TABLE 4.—*Results of tests of bentonite samples from the northern Black Hills district, Montana, Wyoming, and South Dakota*

| County and State | Township and range | Section | Locality indicated on geologic map | Bentonite bed | Thickness of bed: Ft | Thickness of bed: in | Material listed in measured sections | Nonclay material (estimated percent) | Grit (percent) | For use as foundry-sand bonding clay (sand-clay mixtures containing 4 percent clay by weight): Green compression strength, in pounds per square inch, for various percentages of tempering water: 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | Dry compression strength, in pounds per square inch, for various percentages of tempering water: 1.6 | 1.8 | 2.0 | 2.2 | For use in drilling mud: Swelling capacity, in milliliters, of 2 g of bentonite | Yield (bbl per ton) | pH | Viscosity, in centipoises, for slurry containing 6 percent clay by weight | Viscosity for slurries containing various percentages of clay by weight: Clay (percent) | Viscosity (centipoises) | Clay (percent) | Viscosity (centipoises) | Wall-building properties for suspensions containing 6 percent clay by weight: Filtrate, in milliliters, for indicated periods, in minutes*: 2 | 15 | 30 | Thickness of cake, in thirty-seconds of an inch* | Gel strength (Stormer grams): 6 percent clay by weight: At 0 minutes (initial) | After 10 minutes | Percent of clay by weight: Clay (percent) | At 0 minutes (initial) | After 10 minutes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carter County, Mont. | 7 S., 56 E.[1] | 16 | 1 | 1 | | 2½ | 4-5 | 15 | 6.3 | -- | 13.2 | 15.1 | 16.1 | 15 | 13 | 11 | 14 | 18 | 22 | 7 | -- | 3.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 3 | 10-13 | 18 | 8.5 | -- | 10 | 14 | 15.3 | 14 | 12.8 | 9 | 11 | 13 | 15 | 7½ | -- | 3.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 27 | 2 | 1 | 2 | 1 | 2-4 | 25 | 3.2 | -- | 8 | 12.5 | 12.1 | 11 | 9.9 | 18 | 28 | 38 | -- | 8½ | -- | 4.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 1 | 9-10 | 25 | 15.5 | -- | 11.8 | 12.6 | 12 | 10.6 | 9 | 15 | 20 | 25 | 30 | 5½ | -- | 3.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9 S., 57 E. | 12 | 3 | F | | 9 | 2-3 | 30 | 4.6 | -- | 8.1 | 8.2 | 7.6 | 6.8 | 6 | 38 | 51 | 65 | 78 | 8 | -- | 7.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 4 | 8 | 4-8 | 22 | 1.5 | -- | 8 | 9.9 | 9 | 8 | 7 | 38 | 53 | 68 | -- | 28 | 72 | 8.7 | 4.5 | 8 | 18 | 8½ | 23 | 5 | 14.1 | 20.1 | 2 | 4 | 10 | 8½ | 20 | 60 |
| | | 26 | 4 | F | | 9 | 2-3 | 30 | 8.2 | -- | 7.7 | 7 | 6.4 | 5.9 | 5.4 | 35 | 42 | 50 | 57 | 6 | -- | 6.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 4 | 5 | 4-10 | 22 | 5.2 | 6.7 | 8.2 | 8.3 | 7.3 | 6.2 | 5.3 | 57 | 69 | 80 | -- | 27 | 78 | 8.7 | 7 | 7 | 16.5 | 7½ | 20.5 | 5.2 | 12.2 | 16.6 | 3 | 5 | 30 | 7½ | 30 | 90 |
| | 9 S., 58 E. | 11 | 5 | F | 1 | 0 | 2-3 | 30 | 9.5 | 6.8 | 7.8 | 8.4 | 8 | 7.2 | 6 | 25 | 32 | 40 | -- | 6 | -- | 4.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 4 | 6 | 4-7 | 22 | 5.8 | 6.4 | 7.5 | 8.5 | 7.8 | 6.8 | 5.6 | 36 | 47 | 58 | -- | 10 | -- | 7.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 12 | 6 | F | | 8 | 2-3 | 12 | 8 | -- | 8.2 | 8.9 | 8 | 7.3 | 6.4 | 30 | 40 | 50 | -- | 8 | -- | 5.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 4 | 0 | 4-6 | 10 | 1.6 | -- | 8.2 | 9.3 | 9.2 | 8.4 | 7.4 | 30 | 38 | 47 | -- | 11 | -- | 8.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 25 | 7 | Clay Spur | 2 | 4 | 6-7 | 13 | .4 | -- | -- | 9.6 | 9 | 7.8 | 6.3 | 37 | 49 | 61 | -- | 23 | 80 | 8.5 | 7 | 6½ | 12 | 7 | 1.8 | 4.2 | 11.8 | 16.3 | 2 | 4 | 5 | 7 | 5 | 15 |
| | | | | | | 7 | [2]8 | 13 | 1.5 | -- | -- | -- | -- | 7.6 | 7 | -- | 49 | 62 | -- | 33 | 95 | 8.8 | 23.5 | 5 | 8.5 | 5½ | 12 | 4 | 9.8 | 13.2 | 4 | 5 | 15 | 5 | 4 | 5 |
| | | | | | | 10 | [2]9 | 15 | 2.3 | -- | -- | -- | -- | -- | 7.8 | -- | -- | 55 | 62 | 36 | 96 | 8.9 | 18.5 | 5 | 7 | 5½ | 13.5 | 4.4 | 11.7 | 16.5 | 3 | 5 | 25 | 5 | 4 | 6 |
