

PAT WELLS OIL COMPANY

Wells Heirs #1 R

Marshall 508 R

Franklin Township, West Virginia

Top of Onondaga-5842'
Onondaga-5842'-6079'

Interbedded gray translucent to occasionally Milky Chert; buff to Tan Granular, Calcareous Chert; Cherty Gray to Tan Limestone. Chert content increases towards base at 6079. Sample 6070-75 is mainly Gray Translucent Chert, but contains approximately 30% Dark Gray Granular (cinderlike) Chert.

Top of Oriskany-6079'
6079'-80'-Sandstone

White, mainly medium grained with numerous coarse grains, sub-angular to sub-rounded, mainly clear with some frosting, clean, well sorted. No clusters and sand is comprised of individual grains with no visible cementing material.

6080'-85'-Sandstone

White, mainly medium grained with numerous coarse grains, sub-angular to sub-rounded, mainly clear with some frosting, clean, well sorted. No clusters and sand is comprised of individual grains with no visible cementing material. Large amount of very fine sand present in background of sample undoubtedly representing the shattering of the medium to coarse grains.

6085'-90'-Sandstone

White, mainly medium grained with numerous coarse grains, sub-angular to sub-rounded, mainly clear with some frosting, clean, fairly well sorted; sand clusters are tightly cemented and are slightly calcareous; acid etches out sand grains in clusters only slightly.

6090'-95'-Sandstone

White, mainly medium grained with numerous coarse grains, sub-angular to sub-rounded, mainly clear with some frosting, clean, fairly well sorted; sand clusters are tightly cemented and are slightly calcareous; acid etches out sand grains in clusters only slightly. Grain size has become medium to slightly finer with loss of coarse grains; grains are sub-angular with less of sub-rounded classification.

6095'-6100'-Sandstone

White, medium grained, sub-angular, clear, well sorted, clean; sand is mainly loose individual grains, but clusters are tightly cemented with very little calcareous material present.

6100'-6105'-Sandstone

White, medium grained, sub-angular, clear, well sorted, clean; sand is mainly loose individual grains, but clusters are tightly cemented with very little calcareous material present. Medium to slightly finer.

6105'-10'-Sandstone

White, fine, sub-angular, clear, well sorted, clean; clusters have increase of calcareous cement, but are still rather tight.

6110'-15'-Sandstone

White, fine, sub-angular, clear, well sorted, clean; clusters have increase of calcareous cement, but are still rather tight. Further increase of calcareous content -- clusters treated with acid leached well around grains, but original outline of cluster remains.

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- 6450'-55'-Limestone (96%) Buff to tan to brown, finely crystalline to lithographic;
Shale (4%): Gray to black, the latter with dark brown streak; trace gray translucent chert; trace calcite veining; small amount of pyrite.
- 6455'-60'-Limestone (97%) Buff to tan, finely crystalline to lithographic, darker variety gives slight amount of residue while buff is highly pure;
Shale (3%): As above; trace of gray translucent chert; trace pyrite, trace of calcite veining.
- 6460'-65'-Limestone (97%) Buff to tan, finely crystalline to slightly lithographic, very slight residue;
Shale (3%): As above; trace gray translucent chert; trace of very fine sand in background; trace of disseminated pyrite.
- 6465'-70'-Limestone (85%) Gray, finely crystalline to tan lithographic, trace of poorly developed oolitic zones, only a trace of residue, slightly fossiliferous;
Shale (15%): Mainly gray, soft, with good show of dark brown to black shale having a dark brown streak; trace of disseminated pyrite; trace of siltstone; trace of gray translucent chert.
- 6470'-75'-Limestone (80%) Gray, finely crystalline to tan lithographic, trace of poorly developed oolitic zones, only a trace of residue;
Shale (20%): Mainly gray, soft, with good show of dark brown to black shale having a dark brown streak; trace of disseminated pyrite; trace of siltstone; trace of gray translucent chert.
- 6475'-80'-Limestone (70%) Light gray finely crystalline to tan lithographic, traces of poorly developed oolitic zones, slight amount of argillaceous residue to tan lithographic variety;
Shale (30%): Gray to dark brown, brown variety has dark brown streak; trace translucent chert; disseminated pyrite; trace of gray siltstone.
- 6480'-85'-Limestone (80%) Light gray finely crystalline to tan lithographic, traces of poorly developed oolitic zones, slight amount of argillaceous residue to tan lithographic variety;
Shale (20%): Gray to dark brown, brown variety has dark brown streak; trace translucent chert; disseminated pyrite.

