WATER SUPPLY AND BORINGS SECTION
GEOLOGICAL SURVEY OF CANADA

Record of Well Samples

Name of Well **Shell Dorchester No.1.** County Number 205
Penitentiary.
Name of Company Name Symbol SD1

Location; Lot Con. Tp. **Dorchester.** Co. **Westmoreland.** Prov. **N.B.**

Depths Received From to Storage; Section Bunker Bags
Received 1956.
Depths Bottled From to Storage; Cabinet Trays 6623 - 6624 - 6625
6626 - 6627 - 6628
- 6629

Black line indicates samples received Red line indicates samples bottled

 # 21a 860 - 8230 feet

5	240	475	710	945	1180	1415	1650	1885	2120
10	245	480	715	950	1185	1420	1655	1890	2125
15	250	485	720	955	1190	1425	1660	1895	2130
20	255	490	725	960	1195	1430	1665	1900	2135
25	260	495	730	965	1200	1435	1670	1905	2140
30	265	500	735	970	1205	1440	1675	1910	2145
35	270	505	740	975	1210	1445	1680	1915	2150
40	275	510	745	980	1215	1450	1685	1920	2155
45	280	515	750	985	1220	1455	1690	1925	2160
50	285	520	755	990	1225	1460	1695	1930	2165
55	290	525	760	995	1230	1465	1700	1935	2170
60	295	530	765	1000	1235	1470	1705	1940	2175
65	300	535	770	1005	1240	1475	1710	1945	2180
70	305	540	775	1010	1245	1480	1715	1950	2185
75	310	545	780	1015	1250	1485	1720	1955	2190
80	315	550	785	1020	1255	1490	1725	1960	2195
85	320	555	790	1025	1260	1495	1730	1965	2200
90	325	560	795	1030	1265	1500	1735	1970	2205
95	330	565	800	1035	1270	1505	1740	1975	2210
100	335	570	805	1040	1275	1510	1745	1980	2215
105	340	575	810	1045	1280	1515	1750	1985	2220
110	345	580	815	1050	1285	1520	1755	1990	2225
115	350	585	820	1055	1290	1525	1760	1995	2230
120	355	590	825	1060	1295	1530	1765	2000	2235
125	360	595	830	1065	1300	1535	1770	2005	2240
130	365	600	835	1070	1305	1540	1775	2010	2245
135	370	605	840	1075	1310	1545	1780	2015	2250
140	375	610	845	1080	1315	1550	1785	2020	2255
145	380	615	850	1085	1320	1555	1790	2025	2260
150	385	620	855	1090	1325	1560	1795	2030	2265
155	390	625	860	1095	1330	1565	1800	2035	2270
160	395	630	865	1100	1335	1570	1805	2040	2275
165	400	635	870	1105	1340	1575	1810	2045	2280
170	405	640	875	1110	1345	1580	1815	2050	2285
175	410	645	880	1115	1350	1585	1820	2055	2290
180	415	650	885	1120	1355	1590	1825	2060	2295
185	420	655	890	1125	1360	1595	1830	2065	2300
190	425	660	895	1130	1365	1600	1835	2070	2305
195	430	665	900	1135	1370	1605	1840	2075	2310
200	435	670	905	1140	1375	1610	1845	2080	2315
205	440	675	910	1145	1380	1615	1850	2085	2320
210	445	680	915	1150	1385	1620	1855	2090	2325
215	450	685	920	1155	1390	1625	1860	2095	2330
220	455	690	925	1160	1395	1630	1865	2100	2335
225	460	695	930	1165	1400	1635	1870	2105	2340
230	465	700	935	1170	1405	1640	1875	2110	2345
235	470	705	940	1175	1410	1645	1880	2115	2350

2355	2660	2965	3270	3575	3880	4185	4490	4795
2360	2665	2970	3275	3580	3885	4190	4495	4800
2365	2670	2975	3280	3585	3890	4195	4500	4805
2370	2675	2980	3285	3590	3895	4200	4505	4810
2375	2680	2985	3290	3595	3900	4205	4510	4815
2380	2685	2990	3295	3600	3905	4210	4515	4820
2385	2690	2995	3300	3605	3910	4215	4520	4825
2390	2695	3000	3305	3610	3915	4220	4525	4830
2395	2700	3005	3310	3615	3920	4225	4530	4835
2400	2705	3010	3315	3620	3925	4230	4535	4840
2405	2710	3015	3320	3625	3930	4235	4540	4845
2410	2715	3020	3325	3630	3935	4240	4545	4850
2415	2720	3025	3330	3635	3940	4245	4550	4855
2420	2725	3030	3335	3640	3945	4250	4555	4860
2425	2730	3035	3340	3645	3950	4255	4560	4865
2430	2735	3040	3345	3650	3955	4260	4565	4870
2435	2740	3045	3350	3655	3960	4265	4570	4875
2440	2745	3050	3355	3660	3965	4270	4575	4880
2445	2750	3055	3360	3665	3970	4275	4580	4885
2450	2755	3060	3365	3670	3975	4280	4585	4890
2455	2760	3065	3370	3675	3980	4285	4590	4895
2460	2765	3070	3375	3680	3985	4290	4595	4900
2465	2770	3075	3380	3685	3990	4295	4600	4905
2470	2775	3080	3385	3690	3995	4300	4605	4910
2475	2780	3085	3390	3695	4000	4305	4610	4915
2480	2785	3090	3395	3700	4005	4310	4615	4920
2485	2790	3095	3400	3705	4010	4315	4620	4925
2490	2795	3100	3405	3710	4015	4320	4625	4930
2495	2800	3105	3410	3715	4020	4325	4630	4935
2500	2805	3110	3415	3720	4025	4330	4635	4940
2505	2810	3115	3420	3725	4030	4335	4640	4945
2510	2815	3120	3425	3730	4035	4340	4645	4950
2515	2820	3125	3430	3735	4040	4345	4650	4955
2520	2825	3130	3435	3740	4045	4350	4655	4960
2525	2830	3135	3440	3745	4050	4355	4660	4965
2530	2835	3140	3445	3750	4055	4360	4665	4970
2535	2840	3145	3450	3755	4060	4365	4670	4975
2540	2845	3150	3455	3760	4065	4370	4675	4980
2545	2850	3155	3460	3765	4070	4375	4680	4985
2550	2855	3160	3465	3770	4075	4380	4685	4990
2555	2860	3165	3470	3775	4080	4385	4690	4995
2560	2865	3170	3475	3780	4085	4390	4695	5000
2565	2870	3175	3480	3785	4090	4395	4700	8230
2570	2875	3180	3485	3790	4095	4400	4705	
2575	2880	3185	3490	3795	4100	4405	4710	
2580	2885	3190	3495	3800	4105	4410	4715	
2585	2890	3195	3500	3805	4110	4415	4720	
2590	2895	3200	3505	3810	4115	4420	4725	
2595	2900	3205	3510	3815	4120	4425	4730	
2600	2905	3210	3515	3820	4125	4430	4735	
2605	2910	3215	3520	3825	4130	4435	4740	
2610	2915	3220	3525	3830	4135	4440	4745	
2615	2920	3225	3530	3835	4140	4445	4750	
2620	2925	3230	3535	3840	4145	4450	4755	
2625	2930	3235	3540	3845	4150	4455	4760	
2630	2935	3240	3545	3850	4155	4460	4765	
2635	2940	3245	3550	3855	4160	4465	4770	
2640	2945	3250	3555	3860	4165	4470	4775	
2645	2950	3255	3560	3865	4170	4475	4780	
2650	2955	3260	3565	3870	4175	4480	4785	
2655	2960	3265	3570	3875	4180	4485	4790	

