

Operator: United Producing Company, Inc.
 Farm: Yukon Pocahontas Coal Co. et al
 Well No.: 3-1563
 Location: Buchanan County
 6600' S of 37°15') approximate
 10,700' E. of 82°00')
 Elevation: 1673.5' Ground
 Total Depth: 4399' PBSD 4140'
 Drilling Commenced: November 13, 1948
 Well Completed: Completed drilling, May 7, 1949
 Result: Gas Well

Geologic Sample log
 prepared by:
 Oren A. Sams, Jr.
 U. S. Geological Survey
 Fuels Branch
 Lexington, Kentucky
 August 1950

GEOLOGIC LOG

<u>Depth (feet)</u>	<u>Lithology</u>
80 - 85	Sandstone: White (N9) to very light gray (N8), subrounded to angular, medium-to coarse-grained, flakes of mica, few green minerals.
85 - 90	Sandstone: Like 80-85, fine-to coarse-grained.
90 - 112	No sample.
112 - 117	Sandstone: white (N9) to very light gray (N8), subrounded to angular, fine-to coarse-grained, flakes of mica, green minerals (glauconite)
117 - 123	Sandstone: like 112-117.
123 - 130	Sandstone: like 112-117.
130 - 136	Sandstone: like 112-117.
136 - 140	Shale: mica, dark gray (N3), massive.
140 - 145	Shale: like 136-140.
145 - 150	Shale: like 136-140, more sandy.
150 - 158	No sample.
158 - 160	Shale: like 136-140 with calcareous fragments.
160 - 165	Shale: like 136-140.

- 165 - 170 Shale: like 136-140, carbonaceous.
- 170 - 175 Shale: like 136-140; Coal, 60%, dull and bright; calcareous fragments.
- 175 - 181 Shale: slightly micaceous, medium gray (N5), slightly fissile to massive.
- 181 - 187 Sandstone, 50% micaceous, medium light gray (N6), medium to coarse-grained; shale, like 175-181.
- 187 - 193 Shale and sandstone: like 181-187 and 175-181.
- 193 - 199 Sandstone: like 181-187, very calcareous fragments.
- 199 - 210 Shale: micaceous, medium gray (N5), slightly fissile.
- 210 - 220 Shale: like 199-210.
- 220 - 225 Shale: like 199-210, less mica, more massive.
- 225 - 233 Shale: like 199-210.
- 233 - 241 Shale: like 199-210, very slightly calcareous.
- 241 - 249 Shale: like 199-210.
- 249 - 256 Shale: like 199-210.
- 256 - 264 Shale: like 199-210.
- 264 - 269 Shale: like 199-210.
- 269 - 275 Shale, micaceous, medium light gray (N6), massive, sandy.
- 275 - 280 Sandstone, micaceous, medium light gray (N6), coarse-to very coarse-grained, dark minerals.
- 280 - 284 Sandstone: like 275-280, only medium-to coarse-grained.
- 284 - 288 Sandstone: micaceous, medium light gray (N6), medium-to coarse-grained, dark and green minerals.

288 - 291	Sandstone: like 284-288.
291 - 298	Shale: micaceous, medium dark gray (N4).
298 - 305	Shale: 20%, like 291-298; Coal, 10%, bright and dull; sandstone, very light gray (N8), micaceous, medium-to coarse-grained, subrounded to angular.
305 - 310	Sandstone: like 298-305.
310 - 314	Sandstone: like 298-305.
314 - 319	Sandstone: like 298-305.
319 - 325	Sandstone: like 298-305.
325 - 330	Sandstone: like 298-305.
330 - 334	Sandstone: like 298-305.
334 - 339	Sandstone: like 298-305, fine-to coarse-grained.
339 - 344	Sandstone: like 298-305; fine-to coarse-grained.
344 - 350	Sandstone: like 298-305.
350 - 355	Sandstone: like 298-305.
355 - 357	Sandstone: like 298-305.
359 - 364	Sandstone: white (N9) to very light gray (N8), micaceous, fine-to coarse-grained, dark and green minerals.
364 - 367	Sandstone: like 359-364.
367 - 370	Sandstone: like 359-364, carbonaceous material.
370 - 373	Sandstone: like 359-364, carbonaceous material.
373 - 383	Sandstone: like 359-364, calcareous fragments.
390 - 394	Sandstone: micaceous, very light gray (N8), medium-to coarse-grained, dark minerals.