| | | | | | 1 | 5 | [2]8-9 | 15 | 2 | 6 | 7.9 | 9.2 | 8.6 | 7.6 | 6.5 | 24 | 37 | 50 | -- | 32 | 93 | 9.0 | 18.5 | 5 | 7.5 | 5½ | 10.5 | 4.8 | 11.1 | 15.1 | 3 | 5 | 10 | 5 | 4 | 5 |
| | | | 8 | Clay Spur | 1 | 0 | 2-3 | 20 | 6.2 | -- | -- | 7.8 | 7 | 6.2 | 6 | 10 | 25 | 50 | 57 | 10 | -- | 4.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 6 | 4-7 | 12 | 1.1 | -- | 9.6 | 9.7 | 9.2 | 8.5 | 7.8 | 36 | 50 | 64 | -- | 26 | 67 | 7.6 | 5.5 | 8 | 14 | 9 | 21.5 | 5.9 | 16.6 | 23.2 | 2 | 5 | 13 | 9 | 20 | 60 |
| | | 26 | 9 | Clay Spur | 2 | 2 | 2-3 | 18 | 7.4 | 6.7 | 6.2 | 5.8 | 5.4 | 5 | 4.7 | 42 | 52 | 57 | 62 | 17 | -- | 6.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 3 | [2]4-7 | 12 | 1.3 | -- | 8.2 | 9.4 | 8.7 | 7.8 | 6.7 | 32 | 48 | 64 | -- | 39 | 98 | 8.1 | 20.5 | 5 | 8.5 | 5½ | 14.5 | 5 | 12.4 | 17.2 | 2 | 20 | 80 | 5 | 6 | 33 |
| | | 27 | 10 | Clay Spur | 2 | 9 | [2]3-5 | 13 | 1.7 | -- | 8.9 | 9.7 | 9 | 8.2 | 7.3 | 33 | 46 | 59 | 73 | 45 | 115 | 7.8 | 43 | 4½ | 10 | 5 | 15.5 | 4.5 | 10 | 14.4 | 2 | 75 | 215 | 4½ | 13 | 35 |
| | | 32 | 11 | D | 1 | 4 | 2-5 | 12 | 3 | -- | 9.3 | 10.4 | 10 | 9.4 | 8.5 | 27 | 38 | 50 | -- | 11 | -- | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | Clay Spur | | 10 | 7 | 12 | .8 | -- | 8.4 | 9.5 | 8.8 | 7.7 | 6.6 | 32 | 46 | 60 | -- | 30 | 77 | 8.1 | 7 | 7 | 14.5 | 7½ | 18 | 4.8 | 11 | 15.4 | 2 | 5 | 23 | 7 | 6 | 65 |
| | | | | | 1 | 11 | [2]8-10 | 15 | 1.3 | -- | 8 | 9.4 | 8.6 | 7.6 | 6.6 | 26 | 38 | 50 | -- | 31 | 125 | 8.7 | 40 | 4 | 12 | 5 | 28 | 5.5 | 14.7 | 20.2 | 4 | 60 | 95 | 4 | 20 | 35 |
| | | 33 | 12 | Clay Spur | 2 | 4 | 2-3 | 18 | .5 | -- | 8.2 | 9.3 | 8.6 | 7.6 | 6.5 | 33 | 45 | 58 | -- | 30 | 90 | 8.4 | 14 | 5 | 10.5 | 6½ | 18.5 | 4.2 | 11.8 | 16.3 | 2 | 15 | 40 | 6½ | 25 | 60 |
| | | | | | 2 | 3 | [2]4-7 | 15 | 1.5 | -- | 8.2 | 9.8 | 9.7 | 8.7 | 7.8 | 33 | 46 | 60 | 74 | 39 | 118 | 8.8 | 36 | 4½ | 13.5 | 5 | 17.5 | 4.1 | 12.8 | 18 | 3 | 55 | 85 | 4½ | 15 | 35 |
| | | 34 | 13 | Clay Spur | 2 | 4 | 2-3 | 13 | 1.6 | -- | 8.7 | 8 | 7.3 | 6.6 | 6 | 44 | 52 | 61 | 68 | 20 | 60 | 8.0 | 4.5 | 8 | 11 | 9 | 15 | 4.8 | 12.7 | 18.2 | 2 | 4 | 8 | 9 | 12 | 50 |
| | | | | | 1 | 9 | [2]4-6 | 12 | 2.3 | -- | 8.2 | 9.9 | 9.8 | 8.8 | 7.2 | 30 | 44 | 58 | -- | 15 | -- | 7.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 36 | 14 | D | 1 | 5 | 2-4 | 10 | 2.2 | 7 | 8.8 | 10.5 | 9.2 | 8.7 | 7.6 | 40 | 55 | 65 | 73 | 22 | 127 | 4.7 | 52.5 | 4 | 10.5 | 5 | 35 | 8 | 21 | 30 | 4 | 75 | 110 | 4 | 30 | 40 |
| | | | | Clay Spur | 1 | 1 | 6-7 | 15 | 3.8 | -- | 7.2 | 6.4 | 5.5 | 4.8 | 4.5 | 45 | 62 | 77 | 85 | 19 | -- | 8.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 4 | [2]8-9 | 15 | 2.3 | 6.2 | 7 | 7.8 | 7.6 | 7 | 6.3 | 25 | 32 | 50 | -- | 39 | 106 | 8.3 | 33 | 5 | 12 | 5½ | 18.5 | 4.1 | 10 | 13.9 | 3 | 40 | 90 | 5 | 10 | 43 |
| | | | 15 | Clay Spur | | 8 | 2 | 17 | 3.8 | -- | 8 | 8.3 | 7.4 | 6.5 | 5.7 | 39 | 55 | 72 | -- | 20 | 75 | 7.4 | 7.5 | 6½ | 9.5 | 7 | 13 | 5.2 | 13 | 18.5 | 2 | 10 | 20 | 7 | 20 | 40 |
| | | | | | 2 | 5 | [2]3-5 | 15 | 1.4 | -- | 8.2 | 9.2 | 8.6 | 7.7 | 6.2 | 50 | 42 | 55 | -- | 20 | 91 | 8.6 | 14.5 | 5½ | 10.5 | 6½ | 18.5 | 4.1 | 13.8 | 19.5 | 2 | 18 | 50 | 6½ | 30 | 75 |
| | 9 S., 59 E. | 7 | 16 | F | | 8 | 2 | 20 | 2.5 | -- | 9.2 | 9.2 | 8.6 | 7.7 | 6.7 | 40 | 56 | 73 | -- | 8 | -- | 4.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 4 | 10 | 3-6 | 15 | 2.4 | -- | 8 | 9.2 | 8.9 | 8 | 7 | 30 | 41 | 52 | 64 | 8 | -- | 7.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 11 | 17 | F | 1 | 1 | 5-6 | 22 | 6.8 | 6.5 | 8.3 | 9.5 | 8.8 | 7.5 | 6 | 20 | 28 | 37 | -- | 8 | -- | 4.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 7 | 8 | 20 | 4 | -- | 9 | 10 | 9.1 | 8 | 7 | 44 | 57 | 71 | 85 | 10 | -- | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 6 | 7-9 | 15 | 1.2 | -- | 9 | 9.2 | 8.5 | 7.8 | 7 | 33 | 43 | 54 | 65 | 8 | -- | 6.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 28 | 18 | Clay Spur | | 9 | 2 | 25 | 6.9 | -- | 7.1 | 6.5 | 5.9 | 5 | 4.8 | 33 | 41 | 47 | 53 | 15 | -- | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 5 | 3-4 | 17 | 2.1 | -- | -- | 9.7 | 9 | 8 | 7 | 30 | 45 | 60 | -- | 33 | 100 | 8.1 | 21 | 5 | 8.5 | 5½ | 15 | 5.3 | 11.2 | 14 | 3 | 35 | 80 | 5 | 10 | 25 |