SHELL DORCHESTER NO. 1

(Logged by R. A. Brown)

Location: Westmorland County, N.B.
1 mile west of Dorchester Penitentiary.
Lat. N.45° 54' 51"
Long. W.64° 31' 54"

Elevation: 28' K.B. (small rig)
36' K.B. (large rig)
Spudded: June 24, 1949.
Abandoned: February 9, 1950.
Total Depth: 8,229 feet.

0 -	298	Overburden, clay, silt, sand, and gravel; with minor amounts of peat fragments at 80-90, 140-150 feet.
298 -	310	Grit and sandstone, greenish red, grains up to 1/8 inch of all kinds of rocks.
310 -	330	Conglomerate, greenish red, pebbles up to 1 inch of all kinds of rocks.
330 -	340	Sandstone, greenish red, medium grain, somewhat feldspathic.
340 -	370	Grit, reddish, like 300-310.
370 -	380	Sandstone, as 330-340.
380 -	395	Grit, reddish, as above but includes fragments of weathered gypsum or anhydrite.

- TOP OF EVAPORITES. SALT PLUG -

395 -	420	Fresh gypsum and anhydrite, white, fine to medium crystalline.
420 -	430	Gypsum and anhydrite.
430 -	450	Mostly gypsum, in part the variety selenite.
450 -	470	Mostly anhydrite, little gypsum.
470 -	575	Mixed gypsum and anhydrite, considerable of the selenite variety, slightly calcareous 565-570.
575 -	590	Mostly selenite. Few scattered sand grains and rock fragments, and few thin laminae of fine sandstone of a reddish colour.
590 -	595	Gypsum and anhydrite with few scattered sand grains as above.

595 - 620 Mostly anhydrite, little gypsum.

620 - 630 Gypsum and anhydrite, very little calcareous siltstone.

630 - 685 Mostly anhydrite. Little reddish calcareous siltstone to 640 feet, some selenite throughout.

685 - 710 Gypsum and anhydrite with little calcareous red silt, shale, and scattered sand grains.

710 - 735 Anhydrite with some gypsum, few scattered angular sand grains from 720.

735 - 775 Gypsum, anhydrite and sandstone interbedded, probably also little red shale. Also few scattered sand grains.

775 - 785 Sandstone, reddish, fine grain to gritty, gypsiferous, grains rounded.

785 - 815 Gypsum and anhydrite with few fine grain sandstone interbeds and scattered sand grains.

815 - 820 Gypsum and anhydrite with some calcite and dolomite.

820 - 860 Gypsum and anhydrite with scattered crystals of black calcite.

860 - 890 Gypsum and anhydrite with very few thin interbeds of fine sandstone and scattered sand grains.

890 - 895 Gypsum and anhydrite.

895 - 935 Gypsum and anhydrite with rare streaks of siltstone, fine sandstone and red shale, occasional crystals of black calcite.

935 - 980 Gypsum and anhydrite.

980 - 1005 Gypsum and anhydrite with rare streaks of fine sandstone and traces of red shale, slightly calcareous, and scattered sand grains.

1005 - 1035 Gypsum and anhydrite.

1035 - 1050 Gypsum and anhydrite with very few scattered rounded sand grains and little black calcite.

1050 - 1155 Mostly selenite, coarsely crystalline, with minor anhydrite.

1155 - 1160 Same, slightly silty.

1160 - 1195	As 1050-1155.
1195 - 1200	Gypsum with streaks of calcareous shale and limestone and scattered sand grains.
1200 - 1205	Calcareous arenaceous gypsum.
1205 - 1240	Gypsiferous quartzose sandstone, reddish, medium grain; scattered windblown sand grains.
1240 - 1250	Arenaceous gypsum with grains of quartz and limestone.
1250 - 1320	Mostly gypsum, some anhydrite. Very minor sandstone streaks scattered sand grains and a little red siltstone at bottom.
1320 - 1365	Gypsum.
1365 - 1485	Gypsum with very rare streaks of fine sandstone or siltstone and minor anhydrite.
1485 - 1510	Anhydrite with only minor impurities.

- BASE OF CAPROCK -

1510 - 2285	Salt. Some gypsum and anhydrite to 1800 feet. The salt is not pure, gypsum (selenite mostly) and anhydrite occur in various proportions but never make up more than 10% by volume of the samples.
2285 - 2355	Impure salt as last with very few scattered fine subangular sand grains through most of the section.
2355 - 2385	Gypsum and anhydrite of medium to coarse grain with much salt.
2385 - 2440	Salt with considerable gypsum and anhydrite and very few scattered sand grains through most of the section.
2440 - 2835	Salt with minor amounts of gypsum and anhydrite and scattered fine sand grains in small amount in some beds. The section is over 25% salt by volume, as represented in the cuttings.
2835 - 3000	Salt with considerable gypsum and anhydrite impurity and very little scattered sand.
3000 - 3200	Salt, minor amounts of gypsum and anhydrite and very small amounts of fine sand. About 3200 feet, very small amounts of slightly calcareous siltstone.

3200 - 3270 Salt as above but with practically no sand.

3270 - 3295 Sandstone, brownish, with much salt. Fine grain to very fine grain. Also very little gypsum, anhydrite, and limestone, probably in thin interbeds.