- 6485'-90'-Limestone (75%) Light gray finely crystalline to tan lithographic, traces of poorly developed oolitic zones, slight amount of argillaceous residue to tan lithographic variety;
Shale (25%): Gray to dark brown, brown variety has dark brown streak; trace translucent chert; disseminated pyrite.
- 6490'-95'-Limestone (70%) Buff to tan, finely crystalline to lithographic, darker variety has argillaceous residue and some poorly developed oolites;
Shale (30%): Gray to brown as above; disseminated pyrite.
- 6495'-6500'-Shale (70%) 60% gray to dark gray, soft, rather fissile; 10% dark brown with dark gray to tan streak;
Limestone (30%): Gray to dark gray, moderately crystalline, rather pure with only a trace of residue; gray translucent chert; disseminated pyrite.
- 6500'-05'-Shale (65%) 60% gray to dark gray, soft, rather fissile; 5% dark brown with dark gray to tan streak;
Limestone (35%): Gray, very finely crystalline, small amount of argillaceous residue; disseminated pyrite; gray translucent chert.
- 6505'-10'-Limestone Buff to tan, very finely crystalline to almost lithographic, argillaceous residue when acidized; trace of gray translucent chert and very fine sand grains; calcite veining and trace of pyrite.
- 6510'-15'-Limestone Buff to tan, very finely crystalline to almost lithographic, argillaceous residue when acidized; trace of gray translucent chert and very fine sand grains; calcite veining and trace of pyrite.
- 6515'-20' No Sample
- 6520'-25'-Limestone (60%) Buff to tan, finely crystalline, fair amount of argillaceous residue;
Shale (40%): Mainly gray, soft, with 10% black shale having a dark brown streak; good showing of gray translucent chert; trace of disseminated pyrite.
- 6525'-30'-Limestone (70%) Same as above;
Shale (20%): As above;
Chert (10%): Gray, translucent; trace of calcite veining; disseminated pyrite.
- 6530'-35'-Limestone (75%) Same as above;
Chert (20%): Same as above;
Shale (5%): Same as above; trace calcite; pyrite-both disseminated and in crystals.

6535'-40'-Limestone (70%)

Gray to dark gray, pure, finely crystalline;
Chert (26%): Gray, translucent;
Shale (4%): Fairly abundant calcite crystals;
trace of pyrite-both disseminated and in
crystals.

6540'-45'-Limestone (60%)

Gray to dark gray, more coarsely crystalline
than above;
Shale (30%): Gray to dark gray with some
dark brown to black;
Chert (10%): Gray, translucent; few pyrite
and calcite crystals.

6545'-50'-Limestone (75%)

Gray to brown, finely crystalline;
Shale (20%): Gray to greenish gray, soft;
Chert (5%): Gray translucent; few calcite
crystals; pyrite-both free and disseminated;
streak of siltstone to very fine sandstone
(probably cavings).

6550'-55'-Dolomite (40%)

Light tan, creamy in appearance, very
finely crystalline, some pieces containing
fine, clear, sub-angular quartz grains;
Limestone (30%): As above;
Shale (30%): As above; trace translucent
gray chert; trace gray siltstone.

6555'-60'-Limestone (80%)

Gray to buff colored, more coarsely crystalline
than above; fossiliferous;
Shale (20%): Gray to dark brown, soft; free
calcite fairly abundant; trace of chert and
pyrite.

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6670'-75'-Limestone (80%)

Dark brown, flaky, extremely fine grained to almost lithographic, leaves only a very small amount of argillaceous residue in acid;
Shale (18%): light gray, soft;
Chert (2%): light gray, translucent.

6675'-80'-Limestone (80%)

Dark brown, flaky, extremely fine grained to almost lithographic, leaves only a very small amount of argillaceous residue in acid;
Shale (18%): light gray, soft;
Chert (2%): light gray, translucent.

6680'-85'-Limestone (85%)

Dark brown, flaky, extremely fine grained to almost lithographic, trace of oolitic development with oolites tightly cemented and fractured across, trace of argillaceous residue in acid;
Shale (15%): light gray and soft;
trace of gray translucent chert.