- 390 - 397 Sandstone: like 390-394, calcareous fragments.
- 394 - 397 Sandstone: like 390-394.
- 397 - 400 Sandstone: like 390-394, carbonaceous material.
- 400 - 404 Shale, 50%; sandstone, 50%; Shale, micaceous, medium gray (N5), massive, carbonaceous material; sandstone, micaceous, very light gray, (N8), fine-to coarse-grained, dark minerals.
- 404 - 408 Sandstone: like 400-404.
- 408 - 411 Sandstone: like 400-404, only medium-to coarse-grained.
- 411 - 415 Sandstone: like 400-404, medium-to coarse-grained.
- 415 - 417 Sandstone: like 400-404, medium-to coarse-grained.
- 417 - 422 Sandstone: micaceous, very light gray (N8) to medium light gray (N6), medium-to coarse-grained, dark minerals, slightly calcareous.
- 422 - 427 Sandstone: like 417-422.
- 427 - 430 Sandstone: like 417-422, only coarse-grained.
- 430 - 433 Shale: micaceous, medium dark gray (N4), massive, carbonaceous material.
- 438 - 438 Shale: micaceous, medium dark gray (N4), massive.
- 438 - 444 Shale: like 433-438, slightly calcareous.
- 444 - 451 Shale: like 433-438 with silty portions.
- 451 - 458 Shale, 50%: like 433-438; sandstone, light gray (N7), micaceous, coarse-grained, carbonaceous material, calcareous.

458 - 464	Sandstone: like 451-458.
464 - 470	Shale: micaceous, medium gray (N5), massive, slightly calcareous.
470 - 476	Shale: like 464-470.
476 - 481	Shale: silty, medium dark gray (N4), micaceous, slightly calcareous.
481 - 487	Shale: like 476-481.
487 - 493	Shale: like 476-481, less calcareous.
495 - 500	Shale: like 476-481, less calcareous.
Lee Formation:	
500 - 506	No sample.
506 - 507	Sandstone: very light gray (N8) to white (N9), medium-to coarse-grained, subangular, little flakey mica.
512 - 516	Sandstone: like 506-507.
516 - 518	Sandstone: like 506-507.
519 - 522	Sandstone: like 506-507, few green minerals.
522 - 525	Sandstone: like 506-507.
525 - 534	No sample.
534 - 539	Sandstone: like 506-507, more dirty and more green minerals.
539 - 542	Shale; micaceous, medium dark gray (N4).
542 - 547	Sandstone: very light gray (N8) to dirty, fine-to medium-grained, subangular to angular, little flake mica and dark minerals.
547 - 552	Sandstone: like 542-547.
552 - 556	Sandstone, like 542-547.

556 - 560	Sandstone, micaceous, white (N9) to medium light gray (N6), medium-to coarse-grained, 80%; shale, medium gray (N5), probably interbedded, 20%.
560 - 574	Like 556-560.
564 - 566	Sandstone: micaceous, white (N9) to medium light gray (N6), calcareous, carbonaceous material.
566 - 569	Sandstone: like 566-564.
569 - 575	Shale: micaceous, medium gray (N5), massive.
575 - 580	Shale: micaceous, medium gray (N5), massive.
580 - 586	Shale: like 575-580.
586 - 593	Shale: like 575-580.
593 - 602	Shale: like 575-580.
602 - 611	Shale: like 575-580, mottled with little shale.
611 - 620	Shale: like 575-580.
620 - 629	Shale: like 575-580.
629 - 635	Shale: like 575-580.
635 - 642	Shale: like 575-580.
642 - 650	Shale: silty, micaceous, medium light gray (N6), massive, harder than 575-580.
650 - 657	Shale: micaceous, medium gray (N5), massive.
657 - 665	Shale: like 650-657 with fine stringers of carbonaceous material.
665 - 673	Shale: like 650-657.
675 - 685	Shale: silty, micaceous, medium gray (N5), hard, slightly calcareous.