3295 - 3885 Almost pure salt. There is a very small amount of scattered fine sand through most of this section, and there are also laminae of siliceous siltstone and dense hard limestone. Small amounts of gypsum and anhydrite are also generally present, but on the whole the section is over 95% salt.

3885 - 3890 Selenite with salt, scattered sand grains, and laminae of microsilty brownish limestone and brown siliceous microsilt. Selenite is by far predominant.

3890 - 4455 Almost pure salt, minor amounts of gypsum and anhydrite, and very few fine sand grains disseminated throughout.

4455 - 4810 Almost pure salt. Minor amounts of gypsum and anhydrite, the former mostly selenite. Total impurities roughly 5% by volume. Very few scattered fine sand grains throughout.

4810 - 4965 Gypsum and anhydrite, also very minor amounts of pale brownish grey limestone, grey and reddish siltstone, quartz grains, and red argillaceous limestone, and some interbedded salt.

4965 - 5050 Gypsum and anhydrite, increasing in amount steadily downward, with very little salt at 5050 feet. There are very small amounts of limestone, calcareous siltstone, very siliceous siltstone, and scattered grains of quartz and dark green chert.

5050 - 5180 Calcareous anhydrite and a little gypsum.

CORE NO. 1 Cored 5133-5139. Recovered 100%. Dip indeterminable.

Calcareous anhydrite with very little gypsum. Dark grey brown, dense to finely crystalline, mottled with white.

5180 - 5231 Very impure laminated limestone to argillaceous limestone. Dark grey brown. Dense to very finely crystalline. Microsilty in part. Somewhat anhydritic and very slightly gypsiferous.

CORE NO. 2 Cored 5185-5197. Recovered 98%. Dip 24°.

In general dark grey to black laminated impure limestone with considerable anhydrite and very little gypsum, both secondary. Traces of pyrite. Top and bottom of

CORE No. 2 (Cont'd.) interval are argillaceous limestone, also laminated, anhydritic, and in part microsilty.

A more detailed description of CORE NO. 2 is as follows:

5185-5185'6". Argillaceous limestone, dark grey to brownish with few white mottlings. Thinly bedded to laminated. Rare laminae of very finely crystalline white anhydrite. Limestone in general anhydritic and slightly gypsiferous.

5185'6"-5186'1". Calcareous shale or impure laminated limestone, dark grey, compact, firm, very thinly bedded to laminated. Some laminae of pale brown anhydrite and of pyrite, the last very finely crystalline. Few scattered flakes of gypsum on bedding planes.

5186'1"-5191'2". Impure anhydrite. Dark brownish grey, compact, crystalline, laminated, high in anhydrite which is in part in pure white recrystallized aggregates that transgress the bedding planes. The rock is more or less calcareous throughout and also more or less argillaceous and microsilty. There are a few thin beds of microsilty limestone of a greenish cast that are also argillaceous. Very few very thin streaks of pyrite, finely crystalline. Minute-scale flowage structure throughout. Apparent dip 24° throughout.

5191'2"-5191'10". As last but with very abundant white splotches of the recrystallized anhydrite, some of it slightly calcareous, and disseminated microcrystalline pyrite.

5191'10"-5193'9". Same as 5186'1"-5191'2" but slightly more calcareous.

5193'9"-5196'. Argillaceous limestone, black, finely banded, compact. In part slickensided and with mottled concentrations and streaks of finely crystalline white anhydrite. Traces of microcrystalline pyrite. Few thin laminae are greenish and microsilty, and occasional laminae are white and anhydritic.

5196'-5196'9". Shale or impure laminated limestone, dark brownish black, very calcareous, anhydritic, thin laminae of greenish cast, and common splotches of recrystallized anhydrite.

5180
5210
5220

- BASE OF WINDSOR EVAPORITES -

5231 - 5255 Conglomerate and grit, greenish, very slightly calcareous.

CORE NO. 3 Cored 5237-5241. Recovered 100%. Dip indeterminable.

Conglomerate as above with rare grit beds.

5255 - 5290 Conglomerate, grit, and sandstone. Greenish grains and pebbles of metamorphic, volcanic and plutonic rocks, both basic and acidic. The grains are generally sub-angular. The matrix is shaly to silty and slightly calcareous to calcareous. No observable porosity.

5290 - 5390 Conglomerate, grit, and sandstone. Greenish but with a faint red tinge. Composition as above with the addition of some red shale and siltstone that is in part calcareous. There is an increase in red stained quartz and pink to red feldspar over the foregoing interval, which is the reason for the reddish tinge.

5390 - 5450 Conglomerate, etc., as above but with more red shale and siltstone. There is also some anhydrite and gypsum, probably in very small amounts in fractures.

CORE NO. 4 Cored 5422-5427. Recovered 90%. Dip indeterminable.

5422-5423.5. Grit with red shale. The grit contains $\frac{1}{4}$" particles of green metamorphic and volcanic rocks, and considerable granitic material together with quartz and reddish feldspar derived from it. The shale is not bedded but occurs in patches as a groundmass to the coarser material. It is brown red to red, in part slightly calcareous, and includes small aggregates of very finely crystalline anhydrite and minute stringers of gypsum. Grit also slightly calcareous.

5423.5-5425. Conglomerate with red shale. Pebbles up to $1\frac{1}{2}$ inches, mostly about 1 inch in diameter. Composition of conglomerate and shale as in the grit above.

5425-5426.5. Grit with $\frac{1}{4}$ inch pebbles and few larger pebbles; red shale groundmass. Composition, etc., as in foregoing intervals.

5450 - 5470 Conglomerate, grit and sandstone. Reddish, slightly calcareous, arkosic, reddish shale matrix, interbeds of brownish red argillaceous and arenaceous impure limestone.

MONCTON GROUP

- HILLSBOROUGH-ALBERT CONTACT -

5470 - 5550 Shale and mudstone, silty in part, and with bands of argillaceous siltstone. Pale greenish and grey, firm, the greenish shale micaceous with bronze mica. In part calcareous to slightly calcareous. Few specks of carbon. The greenish shale very thinly laminated. Trace of very slightly bentonitic shale about 5540 feet.

CORE NO. 5 Cored 5504-5521. Recovered 17%. Dip about 35°.

2'2" mudstone, olive green colour, laminated, compact, firm, no shaly parting. 10" siltstone, olive green, firm, calcareous, quartzose.

