

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 194

Summary of the Amerada Petroleum Corporation - Scoria Unit #1
Billings County, North Dakota
Well No. 1508 - Permit No. 1520

by Jay Garske
April 1958

Amerada Petroleum Corporation - Scoria Unit #1. Location: Center NE/4 NE/4 Section 10 T. 139 N., R. 101W. Elevation: 2626 K.B. Total Depth 9476 feet. Plug Back Depth 9280 feet.

The Amerada Petroleum Corporation - Scoria Unit #1 was spudded August 16, 1957 and completed December 28, 1957 as a new oil discovery. The well was completed dually (Madison and Heath) for a combined initial production total of 348 barrels of oil per day.

Logs: Laterolog-3 Gamma ray, microlaterolog, and gamma ray-neutron.

Cores: 7992-8026 (Heath), cut 3 feet, recovered 27 feet.

Tests:

DST #1: 7452-7500. Open 1/2 hour, 3/4" choke, 1000' water cushion. Strong air blow immediately, water cushion to pit in 18 minutes, nitrogen gas to surface in 25 minutes. Shut in 30 minutes. Recovered: 6928 feet of highly nitrogen gas cut salt water. Pressures: IHP 4630#, IFP 3205#, FFP 3395#, BHP 3685# FHP 4610#.

DST #2: 7650-7790. Open 1 hour and 5 minutes, 3/4" choke, 1000' water cushion. Strong air blow immediately decreasing to weak blow in 1 hour, SI 30 minutes. Recovered: 1000 feet of mud cut water cushion, 5510 feet of mud cut salt water. Pressures: IHP 4720#, IFP 2600#, FFP 3530#, BHP 3540#, FHP 4680#.

DST #3: 7949-7956. Open 26 minutes, 3/4" choke, 1000' water cushion. Strong air blow immediately, water cushion to surface in 4 minutes, nitrogen gas to surface in 6 minutes. Shut in 30 minutes. Recovered: 4 feet above water cushion, 4 feet of highly gas cut slightly salt water cut drilling mud with trace of oil on top. Pressures: IHP 4855#, IFP 2490#, FFP 2940#, BHP 3475#, FHP 4985#.

DST #4: 7964-7990. Open 1 hour and 30 minutes 3/4" choke, 1000' water cushion. Air immediately, weak blow increasing to strong blow in 2 minutes. Gas to surface in 48 minutes, strong blow for remainder of test. Shut in 30 minutes. Recovered: 5500 feet of highly gas cut and water cushion cut black oil, 500 feet of highly gas cut and slightly mud cut black oil. Estimated 95% oil. Pressures: IHP 4900#, IFP 600#, FFP 1735#, BHP 3460#, FHP 4890#.

DST #5: 8178-8222. Open 1 hour and 30 minutes, 3/4" choke, 1000' water cushion. Strong air blow immediately, water cushion to surface in 46 minutes, salt water to surface in 1 hour and 25 minutes. Flowed 16 barrels of water cushion and estimated 2 barrels salt water to pit. Shut in 30 minutes. Recovered: 8192 feet of salt water. Pressures: IHP 5035#, IFP 2420#, FFP 3650#, BHP 3710#, FHP 4970#.

DST #6; 8963-9090. Open 1 hour, 3/4" choke, 2000' water cushion. Air immediately, weak blow for 5 minutes and died, by-passed fluid in 40 minutes, no indication of blow, dead for remainder of test. Shut in 30 minutes. Recovered: 2000 feet of water cushion, 30 feet of drilling mud. No show of oil or gas. Pressures: IHP 5510#, IFP 980#, FFP 990#, BHP 3230#, FHP 5575#.

DST #7: 9162-9218. Open 3 hours, 3/4" choke, 2000' water cushion. Air immediately, weak blow for 3 minutes and died. By-passed fluid in 2 hours, very weak blow for 1/2 minute and died. Dead for remainder of test. Shut in 30 minutes. Recovered: 2000' of water cushion with bottom 270 feet gas cut, 110 feet of gas cut drilling mud with slight trace of oil. Pressures: IHP 5650#, IFP 940#, FFP 1010#, BHP 3315#, FHP 5600#.

