

2020 Marcellus Shale and Utica-Point Pleasant Production Summary

Prepared by Timothy Vance
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This summary was prepared by the West Virginia Geological and Economic Survey (WVGES). The data summarized herein were reported by operators to the West Virginia Department of Environmental Protection (WVDEP) Office of Oil and Gas for calendar year 2020.



West Virginia Geological and Economic Survey
1 Mont Chateau Road
Morgantown, WV 26508-8079
304-594-2331
www.wvgs.wvnet.edu

Disclaimer:

These production volumes represent data posted by WV Department of Environmental Protection Office of Oil & Gas as of 07/12/2021. Data from several operators reporting Marcellus and Utica-Point Pleasant production in 2020 may not have been available at the time of this report; therefore, the values listed above may change as more data become available.

Glossary

bbl-barrel

Tcf-trillion cubic feet

Bcf-billion cubic feet

Mcf-thousand cubic feet

NGL-natural gas liquids

LL-completed lateral length

BOE-barrels of oil equivalent

2020 Marcellus Production Summary

Wells included in this overview all report production from the Marcellus and are classified as 'Deviated' from their original surface location. Beginning in 2013, WVDEP Office of Oil and Gas reporting requirements stated that natural gas liquids (NGLs) were to be reported separately from oil production. However, the reporting requirements and definition of the NGLs to be reported has changed several times. The current reporting for NGLs as stated in HB4270 (effective beginning for 2018 production reporting) requires that downstream natural gas liquids accounted to a well will be reported as NGL to that well API while wellhead oil and lease condensate will be reported together as crude oil.

Selected data from previous years are shown in blue for comparison.

Number of horizontal Marcellus wells reporting production: 3,251 (2019: 2,758; 2018: 2,456 wells)

Average measured depth reported: 14,533 ft.

Longest/Deepest measured depth reported: 31,541 ft.

Marcellus Gas

Total Deviated Marcellus Gas Production 2020: 2,321.9 Bcf (2019: 1,968.1 Bcf; 2018: 1,645.5 Bcf)

Top Marcellus Gas Producing Counties 2020

1. Tyler (600.8 Bcf)	2019: Tyler (435.7 Bcf)
2. Doddridge (376.0 Bcf)	2019: Doddridge (398.7 Bcf)
3. Marshall (293.4 Bcf)	2019: Ritchie (251.6 Bcf)
4. Ritchie (253.6 Bcf)	2019: Marshall (208.8 Bcf)
5. Wetzel (214.7 Bcf)	2019: Wetzel (200.8 Bcf)
6. Harrison (159.6 Bcf)	2019: Harrison (116.7 Bcf)
7. Monongalia (126.8 Bcf)	2019: Ohio (105.2 Bcf)
8. Ohio (121.1 Bcf)	2019: Monongalia (93.7 Bcf)
9. Brooke (83.1 Bcf)	2019: Brooke (57.9 Bcf)
10. Marion (34.6 Bcf)	2019: Marion (36.3 Bcf)

Top Operators for Marcellus Gas Production 2020

1. Antero Resources Corp. (1078.6 Bcf)	2019: Antero Resources Corp. (906.1 Bcf)
2. Southwestern Prod Co. (355.2 Bcf)	2019: Southwestern Prod Co. (266.5 Bcf)
3. EQT Production Co. (246.0 Bcf)	2019: EQT Production Co. (259.6 Bcf)
4. Tug Hill Operating (116.7 Bcf)	2019: Northeast Natural Energy (86.6 Bcf)
5. Northeast Natural Energy (113.7 Bcf)	2019: HG Energy (82.2 Bcf)
6. HG Energy (108.5 Bcf)	2019: CNX Gas (69.7 Bcf)
7. CNX Gas (64.6 Bcf)	2019: Tug Hill Operating (62.7 Bcf)
8. Arsenal Resources (55.8 Bcf)	2019: Jay-Bee Oil & Gas (57.4 Bcf)
9. Jay-Bee Oil & Gas (42.6 Bcf)	2019: Arsenal Resources (44.6 Bcf)
10. Chevron Appalachia (41.1 Bcf)	2019: Chevron Appalachia (29.4 Bcf)