5550 - 5640 Shale, mostly grey and greenish as above. In part calcareous, generally microsilty, with interbeds of pale grey calcareous microsilt. The greenish shale dies out at 5620'. There are also bands of black carbonaceous shale that are more or less calcareous and slightly bituminous to bituminous. Traces of pyrite at 5560'. Traces of slightly bentonitic pale green shale at 5560' and 5590'.

5640 - 5668 Shale, black, carbonaceous, generally calcareous, firm to soft, bands slightly bituminous to bituminous, rare thin beds of pale grey slightly calcareous microsilt.

CORE NO. 6 Cored 5657-5668. Recovered 55%. Dip 0°-40°.

Shale, black to dark brownish black, in part laminated, generally strongly slickensided. Dips 40° to flat. Mostly rather soft, but last few inches hard and very calcareous. Most with a strong bituminous or petroliferous smell when freshly broken. In general bituminous. Fish remains, including scales of Rhadinichthys alberti, show Albert age.

5668 - 5735 Shale, slightly calcareous, dark grey to black and silty shale, calcareous, dark grey. There are a few interbeds of siltstone about 5710-5720.

5735 - 5780 Shale, very calcareous, dark grey, with minor amounts of finely silty shale interbedded, also calcareous.

5780 - 5790 Siltstone, argillaceous and calcareous, dark grey, with minor interbeds of shale as above.

5790 - 5800 Shale, calcareous, dark brownish grey.

5800 - 5820 Shale, calcareous, in part silty, with very minor amounts of interbedded sandstone, very fine grain and very calcareous and traces of limestone, dense, brown and very argillaceous.

5820 - 5845 Argillaceous siltstone to silty shale, very calcareous, very fine grain.

5845 - 5900 Shale, calcareous to very calcareous, in part silty, the silt generally very fine grain, dark grey; few interbeds of limestone, very impure with much argillaceous and finely sandy material, come in below 5890'.

5900 - 5965 Shale, dark grey, calcareous to very calcareous, in part microsilty to silty and more calcareous than average. Few bands bituminous.

5965 - 6000 Shale, dark grey, slightly calcareous, with laminae of siltstone, white and very calcareous.

6000 - 6045 Same as last with some beds of silty shale in addition. Silt content higher below 6025.

6045 - 6055 Shale and siltstone as above, the shale predominant. Also laminae of impure limestone.

6055 - 6185 Shale, slightly calcareous to calcareous, dark grey, probably with little gypsum or anhydrite. Small amounts of pyrite common. Few thin laminae of very fine grain argillaceous sandstone to 6130; few thin laminae of limestone, compact, brown, impure from 6130-6185. Fish scales about 6075, also traces of slightly bituminous shale 6075-6090 and 6165-6185. Slight slickensiding common.

6185 - 6235 Shale, dark grey to black, in part microsilty and in part micaceous. Generally slightly bituminous. Disseminated pyrite common. Occasional thin bands of impure dolomitic limestone, brown and very finely crystalline. Few fish scales about 6195, 6210 and 6235. Minor amounts of vein calcite and minor slickensiding throughout this interval.

6235 - 6255 Shale, etc., as above and also few thin bands of sandstone, fine to coarse grain, pale grey, tightly cemented with much calcite.

6255 - 6390 Shale, calcareous, dark grey to black, in part microsilty. Some of the black shale has a brown streak. Very fine mica is common. Shale contains numerous zones that are slightly or very slightly bituminous. Few thin bands of impure brown limestone occur to 6285. Below 6285 are a few thin bands of similar limestone that is also slightly dolomitic and the shale is likewise slightly dolomitic in a few beds, and slightly arenaceous in others. Fish scales are present about 6340 and at 6283, 6300, and probably also about 6320, 6340, 6350, and 6390. Minor calcite veining, pyrite, and slickensiding present throughout the interval.

6390 - 6460 Shale similar to the above, in part slightly dolomitic, generally calcareous. Thin beds or lenses of calcareous sandstone to arenaceous limestone of fine grain occur fairly frequently in the shale; also thin beds or veinlets of limestone and/or dolomitic limestone as in the interval 6255-6390. The sandstone is tight and non-

6390 - 6460 (Cont'd.) bituminous. The grains are predominantly angular quartz. Minor slickensiding is common in the shale. Fish scales are present about 6453. Traces of bentonitic shale occur between 6420 and 6440.

6460 - 6705 Shale, calcareous and in part slightly dolomitic to 6490, calcareous below 6490; dark grey to black; non-bituminous; generally slightly pyritic. Bands of calcareous sandstone or siltstone and arenaceous or silty limestone, fine to medium-grained and finely crystalline are common; of pale grey to greenish colour, quartzose, making up to 10% of some samples. Calcite and in a few cases dolomitic veinlets are present in small amount through most of the interval. Spores (?) occur about 6523. There are also some bands of argillaceous to arenaceous brown very finely crystalline dolomitic limestone.

CORE NO. 7 Cored 6462-6472. Recovered 100%. Dip 25°.

Shale, dark grey to brownish grey, firm, very thinly laminated in part microsilty. Few thin beds of arenaceous to silty dolomitic limestone.

6705 - 6735 Shale, calcareous, in part silty, grey to dark grey, in part micaceous, numerous very slightly bituminous beds and a few highly bituminous beds about 6720. Generally pyritic. Thin beds of calcareous sandstone to arenaceous limestone as above make up not more than 10% of the interval. There are rare thin interbeds of impure brown microcrystalline limestone.

6735 - 6775 Shale as last, but non-bituminous. Slightly veined with calcite. Almost no sandstone or siltstone. Few tiny veinlets of albertite (?) between 6750 and 6760.

6775 - 6990 Shale as above but non-bituminous, except for a few highly bituminous beds about 6780. Interbeds of sandstone and arenaceous limestone occur but make up, at most, only 10% of the interval. Calcite veinlets, slickensiding, and laminae of impure brown limestone are minor but usual features of this section. The shale generally slightly pyritic.

6990 - 7290 Shale, calcareous, various shades of medium to dark grey, in part micaceous, interbedded with siltstone, calcareous; quartzose sandstone, calcareous; and silty to arenaceous limestone, all of a pale grey to greenish colour. The shale is generally present in the amount of 75% or more of the interval. Small amounts of pyrite, vein calcite, and slickensided shale are common. There are rare interbeds of impure brown microcrystalline limestone which are dolomitic about 7060, 7070, 7090, and 7150. The sandstone is composed chiefly of angular

6990 - 7290 (Cont'd.) quartz in a very calcareous matrix, with a few rock fragments present in a few beds. It is generally completely cemented, but there is a small amount of poor porosity present about 7000, 7070, and 7160.