| | | 30 | 19 | Clay Spur | | 6 | 2 | 25 | 6.6 | -- | 6.4 | 5.4 | 4.7 | 4.2 | 4 | 37 | 39 | 42 | -- | 11 | -- | 5.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 7 | [2]3-6 | 17 | 2.5 | -- | -- | 9.3 | 8.6 | 7.8 | 7 | 34 | 50 | 66 | -- | 30 | 72 | 7.3 | 6 | 7½ | 14 | 8 | 18.5 | 6.4 | 15 | 20.6 | 3 | 4 | 12 | 8 | 22 | 60 |
| | | 34 | 20 | Clay Spur | 1 | 10 | 2-3 | 17 | 1.1 | -- | 8.6 | 9 | 8.4 | 7.3 | 6 | 37 | 50 | 64 | -- | 20 | 67 | 8.5 | 4 | 7½ | 10.5 | 8½ | 23 | 4 | 11 | 16.2 | 2 | 5 | 12 | 8½ | 13 | 50 |
| | | | | | 2 | 5 | [2]4-7 | 8 | 1.9 | -- | 7.4 | 9.6 | 9 | 8 | 7 | 26 | 37 | 48 | -- | 35 | 99 | 8.5 | 23 | 5 | 8.5 | 5½ | 14.5 | 4 | 11 | 15 | 3 | 15 | 55 | 5 | 5 | 32 |
| | | 35 | 21 | Clay Spur | 2 | 5 | 2-3 | 12 | 2.8 | -- | 9.1 | 8.4 | 7.4 | 6.7 | 5.9 | 44 | 55 | 66 | 78 | 20 | 58 | 8.8 | 3 | 9 | 14.5 | 9½ | 19.5 | 4.5 | 12.1 | 17 | 2 | 4 | 10 | 9½ | 25 | 40 |
| | | | | | 2 | 2 | [2]4-6 | 12 | 2.7 | -- | -- | 8.2 | 7.7 | 7 | 6.5 | 28 | 36 | 42 | 47 | 34 | 103 | 8.1 | 23 | 5 | 12 | 5½ | 17 | 5.5 | 15.8 | 22.3 | 4 | 45 | 95 | 5 | 23 | 50 |
| Crook County, Wyo. | 58 N., 66 W. | 24 | 22 | F | | 7 | 2 | 15 | 1.6 | -- | 8.6 | 9.7 | 9 | 8 | 7 | 23 | 30 | 36 | -- | 11 | -- | 6.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 4 | 5 | 3-6 | 25 | 3 | -- | -- | -- | -- | -- | 6.2 | -- | -- | 65 | 80 | 25 | 85 | 8.7 | 10.5 | 6½ | 16 | 7 | 22 | 6.4 | 16 | 22 | 2 | 20 | 40 | 7 | 40 | 85 |
| | | 35 | 23 | F | 5 | 7 | 3-8 | 40 | 8.5 | -- | 8 | 7.9 | 7 | 6 | 5.3 | 63 | 77 | 85 | 94 | 12 | -- | 8.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 36 | 24 | F | 3 | 0 | 4-7 | 25 | 2 | -- | 9 | 9.7 | 8.8 | 8 | 7 | 48 | 58 | 68 | 80 | 15 | -- | 8.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 58 N., 65 W. | 27 | 25 | E | 3 | 3 | 2-3 | 20 | .5 | -- | -- | 7.2 | 6.4 | 5.6 | 5.2 | 47 | 61 | 67 | -- | 21 | 77 | 8.6 | 5 | 8 | 14.5 | 8½ | 18.5 | 5.5 | 14.5 | 20.5 | 2 | 9 | 18 | 8½ | 40 | 65 |
| | | | | | | 6 | 4-5 | 23 | 3.2 | -- | 7 | 6.6 | 6 | 5.8 | 5.2 | 58 | 77 | 95 | -- | 30 | 130 | 8.9 | 52 | 5 | 25 | 5½ | 38 | 4.5 | 10.5 | 14.2 | 3 | 65 | 135 | -- | -- | -- |
| | | 34 | 26 | Clay Spur | | 11 | 2-3 | 25 | 5.4 | -- | 7.3 | 7.3 | 6.5 | 5.7 | 5.3 | 35 | 37 | 38 | -- | 8½ | -- | 4.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 6 | [2]4-6 | 17 | 1.6 | -- | 8.4 | 9.6 | 9.4 | 8.3 | 7.5 | 40 | 53 | 64 | -- | 33 | 85 | 4.7 | 9 | 6½ | 17 | 7 | 20.5 | 9.8 | 28 | 39.6 | 4 | 22 | 34 | 7 | 53 | 65 |
| | 58 N., 63 W. | 32 | 27 | A | 2 | 0 | 2 | 35 | 7.1 | 5.2 | 4.6 | 3.8 | 3.6 | 3.4 | 3.2 | 42 | 48 | 55 | 62 | 8 | -- | 7.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 9 | 3-4 | 20 | 13.3 | -- | 8.1 | 8.2 | 7.5 | 6.7 | 6 | 33 | 38 | 44 | 51 | 13 | -- | 77 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 33 | 28 | Clay Spur | | 11 | 2-3 | 15 | 2.1 | 8.7 | 10 | 10.2 | 9.6 | 8.2 | 7.1 | 24 | 32 | 40 | -- | 17 | -- | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 1 | 4-5 | 13 | 1.3 | -- | 8.2 | 9.5 | 8.5 | 7.5 | 6.5 | 45 | 60 | 74 | -- | 31 | 74 | 7.3 | 7 | 7 | 12 | 7½ | 16 | 6 | 15.2 | 20.8 | 2 | 12 | 23 | 7½ | 29 | 73 |
| | | 34 | 29 | Clay Spur | 1 | 7 | 2-3 | 15 | .9 | -- | 8 | 11 | 9.8 | 7.8 | 6.3 | 33 | 47 | 63 | -- | 12 | -- | 6.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 1 | [2]4-5 | 15 | 1.4 | 6 | 10 | 11 | 10.4 | 8.4 | 7 | 31 | 43 | 55 | 64 | 16 | -- | 7.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | 30 | B | | 8 | 3-4 | 15 | 6.7 | -- | 9.7 | 10.7 | 10.6 | 10 | 8.8 | 8 | 12 | 20 | 22 | 6 | -- | 3.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 58 N., 62 W. | 29 | 31 | G | 4 | 3 | 2 | 22 | 2.9 | -- | 6.8 | 6 | 5.6 | 5 | 4.5 | 56 | 64 | 72 | 78 | 15 | -- | 8.