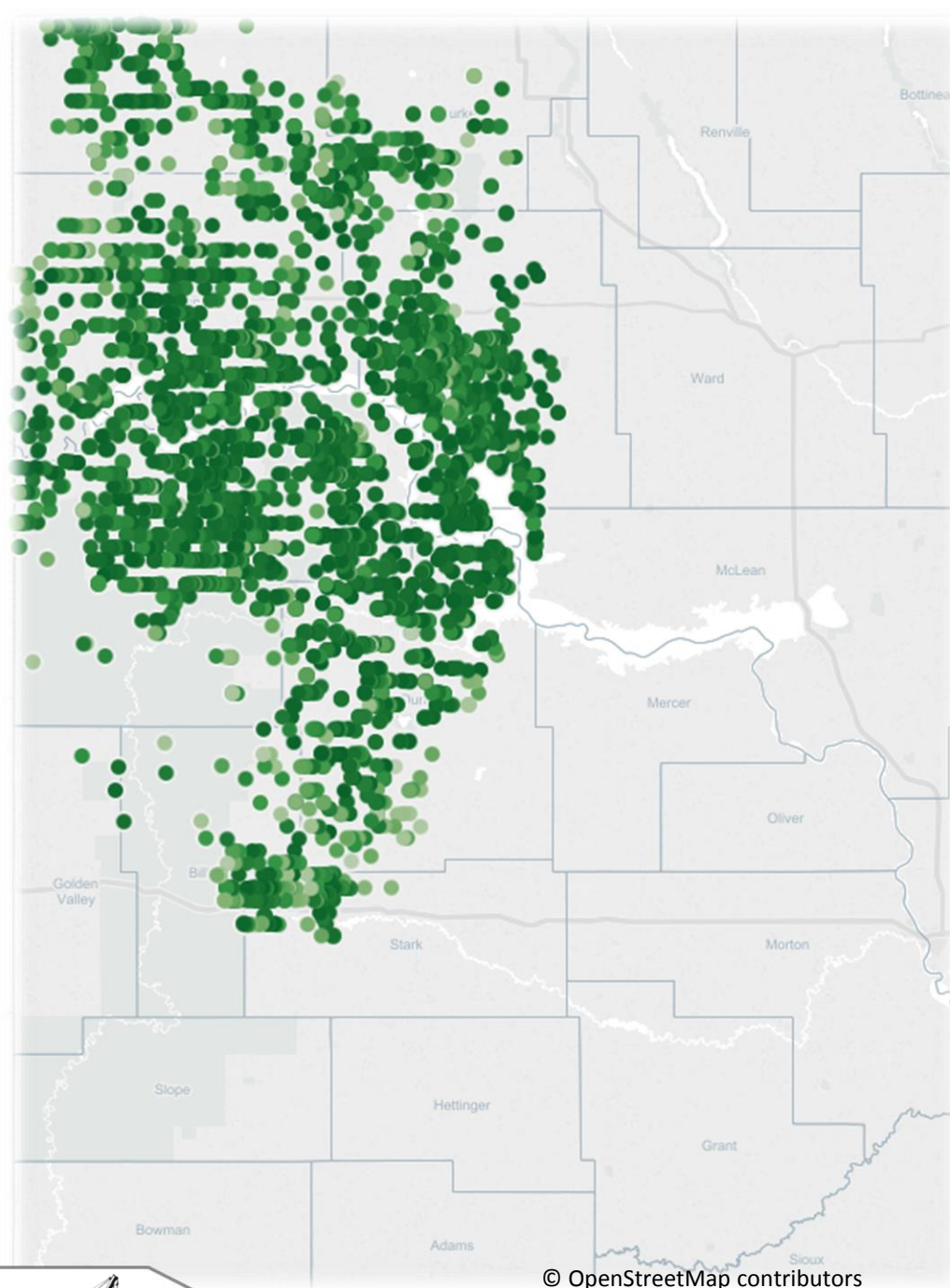
Well Production / Well Cost
1200



Peak Month:
100-300 BOPD*

*Low production wells also occur in areas deemed “Core” or “Hot Spot”. Risk is still present in most areas.