7290 - 7358 Shale, calcareous (slightly to very), grey, with interbeds of siltstone and sandstone, more or less calcareous, quartzose, pale grey and greenish in colour. The sandstone is generally fine to medium-grained but has scattered coarse pebbles or thin conglomeratic lenses. Besides angular to subrounded quartz grains, it contains fragments of green chlorite schist and other green basement rocks and much intergranular silt, and is non-porous. Fish scale at 7330.

CONGLOMERATE AS FOUND IN ALBERT AS PIEDMONT INTERBEDS NORTH OF CARBONIFEROUS MT. R.D.H. NOV. 26/63

CORE NO. 8 Cored 7311-7322. Recovered 86%. Beds contorted.

7311-7311.5±. Dark grey silty shale, calcareous.
7311.5±-7312.5±. Sandstone, greenish grey, quartzose, tight, with some schist fragments, medium to coarse-grained, calcite cemented. Partings of grey shale as above.
7312.5±-7322±. Shale, in part silty, siltstone and sandstone as above interbedded. The whole much contorted and broken and veined with calcite.

- ALBERT-MONCTON FAULT CONTACT -

√ Note conglomerate [illegible] R.D.H. Nov. 26/63

7358 - 7665 Shale, siltstone, sandstone, and conglomerate, all more or less calcareous, all red in shades varying from dull brownish to bright brick red. The siltstone is slightly gypsiferous about 7503. There are minor bands of argillaceous limestone, both red and grey.
Throughout this interval the cuttings contain more or less grey material similar to that above 7358, usually more than 50% of the sample, but the cores (see below) indicate that the section 7358-7665 feet is predominantly red beds and that the grey cuttings are mostly cavings or come from grey interbeds in small part only.
At 7375 feet a circulation sample contained large amounts of albertite and bituminous matter heavily impregnated with oil and gas, probably the filling of a fracture along a fault.

CORE NO. 9 Cored 7374-7389. Recovered 6%. Dip indeterminable.

Sandstone, non-calcareous, gritty, reddish brown.

CORE NO. 10 Cored 7428-7435. Recovered 100%. Dip 25°-45°.

7428-7429.3. Sandstone, medium to coarse grained, interbedded with grit. Subangular to subrounded grains of quartz and metamorphic rocks. Dark red to chocolate red in colour, tight. Slight contortion on fairly well defined bedding planes that dip about 45°.

7429.3-7435. Conglomerate, one-inch pebbles of metamorphic and igneous rocks of green and red colour in red shaly groundmass. Interbeds of shaly fine sandstone to coarse sandstone below 7433.5. Dip 45° to 25° on good bedding planes.

CORE NO. 11 Cored 7590-7600. Recovered 33%. Dip 35°-40°.

16 inches. Silty shale to argillaceous siltstone with one-inch interbeds of grit. Dull greyish red to brownish red. Arkosic.

2 feet. Sandstone, gritty, with some conglomerate, both in part calcareous. Pebbles of quartz, granite, schist, volcanics and calcareous sandstone.

McMeekan (Roof)

- WELDON-ALBERT CONTACT -

7665 - 7760 Shale, calcareous, grey, in part microsilty with minor interbeds of quartzose siltstone and sandstone of pale grey to greenish white colour. Shale somewhat slickensided and veined with calcite.

CORE NO. 12 Cored 7665-7677. Recovered 92%. Dip 30°.

7665-7671.8±. Shale, calcareous, thin laminae of dark grey to black with few of light grey, the last microsilty. Dips 38° at 7665.5 and 30° at 7670.

7671.8±-7673.8±. Silty shale, calcareous, with patches of silt, greenish grey and pale grey, respectively. Contorted in lower 0.6 feet.

7673.8±-7676.3±. Shale, calcareous, in part silty, medium grey with lenses of light grey where silty. Beds 4 or 5 inches thick, dip 33°.

7676.3±-7677±. Thin alternate laminae of shale and siltstone, grey and pale grey. Both calcareous. Dip 30°.

7760 - 7840 Shale, grey, slightly calcareous to calcareous, with minor interbeds of siltstone and some sandstone of a pale grey to greenish white or greenish colour. The siltstone and sandstone calcareous, micaceous, and quartzose. Quartz grains generally rather angular.

7760 - 7840 (Cont'd.) Tight, with much intergranular silt. Few thin laminae of limestone, grey to brown, microcrystalline, impure. The limestone is dolomitic about 7800 and 7840. The shale is slightly slickensided and veined with calcite. One fish scale about 7770.

7840 - 7880 Shale, siltstone, and sandstone as last but no limestone.

7880 - 7970 Shale, grey to dark grey, calcareous, in part silty, interbedded with some siltstone and sandstone as above. Minor laminae of limestone as above which are dolomitic about 7910. The shale slightly bituminous in part about 7900. Sandstone comprises about 10% of interval.

CORE NO. 13 Cored 7904-7909. Recovered 100%. Dip 30°.

Shale, slightly calcareous, grey to dark grey black, with few laminae of pale grey siltstone near bottom. Considerably slickensided and slightly contorted but with good 30° dip in siltstone bands at bottom of core. Minor calcite veining in shale.

7970 - 7990 As 7880-7970 but without limestone.

7990 - 8065 Shale as above with interbeds of siltstone and sandstone as above. Limestone, argillaceous, grey, microcrystalline, comprises up to 5% of interval. Sandstone comprises 30%-40%. From 8005 feet there are minor bands of slightly bituminous shale.

8065 - 8084 Shale, grey, slightly calcareous, in part silty; interbeds of siltstone and sandstone; siltstone is greenish grey, slightly calcareous, micaceous; the sandstone is quartzose, calcareous, slightly micaceous, and generally tight.

CORE NO. 14 Cored 8076-8084. Recovered 100%. Dip 0°-47°.

8076-8076.8. Siltstone to sandstone, slightly calcareous, pale brownish grey, micaceous.
8076.8-8077.4. Mudstone, pale green. Few poor plant remains (?) and flakes of dark shale.
8077.4-8077.7. Siltstone, argillaceous, micaceous.
8077.7-8084. Sandstone, calcareous to very calcareous with few bands slightly calcareous. White to pale green, very fine to fine-grained. Generally micaceous with thin laminae composed solely of mica. The quartz clear glassy in angular particles with very little silty material. There is some very slight porosity below 8080. Pellets of dark shale occur in some beds. Dips: 40° at 8078; 31° at 8078.5; 10° at 8079; 46° at 8080; 47° at 8080.5; flat at 8083; 37° at 8084.