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 8 | 3 | 20 | .5 | -- | 8.4 | 8.9 | 8 | 7 | 6 | 35 | 50 | 65 | 75 | 14 | -- | 8.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 6 | 9 | 2-6 | 22 | 1.5 | 6.7 | 7.4 | 7.4 | 6.8 | 6 | 5 | 32 | 39 | 47 | 55 | 13 | -- | 7.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 31 | 32 | G | 1 | 10 | 2-3 | 40 | 5.5 | 5.8 | 5.2 | 4.6 | 4 | 3.7 | 3.3 | 42 | 47 | 52 | 58 | 6½ | -- | 7.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 10 | 4-9 | 50 | 2.9 | -- | 7.5 | 7 | 6.1 | 5.3 | 5 | 35 | 42 | 47 | 50 | 9 | -- | 7.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 57 N., 65 W. | 5 | 33 | Clay Spur | | 11 | 2-3 | 15 | 2.3 | 8 | 8.4 | 8.4 | 7.8 | 7 | 6.1 | 26 | 35 | 40 | -- | 12 | -- | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 6 | [2]4-6 | 18 | 1.0 | -- | 7.8 | 9.6 | 8.1 | 7.3 | 6.5 | 40 | 58 | 69 | 80 | 32 | 83 | 8.3 | 10 | 6½ | 15 | 7 | 18.5 | 5.4 | 15 | 20 | 3 | 12 | 45 | 7 | 30 | 75 |
| | | 7 | 34 | Clay Spur | 2 | 7 | [2]3-6 | 13 | 1.0 | 5 | 8.4 | 9 | 8.9 | 8 | 7 | 35 | 43 | 51 | 60 | 20 | 54 | 7.4 | 3 | 9½ | 12 | 10 | 16 | 10.3 | 28 | 35.5 | 3 | 7 | 10 | 10 | 35 | 80 |
| | | 10 | 35 | Clay Spur | 3 | 4 | 2-4 | 15 | 2.2 | 9.1 | 9 | 8.6 | 7.2 | 6 | 5.4 | 37 | 44 | 52 | 59 | 21 | 63 | 7.8 | 4 | 8½ | 15 | 9 | 18.5 | 7 | 18.2 | 26 | 3 | 8 | 13 | 9 | 30 | 55 |
| | | | | | 3 | 7 | [2]5-7 | 15 | 1.0 | -- | 8.5 | 10.8 | 9.3 | 8 | 7 | 26 | 54 | 81 | -- | 35 | 92 | 8.1 | 16 | 5½ | 11.5 | 6½ | 22 | 5.6 | 14.4 | 19.4 | 3 | 30 | 50 | 6½ | 45 | 75 |
| | 57 N., 62 W. | 4 | 36 | F | 4 | 5 | 3-7 | 17 | 1.9 | -- | 8.2 | 9.5 | 8.9 | 8 | 7.2 | 38 | 51 | 64 | -- | 9 | -- | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 9 | 37 | F | | 5 | 2 | 25 | 15.6 | -- | 5.4 | 4.9 | 4.5 | 4.2 | 3.9 | 15 | 20 | 25 | 30 | 4 | -- | 4.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 10 | 3-8 | 30 | 5 | 6.7 | 8.3 | 8 | 7 | 6.3 | 5.8 | 35 | 45 | 55 | 65 | 7 | -- | 6.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | 38 | G | 2 | 7 | 2-4 | 10 | 1.1 | -- | 9.2 | 10.2 | 9.8 | 8.7 | 7.6 | 35 | 47 | 60 | -- | 9 | -- | 7.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 15 | 39 | F | 5 | 0 | 3-5 | 17 | 3.2 | -- | 8.2 | 7 | 6.1 | 5.6 | 5 | 43 | 49 | 53 | -- | 9 | -- | 8.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 16 | 40 | Clay Spur | 1 | 1 | 3 | 10 | .2 | -- | 8.4 | 7.6 | 6.9 | 6.2 | 5.8 | 46 | 58 | 70 | 82 | 19 | -- | 8.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 10 | 4 | 25 | .9 | -- | 8.1 | 9.7 | 8.8 | 8 | 7 | 46 | 55 | 64 | 73 | 26 | 66 | 8.4 | 6 | 8 | 10.5 | 8½ | 17 | 4.8 | 13 | 18 | 2 | 4 | 14 | 8½ | 15 | 60 |
| | | 21 | 41 | E | | 6 | 3 | 25 | .1 | -- | -- | 8 | 7.4 | 6.8 | 6.1 | 57 | 70 | 83 | -- | 20 | 52 | 7.6 | 3 | 10 | 10.5 | 11 | 15 | 6.2 | 15.4 | 22 | 2 | 4 | 4 | 11 | 10 | 28 |
| | | | | | 1 | 3 | 4 | 20 | 2.6 | 6 | 7.9 | 8 | 6.4 | 5.8 | 5.5 | 57 | 70 | 84 | 95 | 23 | 82 | 8.4 | 8.5 | 6½ | 13 | 7 | 18.5 | 5.3 | 12 | 16.4 | 4 | 5 | 35 | 7 | 15 | 70 |
| | | 23 | 42 | F | 1 | 0 | 2 | 17 | 1.2 | -- | 8.2 | 9.6 | 10.3 | 9.5 | 7.9 | 41 | 53 | 64 | 75 | 12 | -- | 4.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 6 | 3 | 15 | 2.4 | -- | 9 | 9.2 | 8.8 | 7.3 | 6.7 | 60 | 70 | 75 | -- | 18 | -- | 8.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 6 | 4 | 40 | 4.7 | 6.2 | 8.4 | 8 | 7 | 6.2 | 5.5 | 66 | 75 | 84 | -- | 17½ | -- | 8.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 1 | 5 | 20 | 5.3 | -- | -- | -- | -- | -- | 7 | -- | -- | 58 | 72 | 17 | -- | 8.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 4 | 6 | 17 | 2.4 | -- | -- | -- | 8 | 7.5 | 7 | 41 | 52 | 62 | 73 | 11 | -- | 8.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 5 | 7 | 22 | 2.1 | 5.7 | 8 | 9 | 8.5 | 7.4 | 6.3 | 50 | 63 | 76 | -- | 13 | -- | 7.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 4 | 10 | 2-7 | 20 | 1.7 | -- | 10.4 | 11 | 10 | 8.8 | 7.8 | 26 | 36 | 47 | 58 | 18 | -- | 8.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 33 | 43 | Clay Spur | 3 | 3 | 2-3 | 12 | 1.1 | -- | -- | 8.6 | 7.9 | 6.5 | 5.9 | 36 | 45 | 55 | 65 | 19 | -- | 7.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 1 | [2]5 | 18 | 2 | -- | 8.4 | 9.1 | 9.2 | 8.1 | 7.2 | 42 | 53 | 61 | 70 | 45 | 110 | 8.4 | 33 | 5 | 14.5 | 5½ | 23 | 5 | 12 | 17 | 4 | 50 | 130 | -- | -- | -- |