DST #8: 9171-9236. Open 4 hours, 3/4" choke, 2000' water cushion. Air immediately, weak blow gradually increasing to fair blow in 1 hour. Increased to strong blow in 1 hour and 40 minutes, gas to surface in 3 hours and 11 minutes, gas blow decreased to weak blow too small to measure. Shut in for 30 minutes. Recovered: 3000 feet of highly oil and gas cut slightly mud cut water cushion, estimated 35% oil, 1000 feet of free oil, brownish green in color, and 110 feet of highly oil and gas cut drilling mud, estimated 15% oil. Pressures: IHP 5650#, IFP 980#, FFP 1525#, BHP 3660#, FHP 5650#.

Perforations:

Perforated 9298-9368 with 4 shots per foot, acidized with 2000 gallons; swabbed 106 barrels of salt water with slight trace of oil; squeezed perforations with 125 sacks.

Perforated 9213-9258 with 4 shots per foot and acidized with 2000 gallons; flowed 231 barrels of oil and 11 barrels of water in 23 hours on 24/64" choke, tubing pressure 100, GOR 546/1, API gravity 39.8; flowed 58 barrels of oil and 88 gallons of water in 5 hours on 24/64" choke, TP 105.

Perforated 7958-7976 with 4 shots per foot, acidized with 500 gallons; flowed 0 barrels of oil in 6 1/2 hours. Nitrogen gas flow 1065 MCF per day; squeezed perforations with 75 sacks.

Perforated 7966-7976 with 4 shots per foot; flowed 109 barrels of oil in 13 hours on 18/64" choke, TP 1800; API gravity 34.6, GOR 5201/1; flowed 11 barrels of oil in 2 hours on 18/64" choke, TP 1800; flowed 102 barrels of oil, 0 barrels of water in 12 hours on 18/64" choke, TP 1700; API gravity 34.6, GOR 10,205/1; flowed 147.47 barrels of oil, no water in 24 hours on 18/64" choke, TP 1775; flowed 137 barrels of oil, no water in 24 hours on 18/64" choke, TP 1775; flowed 120 barrels of oil, no water in 24 hours on 18/64" choke, TP 1800; flowed 123 barrels of oil in 24 hours on 18/64" choke, TP 1750; flowed 122.33 barrels of oil in 24 hours on 18/64" choke, TP 1775. Squeezed perforations 7966-7976 with 125 sacks.

Perforated 7973-7979 with 4 shots per foot; flowed 123.5 barrels of oil, 12 gallons of water in 18 hours on 14/64" choke, TP 1600-1825, GOR 4702/1; flowed 31 barrels of oil, no water in 5 hours on 14/64" choke, TP 1850, GOR 4000/1.

Acidized Madison perforations 9213-9258 with 500 gallons.

Completion Data:

On a 24 hour Madison test, using a 16/64" choke, the well flowed 151 barrels of oil (17% water). Gas-oil ratio 433/1, API gravity 39.6, shut in pressure 1000#.

On a 24 hour Heath test using a 16/64" choke, the well flowed 197 barrels of oil (no water). Gas-oil ratio 9137/1, API gravity 38.4, shut in pressure on tubing 2100#, on casing 2350#.

Permanent type production packer set at 9198'.

Casing Record:

Set 9 5/8" surface casing at 627 feet with 450 sacks of cement. Set 7" casing at 9474 with 1000 sacks of cement.

Formation tops were determined from samples and electric logs, corrected to the electric logs. Doubtful or obscure formations were not picked. Colors and descriptive numbers were taken from the Goddard, et. al., 1951 Rock Color Chart distributed by the Geological Society of America, New York, N.Y.

FORMATION TOPS

Cretaceous System	
Pierre formation	1735
Greenhorn formation	4482
Basal Cretaceous sandstones	5425
Jurassic System	
Swift formation	5763
Rierdon formation	6233
Piper limestone	6445
Triassic System	
Spearfish formation	6618
Permian System	
Minnekahta formation	7140
Opeche salt	7223
Pennsylvanian System	
Minnelusa formation	7490
Mississippian System	
Heath formation	7950
Kibbey sandstone	8192
Kibbey limestone	8331
Charles formation	8471
Nesson pay equivalent	9057
Fryburg pay equivalent	9213

0-4310 Missing.

4310-4460 Shale, greenish gray 5GY6/1 to light olive gray 5Y6/1 and medium dark gray to grayish black, fissile to lumpy, compact, bentonitic in part.

4460-4640 Shale, medium dark gray to grayish black, compact, some with soft white calcareous specks, some light olive gray 5Y6/1, lumpy, bentonitic shale and few pieces of fine fragmental limestone, soft, crumbly, light brown 5YR6/4.