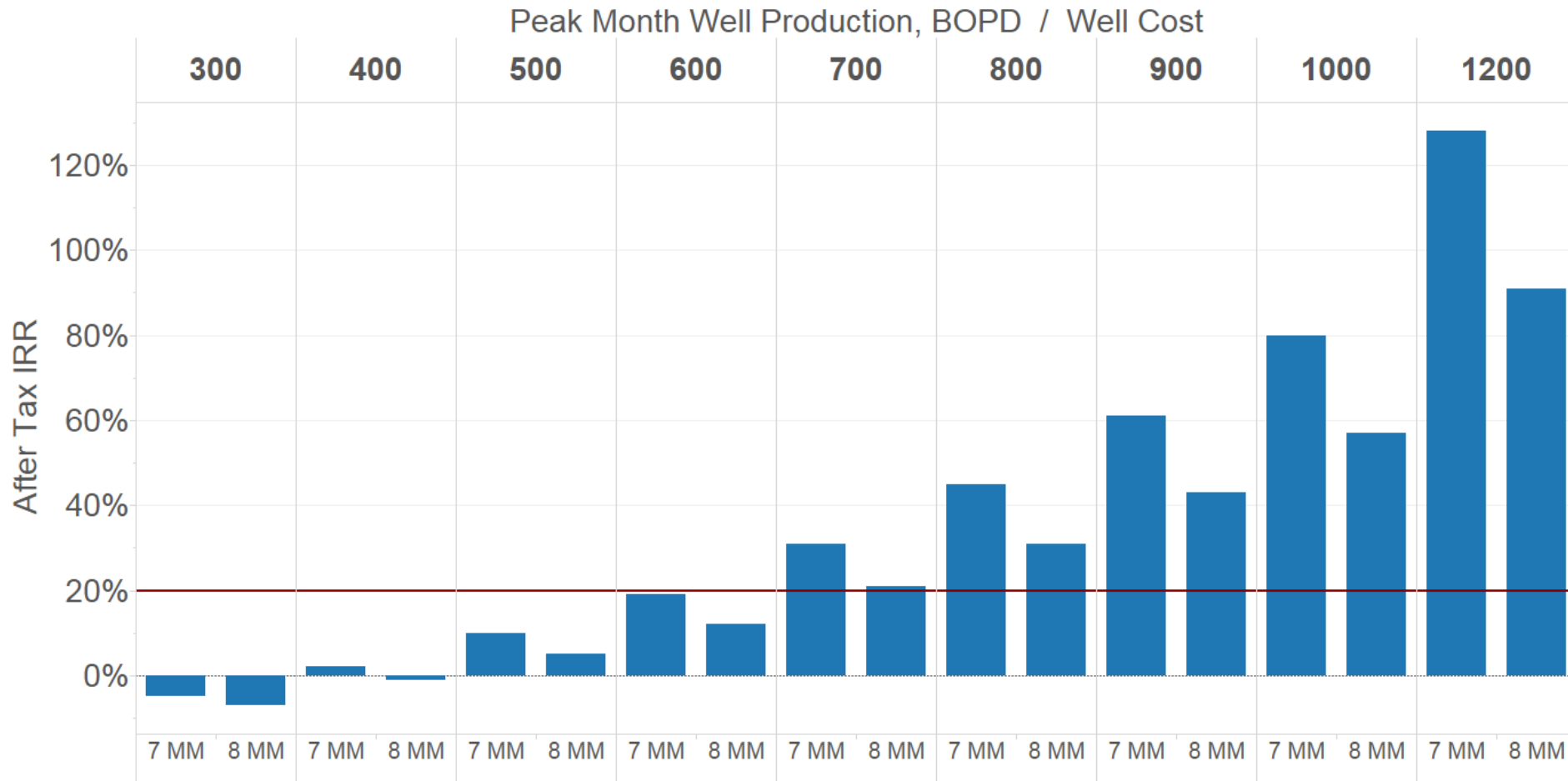
Mapped wells spud
2012-2014