| | | | | | | 6 | 6 | 13 | .7 | -- | -- | -- | -- | -- | 7 | -- | -- | 60 | 72 | 25 | 67 | 7.5 | 5 | 8 | 14 | 8½ | 17 | 6.8 | 18.2 | 25.4 | 2 | 5 | 10 | 8½ | 20 | 55 |
| | | | | | 3 | 11 | [2]4-6 | 17 | 2 | -- | 8 | 10 | 9.4 | 8 | 6.9 | 26 | 37 | 48 | -- | 30 | 95 | 7.6 | 17 | 5 | 10.5 | 5½ | 14.5 | 5.8 | 14.8 | 22 | 3 | 35 | 62 | 5 | 22 | 47 |
| | | 36 | 44 | Clay Spur | 1 | 8 | 7 | 15 | 3.2 | -- | 8.4 | 9.5 | 8.9 | 8 | 7 | 35 | 49 | 63 | -- | 22½ | 59 | 9.0 | 4 | 9 | 14.5 | 9½ | 17.5 | 5.4 | 13 | 22.2 | 2 | 4 | 6 | 9½ | 8 | 50 |
| | | | | | 2 | 3 | [2]8-12 | 12 | 2 | -- | 8.7 | 9.9 | 9.4 | 8.6 | 8 | 22 | 30 | 38 | -- | 36 | 83 | 8.5 | 9.5 | 6½ | 13.5 | 7 | 18 | 6 | 20 | 29.5 | 4 | 5 | 22 | 7 | 15 | 55 |
| | | | 45 | Clay Spur | 2 | 5 | 2-3 | 12 | .5 | -- | 8.7 | 10.3 | 9.4 | 8.4 | 7.4 | 30 | 42 | 55 | -- | 28 | 70 | 7.7 | 5.5 | 7½ | 10.5 | 8 | 18 | 5.4 | 15.8 | 21.6 | 2 | 5 | 10 | 8 | 6 | 50 |
| | | | | | 1 | 10 | [2]4-5 | 18 | 2.1 | -- | 8 | 9.7 | 9.1 | 8.3 | 7.4 | 28 | 40 | 52 | 64 | 40 | 99 | 8.4 | 20 | 5 | 10.5 | 5½ | 15 | 5 | 14.6 | 19.8 | 3 | 35 | 80 | 5 | 12 | 35 |
| | 57 N., 61 W. | 8 | 46 | B | 2 | 11 | 2 | 15 | 7.1 | 8 | 9.3 | 10.3 | 9.6 | 8.3 | 7.5 | 28 | 37 | 45 | -- | 14 | -- | 8.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | 47 | Clay Spur | 2 | 11 | 2-4 | 17 | 1.4 | -- | 9 | 9.3 | 8.6 | 7.8 | 6.8 | 45 | 52 | 59 | 66 | 35 | 90 | 7.7 | 14.5 | 5½ | 10 | 6½ | 18.5 | 4.7 | 8.2 | 13.1 | 2 | 20 | 45 | 6½ | 30 | 60 |
| | | | | | 1 | 11 | [2]5-6 | 15 | 2.2 | -- | 8.1 | 8.1 | 7.7 | 7 | 6.3 | 40 | 50 | 58 | 67 | 43 | 112 | 8.8 | 38 | 4½ | 9 | 5 | 15.5 | 4 | 10.2 | 14.7 | 3 | 25 | 105 | 4½ | 5 | 30 |
| | | 21 | 48 | Clay Spur | 1 | 4 | 2-4 | 30 | 3.2 | -- | 8.2 | 8.3 | 7.3 | 6.7 | 6 | 42 | 48 | 55 | 63 | 8 | -- | 7.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 4 | [2]5-8 | 15 | .9 | -- | 8 | 9.3 | 9 | 8 | 7.2 | 30 | 41 | 53 | 65 | 37 | 99 | 8.3 | 19.5 | 5 | 8.5 | 5½ | 14.5 | 3.9 | 13.2 | 18.3 | 3 | 35 | 105 | 5 | 15 | 55 |
| | | 23 | 49 | F | 1 | 3 | 2 | 15 | 2.5 | -- | 8.8 | 10.3 | 10.3 | 8.9 | 7.5 | 25 | 33 | 41 | 50 | 9 | -- | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 9 | 4 | 17 | 2.7 | 7.8 | 9.4 | 10.8 | 10 | 8.7 | 7.5 | 24 | 31 | 39 | -- | 10 | -- | 3.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 4 | 8 | 2-8 | 35 | 2.7 | -- | 8 | 9.2 | 8.6 | 7.7 | 6.9 | 33 | 43 | 53 | 63 | 9 | -- | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 25 | 50 | F | 4 | 6 | 2-6 | 25 | 2.9 | -- | -- | 8.1 | 7.8 | 7.1 | 6.2 | 42 | 47 | 54 | 60 | 10 | -- | 4.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 27 | 51 | Clay Spur | 1 | 3 | 2-3 | 22 | 1.4 | -- | 9.3 | 9.3 | 8.4 | 7 | 6.6 | 46 | 56 | 67 | 75 | 20 | 51 | 7.3 | 4 | 9½ | 8.5 | 10 | 12 | 6.4 | 16.3 | 22.2 | 3 | 4 | 4 | 10 | 4 | 5 |
| | | | | | 2 | 11 | 4-6 | 17 | 1.8 | 5.6 | 9 | 10.2 | 9.2 | 8 | 6.7 | 38 | 50 | 61 | 70 | 21 | 55 | 8.0 | 3 | 9 | 10 | 10 | 16 | 6.2 | 17.6 | 23 | 2 | 4 | 15 | 10 | 5 | 25 |
| | | 28 | 52 | Clay Spur | 1 | 1 | 2 | 40 | 7.9 | -- | 7.2 | 6.7 | 6 | 5.4 | 5 | 50 | 60 | 70 | -- | 21 | 64 | 7.0 | 5 | 8 | 11 | 8½ | 15.5 | 7 | 19 | 27.5 | 2 | 10 | 20 | 8½ | 33 | 60 |
| | | | | | 2 | 9 | [2]3-5 | 17 | 3.6 | 7.5 | 9 | 9.9 | 9.3 | 8.3 | 7.4 | 34 | 44 | 55 | -- | 35 | 83 | 7.2 | 10.5 | 6½ | 14.5 | 7 | 19 | 5.3 | 12.7 | 18.7 | 3 | 5 | 35 | 7 | 14 | 55 |
| | | 29 | 53 | Clay Spur | 1 | 4 | 2 | 10 | 2.1 | 7.6 | 7.9 | 7.6 | 5.8 | 5.1 | 4.8 | 44 | 48 | 52 | 55 | 17 | -- | 8.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 8 | [2]3-5 | 15 | 1.7 | -- | 8.8 | 10 | 9.7 | 8.9 | 7.8 | 37 | 52 | 67 | 84 | 33 | 90 | 8.3 | 14.5 | 5 | 9.5 | 6½ | 20.5 | 5.2 | 12.9 | 16.4 | 2 | 10 | 40 | 6½ | 15 | 55 |