Top Marcellus Gas Wells In 2020

1. **4710303308**, 7.18 Bcf; Southwestern Production Co., Wetzel County, Total Measured Depth 27,775'
2. **4710303251**, 6.78 Bcf; Southwestern Production Co., Wetzel County, Total Measured Depth 25,776'
3. **4710303253**, 6.59 Bcf; Southwestern Production Co., Wetzel County, Total Measured Depth 25,954'
4. **4701706878**, 5.93 Bcf; Antero Resources Corp., Doddridge County, Total Measured Depth 22,829'
5. **4709502559**, 5.13 Bcf; Antero Resources Corp., Tyler County, Total Measured Depth 24,800'

Annual Comparison of Marcellus Gas Production

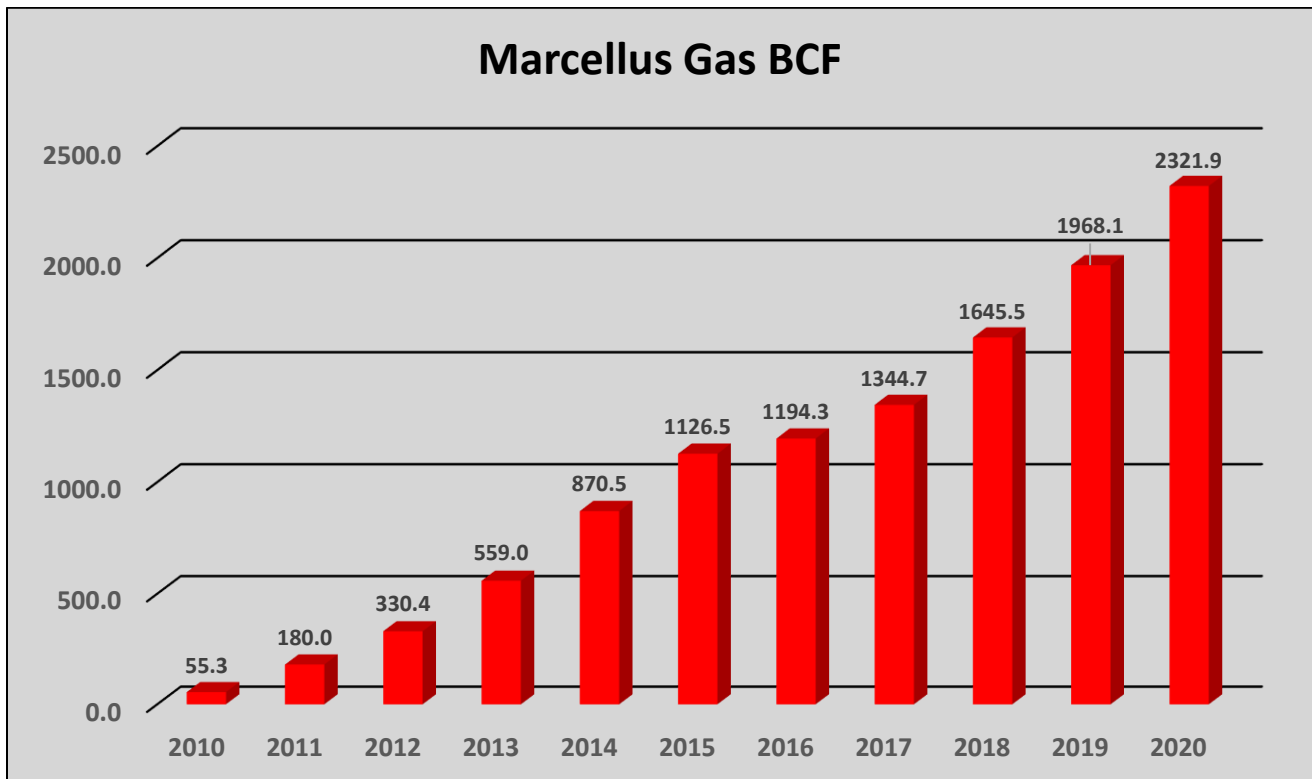


Figure 1. Chart of annual Marcellus gas production. Production continued its decade long growth trajectory and exceeded 2 Tcf for the first time in 2020.