4640-4970 Shale, dark gray to black and greenish gray, fissile, compact, and much lumpy, spongy, bentonitic shale, light olive gray 5Y6/1 to olive gray 5Y4/1.

4970-5060 Shale, black, fissile, compact and some olive gray shale as above.

5060-5430 Shale, dark gray to grayish black, fissile, compact, and some light olive gray 5Y6/1 compact shale.

5430-5450 Shale, as above, and few pieces of very fine grained, moderately well cemented, very light gray sandstone.

5450-5600 Shale, grayish black to black, fissile, compact, and little sandstone as above.

5600-5670 Shale as above, and little light greenish gray 5GY8/1 to greenish gray 5GY6/1 and light olive gray 5Y6/1 shale, fissile to lumpy, compact.

5670-5710 Shale, medium dark gray to grayish black, fissile, compact, little light olive gray 5Y6/1 compact shale, little fine grained, friable white to very light gray sandstone, with probable gypsiferous cement, and few fragments of light bluish gray chert.

5710-5730 Shale and sandstone, as above.

5730-5750 Shale and sandstone as above, and few fine to medium, subangular to rounded, vitreous to frosted colorless loose quartz grains.

5750-5780 Shale, greenish gray 5GY6/1, lumpy, spongy, to fissile, compact, and some dark gray, fissile, compact shale.

5780-5820 Shale as above, and little very fine grained, sandstone, friable to moderately well cemented, glauconitic in part, light greenish gray to yellowish gray 5Y8/1.

5820-5860 Missing.

5860-5880 Shale, light olive gray 5Y6/1 to olive gray 5Y4/1, lumpy, spongy.

5880-5940 Shale, as above, and some medium gray to black, fissile, compact shale.

5940-6020 Shale, medium gray to black, and greenish gray, fissile, compact.

6020-6050 Shale, as above, and little very fine grained sandstone, well cemented, glauconitic in part, light greenish gray 5G8/1 to greenish gray 5G6/1 and yellowish gray 5Y8/1 to light olive gray 5Y6/1.

6050-6060 Shale and sandstone as above, and few pieces of yellowish gray 5Y8/1 micaceous bentonite.

6060-6100 Shale, dark gray to black and olive gray 5Y4/1 fissile, compact.

6100-6160 Shale, as above, and some very fine grained sandstone, moderately well cemented, calcareous, slightly glauconitic in part, very light gray.

6160-6180 Shale, greenish gray 5GY6/1 and medium gray to grayish black, fissile, compact.

6180-6240 Shale, as above and little sandstone as above (6100-6160).

6240-6290 Shale as above, few pieces of limestone, chalky, soft, very pale orange 10YR8/2, some shaly limestone and limy shale, olive gray and medium gray to grayish black.

6290-6330 Shale, limy shale and shaly limestone, as above.

6330-6350 Shale, medium dark gray to black, light olive gray 5Y6/1 to olive gray 5Y4/1, and light brownish gray, fissile, compact.

6350-6380 Shale, as above, grading to very light shale.

6380-6430 Shale, and limy shale as above and some shaly limestone, dense, dark gray and, greenish gray 5GY6/1.

6430-6460 Shale and shaly limestone as above and little fine crystalline, to very fine granular limestone, dense, very pale orange to pale yellowish brown.

6460-6510 Limestone, very fine granular, argillaceous, very pale orange to moderate orange pink 5YR8/4 and moderate pink 5R7/4 to dusky red 5R3/4, and much shale, dark gray to black, and greenish gray 5GY6/1, very limy in part, fissile, compact to brittle.

6510-6550 Limestone, as above to very fine crystalline, dense, and much shale, greenish gray 5GY6/1, light olive gray 5Y6/1 and dark gray to grayish black, fissile, compact.

6550-6610 Limestone, very fine crystalline, and very fine granular, dense, pale red 5R6/2 to grayish red 5R4/2, light red to moderate red 5R4/6, and moderate orange pink 5YR8/4, and much shale as above.

6610-6680 Limestone and shale as above, little very fine grained sandstone and silty sandstone, friable, moderate reddish orange 10R6/6 to moderate reddish brown 10R4/6.

6680-6800 Sandstone as above, with some shale and limestone as above.