| | 56 N., 67 W. | 9 | 54 | F | | 6 | 2 | 22 | 3.3 | -- | 8.7 | 8.2 | 7.7 | 7 | 5.8 | 52 | 55 | 57 | -- | 12 | -- | 7.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 1 | 3 | 20 | 2.2 | -- | 8.4 | 9.9 | 9.3 | 8.4 | 7.4 | 49 | 64 | 80 | 97 | 24 | 99 | 8.4 | 23 | 5½ | 14.5 | 6½ | 31 | 4.8 | 11 | 15.5 | 2 | 50 | 75 | 6½ | 60 | 105 |
| | | | | | 1 | 3 | 4 | 22 | 3 | 6.5 | 8.3 | 9.3 | 8.4 | 7.2 | 6.3 | -- | 28 | 40 | 54 | 35 | 97 | 9.3 | 18.5 | 5 | 8.5 | 5½ | 14 | 3.4 | 8.8 | 12.5 | 3 | 12 | 55 | 5 | 5 | 30 |
| | | | | | | 8 | 5 | 17 | 2.6 | -- | 8.7 | 10.2 | 9.3 | 8.2 | 7.2 | 37 | 50 | 63 | -- | 42 | 108 | 9.2 | 33 | 4½ | 7.5 | 5 | 14.5 | 3.9 | 9.3 | 13.1 | 3 | 40 | 95 | 4½ | 4 | 25 |
| | | | | | 2 | 2 | 6 | 27 | 4.6 | -- | 7.8 | 7.8 | 7 | 6.4 | 5.8 | 34 | 42 | 50 | 58 | 30 | 92 | 9.1 | 15 | 5½ | 11.5 | 6½ | 17.5 | 3.8 | 9 | 12.2 | 3 | 10 | 50 | 6½ | 20 | 85 |
| | | | | | | 7 | 7 | 20 | 2.6 | -- | 8 | 8.8 | 8.4 | 7.8 | 7 | 48 | 62 | 76 | 90 | 26 | 79 | 8.8 | 8.5 | 6½ | 12 | 7 | 16 | 5.2 | 11.9 | 15.8 | 2 | 5 | 25 | 7 | 8 | 40 |
| | | | | | 5 | 9 | 3-7 | 18 | 2.3 | 6.2 | 8 | 8.5 | 7.7 | 6.7 | 5.8 | 49 | 62 | 74 | -- | 32 | 118 | 9.1 | 49 | 4½ | 10.5 | 5 | 18.5 | 4.6 | 11.4 | 16.5 | 4 | 60 | 115 | 4½ | 6 | 30 |
| | | 13 | 55 | Clay Spur | | 7 | 2 | 20 | 7.7 | 7 | 8.2 | 8.2 | 7.6 | 7 | 6 | 41 | 55 | 67 | -- | 20 | 61 | 5.1 | 4 | 8½ | 12 | 9 | 16 | 6.4 | 17.2 | 25 | 2 | 4 | 13 | 9 | 25 | 45 |
| | | | | | 1 | 7 | [2]3-4 | 22 | 2.3 | -- | 8.3 | 9.4 | 9 | 7.8 | 6.6 | 27 | 37 | 48 | 60 | 23 | 67 | 7.7 | 5.5 | 7½ | 10.5 | 8 | 14 | 6 | 12.6 | 19.3 | 3 | 5 | 15 | 8 | 15 | 50 |
| | 56 N., 66 W. | 4 | 56 | Clay Spur | | 11 | 2 | 15 | 4.9 | -- | 7.2 | 6.4 | 5.3 | 4.7 | 4.3 | 70 | 84 | 96 | -- | 22 | 87 | 9.1 | 12 | 5½ | 8.5 | 6½ | 18.5 | 4 | 10.6 | 14 | 2 | 10 | 45 | 6½ | 25 | 75 |
| | | | | | | 10 | 3 | 12 | 1.3 | -- | -- | 7.8 | 7.4 | 7 | 6.5 | 44 | 59 | 75 | 91 | 45 | 125 | 9.1 | 62.5 | 4 | 10 | 4½ | 15 | 4 | 8.9 | 11.3 | 3 | 85 | 145 | 4 | 5 | 43 |
| | | | | | | 11 | [2]4 | 10 | 1.7 | -- | 7.4 | 8.7 | 8.5 | 7.8 | 7.1 | 38 | 55 | 72 | 89 | 50 | 133 | 8.8 | 72 | 4 | 13 | 4½ | 18.5 | 4.8 | 11.4 | 16 | 3 | 105 | 185 | 4 | 10 | 35 |
| | | | | | | 6 | [2]5 | 15 | 2.5 | -- | -- | 8.2 | 7.9 | 7.5 | 7.1 | 23 | 36 | 50 | -- | 42 | 140 | 9.2 | 62.5 | 4 | 18.5 | 5 | 37 | 6 | 19.7 | 28.6 | 4 | 90 | 125 | 4 | 20 | 40 |
| | | | | | | 6 | [2]6 | 17 | 4.1 | -- | 7 | 8.2 | 7.5 | 6.5 | 5.8 | 27 | 36 | 44 | 54 | 43 | 93 | 9.0 | 16 | 5½ | 10.5 | 6½ | 23 | 4.2 | 10 | 14.3 | 3 | 13 | 45 | 6½ | 25 | 75 |
| | | | | | 2 | 9 | [2]3-6 | 17 | 1.7 | -- | 7.3 | 8.4 | 8.3 | 7.9 | 7.1 | 37 | 53 | 70 | -- | 44 | 115 | 9.1 | 55 | 4½ | 10.5 | 5 | 18.5 | 4.5 | 10.5 | 14.7 | 4 | 65 | 190 | 4½ | 10 | 40 |
| | 56 N., 62 W. | 1 | 57 | Clay Spur | 2 | 5 | 8 | 10 | 2 | -- | 8.4 | 9.5 | 8.8 | 8 | 7.1 | 34 | 50 | 66 | 82 | 44 | 119 | 8.5 | 47.5 | 4½ | 13.5 | 5 | 18.5 | 4.2 | 10.7 | 14.8 | 3 | 60 | 150 | 4½ | 13 | 50 |
| | | 6 | 58a | A | 4 | 8 | 3-6 | 18 | 5 | -- | 8.2 | 8.5 | 7.6 | 6.8 | 6.2 | 42 | 56 | 70 | 86 | 32 | 108 | 8.9 | 40 | 5 | 14 | 5½ | 23 | 3.8 | 8.6 | 12.2 | 2 | 15 | 85 | 5 | 7 | 40 |
| | | 8 | 58 | A | 3 | 2 | 3-4 | 20 | 8.2 | -- | -- | 8.4 | 7.7 | 6.8 | -- | 42 | 53 | 64 | 74 | 13 | -- | 8.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 1 | 5 | 23 | 6.2 | -- | 8 | 8.3 | 8 | 7 | 5.8 | 52 | 62 | 74 | -- | 13 | -- | 7.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 56 N., 61 W. | 1 | 59 | Clay Spur | 1 | 3 | 2-3 | 12 | .3 | -- | 8.4 | 9.5 | 8.6 | 7.7 | 6.6 | 38 | 58 | 68 | -- | 35 | 86 | 8.4 | 10.5 | 6½ | 16 | 7 | 24 | 4.6 | 12.6 | 17.3 | 3 | 5 | 30 | 7 | 15 | 105 |
| | | | | | 2 | 2 | [2]4-6 | 10 | .7 | 5.7 | 8.7 | 10 | 9.1 | 8 | 6.7 | 33 | 45 | 57 | -- | 40 | 92 | 7.8 | 16 | 5½ | 12 | 6½ | 20.5 | 4.5 | 11.8 | 16.7 | 3 | 5 | 27 | 6½ | 7 | 45 |
| | | 3 | 60 | Clay Spur | 4 | 11 | [2]2-6 | 15 | 5.3 | -- | 8.8 | 10.4 | 10 | 9 | 7.5 | 32 | 45 | 58 | 71 | 28 | 83 | 8.4 | 10.5 | 6½ | 14.5 | 7 | 19 | 3.8 | 9.5 | 13.7 | 2 | 4 | 13 | 7 | 5 | 40 |