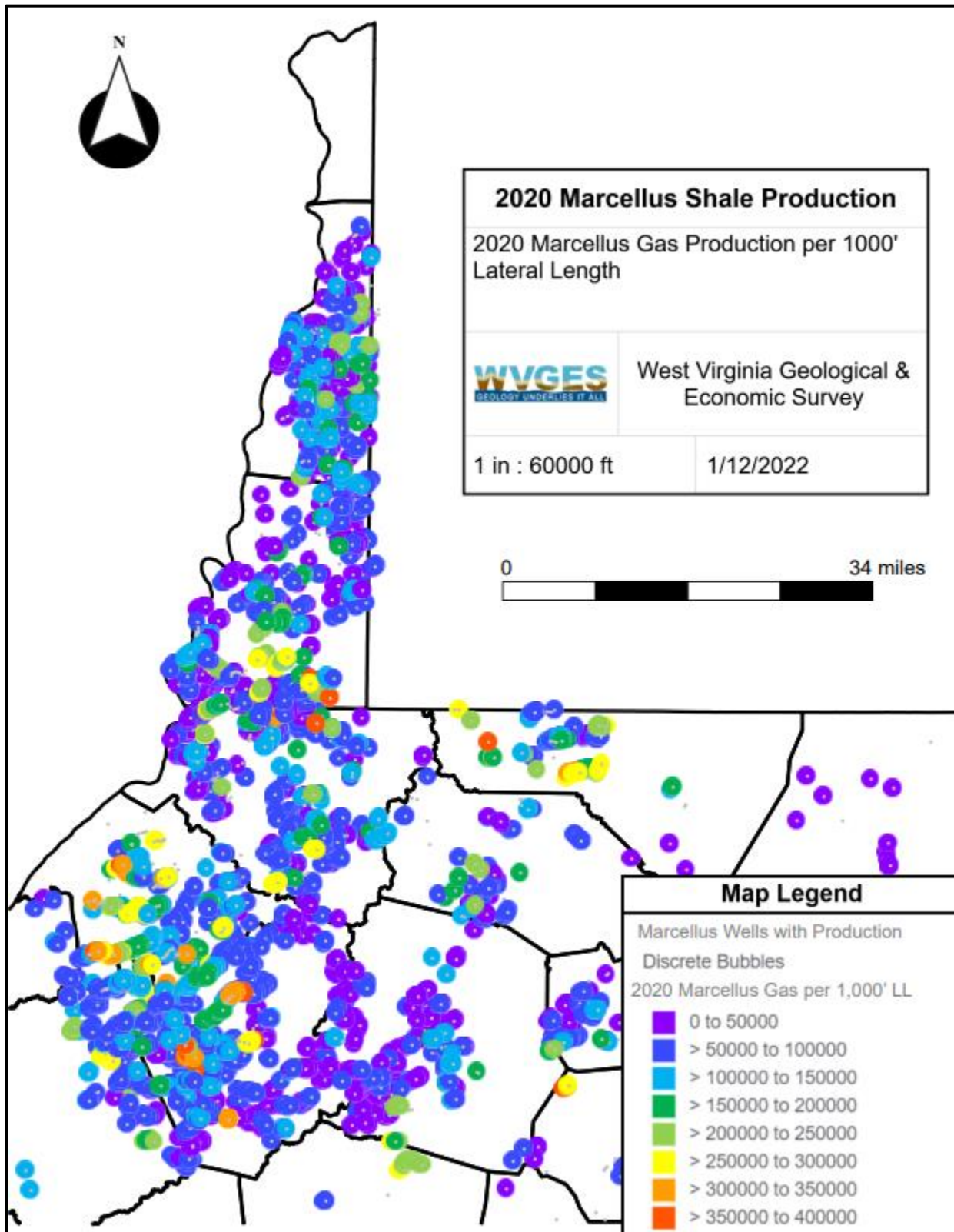


Figure 2. Map of Marcellus gas production color coded to highlight variations in gas volume.

