Summary of the Midwest Exploration Company P. Juntunen
Towner County, North Dakota
Well No. 434 - Permit No. 450

by Morton Strassberg
June, 1954

Midwest Exploration - Juntunen No. 1, Towner County, North Dakota, C NW NW Sec. 27, T. 163 N., R. 68 W. (660 feet from N. Line and 660 feet from W. line) Elevation 1729 G. L.

The Midwest - Juntunen #1 was spudded September 16, 1953 and 10 3/4 inch casing was set at 268 feet with 100 sacks of cement. The well was completed as a dry hole October 1, 1953 and was abandoned. Total depth 4,436 feet.

D.S.T. #1 3704-3417; Open 1 hour, recovered 150' mud, F.P. 0#; 15 minute S.I.P. 1400#, HP 2200#.

Ten sack cement plugs were set at the following depths:
4405 - 4360 2330 - 2350
3700 - 3760 2030 - 2050
3180 - 3220 1670 - 1690
2500 - 2530 1590 - 1620

Formation tops were determined from samples, electric, micro, and radioactivity logs and were corrected to electric log tops unless otherwise stated. Not all lithologic tops were called in the following list. Colors were determined from the rock color chart.

### Formation Tops

<table>
<thead>
<tr>
<th>Formation</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cretaceous System</td>
<td></td>
</tr>
<tr>
<td>Niobrara Formation</td>
<td>845</td>
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<tr>
<td>Greenhorn Formation</td>
<td>1228</td>
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<tr>
<td>Dakota</td>
<td>1610</td>
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<tr>
<td>Jurassic System</td>
<td></td>
</tr>
<tr>
<td>Morrison Formation</td>
<td>1764 ?</td>
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<tr>
<td>Sundance Formation</td>
<td>1790</td>
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<tr>
<td>Piper Formation</td>
<td>2035</td>
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<tr>
<td>Mississippian System</td>
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<tr>
<td>Lodgepole Formation</td>
<td>2126</td>
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<tr>
<td>Englewood Formation</td>
<td>2277</td>
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<tr>
<td>Devonian System</td>
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<tr>
<td>Lyleton Formation</td>
<td>2310</td>
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<tr>
<td>Nisku Formation</td>
<td>2338</td>
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<tr>
<td>Duperow Formation</td>
<td>2411</td>
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<tr>
<td>Souris River Formation</td>
<td>2778</td>
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<tr>
<td>Dawson Bay Formation</td>
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<td>Ashern Formation</td>
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Silurian System

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<tr>
<th>Interlake Group</th>
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Ordovician System

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<tr>
<th>Layer</th>
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<tr>
<td>Upper Stony Mountain</td>
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<tr>
<td>Lower Stony Mountain</td>
<td>3617</td>
</tr>
<tr>
<td>Red River</td>
<td>3695</td>
</tr>
<tr>
<td>Winnipeg Shale</td>
<td>4274</td>
</tr>
<tr>
<td>Winnipeg Sandstone</td>
<td>4404</td>
</tr>
<tr>
<td>Granite</td>
<td>4425</td>
</tr>
<tr>
<td><strong>Total Depth</strong></td>
<td>4436</td>
</tr>
</tbody>
</table>