685 - 695	Shale: like 675-685.
697 - 705	Shale: like 675-685.
705 - 712	Shale: like 675-685.
712 - 718	Sandstone: micaceous, medium light gray (N6), coarse-to medium-grained, large flakes of mica.
718 - 724	Sandstone: like 712-718.
724 - 730	Sandstone: like 712-718.
730 - 736	Sandstone: like 712-718.
736 - 742	Sandstone: like 712-718 with some calcareous sandstone.
742 - 748	Sandstone, 50%: like 712-718; Coal, 50%, probably interbedded.
748 - 755	Sandstone: like 712-718, slightly calcareous.
755 - 760	Shale: micaceous, medium dark gray (N4), carbonaceous.
760 - 768	Shale: micaceous, medium dark gray (N4), massive.
768 - 774	Shale: like 760-768.
774 - 778	Shale: like 760-768.
778 - 784	Shale: like 760-768; Coal, 50%, bright and bone coal interbedded.
784 - 790	Sandstone: micaceous, medium light gray, coarse-to medium-grained, subangular to angular.
790 - 796	Sandstone: like 784-790.
796 - 803	Sandstone: like 784-790.
803 - 809	Sandstone: like 784-790.
809 - 816	Sandstone: like 784-790.

- 816 - 825 Shale: micaceous, medium dark gray (N4), carbonaceous material, some fissile.
- 825 - 835 Shale: like 816-825, less fissile.
- 835 - 840 Shale, 80%; like 778-784; Sandstone, 20%: like 784-790.
- 840 - 845 Sandstone: like 784-790.
- 845 - 850 Sandstone: like 784-790.
- 850 - 865 Sandstone: micaceous, very light gray (N8), coarse-to medium-grained, subangular to angular.
- 865 - 871 Sandstone: like 850-865.
- 871 - 877 Sandstone: like 850-865.
- 877 - 883 Sandstone: like 850-865, carbonaceous material.
- 883 - 889 Sandstone: like 850-865.
- 889 - 895 Sandstone: like 850-865.
- 895 - 900 Sandstone: like 850-865.
- 904 - 910 Sandstone: like 900-904; shale, 10%, micaceous, medium dark gray (N4), massive.
- 910 - 916 Shale, 60%, silty, micaceous, medium light gray (N6), slightly calcareous, massive; sandstone, like 900-904.
- 916 - 926 Sandstone: like 900-904.
- 926 - 931 Sandstone: like 900-904.
- 931 - 936 Sandstone: like 900-904.
- 936 - 940 Sandstone: micaceous, very light gray (N8) to medium light gray (N6), medium-to fine-grained, subangular to angular, flakes of mica; shale, micaceous, sandy, medium dark gray (N4), massive.

940 - 945	Shale: micaceous, medium gray (N5), slightly fissile.
945 - 950	Shale: like 940-945., less fissile.
950 - 954	Shale: like 940-945, massive.
954 - 960	Shale: like 940-945.
960 - 970	Shale: micaceous, medium dark gray (N4), sandy, massive.
970 - 980	Shale: micaceous, medium dark gray (N4), massive.
980 - 987	Shale: like 970-980.
987 - 996	Shale; like 970-980
996 - 1004	Shale: like 970-980.
1004 - 1012	Shale: like 970-980.
1012 - 1021	Shale: like 970-980.
1021 - 1027	Shale: like 970-980 with sandstone, micaceous, light gray (N7), medium-to fine-grained, subangular to angular, probably interbedded.
1027 - 1033	Shale: like 1021-1027.
1033 - 1039	Shale: like 1021-1027 with calcareous portions.
1039 - 1045	Shale: micaceous, silty, medium gray (N5), massive, calcareous.
1045 - 1050	Shale: micaceous, medium dark gray (N4), carbonaceous material, dolomitic.
1050 - 1058	Shale: like 1045-1050.
1058 - 1067	Coal: bright and dull, some bone coal; some shale, like 1045-1050.
1067-1071	Coal: 40%, like 1058-1067; sandstone, 20%, micaceous, medium dark gray (N4), medium-to fine-grained, carbonaceous material; shale, micaceous, medium dark gray (N4), massive.

