

## VDMR Well No. 144

47 - 74	27	Sandstone, clear, poorly cemented, medium-grained, well sorted, interstitially silty, calcareous, with: common mica. Nonporous to slightly porous.
74 - 83	9	Sandstone, as in 47 - 74, with minor stringers of siltstone, light gray, moderately hard, tough, siliceous, with: rare mica.
83 - 90	7	Sandstone, as in 47 - 74.
90 - 105	15	Siltstone, medium gray, moderately hard, tough, locally finely sandy, slightly calcareous, with: common mica.
105 - 117	12	Interbedded: Siltstone, dark gray, moderately hard, tough, locally finely sandy, siliceous, with: common mica, with ; sandstone, clear to white, friable, medium-grained, well sorted, calcareous, with: common mica. Nonporous to slightly porous.
117 - 167	50	Siltstone, dark gray, moderately hard, tough, locally very poorly fissile, with: common mica.
167 - 177	10	Siltstone, as in 117 - 167, with: abundant coaly carbonaceous material.
177		<u>Raven Coal Horizon</u>
177 - 188	11	Sandstone, clear to white, moderately cemented, medium-to coarse-grained, medium sorted, subrounded, calcareous, with: common mica. Nonporous to slightly porous.
188 - 190	2	Siltstone, dark gray to black, moderately hard, tough, locally poorly fissile, with: rare mica.
190 - 197	7	Sandstone, as in 177 - 188.

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197 - 205	8	Siltstone, as in 188 - 190.
205 - 213	8	Sandstone, clear to white, moderately cemented, fine-to coarse-grained, poorly sorted, subangular to subrounded, calcareous, with: common mica. Nonporous.
213 - 224	11	Siltstone, medium gray to black, hard, tough, locally fissile, with: common mica.
224 - 254	30	Siltstone, carbonaceous, black, moderately hard, tough, locally poorly fissile, with: common mica, and common coaly laminae and partings.
254 - 283	29	Sandstone, clear to light gray, poorly cemented, fine-to medium-grained, medium sorted, subrounded, very calcareous, with: common mica. Nonporous to slightly porous.
283 - 304	21	Sandstone, clear to white, friable, medium-grained, well sorted, calcareous, with: common mica. Nonporous.
304 - 324	20	Siltstone, light to dark gray hard, tough, locally poorly fissile, with: rare mica, and rare pyrite.
324		<u>Jawbone Coal</u>
324 - 328	4	Coal, in part silty and impure. (interpreted depth and thickness)
328 - 338	10	Sandstone, clear to brown, poorly cemented, fine-to medium-grained, medium sorted, subrounded, calcareous, with: common mica. Nonporous.
338 - 350	12	Sandstone, clear to white, poorly cemented, medium-grained, medium sorted, subangular, calcareous, with: common mica. Nonporous.
350 - 351	1	Coal (Interpreted depth and thickness)
351 - 359	8	Sandstone, as in 338 - 350.

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359 - 360	1	Coal (Interpreted depth and thickness).
360 - 372	12	Sandstone, as in 338 - 350.
372 - 391	19	Siltstone, medium gray, moderately hard, tough, locally finely sandy, siliceous, with: rare mica.
391 - 401	10	Siltstone, grayish-brown, hard, tough, locally finely sandy, siliceous, with: common mica.
401 - 417	16	Shale, dark gray to black, hard, tough, locally slightly silty, argillaceous, with: common mica, and rare coaly carbonaceous material.
417 - 445	28	Sandstone, white to light gray, moderately cemented, medium-to coarse-grained, poorly sorted, subrounded, interstitially silty, slightly calcareous, with: common mica. Nonporous to slightly porous.
445 - 472	27	Siltstone, grayish-brown to black, hard, tough, locally very finely sandy, slightly calcareous, with: rare mica.
472 - 488	16	Siltstone, as in 445 - 472, with: abundant coaly carbonaceous laminae and partings. (Possible 2 - 3 foot coal bed).
488 - 524	36	Siltstone, as in 445 - 472.
524 - 529	5	Sandstone, white to light grayish-brown, moderately cemented, medium-grained, well sorted, subrounded, calcareous, with: common mica. Nonporous.
529 - 531	2	Siltstone, carbonaceous, black, moderately soft, flaky, with: abundant coaly laminae and partings.
531 - 534	3	Sandstone, as in 524 - 529.
534 - 555	21	Siltstone, dark gray to black, with reddish brown, hard, tough, locally poorly fissile, siliceous, with: common mica.

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555 - 560	5	Siltstone, as in 534 - 555, with abundant coaly carbonaceous lamanae and partings.
560 - 562	2	Sandstone, clear to medium gray, moderately cemented, medium grained, well sorted, subangular, slightly calcareous, with: common mica. Nonporous.
562 - 576	14	Siltstone, as in 534 - 555.
576 - 585	9	Sandstone, clear to white, very fine-grained, well sorted, subangular to subrounded, interstitially silty, calcareous, with: common mica. Nonporous.
585 - 587	2	Siltstone, dark gray, hard, tough, locally finely sandy, siliceous.
<u>Lee formation (587'-1684')</u>		
587 - 589	2	Sandstone, as in 576 - 585.
589 - 590	1	No sample
590 - 604	14	Sandstone, as in 587 - 589
604 - 629	25	Sandstone, clear, moderately cemented, medium-grained, well sorted, subangular, slightly calcareous, with: rare mica. Nonporous to slightly porous.
629 - 665	36	Sandstone, conglomeratic, clear to light gray, fine-to very coarse-grained, with common granule and pebble sized, poorly sorted, subrounded, interstitially silty, siliceous, with: common mica. Nonporous to slightly porous.
665 - 667	2	Coal (Interpreted depth and thickness)
667 - 671	4	Sandstone, conglomeratic, as in 629 - 665.
671 - 689	18	Siltstone, brownish-gray to black, hard, tough, locally poorly fissile, siliceous, With: common mica, and abundant coaly carbonaceous lamanae and partings.