| | | 7 | 61 | Clay Spur | | 9 | 2-3 | 20 | 4.4 | -- | 7.3 | 7.9 | 7 | 6 | 5 | 50 | 63 | 76 | -- | 17 | -- | 7.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 2 | [2]4-7 | 15 | 1.9 | -- | 8 | 9.3 | 9.1 | 8 | 6.8 | 32 | 44 | 58 | -- | 37 | 96 | 7.9 | 19.5 | 5 | 8.5 | 5½ | 13 | 4.6 | 11.8 | 16.5 | 3 | 15 | 55 | 5 | 5 | 25 |
| | | 11 | 62 | Clay Spur | 1 | 6 | [2]3-5 | 15 | 1.7 | -- | 8 | 9.2 | 8.7 | 8 | 7 | 22 | 33 | 44 | 55 | 37 | 102 | 8.1 | 25.5 | 5 | 9.5 | 5½ | 17 | 3.9 | 9.6 | 13.4 | 3 | 25 | 75 | 5 | 5 | 25 |
| | | | 63 | Clay Spur | 1 | 3 | 9-10 | 20 | 3.9 | -- | 8.8 | 8.9 | 8.2 | 7.3 | 6.3 | 36 | 45 | 55 | 65 | 33 | 73 | 7.1 | 5.5 | 7½ | 15 | 8 | 18.5 | 4.3 | 14 | 19.2 | 3 | 5 | 23 | 8 | 3.0 | 85 |
| | | | | | 1 | 10 | [2]11-15 | 17 | 2.9 | -- | -- | 9 | 7.8 | 6.8 | 6.2 | 25 | 35 | 45 | 55 | 38 | 113 | 8.3 | 45 | 4½ | 9 | 5 | 16.5 | 3.6 | 10.8 | 14.2 | 3 | 75 | 145 | 4½ | 15 | 40 |
| | | 13 | 64 | E | 2 | 8 | 2 | 17 | .3 | -- | 7.5 | 7 | 6.7 | 6 | 5.2 | 31 | 41 | 50 | 60 | 16 | -- | 7.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 10 | 3 | 25 | 2.7 | -- | 7 | 7.7 | 6.7 | 5.7 | 5.4 | 55 | 77 | 82 | 87 | 21 | 106 | 8.1 | 28 | 5 | 12 | 5½ | 18.5 | 5.6 | 14 | 19.7 | 3 | 60 | 110 | 5 | 30 | 60 |
| | | | | | 3 | 1 | 4 | 55 | 1 | -- | 4.6 | 4.1 | 3.7 | 3.4 | 3 | 28 | 35 | 40 | 43 | 8 | -- | 7.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 15 | 65 | Clay Spur | 1 | 6 | 2 | 10 | .3 | -- | 8.8 | 9.8 | 8.8 | 7.7 | 6.6 | 28 | 42 | 54 | -- | 32 | 86 | 8.5 | 12 | 5½ | 8.5 | 6½ | 17.5 | 4 | 11 | 15.5 | 3 | 5 | 12 | 6½ | 5 | 20 |
| | | | | | 2 | 4 | [2]3-4 | 10 | 1.1 | -- | 7.8 | 9.4 | 9 | 8.1 | 7.1 | 27 | 38 | 49 | 61 | 40 | 98 | 8.4 | 23 | 5 | 9 | 5½ | 14 | 4 | 11 | 15.4 | 3 | 10 | 55 | 5 | 5 | 30 |
| | | 16 | 66 | Clay Spur | 1 | 0 | 2-3 | 15 | 1.5 | -- | 8 | 8.7 | 7.9 | 7 | 6 | 38 | 51 | 64 | -- | 32 | 102 | 8.8 | 21 | 5 | 10.5 | 5½ | 16 | 4.8 | 14 | 19 | 3 | 15 | 55 | 5 | 5 | 25 |
| | | | | | 3 | 9 | [2]4-6 | 13 | 2.1 | -- | 7.7 | 9 | 8.8 | 8 | 7.1 | 24 | 34 | 44 | 54 | 37 | 97 | 8.3 | 19.5 | 5 | 8.5 | 5½ | 14 | 5.6 | 14.4 | 20.5 | 4 | 15 | 45 | 5 | 5 | 23 |
| | | 17 | 67 | Clay Spur | 2 | 8 | [2]3-7 | 10 | .8 | -- | 7.7 | 10 | 9.4 | 8.4 | 7.3 | 36 | 51 | 66 | 81 | 35 | 100 | 7.6 | 19 | 5 | 11 | 5½ | 14.5 | 5.8 | 15.8 | 22.3 | 3 | 40 | 105 | 5 | 20 | 65 |
| | | 18 | 68 | Clay Spur | 2 | 6 | 2-3 | 17 | .8 | -- | 8.8 | 10.6 | 9.5 | 8.3 | 6.8 | 30 | 43 | 58 | -- | 21 | 69 | 8.4 | 5.5 | 7 | 10.5 | 8 | 16 | 5 | 13.7 | 17.9 | 2 | 4 | 15 | 8 | 12 | 55 |
| | | | | | 3 | 1 | [2]4-6 | 12 | 1.2 | -- | 8.3 | 10 | 9.2 | 8.2 | 7.5 | 40 | 57 | 74 | 91 | 42 | 109 | 8.3 | 35 | 5 | 14.5 | 5½ | 23 | 4 | 10.9 | 14.6 | 3 | 25 | 85 | 5 | 5 | 35 |
| | | 20 | 69 | Clay Spur | 1 | 1 | 2 | 12 | 1 | -- | 7.7 | 8.8 | 8.2 | 7.3 | 6.3 | 33 | 43 | 53 | 63 | 26 | 67 | 8.3 | 4.5 | 7½ | 12 | 8 | 14.5 | 4.3 | 12.6 | 18 | 2 | 4 | 15 | 8 | 12 | 55 |
| | | | | | 2 | 0 | [2]3-6 | 13 | 1 | -- | 8.3 | 9 | 9 | 8.2 | 7.2 | 23 | 32 | 41 | 50 | 33 | 85 | 8.1 | 12 | 5½ | 9 | 6½ | 17 | 5.4 | 14 | 20 | 3 | 15 | 45 | 6½ | 25 | 60 |
| | | 26 | 70 | D | | 8 | 3 | 12 | .1 | -- | -- | 8.5 | 8.8 | 8.3 | 7.6 | 27 | 34 | 43 | 50 | 27 | 87 | 5.9 | 12 | 5½ | 8.5 | 6½ | 19.5 | 6 | 15.8 | 21.9 | 4 | 15 | 25 | 6½ | 35 | 48 |
| | | | | | 1 | 1½ | 3-4 | 12 | .9 | -- | -- | 10.1 | 9.7 | 8.9 | 8 | 37 | 55 | 73 | -- | 28 | 83 | 5.8 | 9.5 | 6½ | 14.5 | 7 | 19.5 | 5.3 | 16.9 | 25 | 3 | 20 | 35 | 7 | 35 | 55 |
| | | | | Clay Spur | 1 | 6 | 6-7 | 15 | 1.3 | -- | 9.3 | 8.4 | 7.5 | 6.8 | 6.1 | 45 | 52 | 59 | 66 | 14 | -- | 7.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 10 | [2]8-9 | 12 | 3 | -- | -- | 10 | 9.6 | 8.8 | 8 | 31 | 45 | 59 | 74 | 29 | 93 | 7.4 | 18.5 | 5 | 7 | 5½ | 10.5 | 4 | 11 | 15 | 2 | 5 | 10 | 5 | 4 | 5 |
| | | 28 | 71 | Clay Spur | 1 | 1 | 2-5 | 25 | 3.8 | -- | -- | 7.9 | 7.5 | 6.9 | 6.2 | 35 | 48 | 63 | -- | 10 | -- | 6.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 1 | [2]6-9 | 17 | 2.1 | -- | 8.5 | 9.3 | 8.9 | 8 | 6.8 | 32 | 42 | 52 | 62 | 33 | 94 | 8.4 | 18.5 | 5 | 7 | 5½ | 10.5 | 4.5 | 10.9 | 15.4 | 3 | 4 | 25 | 5 | 4 | 5 |