- 1071 - 1077 Sandstone: 50%, like 1067-1071; shale, micaceous, dark gray (N3), slightly fissile.
- 1077 - 1083 Sandstone: micaceous, very light gray (N8), medium-to fine-grained, carbonaceous material.
- 1083 - 1088 Sandstone: like 1077-1083.
- 1088 - 1094 Sandstone: like 1077-1083.
- 1094 - 1100 Shale: micaceous, silty, medium gray (N5), slightly fissile to massive.
- 1100 - 1106 Shale: like 1094-1100.
- 1106 - 1112 Shale: like 1094-1100, non-fissile.
- 1112 - 1118 Sandstone: micaceous, white (N9) to very light gray (N8), coarse-to very coarse-grained.
- 1118 - 1124 Sandstone: like 1112-1118.
- 1124 - 1130 Sandstone: like 1112-1118.
- 1130 - 1136 Shale: micaceous, medium gray (N5), massive.
- 1136 - 1142 Shale: 60%, like 1130-1136; sandstone, micaceous, very light gray (N8), medium-to coarse-grained.
- 1142 - 1148 Sandstone: micaceous, white (N9) to very light gray (N8), medium-to coarse-grained, dark and green minerals.
- 1148 - 1152 Sandstone: like 1142 - 1148.
- 1152 - 1157 Sandstone: like 1142 - 1148.
- 1157 - 1163 Sandstone: like 1142 - 1148.
- 1163 - 1169 Sandstone: like 1142 - 1148.
- 1169 - 1174 Shale: silty, micaceous, medium dark gray (N4), massive.
- 1174 - 1179 Sandstone: like 1142-1148, slightly calcareous.

- 1179 - 1183 Sandstone: like 1142-1148, slightly calcareous.
- 1183 - 1188 Sandstone: like 1142-1148, slightly calcareous.
- 1188 - 1193 Sandstone: like 1142-1148, slightly calcareous.
- 1193 - 1197 Sandstone: like 1142-1148, slightly calcareous,
- 1197 - 1201 Sandstone: like 1142-1148, slightly calcareous.
- 1201 - 1207 Sandstone: like 1142-1148, slightly calcareous.
- 1207 - 1215 Sandstone: like 1142-1148, slightly calcareous.
- 1215 - 1219 Sandstone: like 1142 - 1148, slightly calcareous.
- 1219 - 1224 Sandstone: like 1142=1148, slightly calcareous.
- 1224 - 1229 Sandstone: like 1142-1148, slightly calcareous.
- 1229 - 1235 Shale: micaceous, medium gray (N5), massive.
- 1235 - 1244 Shale: micaceous, medium gray (N5), massive.
- 1244 - 1250 Shale: like 1229-1235.
- 1250 - 1255 Sandstone: micaceous, very light gray (N8), medium-to coarse-grained.
- 1255 -1258 Sandstone : like 1250-1255.
- 1258 - 1263 Sandstone: like 1250-1255.
- 1263 - 1268 Sandstone: micaceous, very light gray (N8), medium-to coarse-grained, dark minerals, slightly calcareous.
- 1268 - 1273 Sandstone: 90%, like 1263-1268; with gray to black silty sandstone, with abundant carbonaceous material and flakes of mica.

- 1273 - 1278 Shale: micaceous, medium gray (N5), massive.

- 1274? - 1284 Shale: 80%, like 1273-1278; sandstone, medium light gray (N6), slightly micaceous, medium-to coarse-grained, grading to shale.

- 1284 - 1290 Shale, 50%, like 1273-1278, more silty; sandstone, like 1274-1284.

- 1290 - 1296 Shale: like 1273-1278.

- 1296 - 1305 Shale: micaceous, medium dark gray (N4), massive.

- 1305 - 1313 Shale: like 1296-1305, slightly fissile.

- 1313 - 1320 Shale 80%: like 1296-1305; sandstone, micaceous, light gray (N6), coarse-to very coarse-grained, dark minerals.

- 1320 - 1325 Sandstone, micaceous, very light gray (N8), fine-to coarse-grained, subangular to angular, dark minerals, iron stain.

- 1325 - 1330 Sandstone: like 1320-1325.

- 1330 - 1333 Sandstone: like 1320-1325.

- 1333 - 1337 Sandstone: like 1320-1325.

- 1337 - 1340 Sandstone: like 1320-1325.

- 1340 - 1345 Sandstone: like 1320-1325.