Marcellus Combined Oil & Natural Gas Liquids (NGLs)

Total 2020 Combined Marcellus Oil & Natural Gas Liquids Production: 82,986,268 bbl

HB4270 (effective for 2018 production reporting) requires that downstream natural gas liquids accounted to a well will be reported as NGL to that well API while wellhead oil and lease condensate will be reported together as crude oil. Previously, a 2016 legislative rule change in West Virginia required that condensate (lease condensate) data rather than NGL data are to be reported to WVDEP. The volumes reported are to be liquid condensate at the wellhead, not NGL volumes extracted downstream at processing plants. Beginning with 2020 production, both the oil and NGL volumes are being combined, whereas in prior years they were reported separately. Combining the Oil and NGL volumes will yield a total volume of liquid hydrocarbons produced per well. Finally, it should be noted that depending on individual operator reporting practices, wells that are anticipated to fall within the wet gas/ oil window of the play may not have liquid volumes reported to the state.

Top Combined Marcellus Oil & Natural Gas Liquids Producing Counties 2020

1. Marshall (26,111,635 bbl)	<i>2019: Tyler (18,284,885 bbl)</i>
2. Tyler (18,495,841 bbl)	<i>2019: Marshall (18,064,405 bbl)</i>
3. Ohio (15,866,315 bbl)	<i>2019: Ohio (16,690,416 bbl)</i>
4. Brooke (11,873,800 bbl)	<i>2019: Brooke (9,914,029 bbl)</i>
5. Wetzel (5,344,810 bbl)	<i>2019: Ritchie (6,522,308 bbl)</i>
6. Ritchie (4,552,532 bbl)	<i>2019: Doddridge (5,992,124 bbl)</i>
7. Doddridge (2,175,713 bbl)	<i>2019: Wetzel (3,297,070 bbl)</i>

Top Operators for Combined Marcellus Oil & Natural Gas Liquids Production 2020

1. Southwestern Prod. Co. (35,053,370 bbl)	<i>2019: Southwestern Prod. Co. (31,200,362 bbl)</i>
2. Antero Resources Corp. (18,356,234 bbl)	<i>2019: Antero Resources Corp. (23,391,856 bbl)</i>
3. Tug Hill Operating (11,983,506 bbl)	<i>2019: Tug Hill Operating (6,912,703 bbl)</i>
4. Chevron Appalachia (5,659,499 bbl)	<i>2019: Chevron Appalachia (4,266,942 bbl)</i>
5. HG Energy LLC (3,993,229 bbl)	<i>2019: Jay-Bee Oil & Gas (4,181,526 bbl)</i>
6. Jay-Bee Oil & Gas (3,437,855 bbl)	<i>2019: HG Energy LLC (4,150,111 bbl)</i>
7. CNX Gas (3,223,782 bbl)	<i>2019: CNX Gas (2,774,360 bbl)</i>
8. Tribune Resources (1,614,877 bbl)	<i>2019: Tribune Resources (913,396 bbl)</i>
9. EQT Production Co. (772,480)	<i>2019: Triad Hunter (807,637 bbl)</i>
10. Triad Hunter (759,765 bbl)	<i>2019: EQT Production Co. (574,768 bbl)</i>

Top Combined Marcellus Oil & Natural Gas Liquids Wells In 2020

1. **4706900275**, 438,247 bbl; Southwestern Prod. Co., Ohio County, Total Measured Depth 24,451'
2. **4700900270**, 420,666 bbl; Southwestern Prod. Co., Brooke County, Total Measured Depth 22,337'
3. **4710303253**, 412,009 bbl; Southwestern Prod. Co., Wetzel County, Total Measured Depth 25,954'
4. **4710303251**, 401,575 bbl; Southwestern Prod. Co., Wetzel County, Total Measured Depth 25,776'
5. **4700900281**, 397,040 bbl; Southwestern Prod. Co., Brooke County, Total Measured Depth 18,044'