6800-6830 Sandstone as above to dark reddish brown 10R3/4, and little shale as above; probably cavings since radioactivity and electrical logs indicate salt.

6830-6860 Sandstone and much shale, mostly cavings as above, probably salt with shale stringers.

6860-6950 Salt, vitreous, colorless to grayish orange pink 10R8/2.

6950-7140 Shale, medium dark gray to grayish black and greenish gray 5GY6/1, and little sandstone, very fine grained, friable, moderate reddish orange to moderate reddish brown 10R4/6.

7140-7160 Missing.

7160-7180 Salt, vitreous, and anhydrite, crystalline, grayish orange pink to moderate orange pink, and some shale cavings.

7180-7190 Limestone, very fine granular, interstitial porosity, grayish orange pink, moderate orange pink and moderate reddish orange, some shale, grayish black and greenish gray, fissile, compact.

7190-7210 Shale, as above.

7210-7270 Limestone, very fine granular, anhydritic in part, moderate orange pink to pale reddish brown, little crystalline anhydrite, white to grayish orange pink 10R8/2 and some shale as above.

7270-7300 Anhydrite, very fine granular, moderate orange pink 10R7/4, some salt, vitreous, colorless, and shale cavings.

7300-7330 Missing.

7330-7350 Anhydrite, snowy, soft, white, moderate pink and grayish orange pink to moderate orange pink, with some shale and sandstone cavings.

7350-7390 Salt, vitreous, colorless and tinted moderate orange pink 10R7/4, with much caved shale and sandstone.

7390-7410 Anhydrite, mostly snowy to earthy, little very fine granular, white and moderate orange pink 10R7/4, with much caved shale and sandstone.

7410-7510 Anhydrite as above; very poor samples, almost entirely caved material.

7510-7520 Sandstone, fine grained, friable, grayish orange pink to moderate reddish orange; poor samples, mostly caved material.

7520-7530 Sandstone as above, some greenish gray and grayish black shale and much caved material.

7530-7550 Sandstone, as above to yellowish gray; very poor sample mostly anhydrite cavings.

7550-7560 No sample.

7560-7620 Sandstone, fine grained, friable to moderately well cemented, anhydritic, slightly calcareous, white, grayish orange pink and light red 5R6/6, with anhydrite and shale cavings.

7620-7720 Sandstone, very fine to fine grained, friable to well cemented, slightly calcareous, white, grayish pink 5R8/2, moderate pink, and light red 5R6/6, some dolomite, calcitic, fine crystalline, dense, grayish orange pink 10R8/2, moderate orange pink and pale red 10R6/2, and little shale, greenish gray 5GY6/1 and dark gray, fissile, compact.

7720-7760 Dolomite, fine crystalline, some fine granular, dense, moderate pink 5R7/4 to dusky red 5R3/4 and little sandstone as above.

7760-7810 Dolomite and sandstone as above, and some shale, greenish gray and dark gray, lumpy to fissile, compact.

7810-7850 Dolomite, very fine crystalline, to very fine granular, dense, grayish orange pink 10R8/2 and light red to moderate red 5R4/6, little shale, greenish gray and dark gray, fissile, compact.

7850-7940 Dolomite, very fine granular, some fine crystalline, dense, very pale orange to dusky yellowish brown, moderate pink and light red to moderate red 5R4/6, and little shale as above.

7940-7950 Limestone, fine crystalline, dense, light brownish gray 5YR4/1 to brownish black 5YR2/1, and some shale, black, fissile, compact.

7950-7956 Limestone and shale as above and little sandstone, fine grained, subangular to subrounded, friable, pale yellowish brown 10YR6/2.

7956 Circulation sample: As above.

7956-7965 Limestone, shale and sandstone, as above.

7965-7990 Sandstone as above, some with scattered apparent dead oil stain, and some limestone and shale as above.

Core #1 (7992-8026) Recovered 27 feet.

7992-7993 Shale, grayish red 5R4/2, waxy, brittle.

7993-7994 Shale, very dusky red 10R2/2 waxy, brittle.

7994-7995 Shale, pale olive 10Y6/2, brittle, slightly arenaceous in part, and sandstone, very fine grained, well cemented, dusky red 5R3/4.

7995-7996 Sandstone, as above.

7996-7997 Sandstone, very fine grained, well cemented, yellowish gray 5Y8/1 to light greenish gray 5GY8/1.

7997-7998 Sandstone, as above with scattered dusky red staining.