6685'-90'-Limestone (90%)

As above;
Shale (10%): light gray, soft; trace of gray translucent chert.

6690'-95'-Limestone (85%)

As above;
Shale (12%): light gray, soft;
Shale (3%): dark brownish black with dark brown streak.

6695'-6700'-Limestone (85%)

As above;
Shale (10%): light gray, soft;
Shale (5%): dark brownish black with dark brown streak.

6700'-6710'-

Missing

6710'-6715'-Limestone (70%)

Dark brown, flaky, extremely fine grained to almost lithographic, trace of obscure oolitic development, increase of argillaceous residue in acid;
Shale (20%): light gray, soft;
Shale (8%): dark brownish black with dark brown streak;
Siltstone (2%): light gray, fairly calcareous.

6715'-20'-

Missing

6720'-25'-Limestone (55%)

Light to tan to dark brown, very fine grained, dark brown variety leaves fair amount of argillaceous residue;
Shale (30%): light gray, soft with a streak of dark brown shale;
Anhydrite (15%): light gray to tan, in minutely granular crystalline masses; trace of slightly calcareous siltstone.

6725'-30'-Limestone (85%)

Same as above;
Anhydrite (10%): same as above;
Shale (5%): same as above;
 trace of pyrite and green argillaceous siltstone.

6730'-35'-Shale (70%)

Light gray, soft;
Limestone (15%): tan to dark brown, very fine grained, fair amount of argillaceous residue;
Shale (10%): dark brown, soft, with dark brown to brownish black streak;
Chert (5%): gray, translucent.

6735'-40'-

Missing

6740'-45'-

Contaminated Sample

6745'-50'-

Missing

6750'-55'-Limestone (80%)

Tan to dark brown, very fine grained, goodly amount of argillaceous residue;
Shale (10%): light gray to dark brown, soft;
Sandstone (10%): very fine to fine grained, tightly cemented (probably cavings); trace of gray translucent chert; trace of creamy, dove colored dolomitic limestone.

6755'-60'-Limestone (90%)

Tan to dark brown, very fine grained, slight amount of residue;
Shale and Siltstone (10%): trace of translucent chert and minutely granular crystalline masses of anhydrite.

6760'-65'-Limestone (90%)

Tan to dark brown, very fine grained, slight amount of residue;
Shale and Siltstone (10%): trace of translucent chert and minutely granular crystalline masses of anhydrite.

6765'-70'-

Missing

6770'-75'-Limestone (90%)

Same as 6755'-65'

6775'-80'-Limestone (65%)

Tan to dark brown, finely crystalline, fair amount of argillaceous residue;
Shale (35%): light gray to greenish-gray, soft.

6780'-6870'-

Missing

6870'-75'-Shale (35%)

Light gray to greenish-gray, soft;
Limestone (30%): tan to dark brown, very finely crystalline, good amount of residue;
Anhydrite (25%): light tan to white, in minutely crystalline masses;
Shale (10%): dark brown with dark brownish-black streak.

6875'-80'-Anhydrite (40%)

Light tan to tan, in minutely crystalline masses, flaky like lime megascopically, but crystalline under magnification;
Limestone (30%): dark tan to dark brown, argillaceous residue;
Shale (20%): light gray to grayish-green, soft;
Shale (10%): dark brown with dark brown to brownish-black streak.

6880'-85'-Shale (60%)

Light gray to grayish-green, soft;
Anhydrite (20%): light tan to tan, minutely crystalline masses;
Limestone (15%): dark tan to dark brown, argillaceous;
Shale (5%): dark brown, soft, dark brown to brownish black streak.

6885'-90'-Shale (65%)

Light gray to grayish-green, soft;
Shale (15%): dark brown, soft;
Anhydrite (15%): light tan to tan, minutely crystalline;
Limestone (5%): dark tan to dark brown; trace of gray siltstone.

6890'-95'-Anhydrite (65%)

As above;
Shale (15%): light gray to greenish-gray;
Limestone (10%): as above;
Shale (10%): dark brown, soft.

6895'-6900'-Shale (50%)

Light gray to grayish-green, soft 40%; dark brown, soft 10%;
Dolomite (30%): light tan, finely crystalline, containing anhydrite crystals and considerable silty material;
Anhydrite (15%): light gray to tan, approaches color of dolomite, minutely crystalline;
Limestone (5%): tan to dark brown, argillaceous residue; trace pyrite.