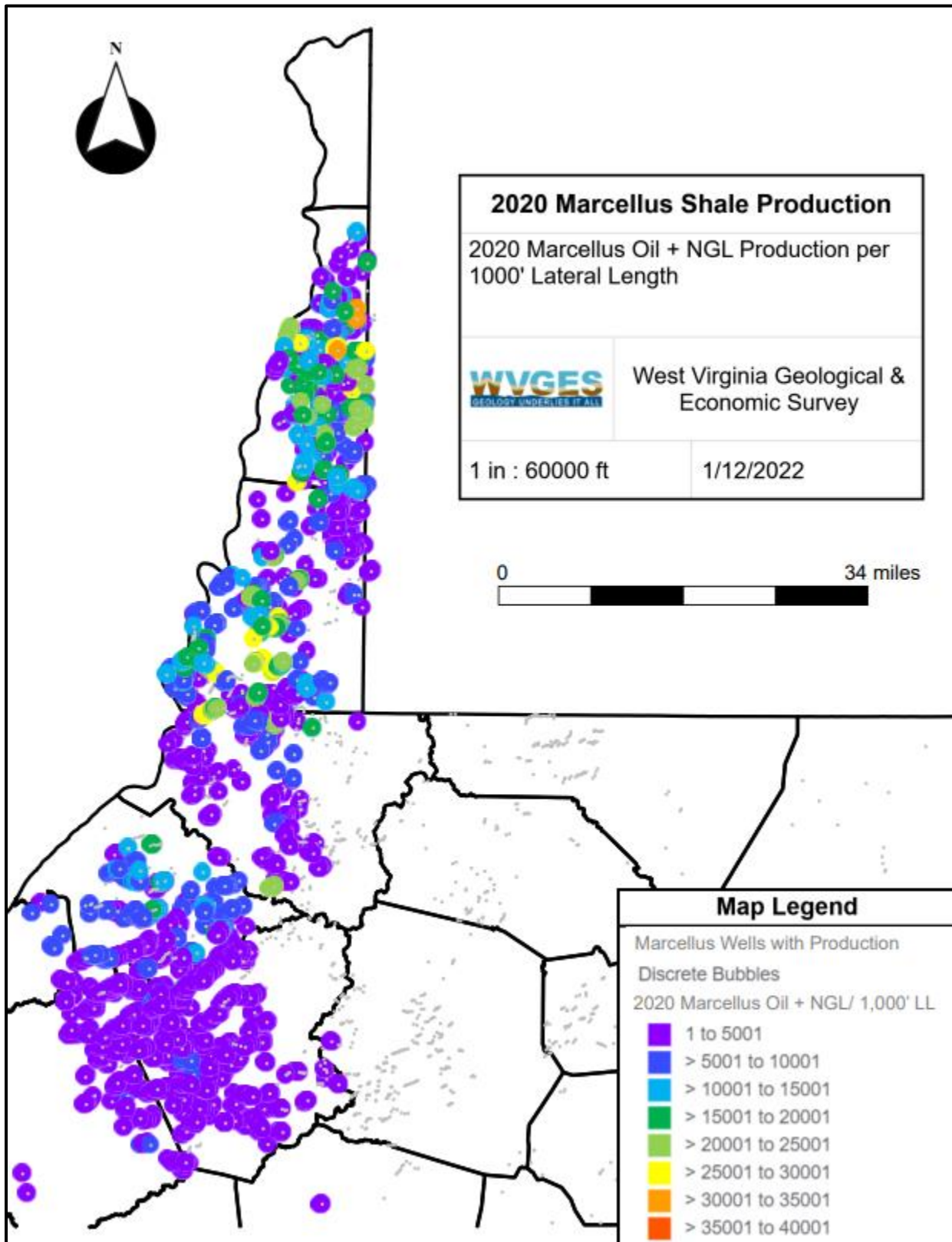


Figure 3. Map of Marcellus Oil and NGL production colored to show variations in liquids volume. Note that Marcellus liquids are geographically constrained to the western counties of the state.

Marcellus Normalized BOE per 1,000' Lateral Length

New for 2020 is a new metric for comparing well results across wells, counties, and operators: barrels of oil equivalent (BOE) per completed lateral length (LL). BOE is calculated by converting gas volumes to barrels of oil equivalent by multiplying the gas by a 0.167 conversion factor. These equivalent barrels are then added to the previously reported Oil and NGL barrels to generate a total BOE value. The completed lateral length is determined by subtracting the depth of the last perforation at the “heel” of the horizontal portion of the well, from the depth of the first perforation at the “toe” of the horizontal wellbore. BOE is then divided by LL, and then multiplied by 1,000. Gross production volumes listed earlier in this report may be skewed by long lateral lengths. This new normalized metric gives an insight into the productive capacity of the wellbore per each thousand feet of rock traversed, thereby providing an “apples to apples” comparison of each well.