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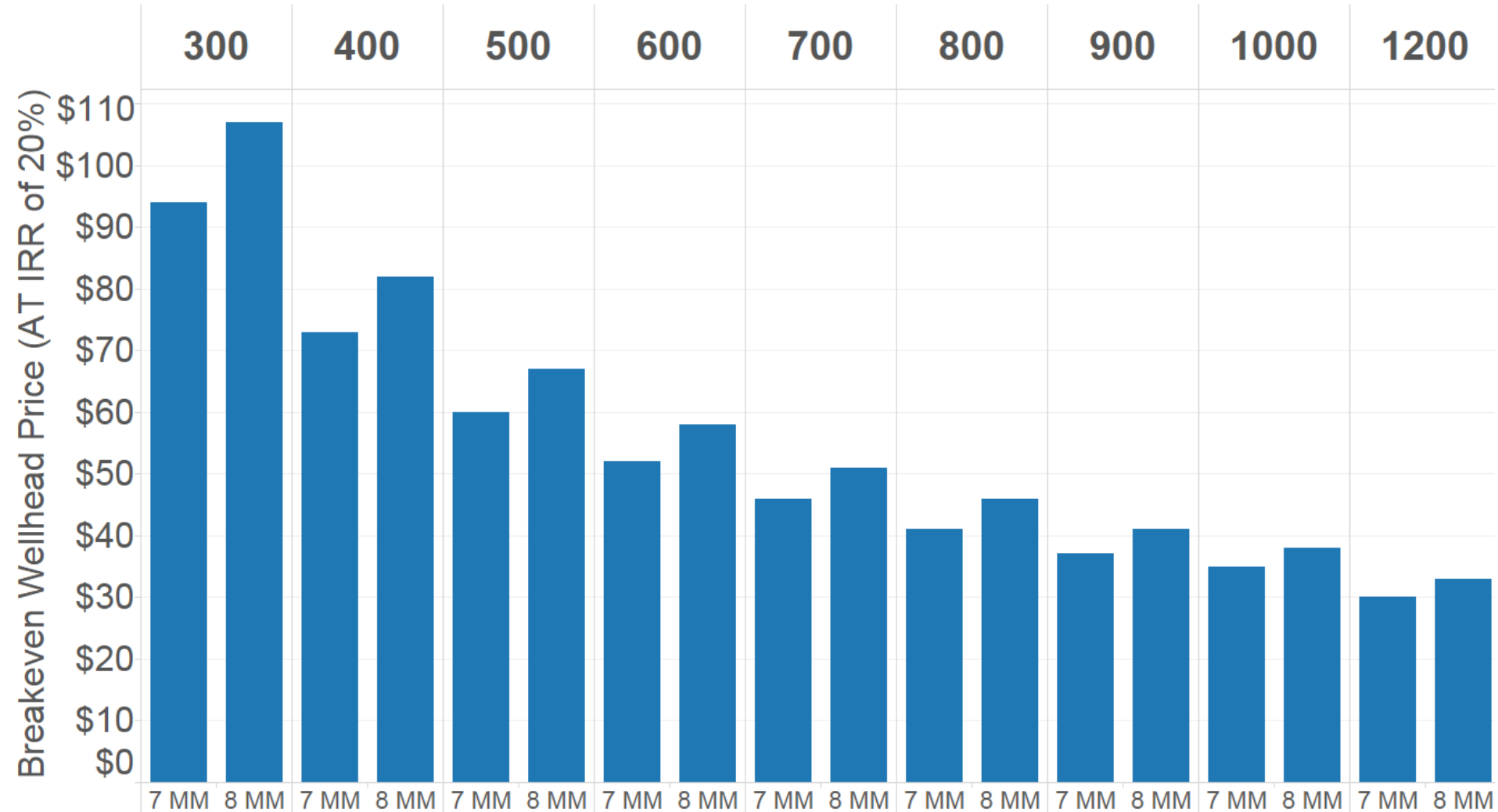