0-66  Sand, medium to very coarse grained.
60-120 Shale, medium to light gray.
120-150 Sand, fine to coarse grained.
150-210 Shale, medium light gray.
210-310 Sand, fine to coarse grained.
310-390 Sand, medium to very coarse grained.
390-420 Sand, fine to coarse grained.
420-450 Shale, medium light gray.
450-500 Sand, medium to coarse grained. Medium light gray shale.
500-520 Shale, medium light gray.
520-580 Shale, medium light to medium dark gray.
580-640 Shale, medium light to medium gray.
640-660 Shale, light to medium dark gray.
660-700 Shale, light to medium gray.
700-740 Shale, light to medium gray. White bentonite.
740-800 Shale, medium to light olive gray.
800-860 Shale, dark gray, white specks.
860-960 Shale, medium to medium dark gray, white specks, calcareous.
960-980 Shale, medium to dark gray, calcareous.
980-1240 Shale, medium to medium dark gray, calcareous, white specks.
1240-1260 Limestone, fragmental, calcite prisms. Dark gray, calcareous, white specked shale.
1260-1400 Shale, dark gray, white specks, calcareous. Fragmental calcite prism.
1400-1450 Shale, medium to medium dark gray.
1450-1480 Shale, medium to medium dark gray, white specks, calcareous. Calcite prism.
1480-1530 Shale, medium to medium dark gray, white specks, calcareous.
1540-1590 Shale, medium to medium dark gray. Calcite prism fragments.
1590-1610 Shale, medium light to medium gray.
1610-1630 Sandstone, medium to very coarse grained, medium gray shale.
1630-1680 Sandstone, coarse to very coarse grained, frosted, subrounded to subangular.
1680-1700 Sandstone, coarse to very coarse grained, frosted, subrounded. Medium gray shale.
1700-1730 Shale, medium to medium dark gray. Medium to very coarse grained quartz.
1730-1740 Sandstone, medium to very coarse grained, rounded, frosted.
1740-1760 Sandstone, very fine grained calcareous and medium to coarse grained, subrounded, frosted. Medium gray shale.
1760-1790 Shale, medium gray. Very fine grained calcareous sandstone. Coarse grained free quartz.
1790-1810  Limestone, white, fine grained arenaceous. Medium to light olive gray shale. Coarse grained free quartz.
1810-1820  Shale, medium gray to pale brown. Medium to very coarse grained sandstone.
1820-1860  Shale, medium to pale brown, white limestone. Medium to very coarse grained free quartz.
1860-1880  Sandstone, medium to very coarse grained. Medium gray shale.
1877 20 minutes circulation. Sandstone, medium to very coarse grained, frosted, rounded. Light gray calcareous siltstone. Medium gray shale.
1880-1910  Sandstone, medium to very coarse grained, frosted, rounded and very fine grained, calcareous.
1910-1930  Shale, medium gray and silty light brown. Medium to very coarse grained quartz.
1930-1950  Shale, pale reddish brown, silty. Medium to coarse subrounded, frosted sandstone. Light to greenish gray calcareous siltstone.
1950-1980  Sandstone, coarse to very coarse grained and light to greenish gray calcareous siltstone. White chalky limestone.
1980-2010  Shale, medium gray and silty light brown. Medium to very coarse grained sandstone.
2010-2040  Shale, medium gray. White chalky limestone. Medium to very coarse grained sandstone.
2040-2050  Limestone, white chalky and yellowish gray fine grained. Medium gray shale.
2050-2060  Limestone, white to yellowish gray fine grained to chalky. White chert.
2060-2070  Dolomite, light gray, microsucrosic.
2070-2080  Dolomite, light gray, microsucrosic. White gypsum. Medium to coarse grained quartz.
2080-2090  Limestone, light to yellowish gray, fine grained.
2090-2100  Limestone, yellowish gray, sublithographic.
2100-2110  Limestone, yellowish gray, fine grained to sublithographic. Yellowish gray chert.
2110-2120  Chert, white to yellowish gray. Yellowish gray limestone.
2120-2130  Limestone, pinkish gray, fine grained dolomitic. Yellowish gray chert.
2130-2140  Limestone, yellowish to pinkish gray, fine grained to sublithographic.
2140-2150  Limestone, moderate reddish orange, fine grained, dolomitic.
2150-2160  Chert, white. Yellowish gray fine grained limestone.
2160-2190  Limestone, yellowish to pinkish gray, fine grained white chert.
2190-2200  Limestone, white to yellowish gray, fine grained. White chert.
2200-2230  Dolomite, pale red, sublithographic. Yellowish gray fine grained limestone. White to yellowish gray chert.
2230-2250  Limestone, white to yellowish gray, fine grained to chalky. Grayish red calcareous shale.
2250-2270  Shale, medium gray and calcareous pale reddish brown. White to yellowish gray fine grained limestone.
2270-2280  Shale, pale reddish brown calcareous, arenaceous and medium gray.
2278  Circulation. Shale, pale reddish brown calcareous.
2280-2300  Shale, pale red brown and medium gray, calcareous. Medium to very coarse grained free quartz.
2300-2330  Shale, pale reddish brown, calcareous. Medium to coarse grained free quartz.
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2330-2340 Shale, pale yellowish orange, calcareous.
2335 1/2 hour circulation. Limestone, white, fine grained, chalky.
Pale reddish brown calcareous, shale.
2340-2350 Limestone, yellowish gray, sucrosic, dolomitic.
2351 20 minute circulation. Dolomite, grayish orange pink sucrosic.