Top Normalized Marcellus BOE per 1,000' Lateral Length Counties 2020

1. Tyler – 36,515.3 BOE/1,000'LL
2. Monongalia – 26,479.3 BOE/1,000'LL
3. Ohio – 25,788.3 BOE/1,000'LL
4. Marshall – 25,123.5 BOE/1,000'LL
5. Ritchie – 23,332.8 BOE/1,000'LL
6. Brooke – 22,184.2 BOE/1,000'LL
7. Wetzel – 21,295.1 BOE/1,000'LL
8. Pleasants – 19,677.3 BOE/1,000'LL
9. Doddridge – 16,096.8 BOE/1,000'LL
10. Marion – 15,553.7 BOE/1,000'LL

Top Normalized Marcellus BOE per 1,000' Lateral Length Operators 2020

1. Northeast Natural Energy – 27,629.9 BOE/1,000'LL
2. CNX Gas – 23,552.4 BOE/1,000'LL
3. Antero Resources Corp. – 21,741.7 BOE/1,000'LL
4. Tribune Resources – 20,696.9 BOE/1,000'LL
5. Arsenal Resources – 20,115.4 BOE/1,000'LL
6. HG Energy – 19,359.4 BOE/1,000'LL
7. Tug Hill Operating – 18,600.5 BOE/1,000'LL
8. Southwestern Production Co. – 17,438.6 BOE/1,000'LL
9. EQT Production Co. – 16,289.0 BOE/1,000'LL
10. Chevron Appalachia – 16,243.5 BOE/1,000'LL

Top Normalized Marcellus BOE per 1,000' Lateral Length Wells In 2020

1. **4710303232**, 92,997.3 BOE/1,000'LL; Southwestern Prod Co., Wetzel County, Lateral Length 11,066'
2. **4710303253**, 84,414.2 BOE/1,000'LL; Southwestern Prod Co., Wetzel County, Lateral Length 17,934'
3. **4700900274**, 82,775.4 BOE/1,000'LL; Southwestern Prod Co., Brooke County, Lateral Length 6,308'
4. **4705102035**, 79,853.9 BOE/1,000'LL; Tug Hill Operating, Marshall County, Lateral Length 6,745'
5. **4710303233**, 76,538.9 BOE/1,000'LL; Southwestern Prod Co., Wetzel County, Lateral Length 13,170'