Summary of \$51 Wellhead Oil



Breakeven Summary

Peak Month Well Production, BOPD / Well Cost

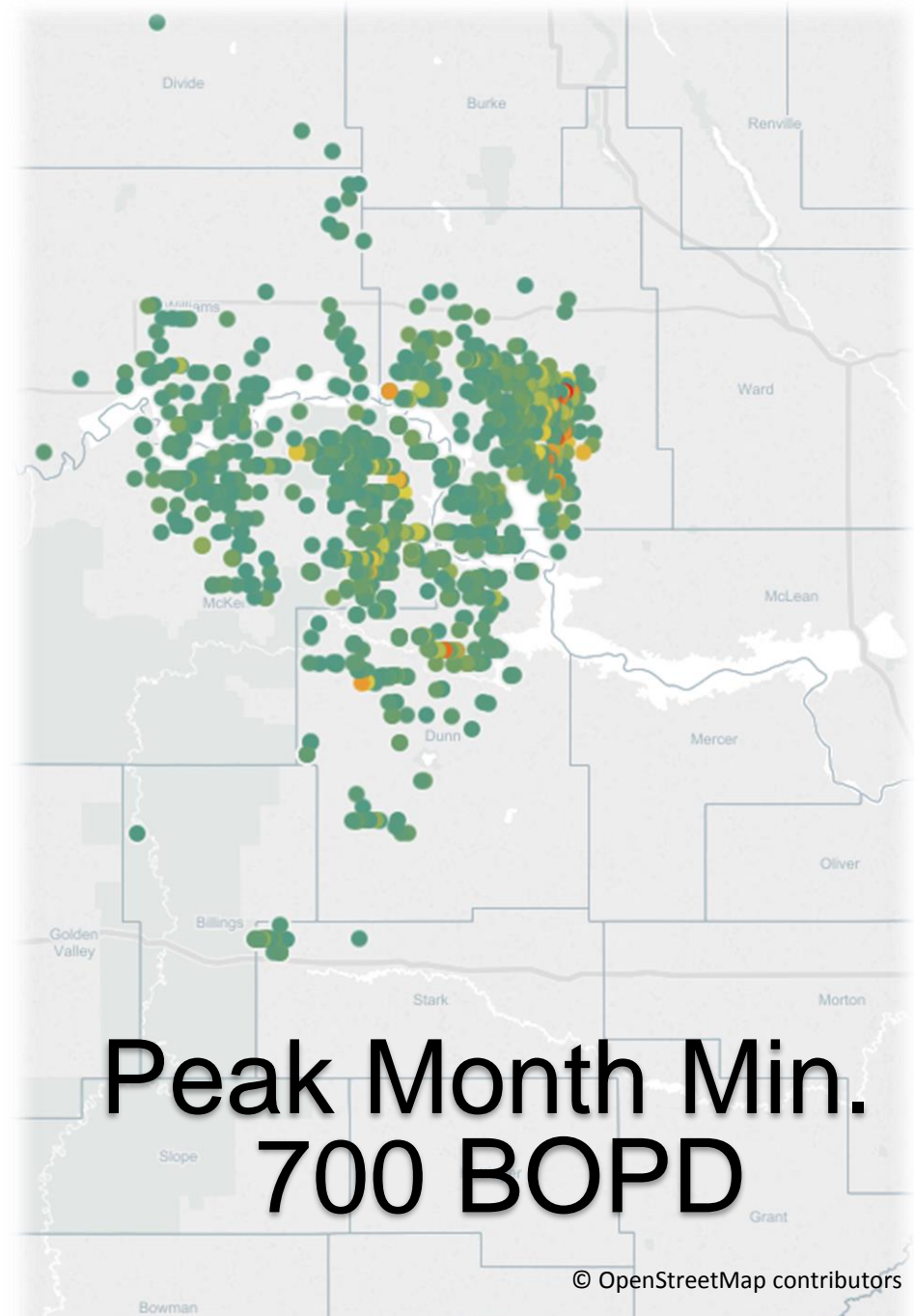


Options for rigs outside 700 BOPD:

1) Prove location is viable in low price environment (lower costs, improved IP, etc)