- 1345 - 1347 Sandstone: white (N9), iron-stained, fine-to coarse-grained, few dark minerals, no mica, subangular to angular, slightly calcareous.

- 1347 - 1350 Sandstone: like 1345-1347.

- 1350 - 1352 Sandstone: like 1345-1347.

- 1352 - 1355 Sandstone: like 1345-1347, except very fine to coarse-grained.

- 1355 - 1359 Sandstone: like 1345-1347, except very fine to coarse-grained.

- 1359 - 1362 Sandstone: like 1345-1347.

1362 - 1364	Sandstone: like 1345-1347.
1364 - 1370	Sandstone: like 1345-1347.
1370 - 1375	Sandstone: like 1345-1347.
1375 - 1381	Sandstone: like 1345 - 1347.
1381 - 1385	Sandstone: like 1345-1347.
1385 - 1388	Sandstone: like 1345-1347.
1388 - 1394	Sandstone: like 1345 - 1347.
1394 - 1406	Sandstone: granule size white and clear quartz (from a conglomerate, Lee), very angular.
1400 - 1405	Conglomerate: like 1394-1406.
1405 - 1410	Conglomerate: like 1394-1406.
1410 - 1414	Sandstone: like 1345-1347.
1414 - 1418	Conglomerate; like 1394-1406.
1418 - 1425	Conglomerate: like 1394-1406; shale, 10%, dark gray (N3).
1425 - 1430	Conglomerate: like 1394-1406; Coal: 10%, bright.
1430 - 1434	Conglomerate, like 1394-1406; fragments very calcareous; shale, like 1418-1425.
1434 - 1438	Conglomerate: like 1394-1406 and 1430-1434, more sandy.
1438 - 1442	Sandstone: white (N9) to light gray (N8), very fine to coarse grained, subangular to angular.
1442 - 1446	Sandstone: like 1438-1442.
1446 - 1452	Coal, 60%, bright and dull; sandstone, very light gray (N8) to buff, medium-to coarse-grained, subangular to angular, calcareous.
1452 - 1459	Coal: Sandstone: like 1446-1452, less calcareous, some pyrite.

1459 - 1465	Coal: 50%, bright and dull; sandstone, micaceous, medium light gray (N6) to medium gray (N5), medium to coarse-grained, subangular to angular, slightly calcareous, carbonaceous material.
1465 - 1470	Sandstone, like 1459-1465.
1470 - 1477	Shale: micaceous, medium dark gray (N4), slightly fissile.
1477 - 1484	Sandstone: micaceous, very light gray to medium gray (N5), medium-to coarse-grained, dark minerals, carbonaceous material, subrounded to angular.
1484 - 1490	Sandstone: like 1477-1484.
1490 - 1496	Sandstone: like 1477-1484.
1496 - 1504	Sandstone: like 1477-1484.
1504 - 1511	Sandstone: like 1477-1484.
1511 - 1519	Sandstone: like 1477-1484.
1519 - 1526	Shale: micaceous, medium dark gray (N4), massive to slightly fissile.
1526 - 1533	Shale: like 1519-1526.
1533 - 1539	Shale: like 1519-1526.
1539 - 1546	Shale: like 1519-1526.
1546 - 1555	Shale: like 1519-1526.
1555 - 1562	Shale: silty, micaceous, medium dark gray, massive to slightly fissile.
1562 - 1570	Shale: like 1555-1562.
1570 - 1577	Shale: like 1555-1562, more fissile, fragments; coal, bright with attached calcite.
1577 - 1585	Coal, 50%, bright and dull; shale: like 1555-1562.
1585 - 1593	Coal and shale: like 1577-1585.

- 1593 - 1600 Sandstone: medium light gray (N6), very coarse-grained, to silty.
- 1600 - 1610 Sandstone: like 1593-1600, slightly micaceous.
- 1610 - 1616 Shale: micaceous, medium dark gray (N4), massive to slightly fissile.
- 1616 - 1621 Shale: micaceous, medium dark gray (N4), silty to sandy, massive.
- 1621 - 1628 Shale: like 1616-1621, only silty and slightly fissile.
- 1628 - 1632 Sandstone: light gray (N7), micaceous, medium-to coarse-grained, few dark minerals.