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Predictive Well Performance Mapping for the Delaware Basin, SENM

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In the Northern part of the Delaware Basin, the prolific plays are classified as tight, hybrid-conventional reservoirs (Bone Spring), and unconventional-type resource plays (Wolfcamp, Avalon). Because these reservoirs are highly heterogeneous both stratigraphically and spatially, estimating "pay" can be challenging. Property modeling that is limited to single variable (e.g. Porosity) or sometimes two variables combined to create pay maps (e.g. SoPhi) is often used to drive development decisions and influence drilling programs – but does not necessarily provide the strongest indication of how a well will perform in a given area.

Multivariate statistical analyses that combine multiple parameters provide a more robust and sophisticated method for analyzing these reservoirs by highlighting a subset of variables as statistically significant in driving well performance for a given reservoir or field. Here, we present the results of multivariate statistical modeling for several Permian reservoirs in the Delaware Basin. Initial models suggest that 90-day and 180-day production can be predicted within ± 20 mbo for Bone Spring reservoirs in NM. Reservoir, drilling and completions parameters were incorporated into the models, and spatial filters were applied to the resulting grids to account for the distribution of complete datasets. Future studies will incorporate publicly available production and completions data in order to test the effectiveness of the model away from areas with dense well control.