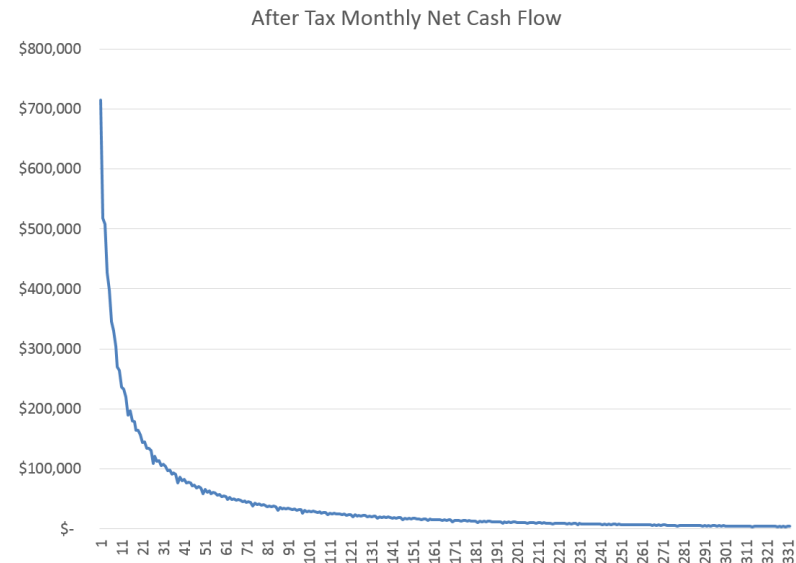
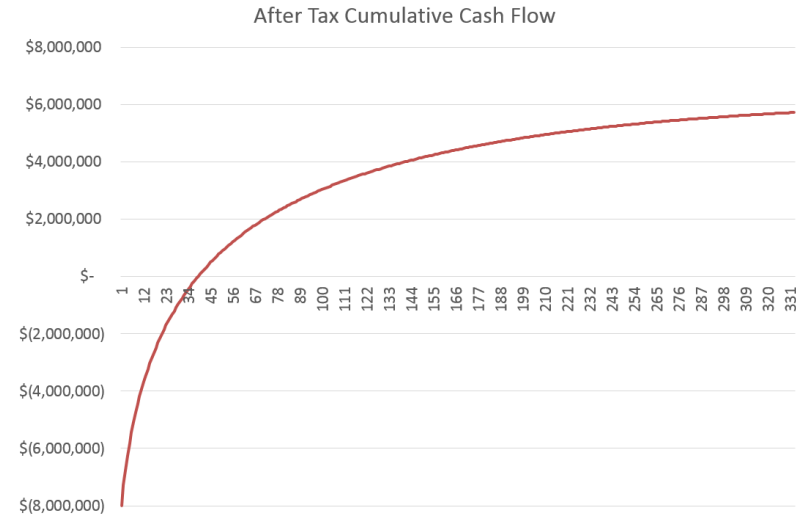
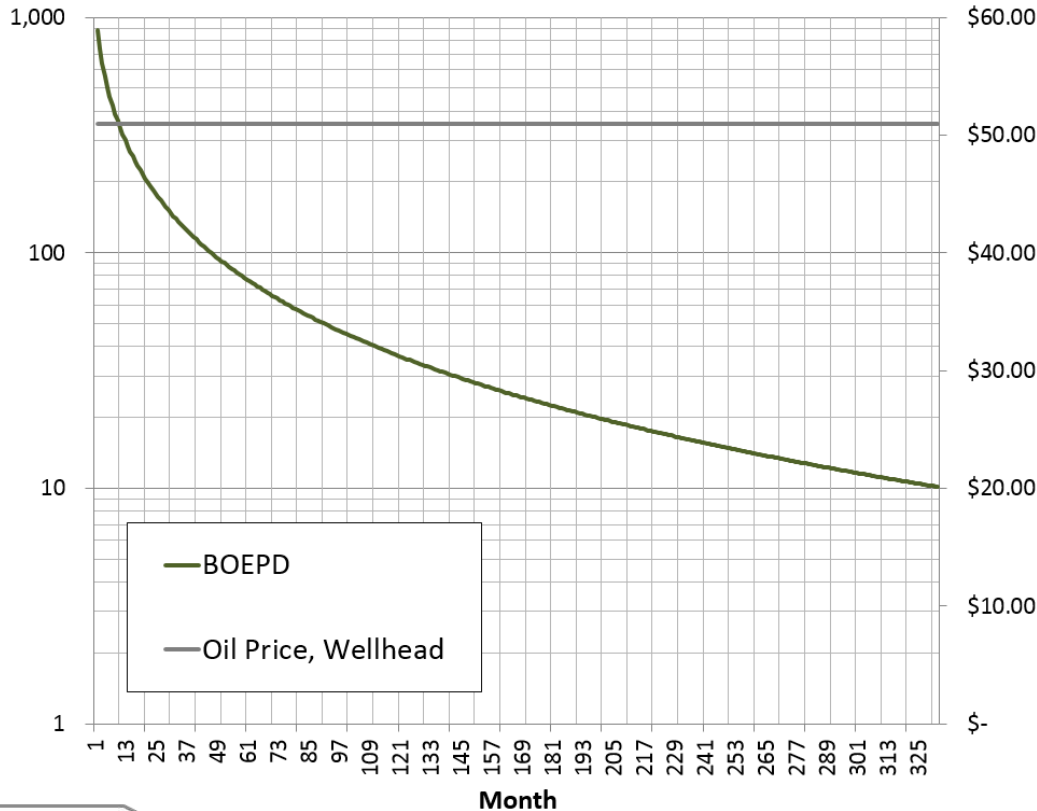
2) Move rig to better geology (inside or outside of basin)

3) Release rig



700 BOPD Well Example

- \$8 MM Well
- \$51/bbl oil and \$6/mcf gas
- AT IRR = 21%
- AT NPV (10) = \$1.8 MM
- Simple Payback = 3.2 Years



Additional Considerations

- Can well costs come down further?
- Individual company budgets, cash flows, hedges, obligations, and management strategies
- Competition from other plays
- Completion technology continues to improve
 - Higher volumes of proppant and water
 - Higher density drilling success



Arguments

- Well economic assumptions too optimistic or conservative
 - Jump to lower or higher well performance footprints
- Some rigs are not drilling Bakken/Three Forks wells
 - No economics were run on wells in other formations



Next Steps

- Use the findings to refine crude oil and natural gas forecasts for the region
- Continue to monitor pricing, production, and technology to further enhance our understanding of well economics in North Dakota



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