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689 - 697	8		Siltstone, light gray, brownish-gray to black, moderately hard, tough, locally poorly fissile, siliceous, with: common mica, and abundant coaly carbonaceous lamanae and partings.
697 - 718	21	<i>ck</i>	Sandstone, white to light gray, poorly cemented, fine-to medium-grained, medium sorted, subangular to subrounded, calcareous, with: common mica. Slightly porous.
718 - 739	21	<i>ck</i>	Sandstone, conglomeratic, clear to brownish-gray, poorly cemented, fine-to very coarse-grained, with common granule-sized, subrounded, siliceous, with: common mica. Nonporous to slightly porous.
739 - 742	3		Siltstone, light gray, hard, tough, locally finely sandy, with: rare mica.
742 - 765	23	<i>ck</i>	Sandstone, conglomeratic, as in 718 - 739.
765 - 766	1		Coal (Interpreted depth and thickness)
766 - 776	10	<i>ck</i>	Sandstone, conglomeratic, as in 718 - 739.
776 - 789	13		Shale, dark gray to black, moderately soft, flaky, fair fissility, with: common coaly carbonaceous material.
789 - 846	57		Siltstone, light to dark gray, hard, tough, locally poorly fissile, slightly calcareous, with: common mica.
846 - 865	19		Shale, dark gray to black, moderately soft, flaky, fair fissility, with: siderite, phosphate, and common coaly carbonaceous partings. (X-ray diffraction check)
865 - 867	2		Interbedded; Shale, as in 846 - 865, with; sandstone, clear to white, moderately cemented, medium-grained, well sorted, slightly calcareous, with: abundant mica. Nonporous.
867 - 868	1		Coal (Interpreted depth and thickness)

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868 - 878	10	Interbedded; Shale and sandstone, as in 865 - 867, with; siltstone, light gray, moderately hard, tough, siliceous.
878 - 899	21	Sandstone, clear to white, medium-grained, well sorted, interstitially silty, slightly calcareous, with: common mica, and minor stringers of siltstone, light gray, hard, tough. Nonporous to slightly porous.
899 - 907	8	Siltstone, medium to dark gray, hard, tough, locally poorly fissile, with: abundant mica.
907 - 972	65	Siltstone, light to dark gray, hard, tough, locally poorly fissile, slightly calcareous, with: common mica.
972 - 1030	58	Siltstone, medium gray to brownish-gray, very hard, tough, siliceous, with: common mica.
1030 - 1058	28	Sandstone, clear to light grayish-brown, poorly cemented, fine-to medium-grained, medium sorted, interstitially silty, calcereous with: common mica. Nonporous to slightly porous.
1058 - 1072	14	Siltstone, black, hard, tough, locally poorly fissile, siliceous, with abundant mica, and common carbonaceous lamanae and partings.
1072 - 1092	20	Interbedded; siltstone, medium to dark gray, locally very finely-sandy, siliceous, with: common mica, with; sandstone, white to buff, very fine-to medium-grained, poorly sorted, interstitially silty, siliceous, slightly calcareous, with: common mica. Slightly porous.
1092 - 1097	5	No samples
1097 - 1131	34	Interbedded siltstone and sandstone, as in 1072 - 1092.

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1131 - 1138	7	Siltstone, carbonaceous, black, moderately soft, flaky, with: Common mica, and common coaly lamanae and partings.
1138 - 1150	12	Interbedded; siltstone and sandstone, as in 1072 - 1131.
1150 - 1178	28	Sandstone, white, friable, very fine-to medium-grained, poorly sorted, sub-angular to subrounded, slightly calcareous, with: rare mica. Nonporous to slightly porous.
1178 - 1193	15	Siltstone, medium to dark gray, hard, tough, siliceous, with: common coaly lamanae and partings.
1193 - 1233	40	Siltstone, light brown to dark gray, hard, tough, locally poorly fissile, siliceous, with: common mica.
1233 - 1291	58	Siltstone, as in 1193 - 1233, with : abundant calcareous carbonaceous material.
1291 - 1315	2 24	Sandstone, white to light grayish-brown, fine-to medium-grained, medium sorted, locally silty, slightly calcareous, with: common mica. Nonporous to slightly porous.
1315 - 1330	15	Siltstone, carbonaceous, dark gray to black, moderately hard, tough, locally fissile, siliceous, with: common mica, and abundant coaly lamanae and partings.
1330 - 1334	4	Siltstone, light gray to white, moderately soft, flaky, locally finely sandy, siliceous.
1334 - 1340	6	Siltstone, as in 1315 - 1330.
1340 - 1382	42	Sandstone, white to clear, moderately soft, fine-to very coarse-grained, poorly sorted, subangular to subrounded, interstitially silty, calcareous, with: common mica partings. Nonporous to slightly porous.

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1382 - 1421	39	*	Sandstone, clear, poorly cemented, fine-to medium-grained, medium sorted, calcareous, with: common mica. Non-porous to slightly porous.
1421 - 1422	1		No samples.
1422 - 1470	48	*	Sandstone, as in 1382 -1421.
1470 - 1478	8	* J	Sandstone, conglomeratic, clear to white, poorly cemented, fine-to very coarse-grained, with abundant granule and pebble-sized, poorly sorted, calcareous, with: rare mica. Slightly porous.
1478 - 1481	3		Siltstone, carbonaceous, black, moderately soft, flaky, locally fissile, siliceous, with: abundant coaly lamanae and partings.
1481 - 1513	32	V *	Sandstone, conglomeratic, as in 1470 -1478, without pebble-size.
1513 - 1527	14		Siltstone, medium to dark gray, brownish-gray, moderately hard, tough, locally finely sandy, siliceous, locally slightly calcareous, with: rare mica.
1527 - 1562	35	Poca	Siltstone, argillaceous, dark gray to black, brownish-gray, reddish-brown, moderately hard, flaky, poorly fissile, grades locally into shale, with: common mica, common coaly lamanae, and minor stringers of sandstone, white to light gray, brownish-gray, moderately cemented, very fine-to fine-grained, medium sorted, subrounded, interstitially silty, siliceous, slightly calcareous, with: abundant mica, and common carbonaceous streaks. Nonporous.
1562 - 1573	11		Interbedded; Siltstone, medium gray to black, brownish gray, moderately hard, flaky, locally poorly fissile, locally finely sandy, siliceous, with: abundant mica, and common carbonaceous lamanae, with; sandstone, clear to white and light gray, well cemented, fine-to medium-grained, well sorted, subrounded to well rounded, interstitially silty, carbonaceous streaks,