8084 - 8115 Shale and sandstone with some siltstone the same as above. The shale may be in part cave, but the sandstone comprises at least 40% of the interval. One fish scale at 8112.

8115 - 8170 Shale, slightly calcareous to calcareous, grey to dark grey; interbedded with siltstone to fine grain sandstone pale grey to greenish white. The siltstone and sandstone have calcareous content increasing with grain size. Quartz is the predominant constituent, angular, well cemented, and with much intergranular silt and considerable mica. Very small amounts of vein calcite are present and also occasional thin beds of very impure brownish grey microcrystalline limestone. Siltstone and sandstone constitute 50% or more of the interval.

8170 - 8229 Shale, siltstone, and sandstone as above but some of the shale has a greenish grey colour. Laminae of the impure limestone occur down to 8210 feet.

CORE NO. 15 Cored 8220-8229. Recovered 100%. Dip 29°-45°.

8220-8228.3. Sandstone, quartzose, micaceous, calcareous, tight, laminated to thin bedded, small scale cross-bedding or ripple-mark present with mica concentrated on these bedding planes. Colour greenish white to green. Four-inch bed of interformational conglomerate at 8228 feet.

8228.3-8229. Argillaceous siltstone to microsilty shale, slightly calcareous, slightly arenaceous at base, dark green, laminated to thin bedded. Contains a few poorly preserved plant fragments.

T.D. - 8229 feet.

MONCTON - DECEMBER 28TH, 1949

DORCHESTER NO. 1 WELL

Drilling operations recommenced on October 26th, and drilling is now proceeding at a depth of 7175 feet. A string of 9-5/8" casing was run to a depth of 7178 feet.

BELLIVEAU STRATIGRAPHIC TEST

Commenced drilling on September 30th and is now at a depth of 3389 feet.

EXPLORATION WORK

Geological and geophysical field survey work, over areas mentioned in the attached press release, was completed early in November and reports are now being prepared.

ADK'BR

UI 325

SHELL EXPLORATION NEW BRUNSWICK LTD.

Data that accompanied a letter from A.D.Kingsford, dated March 3rd., 1950. Letter addressed to Dr.Prince.

SUMMARY OF EXPLORATION AND DRILLING-SHELL DORCHESTER NO.1

Location.Lat.N.45° 54' 51",Long.W.64° 31' 54". See letter from Gussow to Wright, Mar. 28, 1950

Shell Dorchester No. 1 was spudded June 24, 1949, to test the oil and gas potentialities of the Albert formation as found in an anticline located about one mile northwest of the town of Dorchester, Westmorland County, New Brunswick.

Shell Dorchester No. 1 was drilled to a depth of 8229 feet (8208 feet sub-sea) over a period of 225 days. However, no footage was made from August 23 to October 28. During this time, the Franks 4000 rig, which had drilled to 5668 feet, was moved off the location and after suitably widening and reinforcing the foundation, an Emsco 1000 with a 136-foot "Muskogee" derric was erected. In addition, a portable, low-pressure, oil-burning, horizontal fire-tube boiler was installed to supply heat to flow lines, water storage tanks, and mud settling tanks during winter operations. All of this equipment was suitably housed in wooden frame buildings as a further protection during cold weather.

A string of 13-3/8-inch casing was run to 410 feet and cemented to the surface in a 17-inch hole. An intermediate string of 9-5/8-inch casing was cemented at 5178 feet with 500 sacks of Canada Portland cement to case off the cap rock and salt section extending from 395 feet to 4910 feet. Open hole was drilled to total depth using 3½-inch drill pipe, 6¼-inch drill collars, and 7-7/8-inch hard-formation bits.

A total of 101 7-7/8-inch bits was used during the course of drilling with an average footage of 82 feet per bit. Fourteen 6-inch Hughes hard-formation core bits were used with an average footage of 10.3 feet per bit. Nineteen 12¼-inch reaming bits were used prior to running the intermediate casing string. Total diesel fuel consumption was approximately 56,000 gallons.

The drilling, engineering, and supervisory personnel employed in the two earlier tests at Urney and Apohaqui carried on similar duties at Dorchester with the exception that the Emsco 1000 rig required a five-man crew for its operation.

Aside from mechanical repairs, the main difficulty encountered while drilling was maintenance of the water-base drilling fluid. The flocculating effect of the calcium ion, originating in the anhydrite and gypsum

section, which extends from 395 feet to 1510 feet, was controlled by continual additions of aqueous solutions of soda ash together with smaller amounts of caustic soda and quebracho. Salt was encountered at a depth of 1510 feet. Since salt water also flocculates a clay-fresh water suspension, new mud was mixed for drilling below this depth using a special saltwater-resistant clay in a saturated brine solution containing small quantities of starch.

After setting the 9-5/8-inch casing, the salt mud was discarded and replaced by new fresh water-clay-mud. Fresh water mud was necessary to run an electrical survey and, in addition, its colloidal properties are superior and more easily and economically maintained than those of a saltwater base mud. Relatively few difficulties were encountered in the circulation system in drilling to total depth.

Two electrical surveys were run on the hole; the first to a depth of 6673 feet, and the second to a depth of 8067 feet. A dipmeter survey was made in connection with the second electrical log to obtain information on the amount and direction of the dip of the strata exposed in the wall of the hole. No survey was made of the remaining 162 feet of hole.

Fifteen cores were taken during the course of drilling for dip information, lithologic and formational identification, and for laboratory analysis as an aid in interpreting the electrical log. A total of 143.5 feet was cored with a recovery of 98 feet or 68.4%. Samples of drill cuttings, each representing successive five-foot intervals of the hole, were taken from the surface to total depth. A complete set of these samples were sent to Water Supply and Borings Division, Geological Survey of Canada, Ottawa, for permanent record.

In general, the section of Albert penetrated at Dorchester consists of hard grey shales, calcareous or dolomitic in part, with interbedded grey to brown siltstones, hard tight sandstones, and small amounts of grit and conglomerate.

The geologic formations and their thickness encountered during the course of drilling are:

Overburden	0 - 298	
Hopewell Group	298 - 395	
Windsor (Cap Rock	395 - 1510	1115' anhydrite, gypsum
Windsor (Salt	1510 - 4910	3400 halite
Windsor (Lower Windsor	4910 - 5232	Casing tempered & 3227
Moncton (?) or basal Windsor	5232 - 5470	
Albert	5470 - 7358	
Moncton (?) (Red Beds)	7358 - 7665	Hole dev 4° & 322
Albert	7665 - 8229 (T.D.)	