| | | 33 | 72 | Clay Spur | 1 | 2 | 8 | 10 | 8 | 6.4 | 8 | 9.3 | 8.8 | 8 | 7.3 | 37 | 52 | 67 | 77 | 28 | 77 | 9.1 | 6 | 7 | 14 | 8 | 33 | 3.4 | 9 | 13.2 | 2 | 5 | 10 | 8 | 15 | 65 |
| | | | | | 2 | 5 | [2]9-14 | 15 | 5.2 | -- | -- | 8.8 | 8.8 | 7.8 | 7 | 20 | 25 | 31 | 38 | 27 | 80 | 5.0 | 7 | 6½ | 13.5 | 7 | 17 | 10.6 | 27 | 39 | 4 | 15 | 30 | 7 | 35 | 55 |
| | | 34 | 73 | Clay Spur | 1 | 1 | 2 | 13 | 5.4 | -- | 7.2 | 7.7 | 7.1 | 6.3 | 5 | 45 | 60 | 75 | -- | 22½ | 75 | 9.0 | 7 | 6½ | 8.5 | 7 | 14 | 3.5 | 9.4 | 12.1 | 2 | 4 | 5 | 7 | 4 | 6 |
| | | | | | 2 | 4 | [2]3-5 | 10 | .8 | -- | 8.8 | 10.5 | 10 | 9 | 7.8 | 30 | 41 | 52 | 63 | 41 | 92 | 8.1 | 16 | 5 | 7.5 | 5½ | 12 | 5.6 | 14.8 | 21.4 | 3 | 20 | 80 | 5 | 10 | 30 |
| | 56 N., 60 W. | 17 | 74 | F | 2 | 2 | 2-3 | 20 | 1.4 | -- | 7.5 | 9.8 | 8.9 | 8.1 | 7.4 | 42 | 55 | 69 | 79 | 20 | 58 | 8.0 | 3.5 | 9 | 16 | 10 | 20.5 | 14.2 | 48 | 61 | 5 | 5 | 27 | 10 | 35 | 65 |
| | | 19 | 75 | Clay Spur | | 10 | 6-8 | 25 | 5.4 | 7.8 | 7 | 6.4 | 5.5 | 4.9 | 4.5 | 36 | 40 | 44 | 48 | 7½ | -- | 7.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 11 | [2]9-11 | 15 | 3.1 | -- | 8.5 | 9.4 | 9 | 8 | 6.7 | 33 | 44 | 55 | 66 | 20 | 59 | 8.0 | 4.5 | 8½ | 10.5 | 9 | 14.5 | 4.6 | 12.8 | 18.4 | 2 | 4 | 8 | 9 | 5 | 33 |
| | 55 N., 61 W. | 10 | 76 | Clay Spur | 2 | 10 | 2-4 | 20 | 1.8 | 7 | 7.5 | 7.1 | 6.4 | 5.6 | 5 | 45 | 55 | 65 | 75 | 30 | 77 | 8.3 | 8 | 6½ | 10 | 7 | 14.5 | 7.6 | 18 | 25.3 | 3 | 15 | 30 | 7 | 18 | 55 |
| | | | | | 1 | 10 | [2]5 | 12 | 2.2 | -- | 7.6 | 9.1 | 8.4 | 7.2 | 6 | 35 | 48 | 63 | -- | 45 | 125 | 8.7 | 60 | 4½ | 16 | 5 | 23 | 3.9 | 9.5 | 15.5 | 3 | 65 | 135 | 4½ | 10 | 55 |
| | | 23 | 77 | Clay Spur | 1 | 8 | 2 | 20 | 2.4 | -- | 8.1 | 8 | 6.8 | 5.9 | 5.5 | 47 | 62 | 73 | 80 | 27 | 75 | 8.4 | 6.5 | 7½ | 16 | 8 | 23 | 5.2 | 12.5 | 17.1 | 3 | 5 | 20 | 8 | 35 | 63 |
| | | | | | 1 | 9 | 3 | 13 | 1.2 | -- | 8 | 9.6 | 9 | 8.1 | 6.6 | 38 | 55 | 73 | -- | 33 | 91 | 8.6 | 14 | 6¼ | 17 | 6½ | 21 | 4.6 | 10 | 15.4 | 3 | 5 | 20 | 6½ | 9 | 36 |
| Butte County, S. Dak. | 12N., 2E. | 35 | 78 | 1 | 3 | 1 | 8-11 | 25 | 7 | -- | -- | 11.8 | 12.8 | 11.6 | 10 | 17 | 22 | 27 | 32 | 9 | -- | 4.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 7 | 17 | 20 | 6 | -- | 11.6 | 13.5 | 13.7 | 12 | 9.8 | 22 | 27 | 32 | 37 | 10 | -- | 7.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 11 N., 2E. | 10 | 79 | 1 | 3 | 4½ | 2-10 | 40 | 2.6 | -- | 11.2 | 13.5 | 13.3 | 11.6 | 9 | 19 | 23 | 36 | -- | 7½ | -- | 6.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 2 | 10 | 12-15 | 25 | 5.2 | 12 | 15 | 16.3 | 15.1 | 13.9 | 12 | 16 | 20 | 24 | 28 | 8 | -- | 3.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 6 | 17 | 25 | 7.4 | -- | 15.4 | 16.6 | 15.2 | 13.1 | 10.9 | 27 | 36 | 45 | -- | 9 | -- | 3.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | 8 | 19 | 27 | 10.3 | -- | -- | 14.2 | 13.3 | 12.6 | 9.8 | 30 | 40 | 50 | -- | 9 | -- | 3.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 1 | 11 | 23 | 12 | 7.7 | -- | -- | 15 | 14.6 | 13 | 11.3 | 26 | 34 | 42 | 51 | 8 | -- | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | 3 | 3 | 21-23 | 27 | 9.9 | 12.5 | 14.5 | 16.7 | 15.5 | 13.5 | 11.5 | 18 | 27 | 36 | 43 | 9 | -- | 6.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9 N., 2 E. | 15 | 80 | Clay Spur | 2 | 2 | [2]2 | 10 | 2.1 | -- | 8.2 | 9 | 8.4 | 7.5 | 6.7 | 25 | 34 | 43 | 53 | 35 | 104 | 9.1 | 36 | 5 | 8.5 | 5½ | 18.5 | 3.6 | 10 | 13.6 | 3 | 5 | 23 | 5 | 4 | 5 |
| | 11 N., 3 E.[3] | 8 | -- | H | 1 | 2 | 2 | 55 | 8 | -- | 8 | 7.8 | 7 | 6.1 | 5.5 | 25 | 27 | 31 | 35 | 7 | -- | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

[1] Shown on figure 92. [2] Pulverized material is white. [3] Lies a few miles to the east of area shown on geologic map. *Pressure of 100 pounds per square inch was applied to 300 milliliters of suspension.

583554 O—61

583554 O - 61 (In pocket)