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and rare pyrite. Nonporous.

1573 - 1634	61	7 # 1/2	Sandstone, clear to white, well cemented, medium grained, well sorted, subangular to rounded, slightly calcareous, with: common mica, rare chlorite, and minor stringers of siltstone, dark brownish-gray to black, hard, tough, siliceous, with: rare mica, Nonporous.
1634 - 1657	23		Siltstone, carbonaceous, dark gray to black, reddish-brown, hard, tough, locally poorly fissile, siliceous and ferruginous, with: rare mica, and common coal lamanae and partings.
1657 - 1661	4		Coal, in part silty and impure, glossy black, soft (Interpreted depth and thickness)
1661 - 1667	6		Siltstone, as in 1634 - 1657.
1667 - 1672	5		Coal, glossy black, moderately soft, <u>conchoidal fracture (Interpreted thickness)</u>
1672 - 1676	4		Siltstone, as in 1634 - 1657.
1676 - 1679	3		Sandstone, white to light gray, poorly cemented, very fine-to fine-grained, medium sorted, subangular to subrounded, interstitially silty, siliceous, with: rare mica, and rare chlorite, Slightly porous.
1679 - 1681	2		Siltstone, dark brownish-gray to black, moderately soft, flaky, locally poorly fissile, locally finely sandy, siliceous, with: rare mica.
1681 - 1684	3		Sandstone, clear to white and light orange, poorly cemented, fine-grained, with rare medium-grained, well sorted, subangular, interstitially silty, calcareous, with: common mica, and common silty-micaceous partings.

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Mississippian System (1681' - 1224)

Pennington Group (1684 - 2930)

Blue Stone formation (1684 - 2280)

1684 - 1703	19	Siltstone, grayish-green, medium to dark gray, moderately hard, tough, poor fissility, locally very finely sandy, siliceous, with: abundant rounded brown chert nodules, and rare mica.
1703 - 1721	18	Shale, silty, light gray to black, with brownish-gray, hard, tough, fair fissility, locally very finely sandy, siliceous, with: rare mica, and minor stringers of limestone, light to medium gray, moderately hard, very fine-grained, microcrystalline.
1721 - 1744	23	Siltstone, light to dark gray, red, green, beige, orange, moderately hard, tough, locally finely sandy, siliceous, with: rare mica.
1744 - 1769	25	Sandstone, clear to white, pale green, orange, poorly cemented, very fine to fine-grained, medium sorted, subangular to subrounded, interstitially silty, calcareous, with: rare mica, and common chlorite.
1769 - 1777	8	Siltstone, light to medium gray, medium green, hard, tough, locally finely sandy, siliceous, with: common mica, and common carbonaceous laminae and partings.
1769 - 1777	8	Siltstone, light to medium gray, medium green, hard, tough, locally finely sandy, siliceous, with: common mica, and common carbonaceous laminae and partings.
1777 - 1785	8	Siltstone, red, maroon drab, light brownish-gray, hard, tough, locally poorly fissile, calcareous and argillaceous, with: rare mica.
1785 - 1824	39	Siltstone, variegated, red, maroon-drab, light to medium gray, beige, brown, light green, locally mottled (red and pale green) hard, tough, locally finely sandy, siliceous and calcareous, with: common mica.

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1824 - 1835	11	Siltstone, red, with rare medium-gray, moderately hard, flaky, locally poorly fissile, locally finely sandy, siliceous, slightly calcareous, with: rare mica.
1835 - 1847	12	Siltstone, variegated, red, light green, brownish-gray, light to medium gray, hard, tough, locally finely sandy, siliceous, with: rare mica.
1847 - 1857	10	Siltstone, clayey, reddish-brown, moderately soft, flaky, locally poorly fissile, argillaceous, with: rare mica.
1857 - 1878	21	Siltstone, variegated, red, reddish-brown, light green, light to dark gray, beige, hard, tough, locally finely sandy, siliceous and calcareous, with: rare mica, and minor stringers of limestone, light gray, moderately, hard, fine-grained, cryptocrystalline.
1878 - 1900	22	Siltstone, red medium green, hard, tough, locally finely sandy, locally calcareous, siliceous, with: rare mica.
1900 - 1907	7	Interbedded; siltstone, red, green, light to medium gray, hard, tough, locally finely sandy, siliceous, with: rare mica, with; sandstone, clear to white and light gray, poorly cemented, fine-grained, well sorted, subrounded to subangular, interstitially silty, calcareous, with: rare mica.
1907 - 1936	29	Sandstone, clear to white, with light gray, poorly cemented, very fine-to fine grained, with common medium-grained, poorly sorted, interstitially silty, calcareous, with: common mica.
1936 - 1956	20	Siltstone, light brownish-gray, medium to dark gray, hard, tough, locally finely sandy, siliceous, locally slightly calcareous, with: common mica.