Note: Thickness of formations is not corrected for dip.

Deflection surveys were made at frequent intervals. Hole deflection averaged less than one degree from the surface to 4000 feet, 1½ degrees from 4000 to 6000 feet, and about 2½ degrees from 6000 feet to total depth. Deviation from the vertical is considerably less than in the Urney and Apohaqui tests. This may be attributed to the use of larger and heavier drill collars, more uniform dip of the strata, and the use of the Bassinger percussion drill.

The Bassinger percussion drill is being developed by the Shell Oil Company to increase drilling rate in hard formations. This tool, still in the experimental stage, underwent numerous test runs at Dorchester. It not only increased rate of penetration in hard formations but also tended to correct hole deflection. The principle of operation of this tool is similar to that of the pneumatic drill except that drilling mud under pressure instead of compressed air is utilized as the energizing medium.

The primary objective of the exploration program at Dorchester was to test the oil and gas potentialities of the Albert formation. Geologic evidence indicates faulting at approximately 7358 feet and at 7374 feet. In the light of present knowledge it was felt that the productive potentialities of the Albert formation did not warrant further drilling. However, before abandonment, it was decided to recover as much of the intermediate casing as possible. Accordingly, after attempting to set a cement plug at the bottom of the 9-5/8-inch, the

freeze point of the casing was determined. The casing was then shot with two quarts of 60% SNG at a depth of 3227 feet. Seventy-six joints of casing were recovered. A cement plug was then placed at the bottom of the surface casing and a steel plate welded on top. The hole was officially abandoned February 9, 1950.

415'
Hole open 4"

AFH'BR
March 3rd, 1950.