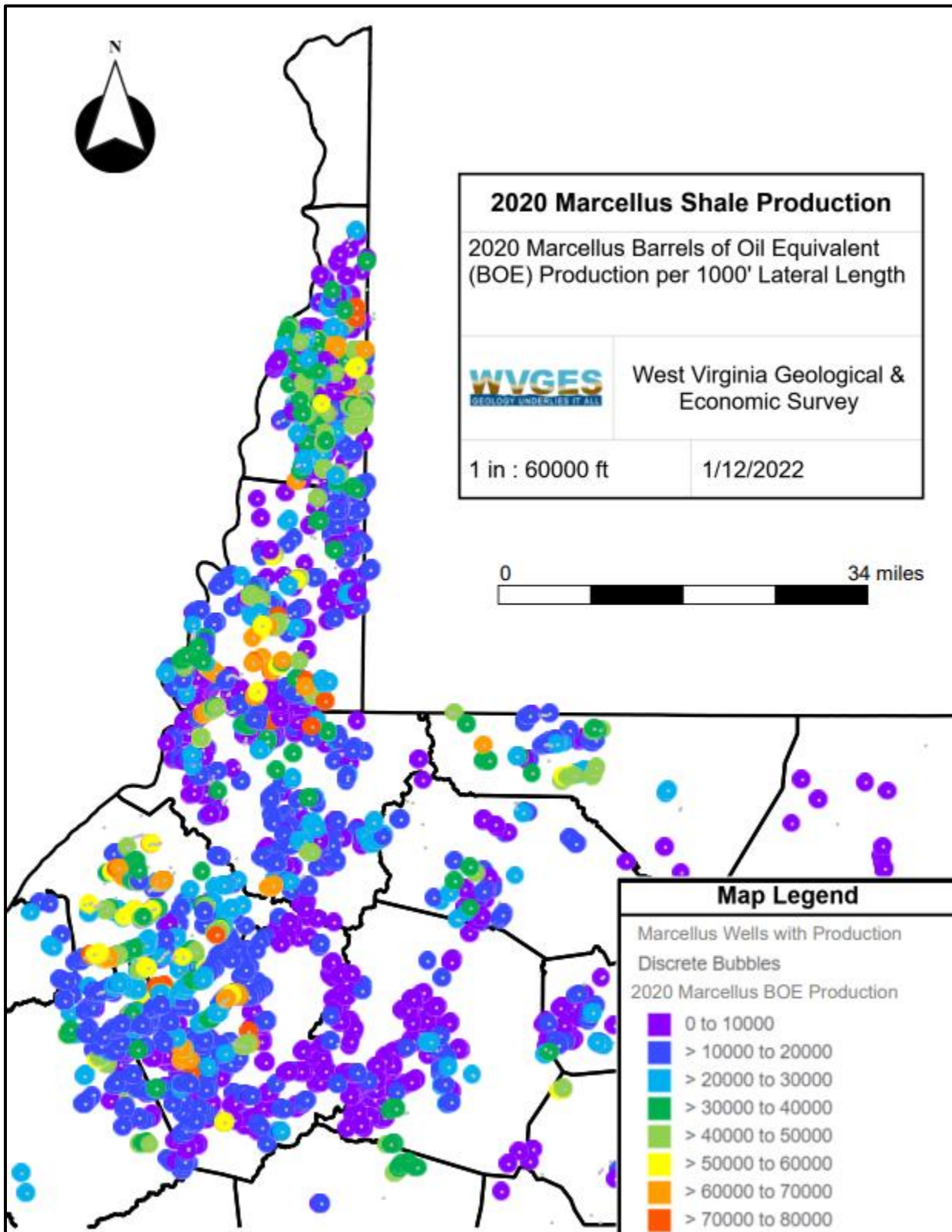


Figure 4. Map of Marcellus BOE production colored to show variations in produced volume.

2020 Activity in Utica-Point Pleasant Play

Development of the Utica-Point Pleasant natural gas play in West Virginia continues to accelerate. Records currently on file with WVDEP and/or WVGES indicate that 66 wells have reported 2020 production, up from 48 in 2019. The Utica-Point Pleasant play is predominantly dry gas, with small amounts of oil or NGL reported in Pleasants, Tyler, and Wetzel Counties. This report focuses on the gas production only.

Total 2020 Utica-Point Pleasant Gas Production: 149.9 Bcf *(2019: 79.8 Bcf)*

Average measured depth reported: 20,167 ft.

Longest/Deepest measured depth reported: 28,221 ft.

Top Utica-Point Pleasant Gas Producing Counties 2020

1. Marshall (139.9 Bcf)
2. Tyler (4.5 Bcf)
3. Monongalia (3.3 Bcf)
4. Pleasants (1.7 Bcf)
5. Wetzel (0.7 Bcf)

Top Operators for Utica-Point Pleasant Gas Production 2020

1. Tug Hill Operating (78.3 Bcf)
2. HG Energy (35.6 Bcf)
3. CNX Gas (14.3 Bcf)
4. American Petroleum Partners (12.2 Bcf)
5. Jay-Bee Oil & Gas (3.5 Bcf)
6. Triad Hunter (2.3 Bcf)
7. Chevron Appalachia (1.9 Bcf)
8. Southwestern Prod. Co. (0.8 Bcf)
9. EQT Production Co. (0.5 Bcf)
10. Antero Resources Corp. (0.3 Bcf)

Top Utica-Point Pleasant Gas Wells In 2020

1. **4705102045**, 10.8 Bcf; HG Energy, Marshall County, Total Measured Depth 28,221'
2. **4705102014**, 9.4 Bcf; HG Energy, Marshall County, Total Measured Depth 27,200'
3. **4705102013**, 8.2 Bcf; HG Energy, Marshall County, Total Measured Depth 26,656'
4. **4705101968**, 5.2 Bcf; Tug Hill Operating, Marshall County, Total Measured Depth 23,868'
5. **4705102012**, 5.1 Bcf; HG Energy, Marshall County, Total Measured Depth 24,325'