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1956 - 2019	63	Siltstone, sandy, light gray to greenish-gray, moderately hard, tough, calcareous, with: common mica, common carbonaceous silty-micaceous partings and streaks and grades locally to very fine-grained sandstone.
2019 - 2036	17	Siltstone, light to dark gray and black, moderately soft, flaky, locally finely sandy, siliceous, with: common mica, and common carbonaceous lamanae and partings.
2036 - 2068	32	Interbedded; siltstone, medium to dark gray and black, hard, tough, locally very finely-sandy, siliceous, with: rare mica with; sandstone, clear to white, light brownish-gray, friable, very fine-grained, with rare fine-to medium-grained, well sorted, angular to subangular, interstitially silty, siliceous, locally slightly calcareous, with: common mica. Nonporous.
2068 - 2071	3	No samples
2071 - 2092	21	Shale, carbonaceous, black, moderately hard, flaky, fair fissility, argillaceous, with: rare mica.
2092 - 2136	44	Siltstone, light to dark gray, brownish-gray, moderately hard, tough, locally poorly fissile, locally finely sandy, siliceous, locally argillaceous, with: common mica.
2136 - 2175	39	Siltstone, light to dark gray, greenish-gray, black, very hard, tough, locally poorly fissile, calcareous, with: abundant mica, and common carbonaceous lamanae.
2175 - 2199	24	Shale, silty, medium to dark gray and black, moderately hard, flaky, fair fissility, argillaceous, locally slightly calcareous, with: abundant pyrite, and rare mica.
2199 - 2241	42	No samples.

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Operator: Clinchfield Coal Company  
Farm: H. P. Phillips  
Well No.: 101  
Location: Dickenson County  
5450 ft. S. of 37°10 ft.  
4400 ft. W. of 82°20 ft.  
Elevation: 1520.5 Ground  
Total Depth: 4551'  
Drilling Commenced: 10/15/48'  
Well Completed: 4/12/49  
Result: Gas Well

Geologic log  
Samples studied and described  
by: John M. Wilson  
Virginia Division of Mineral Resources  
November, 1962

GEOLOGIC LOG

<u>Depth</u>	<u>Interval</u>	<u>Description</u>
<u>PENNSYLVANIAN SYSTEM (0-1684)</u>		
<u>POTTSVILLE GROUP (0-1684)</u>		
<u>Norton formation (0-587')</u>		
0 - 8	8	Sandstone, white to yellowish-gray, moderately cemented, fine-to coarse-grained, medium sorted, subangular to subrounded, siliceous, with: rare mica. Nonporous to slightly porous.
8 - 24	16	<i>See RY</i> Sandstone, clear to pale green, poorly cemented, medium-grained, well sorted, subrounded, siliceous, with: common mica. Nonporous
24 - 28	4	Siltstone, light to dark-gray, hard, tough, locally poorly fissile, with: common mica.
28 - 29	1	<i>RAVEN</i> Coal (Interpreted depth and thickness)
29 - 35	6	Siltstone, as in 24 - 28.
35 - 47	12	Sandstone, clear to light gray, moderately cemented, medium-to coarse-grained, medium sorted, interstitially silty, siliceous, with: common mica. Nonporous to slightly porous.

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2241 - 2246	5	Interbedded; siltstone, light to dark gray, greenish-gray, black, moderately hard, tough, locally finely sandy, siliceous, with: rare mica, and rare pyrite, with; sandstone, clear to white, light greenish-gray, friable, very fine-grained, well sorted, subangular to subrounded, interstitially silty, calcareous and siliceous. Nonporous.
2246 - 2250	4	No samples.
2250 - 2268	18	Siltstone, light to medium gray, greenish-gray, cream, moderately hard, flaky, locally finely sandy, calcareous and siliceous, with: rare mica, and minor stringers of limestone, silty, light gray, greenish-gray, very hard, tough, fine-grained, microcrystalline, with: common mica.
2268 - 2274	6	No samples.
2274 - 2277	3	Interbedded; limestone, silty, light gray, greenish-gray, hard, tough, fine-grained, microcrystalline, with; siltstone, light gray, black, greenish-gray, moderately hard, tough, locally poorly fissile, siliceous, with: abundant mica, with: sandstone, clear to white, moderately cemented, very fine-to medium-grained, poorly sorted, subrounded to well rounded, very calcareous, with: common mica, and rare chlorite. Nonporous.
2277 - 2280	3	No samples.
<u>Princeton Sandstone (2280 - 2345)</u>		
2280 - 2283	3	Sandstone, as in 2274 - 2277.
2283 - 2307	24	Sandstone, clear to white and milky white, moderately cemented, very fine-to very coarse-grained, very poorly sorted, subangular to rounded, interstitially silty, calcareous, with: rare mica, common chlorite, and common silty-micaceous partings. Nonporous to slightly porous.

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2307 - 2315	8	Sandstone, clear to white, light brown, moderately cemented, very fine-to fine-grained, with rare medium-grained, medium sorted, subangular to well rounded, interstitially silty, siliceous, slightly calcareous, with: rare mica, rare chlorite, and common iron stainings. Slightly porous.
2315 - 2316	1	Siltstone, medium gray, brownish gray, moderately hard, tough, locally poorly fissile, siliceous and argillaceous, with: rare mica.
2316 - 2334	18	Sandstone, clear to white, friable, very fine-to fine-grained, well sorted, subangular to rounded, siliceous, slightly calcareous, with: rare mica. Nonporous to slightly porous.
2334 - 2345	11	Sandstone, clear to white, moderately cemented, fine-to medium-grained, with rare very fine-grained, medium sorted, subangular to subrounded, interstitially silty, siliceous, slightly calcareous, with: rare mica, rare chlorite, and rare silty-micaceous partings. Nonporous.
Hinton formation (2345 - 2930)		
2345 - 2346	1	Coal, black, moderately soft, poor conchoidal fracture.
2346 - 2375	29	Limestone, silty, white, light to dark gray, tan, cream, brownish-gray, fossiliferous (abundant crinoid stems), moderately soft, flaky, fine-grained, microcrystalline, with: rare pyrite, and common mica.
2375 - 2381	6	Limestone, as in 2346 to 2375, without white and cream, and also very shaly and argillaceous.
2381 - 2417	36	Limestone, medium to dark gray, brownish-gray, with rare white, fossiliferous (common crinoid stems), moderately soft, flaky, fine-grained, microcrystalline locally argillaceous, with: rare pyrite, rare mica, and common