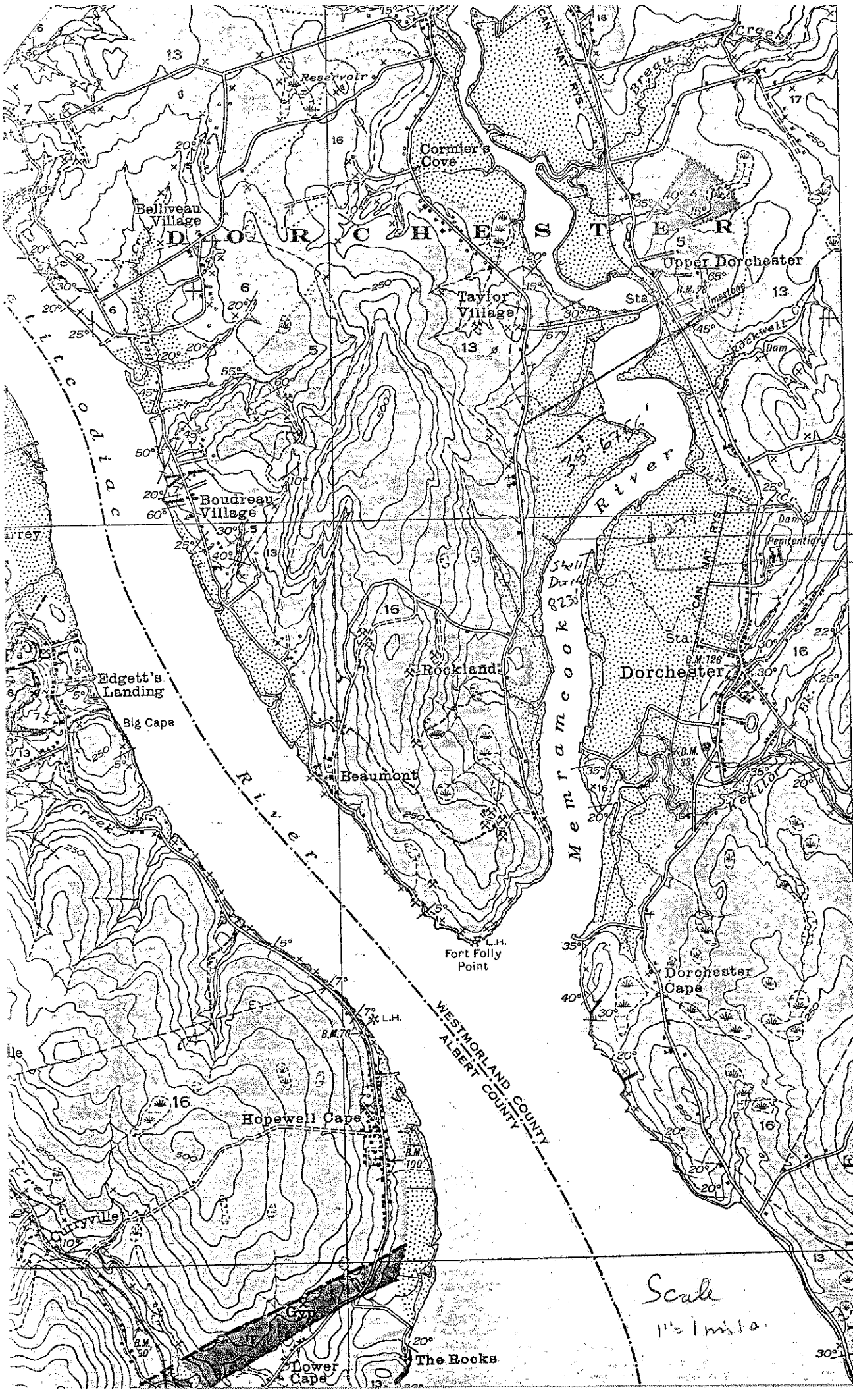
SHELL DORCHESTER NO 1

From	To	Th	Lithology
0	130	130	Surface Gravel - gen. br., large pebbles
130	298	168	Sandstone & Grit - red to grey
298	330	32	Conglomerate - white, pink, red and green pebbles
330	340	10	Grit & Sandstone - red to grey
340	370	30	Conglomerate - white, pink, red and green pebbles and some Grit, grey - 350-370
370	398	28	Conglomerate & Grit - grey to red
398	424	26	Anhydrite - white to pink and some selenite crystals
424	430	6	Gypsum & A hydrite & Selenite
430	450	20	Anhydrite - light grey to white with selenite crystals & gypsum
450	775	335	Anhydrite - white to pink with selenite crystals with gypsum stringers throughout
cgl 775	815	40	Anhydrite - white to pink with some conglomerate bands and selenite crystals, very little gypsum
815	1015	200	Anhydrite - grey to white with some selenite and stringers of gypsum, thicker gypsum 905-910, not so much selenite 916-1015
1015	1195	180	Gypsum - white with some pink to reddish 1120-1130, 1135-1140 and selenite stringers throughout
1195	1205	10	Gypsum with about $\frac{1}{4}$ conglomerate pebbles
cgl 1205	1235	30	Quartz conglomerate with stringers of gypsum and selenite
1235	1247	12	Quartz conglomerate with gypsum and (ls frags) selenite - 50-50
1247	1430	183	Gypsum with selenite interbedded
1430	1455	25	Gypsum and selenite - 50-50
1455	1780	325	Selenite - gen. large crystals - 1455-1515, 1560-1660, 1700-1780, rest gen. small crystals with a showing of rock salt throughout
1780	1800	20	Rock salt - white with selenite - 50-50
1800	1860	60	Rock salt - white to water white with $\frac{1}{4}$ to $\frac{1}{2}$ selenite crystals
1860	2210	350	Rock salt - white to water white with some selenite crystals, reddish tinge to crystals 2180-2210
2210	4930	2720	Rock salt - white to water white with thin stringers of selenite throughout, some yellow stains 2270-2280

NOTE: Shell Oil calls bottom of massive salt 4610, but samples show all salt to 4930.

From	To	Th	Lithology
4930	4985	55	Rock salt - white to water white with thin stringers of selenite & anhydrite
4985	5175	190	Anhydrite, Gypsum with selenite crystals, a showing of rock salt and some grey limestone bands - 5100-5150, 5160-5175
5175	5260	85	Limestone breccia Limestone - grey with some anhydrite and gypsum, some thin greenish grey shale
	5231		Base of Windsor? (Gussow)
	5260		Base of Windsor? (Wright)

Incomplete



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DEEP WELLS IN MONCTON SUBBASIN OF NEW BRUNSWICK

WELL NAME AND NUMBER	LAT.	LONG.	DEPTH(m)	FORMATIONS (basal depth in metres)
Shell Dorchester No. 1	45°54′51″	64°31′54″	2509	Enragé(121), Unnamed formation of gypsum and anhydrite(? Clover Hill(543)), Cassidy Lake(1520), Upperton(1578), Macumber(1604), Hillsborough(1686), Albert(2509, TD)
Irving / Chevron Hillsborough No. 1	45°55′07″	64°43′12″	3013	Hillsborough(45), Weldon(1330), Boyd Creek Tuff(within Weldon, 1075-1090), Albert(3013, TD)
New Brunswick Gas and Oilfields, Turtle Creek No. 1	45°57′50″	64°55′13″	1549	Salisbury(58), Boss Point(340), Enragé(537), Shepody(698), Maringouin(752), Upperton(826), Macumber(874), Hillsborough(1061), Memramcook(1549, TD)
Imperial Oil Limited Pollett River No. 1	45°54′36″	65°05′22″	2060	Salisbury(107), Boss Point(500), Shepody*(985), Maringouin(1634), Upperton(1744), Macumber(?)(1747), Hillsborough(1860), Albert(2060, TD)
New Brunswick Oilfields Urney No. 72-1	45°43′27″	65°19′43″	1358	Hopewell Gp. undivided(326), Upperton(405), Macumber(491), Hillsborough(610), Albert(1358, TD)

* It is not presently clear whether the Enragé Fm. is missing in the Imperial Pollett River No. 1 well. The beds below the Boss Point Fm. are mainly fine- to medium-grained lithic quartzose arenites and consequently lithologically similar to the type Shepody. For the present time and until we get the palynological results from Graham Dolby on this well I am tentatively assigning the beds to the Shepody Fm.. If my assignment turns out to be correct, the base of the Cumberland Group would coincide with the base on the Boss Point in this well like on the south side of the Subbasin at Parkindale.

The Shell Upper Dorchester exploration notes indicate the well was drilled 8208 ft subsea and 8229 ft sub-datum. Evidence from other Shell wells drilled during this program in New Brunswick indicates the Kelly Bushing on rig was about 7 ft above ground level. The datum for the logs is assumed to have been the Kelly at 21 ft above M.S.L. Therefore the ground elevation must have been 14 ft above MSL at the drill site.

Shell Dorchester No. 1.

(Unnamed Fm (carbonate))

~~Emerage~~ 0 - 121.34 m (121.34 m); Clover Hill Fm. 121.34 - 542.68 m (421.34) Cassidy Lake Fm. 542.68 - 1519.82 (977.14 m); Upperton Fm. 1519.82 - 1577.74 (57.92 m); Macumber Fm. 1577.74 - 1603.66 (25.92 m); Hillsborough. 1603.66 - 1685.98 (82.32 m); Albert 1685.98 - 2509.15 (TD) = 823.17 m

True Thicknesses:

Emerage	~120 m
Clover Hill	~400 m
Cassidy Lake	~770 m
Upperton	~45 m
Macumber	~20 m
Hillsborough	~65 m
Albert	< 650 m

Cassidy Lake:

GROUNDWATER AND BORINGS SECTION, GEOLOGICAL LOG
INDIVIDUAL WELL RECORD

Sec. Sheet:

Name of well: DORCHESTER No. 1

Drilling Company: Shell Oil Co.

TRAN # 6623 - 6629

Province: New Brunswick.

Location: SEE LOCATION ON BACK SIDE OF THIS SHEET

Lsd. Sec. Twp. Rge. W. of:

Lot Cons. Twp. County:

Co-ordinates: N. Latitude 45° 54' 51"
W. Longitude 64° 31' 54"

Elevation: Total Depth: Type of Rig:

Commenced: Completed: Result:

Initial Reservoir Pressure: I.P.

Core Taken:

Logs:

Electrolog:

CASING RECORD

DEPTH OCCURRENCE: OIL, GAS & WATER

	Oil		Gas		Water	
	Depth	Elev.	Depth	Elev.	Depth	Elev.

Producing Formation:

FORMATION CONTACTS & MARKERS

SEE REVERSE SIDE OF THIS SHEET FOR OTHER INFORMATION

REMARKS

SOURCE

LOCATION

East side of the Memramcook River, approximately one and one-quarter miles N. 35° W of Dorchester village. The site is one mile west of Dorchester Penitentiary.

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