6900'-05'-Shale (60%)

Light gray to greenish-gray, soft 50%; dark brown, soft 10%;
Dolomite (20%): tan, finely crystalline, moderate amount of silty residue;
Anhydrite (10%): tan to light gray, finely crystalline;
Limestone (10%): dark brown, argillaceous; trace of light gray siltstone.

- 6905'-10'-Dolomite (60%)
 Tan, finely crystalline, goodly amount of silty residue;
Shale (20%): light gray to greenish-gray with streak of dark brown shale;
Anhydrite (15%): tan to light gray, minutely crystalline;
Limestone (5%): dark brown, argillaceous.
- 6910'-15'-Shale (60%)
 Light gray to greenish-gray, soft 50%; dark brown with dark brown to brownish-black streak (10%);
Dolomite (25%): tan, finely crystalline with goodly amount of silty residue;
Limestone (10%): dark brown, argillaceous;
Anhydrite (5%): light gray to tan, minutely crystalline.
- 6915'-20'-Dolomite (55%)
 Tan, finely crystalline;
Shale (30%): light gray to grayish-green, soft 25%; dark brown, soft 5%;
Anhydrite (10%): tan to white, finely crystalline;
Limestone (5%): dark brown, argillaceous.
- 6920'-35'-
 Missing
- 6935'-40'-Limestone (85%)
 Tan to dark brown, very finely crystalline to lithographic, argillaceous residue;
Anhydrite (10%): white to tan, minutely crystalline;
Shale and Siltstone (5%): light gray to grayish-green.
- 6940'-45'-Shale (50%)
 Light gray to greenish gray, soft 40%; dark brown, soft 10%;
Dolomite (35%): light tan to creamy brown, finely crystalline, silty residue;
Anhydrite (10%): white to light tan, minutely crystalline masses;
Limestone (5%): dark brown, argillaceous.
- 6945'-50'-Dolomite (65%)
 Mainly light tan, creamy, very finely crystalline, some dark brown, highly argillaceous;
Shale (20%): light gray to greenish-gray, soft 15%; dark brown with brownish-black streak 5%;
Limestone (10%): dark brown, very finely crystalline, argillaceous residue;
Anhydrite (5%): white to light tan; trace chert and light gray siltstone.
- 6950'-55'-Shale (50%)
 Light gray to grayish-green, soft 35%; dark brown, soft 15%;
Dolomite (40%): mainly light tan, creamy, finely crystalline with some dark brown argillaceous variety;
Limestone (5%): dark brown, argillaceous;
Anhydrite (5%): white to light tan.

- 6955'-60'-Shale (50%)
 Light gray to grayish-green, soft 40%;
 dark brown, soft 10%;
Dolomite (40%): mainly light tan, creamy,
 finely crystalline with some tan to brown
 argillaceous variety;
Limestone (6%): dark brown, argillaceous;
Anhydrite (4%): white to light tan,
 minutely crystalline masses; streak of
 grayish-green siltstone.
- 6960'-65'-Shale (60%)
 Light gray to grayish-green, soft 50%;
 dark brown, soft 10%;
Dolomite (30%): as above;
Limestone (5%): as above;
Anhydrite (5%): as above.
- 6965'-70'-Shale (80%)
 Light gray to greenish gray 70%; dark
 brown with brownish-black streak 10%;
Dolomite (15%): light tan, creamy to
 light tan finely crystalline, slight
 amount of silty residue;
Limestone (5%): dark brown, argillaceous;
 streak of light gray to tan anhydrite
 and light gray-green siltstone.
- 6970'-75'-
 Missing
- 6975'-80'-Shale (85%)
 Light gray to greenish gray 80%;
 dark brown with brownish-black streak 5%;
Dolomite (5%): light tan, creamy, finely
 crystalline, silty residue;
Limestone (5%): dark brown, argillaceous
 residue;
Siltstone (5%): gray-green, slightly
 calcareous.
- 6980'-85'-Shale (55%)
 Light gray to greenish-gray 45%;
 dark brown 10%;
Dolomite (25%): light tan, creamy, very
 finely crystalline, silty residue;
Anhydrite (15%): tan to dark brown,
 very finely crystalline, limestone in
 appearance, dolomitic;
Limestone (5%): dark brown, argillaceous;
 good show of white slightly calcareous
 siltstone.
- 6985'-90'-Shale (45%)
 Light gray to greenish-gray 35%; dark
 brown 10%;
Anhydrite (30%): brown to tan, very
 finely crystalline, dolomitic;
Limestone (15%): tan to brown, almost
 lithographic, relatively pure;
Dolomite (10%): light tan, creamy, very
 finely crystalline; streak of gray,
 slightly calcareous siltstone.
- 6990'-95'-Dolomite (35%)
 Light tan, creamy, earthy in appearance,
 becoming very finely crystalline in
 portions;