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		calcite.
2417 - 2431	14	Interbedded; limestone, as in 2381 to 2417, with; sandstone, clear to white, pale green, light gray, moderately cemented, very fine-to fine-grained, medium sorted; subangular to subrounded, interstitially silty, siliceous, slightly calcareous, with: rare mica. Nonporous.
2431 - 2475	44	Sandstone, as in 2417 - 2431.
2475 - 2485	10	Sandstone, clear to white, milky white, pale green, moderately cemented, fine-to medium-grained, medium sorted, subangular to subrounded, interstitially silty, siliceous, locally slightly calcareous, with: rare mica, and rare chlorite. Nonporous to slightly porous.
2485 - 2496	11	Siltstone, calcareous, dolomitic, brownish-gray, medium green, moderately hard, brittle, locally poorly fissile, siliceous, locally argillaceous, with: rare mica, and common carbonaceous lamanae and partings.
2496 - 2514	18	Siltstone, variegated, red, maroon-drab, pale green, light to dark gray, black, cream, moderately hard, tough, locally poorly fissile, siliceous, calcareous, locally argillaceous, locally ferruginous, with: rare mica.
2514 - 2532	18	Siltstone, red, with light green and light to medium gray, moderately soft, brittle, ferruginous and siliceous, locally slightly calcareous, with: rare mica.
2532 - 2536	4	Interbedded; siltstone, as in 2514 - 2532, with; sandstone, pink, white, pale green, moderately cemented, very fine-to fine-grained, medium sorted, subrounded, interstitially silty, siliceous, locally calcareous, with: rare mica, and common chert. Nonporous to slightly porous.



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2536 - 2557	21	Siltstone, light red to maroon-drab, with rare light gray, moderately soft, crumbly, locally finely sandy, ferruginous and argillaceous, locally calcareous, with: abundant mica.
2557 - 2564	7	Interbedded; siltstone, as in 2536 - 2557, with; sandstone, colorless, milky white, well cemented, very fine-grained, very well sorted, subangular, siliceous, slightly calcareous, with: rare mica. Nonporous to slightly porous.
2564 - 2571	7	Sandstone, as in 2557 to 2564.
2571 - 2579	8	Sandstone, clear to white, light gray, poorly cemented; very fine-to fine-grained, medium sorted, subangular, interstitially silty, siliceous, with: common mica, rare chlorite, and minor stringers of siltstone, carbonaceous, black, moderately soft, flaky, locally poorly fissile, argillaceous.
2579 - 2608	29	Sandstone, silty, clear to white, friable, very fine-grained, with rare fine-grained, medium sorted, subangular to subrounded, interstitially silty, siliceous, slightly calcareous, with: rare mica, and rare pyrite. Nonporous.
2608 - 2618	10	Sandstone, colorless, white, milky white, pale green, poorly cemented, very fine-to fine-grained, medium sorted, angular to subangular, siliceous and calcareous, with: common mica, and minor stringers of siltstone, carbonaceous, dark gray to black, moderately soft, crumbly, locally poorly fissile, argillaceous, with: abundant mica. Nonporous.
2618 - 2630	12	Siltstone, medium to dark gray, olive-drab, brownish-gray, moderately hard, tough, locally fissile, locally finely sandy, siliceous and argillaceous, with: abundant mica.

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- 2630 - 2651 21 Siltstone, as in 2618 - 2630, with: minor stringers of sandstone, clear to white and pale green, moderately cemented, very fine-to fine-grained with rare medium-grained, medium sorted, subangular to subrounded, interstitially silty, calcareous, with: common mica. Nonporous.
- 2651 - 2665 14 Siltstone, pale green, medium to dark gray, hard, tough, locally very finely-sandy, siliceous, slightly calcareous, with: common mica, and common carbonaceous lamanae and partings.

Stony Gap Sandstone Member of Hinton Formation (2665 - 2930)

- 2665 - 2685 20 Interbedded; siltstone, medium green, medium to dark gray and black, moderately hard, tough, locally poorly fissile, siliceous and argillaceous, with: rare mica, with; sandstone, white to milky white, very well cemented, very fine-to fine-grained, well sorted, subrounded to rounded, siliceous, locally calcareous, with: rare mica, and rare pyrite. Nonporous to slightly porous.
- 2685 - 2712 27 Sandstone, colorless, white, moderately cemented, very fine-to fine-grained, well sorted, angular to subrounded, interstitially silty, siliceous, with: rare mica, and common silty-micaceous partings. Nonporous.
- 2712 - 2717 5 Sandstone, colorless, moderately cemented, very fine-grained, with common fine-grained, well sorted, angular to subangular, siliceous, with: common mica. Nonporous.
- 2717 - 2722 5 No samples:
- 2722 - 2735 13 Sandstone, clear, white, milky white, moderately cemented, very fine-to medium-grained, poorly sorted, subangular to subrounded, interstitially silty, siliceous, with: rare pyrite, common mica, and minor stringers of