7998-8000 Shale, greenish gray 5GY6/1 and dark reddish brown 10R3/4, brittle, with little included sandstone as above.

8000-8001 Sandstone, very fine grained, well cemented, greenish gray 5GY6/1, and dark reddish brown 10R3/4.

8001-8002 Sandstone, medium grained, rounded, well cemented, white and dark reddish brown 10R3/4, and dolomite, shaly, fine crystalline, dense, grayish green 5G5/2 and dark reddish brown.

8002-8003 Limestone, dolomitic, fine crystalline, dense, olive gray 5Y4/1.

8003-8004 Shale, grayish red 10R4/2, slightly calcareous, waxy, brittle, abundant ostracodes.

8004-8005 Shale, dark greenish gray 5G4/1, calcareous, waxy, compact with numerous ostracodes and few pelecypod fragments.

8005-8006 Limestone, fine crystalline, dense, fossiliferous, greenish gray 5GY6/1.

8006-8007 Shale, olive gray 5Y4/1, calcareous, brittle.

8007-8009 Shale black, limy, brittle.

8009-8010 Shale, black, siliceous, brittle.

8010-8011 Shale, black, calcareous, fossiliferous, pyritic, brittle.
8011-8019 Shale, grayish black, compact.

Samples

8015-8020 Shale as above, poor sample, mostly cavings.
8020-8025 Missing.
8025-8030 Lost circulation material.
8030-8050 Shale as above and cavings.
8050-8080 Shale as above, some limestone, fine crystalline, dense, brownish gray to brownish black and some limy shale, grayish black, brittle.
8080-8180 Limestone as above to light brownish gray, some yellowish gray 5Y8/1, and much shale and limy shale as above.
8180-8190 Shale and limestone as above, and little sandstone, very fine to fine grained, friable, calcareous, white, yellowish gray 5Y8/1 and moderate pink 5R7/4 to moderate orange pink 10R7/4.
8190-8220 Sandstone as above, and shale, dark gray to grayish black, compact.
8222 Circulation sample: As above.
8220-8270 Sandstone and some shale as above.
8270-8340 Sandstone, very fine to medium grained, subangular to rounded, mostly vitreous, some frosted, friable, slightly calcareous, white, moderate orange pink to pale reddish brown 10R5/4 and grayish orange pink to moderate pink 5R7/4, some shale medium gray grayish black and greenish gray 5GY6/1, compact.
8340-8350 Lost circulation material.
8350-8360 Missing.
8360-8390 Limestone, very fine crystalline, dense, light brownish gray to brownish gray 5YR4/1 and little anhydrite, snowy to earthy, white.
8390-8410 Shale, dark gray and greenish gray 5GY6/1, compact with some limestone and anhydrite as above.
8410-8450 Shale, as above, some sandstone, very fine to medium grained, friable, calcareous, moderate orange pink to dark reddish brown 10R3/4 and grayish orange pink to moderate pink 5R7/4 and little limestone as above.
8450-8470 Shale, sandstone and limestone, as above and little earthy to snowy, white to grayish orange pink anhydrite.
8470-8480 Salt, and salt coated shale and sandstone cavings.
8480-8490 Shale, medium dark gray to black and olive gray 5Y4/1, fissile, compact, and little silty shale, moderate reddish orange, compact.
8490-8500 Shale, as above to greenish gray 5GY6/1, and more silty shale as above.
8500-8520 Shale as above, and little earthy to snowy, white anhydrite.
8520-8530 Missing.
8530-8540 Shale and anhydrite, as above.
8540-8560 Missing.
8560-8590 Shale, dark gray to black, and olive gray 5Y4/1, some silty sandstone, slightly calcareous, friable, light brown 5YR6/4 and some snowy to earthy, white anhydrite.
8590-8630 Anhydrite, earthy, white, and much caved material, some coated with salt.
8630-8370 Salt.
8370-8710 Limestone, fine crystalline, dense, pale yellowish brown to dark yellowish brown.

8710-8720 Limestone as above, some shale, grayish black, and olive gray 5Y4/1, and little anhydrite, earthy, white.

8720-8730 Limestone and shale, as above.

8730-8750 Limestone and shale as above, and some earthy, white anhydrite.

8750-8770 Poor samples; limestone, shale and anhydrite, as above and much lost circulation material.