2350-2370 Dolomite, grayish orange pink, sucrosic.
2370-2400 Limestone, yellowish gray, fine grained to microsucrosic.
2400-2410 Shale, pale brown and medium gray. Yellowish gray fine grained limestone.
2410-2420 Shale, pale reddish brown, calcareous.
2420-2430 Limestone, pale red, fine grained.
2430-2440 Dolomite, pale red, microsucrosic.
2440-2450 1/4 hour circulation. Dolomite, pale red, microsucrosic. Pale red fine grained limestone.
2450-2460 Dolomite, grayish orange pink, fine grained.
2460-2480 Gypsum, white, grayish orange pink, fine grained limestone. White gypsum.
2480-2490 Limestone, white to very light gray, fine, grained. White gypsum.
2490-2500 1/4 hour circulation. Limestone, white to yellowish gray, fine grained to chalky. Medium gray shale.
2500-2520 Limestone, grayish orange pink, fine grained.
2520-2530 1/4 hour circulation. Dolomite, yellowish gray, sucrosic.
2530-2550 Dolomite, same as above.
2550-2570 Limestone, yellowish gray, fine grained to fragmental.
2570-2600 Dolomite, grayish orange pink sucrosic, intergranular porosity.
2600-2630 Dolomite, pale brown, sucrosic, intergranular porosity. White gypsum.
2630-2670 Limestone, very light to yellowish gray, fine grained.
2670-2690 Limestone, yellowish gray, fragmental to sublithographic.
2690-2710 Limestone, yellowish gray, fine grained to chalky.
2710-2720 Limestone, yellowish gray, fine grained to sublithographic.
2720-2730 Limestone, yellowish gray, fine grained. Medium gray shale.
2730-2740 Limestone, grayish orange pink, fine grained to oolitic, some intergranular porosity.
2740-2750 Limestone, yellowish gray, fine grained. Medium gray shale.
2750-2770 Dolomite, pale yellowish brown, microsucrosic.
2770-2780 Limestone, very light gray, fine grained.
2780-2790 Dolomite, light to yellowish gray, microsucrosic.
2790-2800 Limestone, yellowish gray, microsucrosic.
2800-2820 Dolomite, very light gray, microsucrosic.
2820-2860 Anhydrite, pale yellowish brown to white.
2860-2870 Limestone, white to very light gray, microsucrosic.
2870-2880 Limestone, white to very light gray, microsucrosic to sub-lithographic.
2880-2890 Limestone, very light to light gray, fine grained, argillaceous.
2890-2900 10 minute circulation. Dolomite. Yellowish gray to pale yellow brown, microsucrosic.
2900-2910 Dolomite, yellowish gray, microsucrosic.
2910-2920 Anhydrite, white to pale yellowish brown. Medium to coarse grained, subrounded frosted free quartz. Medium gray shale.
2920-2930 Shale, medium and greenish gray.
2930-2950 Dolomite, pale red, microsucrosic.
2960-2970 Dolomite, pale yellowish brown, microsucrosic.
2970-2980 Limestone, pale yellowish brown, fine grained to microsucrosic, dolomitic.
2980-2990 Dolomite, pale red, fine grained to microsucrosic.
2990-3000 Shale, pale reddish brown, calcareous.
3000-3010 Dolomite, pale red, sucrosic.
3010-3020 Dolomite, grayish orange pink and pale red, fine grained to sucrosic.
3020-3070 Dolomite, grayish orange pink, sucrosic to fine grained, some pinpoint porosity.
3070-3080 Limestone, grayish orange pink fine grained.
3080-3110 Limestone, grayish orange pink fine grained to sublithographic.
3110-3120 Dolomite, grayish orange pink, sucrosic.
3120-3140 Limestone, yellowish gray to grayish orange pink, fine grained to sublithographic.
3140-3150 Limestone, grayish orange pink, sucrosic, dolomitic. Medium to coarse free quartz.
3150-3170 Dolomite, pale red calcareous, fine grained. Pale red calcareous shale.
3170-3180 Shale, moderate reddish orange, calcareous.
3180-3190 Dolomite, pale red, fine grained. Pale red calcareous shale.
3190-3200 Dolomite, moderate orange pink, sublithographic.
3200-3210 Dolomite, very pale orange, microsucrosic.
3210-3240 Dolomite, grayish orange pink, sucrosic, intergranular to vuggy porosity.
3240-3250 Dolomite, grayish orange pink, microsucrosic.
3250-3280 Limestone, grayish orange pink, fine grained to sucrosic, dolomitic.
3280-3330 Dolomite, very pale orange, sublithographic.
3330-3350 Limestone, white, chalky.
3350-3370 Dolomite, very pale orange, sublithographic.
3370-3390 Limestone, white to very pale orange, chalky to sublithographic.
3390-3430 Dolomite, very pale orange, microsucrosic.
3430-3440 Limestone, very pale orange, sublithographic. Medium gray shale.
3440-3450 Dolomite, very pale orange, sublithographic. Medium gray shale.
3450-3490 Dolomite, very pale orange, sublithographic.
3490-3500 Dolomite, very pale orange and light red, sublithographic to microsucrosic.
3500-3510 Dolomite, very pale orange and light red, sublithographic to microsucrosic.
3510-3530 Dolomite, very pale orange, sublithographic. Medium gray shale.
3530-3560 Dolomite, grayish orange pink, sublithographic.
3560-3570 Shale, moderate reddish orange, calcareous.
3570-3590 Dolomite, pale red, sucrosic.
3590-3620 Dolomite, very pale orange, microsucrosic.
3620-3630 Dolomite, very pale orange and light gray, microsucrosic. Medium gray shale.
3630-3690 Shale, light to medium gray, calcareous. Very light to pinkish gray fine grained limestone.
3690-3710 Limestone, very light gray, fine grained, black inclusions.