Shale (30%): light gray to greenish-gray, soft, 25%; dark brown, soft, 5%;
Anhydrite (20%): brown to dark brown, having the appearance of limestone that is finely crystalline; dolomitic;
Limestone (10%): brown, very fine grained, fair amount of argillaceous residue;
Siltstone (5%): gray to greenish-gray, slightly calcareous.

6995'-7000'-Dolomite (55%)

Light tan, creamy, earthy in appearance with occasional inclusion of dark brown anhydrite 45%; tan almost lithographic variety 10%;
Anhydrite (20%): dark brown, finely crystalline variety predominates; small percentage of gray, finely crystalline;
Shale (20%): light gray-green, soft variety predominates with some dark brownish-black, soft occurring;
Limestone (5%): tan, lithographic, rather pure.

7000'-7005'-Shale (75%)

Light gray to grayish-green, soft, 65%; dark brown, soft, 10%;
Dolomite (10%): light tan, creamy to tan lithographic;
Siltstone (10%): light gray, hard, slightly calcareous;
Anhydrite (5%): light tan to dark brown, finely crystalline.

7005'-10'-Shale (80%)

Light gray to grayish-green, soft, 65%; dark brown to brownish-black, soft, 15%;
Siltstone to Very Fine Sand (15%): grayish-white, tightly cemented, slightly calcareous;
Dolomite and Anhydrite (5%): as above.

7010'-15'-Shale (75%)

As above;
Siltstone to Very Fine Sand (20%): as above;
Dolomite and Anhydrite (5%): as above;

7015'-20'-Shale (55%)

Light gray to grayish-green, soft, 45%; dark brown to brownish-black, 10%;
Dolomite (30%): mainly light tan, creamy, earthy in appearance and very finely crystalline;
Anhydrite (10%): light tan to dark brown, very finely crystalline;
Limestone (5%): tan, almost lithographic, very little residue; trace white siltstone.

7020'-25'-Shale (50%)

Light gray to grayish-green, soft 40%; dark brown to brownish-black 10%;
Dolomite (35%): mainly light tan, creamy and earthy in appearance; some dark tan and finely crystalline;

Anhydrite (10%): ranges from light gray to dark tan and both varieties very finely crystalline; trace of light gray tightly cemented siltstone.

7025'-30'-

Same as above.

7030'-35'-Dolomite (45%)

Mainly light tan, creamy, and earthy in appearance; same light tan to brown finely crystalline variety;
Shale (35%): light gray to grayish-green 25%; dark brown to brownish-black 10%;
Limestone (10%): tan, lithographic, with silty residue rather than argillaceous;
Anhydrite (10%): gray to dark brown, both with a pearly type of sheen and finely crystalline; trace of siltstone.

7035'-40'-Dolomite (50%)

As above;
Shale (30%): light gray to grayish-green 25%; dark brown to brownish-black 5%;
Anhydrite (15%): as above;
Limestone (5%): as above; trace of siltstone.

7040'-45'-Dolomite (55%)

As above;
Shale (25%): light gray to grayish-green 20%; dark brown to brownish-black 5%;
Limestone (15%): dark brown to dark tan, very finely crystalline to lithographic, silty residue;
Anhydrite (5%): as above.

7045'-50'-Shale (40%)

Light gray to grayish-green 30%; dark brown to brownish-black 10%;
Dolomite (30%): as above;
Limestone (20%): dark tan to dark brown, lithographic, silty residue;
Anhydrite (10%): as above; trace of gray siltstone.

7050'-55'-Shale (60%)

Light gray to greenish-gray, soft, 45%; dark brown to brownish-black 15%;
Limestone (15%): tan to dark brown, lithographic to very fine grained, silty residue;
Dolomite (15%): tan, creamy, rather earthy to tan, finely crystalline;
Anhydrite (10%): gray to brown, very finely crystalline; trace of gray siltstone.