8770-8790 Limestone, fine crystalline, dense, pale yellowish brown to dusky yellowish brown 10YR2/2 and little shale, greenish gray 5GY6/1 and dark gray.

8790-8800 Limestone, fine crystalline, scattered pinpoint porosity, dark yellowish brown to dusky yellowish brown, and little shale as above.

8800-8830 Limestone and shale as above and little earthy to snowy white anhydrite.

8830-8840 Anhydrite, earthy to crystalline, white, and some limestone and shale as above.

8840-8860 Shale, light olive gray 5Y6/1 to olive gray 5Y4/1 and medium dark gray to black, mostly lumpy, spongy, little fissile, compact.

8860-8885 Anhydrite, earthy, white, much shale, olive gray, greenish gray and medium dark gray to black, compact and some limestone, fine crystalline, dense, dark yellowish brown to dusky yellowish brown.

8885-8900 Anhydrite, earthy to crystalline, white to light gray, and much shale and limestone as above.

8900-8905 Poor sample, mostly lost circulation material.

8905-8915 Anhydrite as above, much shale, brownish gray and dark gray to black, and little fine crystalline, dense, dusky yellowish brown limestone.

8915-8920 Anhydrite, earthy, lumpy, spongy, with shale and limestone inclusions, white to light gray and yellowish gray 5Y8/1, and little shale and limestone as above.

8925-8960 Limestone, fine crystalline, dense, dusky yellowish brown, some very fine granular limestone, dense, very pale orange to pale yellowish brown, and little anhydrite as above.

8960-9000 Limestone, fine crystalline, dense, brownish black 5YR2/1, and dusky yellowish brown, some very fine granular limestone, as above and little dark gray to black shale.

9000-9090 Limestone, very fine granular, scattered pinpoint porosity, very pale orange to pale yellowish brown, and some fine crystalline to fine fragmental, dense limestone, dark yellowish brown to dusky yellowish brown.

9090- Circulation sample; 1 1/2 hours: Limestone, as above.

9095-9105 Limestone, as above and little earthy to snowy white anhydrite.

9105-9115 Anhydrite, and some limestone as above, some shale, olive gray 5Y4/1, greenish gray 5GY6/1 and dark gray to black.

9115-9125 Anhydrite as above to light gray and some limestone and shale as above.

9125-9190 Anhydrite and limestone, as above, and little shale as above to moderate reddish brown.

9190-9200 Limestone, mostly fine to medium fragmental, dense, dark yellowish brown to dusky yellowish brown, some very fine granular, very pale orange to pale yellowish brown.

9200-9205 Limestone, very fine granular, chalky in part, pale yellowish brown 10YR6/2, little fragmental limestone as above and little shale, olive gray 5Y4/1, compact.

9205-9215 Limestone, fine granular, scattered pinpoint porosity, very pale orange to dusky yellowish brown, some brown staining, slight fluorescence, no cut.

9218- Circulation sample; 1 1/2 hours: Limestone, as above.

9218-9230 Limestone as above with several pieces showing and fair fluorescence and excellent cut.

9230-9235 Limestone as above, scattered stain, no fluorescence, or cut.

9236- Circulation sample; 1 hour: Limestone, fine granular, scattered pinpoint porosity, pale yellowish brown to dark yellowish brown, fair to good stain, fair spotty fluorescence and good cut.

9235-9270 Limestone, as above, with very poor fluorescence and slight cut.

9270-9305 Limestone, fine granular, little scattered pinpoint porosity, pale yellowish brown to dark yellowish brown.

9305-9310 Limestone, mostly fine granular, some fine to dense medium fragmental, very pale orange to dusky yellowish brown.

9310-9320 Limestone as above, and little earthy to snowy, white anhydrite.

9320-9390 Limestone as above.

9390-9415 Limestone as above, and little fine to medium very oolitic limestone, very pale orange to dusky yellowish brown.

9415-9445 Limestone, mostly fine granular, same fine to little medium oolitic and fine fragmental, very pale orange to dusky yellowish brown.

9445-9460 Limestone, dolomitic, microsugrosic, interstitial porosity, pale yellowish brown to dark yellowish brown, some scattered staining, fair fluorescence and slight cut.

9460-9470 Limestone, very fine to fine granular, chalky in part, very pale orange to dark yellowish brown and some microsugrosic limestone as above.

9470- Circulation sample; 1/2 hour: Limestone, as above.

9470-9476 Missing.

9476 Total depth.