		siltstone, light-to dark gray, moderately hard, tough, locally poorly fissile, siliceous, with: common mica. Nonporous to slightly porous.
2735 - 2737	2	Sandstone, white, colorless, light gray, well cemented, very fine-to fine-grained, well sorted, subangular, siliceous, with: common mica, rare pyrite, and common silty-micaceous partings. Nonporous to slightly porous.
2737 - 2745	8	Sandstone, as in 2735 - 2737, but slightly calcareous.
2745 - 2748	3	No samples.
2748 - 2806	58	Sandstone, as in 2737 - 2745.
2806 - 2825	19	Sandstone, colorless, milky white, moderately cemented, very fine-to fine-grained, medium sorted, subangular to subrounded, interstitially silty, siliceous, with: rare mica, and common silty-micaceous partings. Slightly porous.
2825 - 2827	2	Sandstone, clear to white, yellow, poorly cemented, very fine-to fine-grained with rare medium-grained, medium sorted, subangular to subrounded, siliceous, with: common mica and abundant iron staining (probably bit particles). Nonporous to slightly porous.
2827 - 2832	5	Sandstone, white to milky white, moderately cemented, very fine-to fine-grained, well sorted, subangular to rounded, siliceous, locally slightly calcareous, with: rare mica. Nonporous.
2832 - 2834	2	No samples.
2834 - 2844	7	Sandstone, as in 2827 - 2832.
2841 - 2850	9	Sandstone, colorless, poorly cemented, fine-grained with rare very fine-grained, well sorted, subangular to subrounded, siliceous, with: rare mica. Nonporous to slightly porous.

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2850 - 2852	2	Sandstone, as in 2841 - 2859, but with abundant iron staining (probably bit particles).
2852 - 2854	2	Sandstone, as in 2841 - 2850.
2854 - 2874	20	Sandstone, white to light gray and brownish-gray, moderately cemented, fine-grained, with rare medium-grained, well sorted, subangular, interstitially silty, siliceous, with: common mica, and minor stringers of siltstone, medium to dark gray, moderately hard, tough, locally finely sandy, siliceous and calcareous, with: rare mica.
2874 - 2881	7	Sandstone, white, light gray, moderately cemented, very fine-grained, well sorted, subangular to subrounded, interstitially silty, calcareous, with: common mica. Nonporous.
2881 - 2882	1	Sandstone, as in 2874 - 2881, but with common iron staining (probably bit particles).
2882 - 2884	2	Sandstone, as in 2874 - 2881.
2884 - 2890	6	Interbedded; sandstone, colorless, white, well cemented, very fine-to fine-grained, well sorted, subangular, siliceous, with: rare mica. Nonporous. With: siltstone, light to dark gray, brownish-gray, moderately soft, flaky, locally poorly fissile, siliceous and argillaceous, with: rare mica.
2890 - 2893	3	Sandstone, as in 2884 - 2890, with: abundant silty-micaceous partings.
2893 - 2900	7	Sandstone, clear to white, milky white, well cemented, very fine-to medium-grained with rare coarse-grained, poorly sorted, subangular to rounded, interstitially silty, siliceous, with: common mica, and minor stringers of siltstone, as in 2884 - 2890.

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2900 - 2930	30	Sandstone, clear to white, moderately cemented, very fine-to fine-grained, with rare medium-grained, medium sorted, subangular to subrounded, siliceous, locally slightly calcareous, with: common mica, and common silty-micaceous partings. Nonporous.
<u>Bluefield Formation (2930 - 3407)</u>		
2930 - 2955	25	Siltstone, shaly, light to dark gray and black, brownish-gray, hard, tough, locally poorly fissile, siliceous and argillaceous, with: rare mica.
2955 - 2970	15	Siltstone, dark gray to black, with light greenish-gray, moderately hard, tough, locally poorly fissile, siliceous and argillaceous, with: abundant pyrite, common mica, and common carbonaceous partings.
2970 - 2982	12	Interbedded; siltstone, as in 2955 - 2970, with; sandstone, clear to white, poorly cemented, very fine-to fine-grained, well sorted, subangular, siliceous, locally slightly calcareous with: rare mica. Nonporous.
2982 - 2987	5	Siltstone, light to medium gray, greenish-gray, hard, tough, locally poorly fissile, locally finely sandy, siliceous and argillaceous, with: rare mica, and minor stringers of sandstone, clear to white, well cemented, very fine-to fine-grained, medium sorted, subangular, calcareous, with: common mica. Nonporous.
2987 - 3003	16	Interbedded; siltstone, as in 2982-2987, with: sandstone, clear to white, milky white, well cemented, very fine-to fine-grained with common medium-grained, medium sorted, subangular to subrounded, calcareous, with: common pyrite, and rare mica. Nonporous to slightly porous.

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3003 - 3024	21	Siltstone, light to dark gray, black, greenish-gray, hard, tough, locally poorly fissile, calcareous and siliceous, locally argillaceous, with rare pyrite, and rare mica.
3024 - 3032	8	Shale, dark gray to black, moderately soft, flaky, fair to good fissility, locally silty and siliceous, argillaceous, with rare pyrite, rare mica, and stringers of limestone, dolomitic, silty, dark gray to black, fossil fragmental (crinoid stems), moderately hard, fine-grained, microcrystalline, with: rare mica. (X-ray diffraction check).
3032 - 3065	33	Shale, with limestone stringers, as in 3024 - 3032, with: common siltstone, red, moderately soft, brittle.
3065 - 3073	8	Limestone, dolomitic, medium to dark gray and black, rare oolites, rare fossils (crinoid stems), fine-grained, microcrystalline, with: rare calcite, and minor stringers of shale, dark gray, moderately soft, flaky, good fissility, slightly calcareous (X-ray diffraction check).
3073 - 3075	2	Interbedded; limestone, as in 3065- 3073, with; siltstone, light to medium gray, moderately hard, tough, locally finely sandy, siliceous and calcareous.
3075 - 3087	12	Shale, medium to dark gray and black, moderately soft, flaky, fair fissility, argillaceous, slightly calcareous, with: common carbonaceous laminae and partings, and minor stringers of limestone, shaly, light to medium gray, fossiliferous (rare crinoid stems), moderately hard, fine-grained, microcrystalline, with: rare calcite, and rare pyrite.