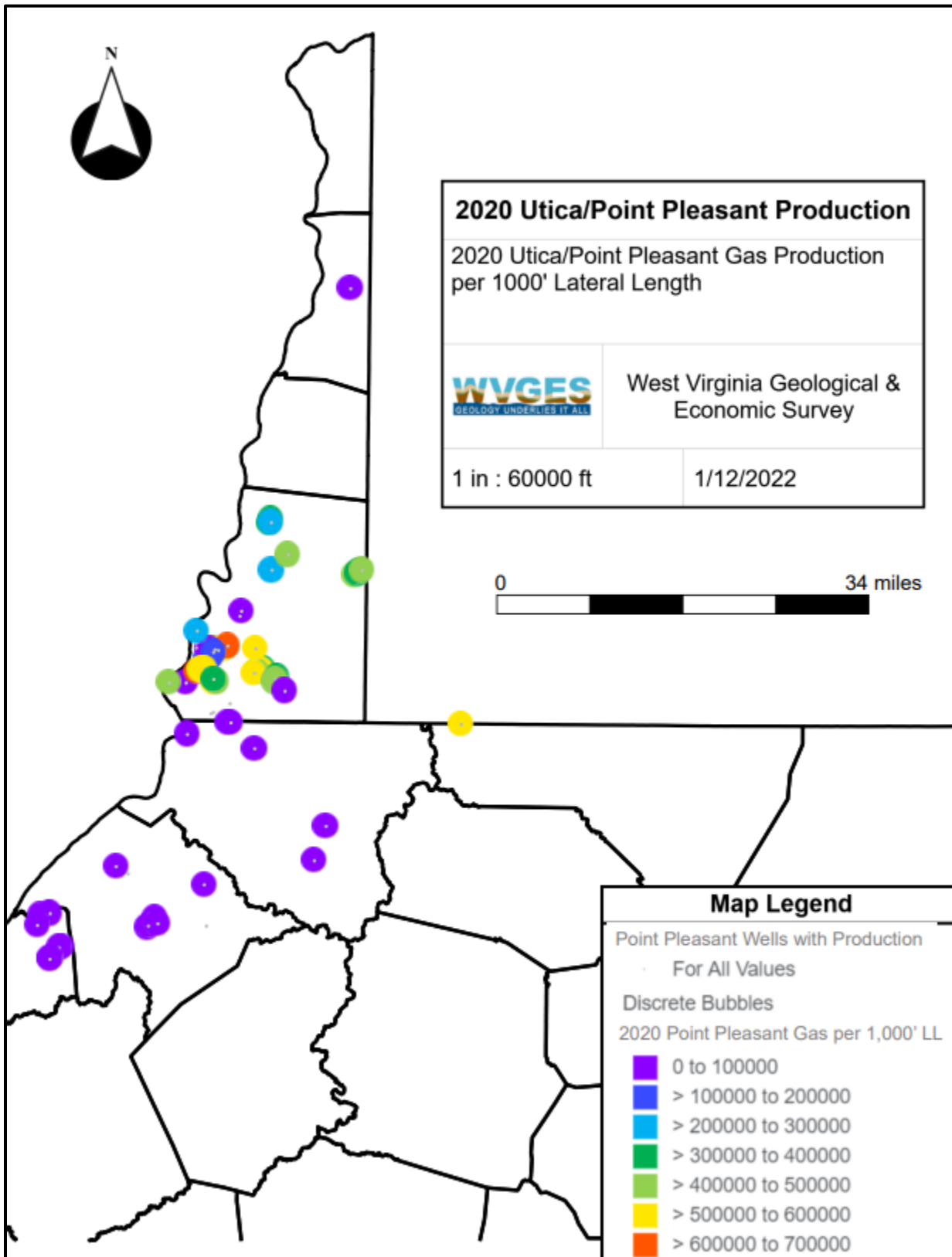


Figure 5. Map of Point Pleasant production colored to show variations in produced volume.