

The U.S. Geological Survey Assessment of Undiscovered Continuous Petroleum Resources in the Permian Basin Province, Texas and New Mexico

Stephanie B. Gaswirth and Kristen R. Marra, Central Energy Resources Science Center, U.S. Geological Survey, Denver, CO 80225, sgaswirth@usgs.gov

The U.S. Geological Survey (USGS) completed geologic-based assessments of undiscovered, technically recoverable continuous (unconventional) oil and gas resources of the Midland and Delaware Basins of the greater Permian Basin of west Texas and southeast New Mexico in 2016 and 2018, respectively. The continuous reservoirs of the Wolfcamp shale, Spraberry, and Bone Spring Formations have been the focus of increased horizontal drilling during the past decade, with industry targeting multiple oil and/or gas saturated intervals.

In 2016, the USGS completed the assessment of continuous oil and associated gas in the Wolfcamp shale and Spraberry Formation of the Midland Basin, the eastern subbasin of the Permian Basin. The Wolfcamp shale was divided into six continuous assessment units (AU), and the Spraberry Formation was divided into two continuous AUs and one conventional AU based on geologic and production data. The estimated mean resource is 20 billion barrels of oil (BBO) in the Wolfcamp shale and 4 BBO in the Spraberry Formation. The assessment of petroleum resources in the Wolfcamp shale and the Bone Spring Formation within the Delaware Basin was completed in 2018, with six AUs defined in the Wolfcamp Shale (two continuous gas and four continuous oil) and five continuous oil AUs in the Bone Spring Formation. The estimated mean resource is 29 BBO of oil in the Wolfcamp shale and 17 BBO of oil in the Bone Spring Formation. Additionally, 281 trillion cubic feet of gas was estimated in the Wolfcamp shale and Bone Spring Formation. Combined with the estimated resource from the Midland Basin, the USGS estimates a mean of more than 70 BBO of undiscovered, technically recoverable continuous oil in the Midland and Delaware Basins.