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3087 - 3109	22	Sandstone, white to light gray, moderately cemented, very fine-grained, well sorted, subangular to subrounded, interstitially silty, siliceous, slightly calcareous, with: common mica, rare pyrite, and minor stringers of siltstone, light to dark gray, moderately hard, tough, locally poorly fissile, argillaceous, slightly calcareous, with common mica, and common carbonaceous lamanae. Nonporous to slightly porous.
3109 - 3116	7	Shale, light to dark gray and black, moderately soft, flaky, fair fissility, argillaceous and calcareous, locally carbonaceous, with: rare mica and minor stringers of sandstone, as in 3087 - 3109.
3116 - 3137	21	Sandstone, clear to white and light gray, well cemented, very fine-grained, well sorted, subrounded, interstitially silty, locally slightly calcareous, with: abundant pyrite, abundant carbonaceous streaks and partings, and minor stringers of siltstone, medium to dark gray, moderately hard, tough, locally finely sandy, siliceous, with: rare mica.
3137 - 3141	4	Sandstone, clear to white and milky white, well-cemented, very fine-grained, with rare fine-grained, well sorted, subangular to subrounded, interstitially selty, siliceous, slightly calcareous, with: rare mica, rare pyrite (including 2 twinned pyrite crystals "iron cross"). Nonporous.
3141 - 3195	54	Shale, silty, light to dark gray and black, moderately hard, tough, poor to fair fissility, argillaceous and siliceous, locally calcareous, with: common mica, rare pyrite, and common carbonaceous streaks.
3195 - 3221	26	Shale, light to dark gray and black, moderately hard, tough, poorly fissile,

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		locally silty, siliceous and argillaceous, with: rare pyrite, common calcite, rare mica, and minor stringers of limestone, silty, dolomite, light to medium gray, fossiliferous (crinoid stems), moderately soft, fine-grained, microcrystalline, with: common carbonaceous streaks, and common calcite. (X-ray diffraction check).
3221 - 3228	7	Shale, silty moderately hard, flaky, good fissility, locally siliceous, argillaceous and calcareous, with: common calcite, rare fossil fragments, and rare pyrite.
3228 - 3244	16	Shale as in 3221 - 3228, with: minor stringers of limestone, light gray, oolitic, fossil fragmental, moderately soft, fine-grained, microcrystalline, with: rare calcite, and common carbonaceous streaks.
3244 - 3269	25	Limestone, light gray to dark brownish-gray, locally oolitic, fossiliferous (crinoid stems), hard, very fine-grained, microcrystalline, with: rare pyrite, common calcite, and stringers of shale, medium to dark gray, moderately hard, flaky, fair fissility, locally siliceous, argillaceous, calcareous, with: rare mica, and rare fossil fragments. (X-ray diffraction check).
3269 - 3273	4	Limestone, light gray, light to dark brownish-gray, fossil fragmental, moderately hard, fine-grained, microcrystalline, with: rare pyrite, and rare calcite.
3273 - 3288	15	Limestone, locally argillaceous, light to dark gray, light to medium brownish-gray, locally oolitic, fossil fragmental, moderately hard, fine-grained, microcrystalline, with: rare calcite.



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| 3288 - 3311 | 23 | Shale, light to dark gray, moderately soft, brittle, fair fissility, locally silty, calcareous and argillaceous with: common calcite, common carbonaceous streaks, abundant fossils (crinoid stems), and stringiness of limestone, as in 3273 - 3288.  |
| 3311 - 3324 | 13 | Shale, light to dark gray and black, soft, flaky, poor to fair fissility, argillaceous, slightly calcareous, with: rare pyrite, common fossils (crinoid stems), and minor stringers of limestone, as in 3273 - 3288.   |
| 3324 - 3349 | 25 | Shale, medium to dark gray, hard, tough, fair to good fissility, locally silty, argillaceous, slightly calcareous, with: rare mica, and minor stringers of limestone, light gray, fossiliferous (crinoid stems), moderately hard, fine-grained, microcrystalline, with: common calcite, and rare pyrite ("Boxwork" structure shown). |
| 3349 - 3369 | 20 | Limestone, silty and argillaceous, medium- to dark gray and black, locally oolitic, fossil fragmental (crinoid stems and brachiopods), moderately soft, fine-grained, microcrystalline, with: rare calcite, and rare pyrite. (X-ray diffraction check).  |
| 3369 - 3407 | 38 | Limestone, tan, light green, light to dark gray, fossiliferous (crinoid stems), hard, very fine-grained, cryptocrystalline, with: rare pyrite, rare calcite, and minor stringers of shale, medium to dark gray and black, moderately hard, tough, locally poorly fissile, argillaceous and calcareous, with: rare mica.              |

Greenbriar Limestone (3407 - 3897)

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| 3407 - 3477 | 20 | Limestone, white, light green, light to dark gray, fossil fragmental, (crinoid stems) moderately soft, fine-grained, microcrystalline, with: abundant pyrite, and common calcite. |
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3427 - 3451	24	Limestone, light gray, brownish-gray, locally oolitic, fossil fragmental (crinoid stems) moderately hard, fine-grained, microcrystalline, with: abundant calcite, and rare pyrite.
3451 - 3464	13	Limestone, white, tan, light to medium gray, locally oolitic, rare fossil fragments, moderately soft, fine-grained, microcrystalline, with: rare pyrite, and abundant calcite.
3464 - 3477	13	Limestone, in part shaly and argillaceous, white, light to dark brown, medium to dark gray, light greenish-gray, oolitic, fossil fragmental, moderately hard, very fine-grained, crystocrystalline, with: rare calcite.
3477 - 3497	20	Limestone, light brownish-gray, with light to dark gray, oolitic, rare fossil fragments, moderately soft, fine-grained, microcrystalline, with: rare calcite, and rare pyrite.
3497 - 3518	21	Limestone, in part shaly and argillaceous, light brownish-gray with dark gray, locally oolitic, rare fossil fragments, moderately hard, fine-grained, microcrystalline, with: common calcite.
3518 - 3522	4	Limestone, medium to dark brown, tan, medium gray, fossiliferous (crinoid stems, brachiopods), moderately hard, fine-grained, microcrystalline, with: rare pyrite, and common calcite.
3522 - 3527	5	No samples.
3527 - 3539	12	Limestone, as in 3518 - 3522.
3539 - 3573	34	Limestone, dark brownish-gray, dark gray, fossiliferous (crinoid stems, brachiopods), hard, fine-grained, microcrystalline, with: common calcite.