3710 2 hours circulation. Dolomite, very light to yellowish gray, microsucrosic to sublithographic.
3710-3720 Sandstone, medium to very coarse grained, cave?
3720-3730 Dolomite, yellowish gray, fine grained to sucrosic.
3730-3740 Dolomite, very pale orange to grayish orange pink, sucrosic, pinpoint porosity.
3736 1/2 hour circulation. Dolomite, grayish orange pink to pale yellowish brown, sucrosic, pinpoint to intergranular porosity.
<table>
<thead>
<tr>
<th>Interval</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>3740-3750</td>
<td>Limestone, very light to yellowish gray, fine grained.</td>
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<tr>
<td>3750-3770</td>
<td>Dolomite, very pale orange, sublithographic.</td>
</tr>
<tr>
<td>3770-3790</td>
<td>Dolomite, very pale orange, oolitic to sublithographic.</td>
</tr>
<tr>
<td>3790-3800</td>
<td>Dolomite, very pale orange, fine grained to microsucrosic.</td>
</tr>
<tr>
<td>3800-3830</td>
<td>Dolomite, very pale orange, sublithographic to microsucrosic.</td>
</tr>
<tr>
<td>3830-3840</td>
<td>Dolomite, light gray to grayish orange pink, fine grained.</td>
</tr>
<tr>
<td>3840-3860</td>
<td>Dolomite, grayish orange pink, sucrosic.</td>
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<tr>
<td>3860-3870</td>
<td>Limestone, very pale orange, fine grained.</td>
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<tr>
<td>3870-3880</td>
<td>Dolomite, grayish orange pink, sucrosic. Very pale orange fine grained limestone.</td>
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<td>3880-3940</td>
<td>Limestone, light gray, fine grain to sublithographic.</td>
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<td>3940-4000</td>
<td>Limestone, very light to yellowish gray, fine grained to sublithographic.</td>
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<td>4000-4010</td>
<td>Dolomite, very light to yellowish gray, sucrosic, pinpoint porosity.</td>
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<td>4010-4030</td>
<td>Dolomite, pale yellowish brown, sucrosic.</td>
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<td>4030-4040</td>
<td>Dolomite, light gray, sublithographic to microsucrosic.</td>
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<td>4040-4050</td>
<td>Dolomite, light gray, sublithographic. White chert.</td>
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<td>4050-4060</td>
<td>Limestone, white to very light gray, fine grained to sublithographic.</td>
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<td>4180-4200</td>
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<td>Limestone, very light to yellowish gray, fine grained. Fine to medium grained free quartz. Medium gray shale.</td>
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<td>4250-4270</td>
<td>Shale, medium to medium dark gray.</td>
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<td>4270-4290</td>
<td>Shale, medium to greenish gray, calcareous.</td>
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<tr>
<td>4290-4300</td>
<td>Shale, medium to greenish gray. Hematite concretions.</td>
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<td>4300-4320</td>
<td>Shale, greenish gray. Hematite concretions.</td>
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<td>4320-4340</td>
<td>Shale, medium to greenish gray. Hematite concretions.</td>
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<td>4340-4365</td>
<td>Shale, greenish gray and grayish red. Hematite concretions.</td>
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<td>4365-4385</td>
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<td>4385-4390</td>
<td>Shale, greenish gray and grayish red. Hematite concretions.</td>
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<td>4390-4395</td>
<td>Shale, greenish gray. Hematite concretions.</td>
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<tr>
<td>4395-4400</td>
<td>Shale, greenish gray and grayish red. Hematite concretions. Fine to coarse grained free quartz.</td>
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<tr>
<td>4400-4405</td>
<td>Shale, greenish gray. Hematite concretions.</td>
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<td>4405</td>
<td>1/2 hour circulation. Shale, greenish gray. Hematite concretions.</td>
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<td>4405-4410</td>
<td>Shale, greenish gray. Hematite concretions. Fine to medium grained free quartz.</td>
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<td>4410-4415</td>
<td>Sandstone, medium to coarse grained. Greenish gray and gray red shale. Hematite concretions.</td>
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<td>4417</td>
<td>1/4 hour circulation. Sandstone, fine to coarse grained, subrounded, frosted.</td>
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<td>4415-4420</td>
<td>Sandstone, same as above.</td>
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<td>4420-4435</td>
<td>Shale, greenish gray. Fine to coarse grained sandstone.</td>
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<tr>
<td>4436</td>
<td>1/2 hour circulation. Granite, quartz, biotite, feldspar.</td>
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