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3573 - 3598	25	Limestone, light to dark brown, tan, locally oolitic, fossil fragmental, very hard, fine-grained, microcrystalline, with: abundant calcite, and rare pyrite.
3598 - 3600	2	Limestone, light brown, tan, brownish-gray, oolitic, fossil fragmental, very hard, very fine-grained, cryptocrystalline, with: common calcite, and rare pyrite.
3600 - 3607	7	No samples.
3607 - 3618	11	Limestone, as in 3598 - 3600.
3618 - 3623	5	No samples.
3623 - 3630	7	Limestone, as in 3598 - 3600.
3630 - 3687	57	Limestone, white, light tan, light brownish-gray, fossil fragmental, moderately hard, fine-grained, microcrystalline, with: rare calcite.
3687 - 3698	11	Limestone, light to medium brownish-gray, black, locally oolitic, fossil fragmental, fine-grained, microcrystalline, with: common calcite.
3698 - 3724	26	Limestone, white, tan, light grayish-brown, rare oolitic, fossil fragmental, moderately hard, fine-grained, microcrystalline, with: rare calcite, and rare pyrite.
3724 - 3738	14	Limestone, light greenish-gray, light gray, tan, black, fossil fragmental, moderately hard, fine-grained, microcrystalline, with: common anhydrite, and rare calcite.
3738 - 3778	40	Limestone, white, light tan, light brown, black, fossil fragmental, moderately soft, very fine-grained, cryptocrystalline, with: common calcite.

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3778 - 3801	22	Limestone, white, light to medium brown, rare fossil fragments, moderately hard, very fine-grained, cryptocrystalline.
3800 - 3889	89	Limestone, light to dark gray, locally oolitic, rare fossil fragments, moderately hard, with: rare carbonaceous material, rare calcite, and rare pyrite.
3889 - 3897	8	Limestone, as in 3800 - 3889, with: abundant chert.

Maccrady Formation (3897 - 3947)

3897 - 3947	50	Siltstone, dark red, with light gray, moderately hard, tough, locally siliceous, calcareous, with: common mica, common coaly carbonaceous material, and rare fossil fragments.
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Price Siltstone (Sandstone) (3947 - 4224)

3947 - 3950	3	Siltstone, light to dark gray, moderately hard, tough, slightly calcareous, with: rare mica, rare carbonaceous lamanae and partings, and rare pyrite.
3950 - 3959	9	Siltstone, as in 3947 - 3950, with stringers of sandstone, clear to white, moderately cemented, fine-grained, medium sorted, subrounded to sub-angular, calcareous. Slightly porous.
3959 - 4067	108	Siltstone, as in 3947 - 3950.
4067 - 4070	3	Shale, black, moderately hard, tough, locally silty and siliceous, argillaceous, fair to good fissility, with: common mica.
4070 - 4120	50	Siltstone, light to dark gray and black, hard, tough, slightly calcareous, siliceous, with: rare mica, common carbonaceous material, and rare pyrite.
4120 - 4143	23	Shale, black, moderately hard, tough, poor fissility, locally finely sandy and siliceous, argillaceous, with: rare pyrite, rare mica, and common coaly carbonaceous lamanae and partings.

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4143 - 4200 57

Siltstone, medium to dark gray, hard, tough, rare poor fissility, locally slightly calcareous, siliceous, with: common mica, and common coaly carbonaceous material.

4200 - 4224 24

Siltstone, dark gray, moderately soft, flaky, rare poor fissility, locally finely sandy, siliceous, with: rare mica, and rare pyrite.

Big Stone Gap Shale (4224 - 4491)

4224 - 4407 183

Shale, dark gray to black, moderately hard, tough, poor to fair fissility, argillaceous, with: rare mica, rare pyrite, and common coaly carbonaceous material.

4407 - 4491 84

Shale, carbonaceous, black, moderately soft, flaky, fair to good fissility, with: common mica, and common pyrite.

Devonian Shales and Siltstones (4491'- T. D.)

4491- 4551 61

Siltstone, light to medium gray, hard, tough, locally finely sandy, siliceous, locally calcareous, with: common pyrite, rare mica, and common coaly carbonaceous streaks and partings.

T. D. 4551'

SUMMARY

Pennsylvanian  
System  
(0'1684')

Pottsville  
Group  
(0'1684')

Norton Formation  
(0-587')

Raven Coal Horizon  
(177')  
Jawbone Coal  
(324')

Lee Formation  
(587'-1684')

Bluestone Formation  
(1684'-2280')

Mississippian  
System  
(1684'-4224)

Pennington  
Group  
(1684'-2930')

Princeton Sandstone  
(2280'-2345')

Hinton Formation  
(2345'-2930')

Stony Gap Sandstone  
Member (2665'-2938)

Bluefield Formation  
(2930'-3407')

Greenbriar Limestone  
(3407'-3897')

Maccrady Formation  
(3897'-3947')

Price Siltstone (Sandstone)  
(3947'-4224')

Big Stone Gap Shale  
(4224'-4491')

Devonian  
System  
(4224'- T. D. )

Devonian Shales and Siltstones  
(4491'- T. D. )