

LITHOLOGIC DESCRIPTION OF DRILL HOLE CE-703

Drill Sample Descriptions (5')  
2370' FNL X 785' FWL

Sec. 5, T2S, R99W

Rio Blanco County, Colorado

From	To	Description
0	5.0	Alluvium, sandstone, fine grained.
5.0	10.0	Same as above.
10.0	15.0	Alluvium, chips of oil shale, dark brown, and light buff siltstone.
15.0	20.0	Siltstone, light buff to orange buff, 80%; oil shale, dark brown, dolomitic 20%.
20.0	25.0	Same as above.
25.0	30.0	Limestone, light buff, 60%; oil shale, dark brown, varved dolomitic 40%.
30.0	35.0	Marlstone, light brown, slightly varved, 40%; oil shale dark brown, dolomitic 40%; sandstone very fine grained orange buff, salt and pepper 20%.
35.0	40.0	Marlstone, light brown, slightly varved, 90%; sandstone very fine grained, orange buff, salt and pepper 5%; oil shale dark brown, dolomitic 5%.
40.0	45.0	Marlstone, light brown, slightly varved, 40%; oil shale dark brown, dolomitic, 40%; sandstone, very fine grained, orange buff 20%.
45.0	50.0	Marlstone, light brown, slightly varved 95%; oil shale, dark brown dolomitic 5%.
50.0	55.0	Marlstone, light buff to light brown, slightly varved 50%; oil shale, dark brown, dolomitic, varved 50%.
55.0	60.0	Same as above.
60.0	65.0	Same as above.
65.0	70.0	Marlstone, light brown, slightly varved 90%; oil shale, dark brown, dolomitic 10%.
70.0	75.0	Marlstone, light brown, slightly varved 75%; oil shale, dark brown, dolomitic 25%.
75.0	80.0	Marlstone, light brown, slightly varved 70%; siltstone, light gray, 25%, oil shale, dark brown, dolomitic 5%.
80.0	85.0	Same as above, only pyrite with siltstone.
85.0	90.0	Missing.
90.0	95.0	Oil shale, dark brown, dolomitic, 80%; tuff, analcitized, steel gray 20%.
95.0	100.0	Oil shale, dark brown, dolomitic, 65%; marlstone, light brown 30%; tuff analcitized 5%.

From	To	Description
100.0	105.0	Marlstone, light brown, slightly varved; trace of oil shale, dark brown; trace of white siltstone. Some pyrite on marlstone.
105.0	110.0	Same as above.
110.0	115.0	Same as above.
115.0	120.0	Oil shale, varved medium brown to dark brown, dolomitic 60%; marlstone, light brown, slightly varved 40%.
120.0	125.0	Oil shale, (as above) 60%, marlstone (as above) 40%; trace of tuff, analcitized and trace of white siltstone.
125.0	130.0	Oil shale, dark brown, varved, dolomitic; trace of brown marlstone.
130.0	135.0	Oil shale, dark brown, varved dolomitic 70%; marlstone, light buff to light brown 30%; trace of analcitized tuff.
135.0	140.0	Oil shale, dark brown, varved, dolomitic 98%; dolomite, light brown varved, thin pyrite streaks 2%.
140.0	145.0	Oil shale, varved medium dark brown to dark greenish brown, dolomitic; trace of light brown marlstone.
145.0	150.0	Oil shale (as above) 90%; marlstone medium brown, 5%; tuff (analcitized) 5%.
150.0	155.0	Oil shale, dark gray brown, dolomitic.
155.0	160.0	Oil shale, medium brown to dark brown, varved dolomitic.
160.0	165.0	Oil shale, varved dark brown, dolomitic to marly.
165.0	170.0	Oil shale, medium brown to dark brown 70%; marlstone, medium brown (lean oil shale) 30%.
170.0	175.0	Oil shale (marlstone, medium brown), lean, varved 80%; marlstone, light brown, slightly varved 20%.
175.0	180.0	Oil shale, (marlstone, medium brown) lean, varved 65%; marlstone, light brown, slightly varved 35%. Trace of light buff siltstone with pyrite altering to limonite.
180.0	185.0	Oil shale, varved dark brown to medium brown, dolomitic, 90%; marlstone, light buff, slightly varved 10%.
185.0	190.0	Marlstone, light brown to medium brown, slightly varved, some pyrite, 90%; sandstone, white very fine grained 5%; oil shale, dark brown, dolomitic 5%.
190.0	195.0	Oil shale, dark brown dolomitic, 97%; marlstone, light brown, 3%, trace of analcitized tuff.
195.0	200.0	Oil shale, medium brown, dolomitic, 50%; marlstone, light brown, slightly varved 50%.

From	To	Description
200.0	205.0	Oil shale, dark brown, varved to medium brown, thin segregate crystals of calcite.
205.0	210.0	Marlstone, varved light brown interbedded with light brown dolomite; pyrite on marlstone and dolomitic small veinlets of Pyrite.
210.0	215.0	As above, only traces of Cinnabar like material on some surfaces.
215.0	220.0	Marlstone, medium brown, varved (possibly lean oil shale).
220.0	225.0	Marlstone as above 70%; oil shale, dark brown, varved, 30%.
225.0	230.0	Oil shale, very dark brown, dolomitic, varved.
230.0	235.0	Marlstone, light buff, pyrite 50%; marlstone - dolomite, medium brown, (lean oil shale) 50%. Hydrocarbon (dark brown) on some surfaces.
235.0	240.0	As above.
240.0	245.0	As above.
245.0	250.0	Marlstone, medium brown, varved, blocky (slightly kerogenitic).
250.0	255.0	Oil shale, dark brown, dolomitic, varved.
255.0	260.0	Marlstone, light brown, slightly varved.
260.0	265.0	Oil shale, dark brown, dolomitic varved 70%; marlstone, light brown slightly varved 30%.
265.0	270.0	As above, only oil shale 40%; marlstone 60%.
270.0	275.0	Oil shale, varved dark brown to medium dark brown, dolomitic 90%. Tuff, analcitized, steel gray 10%.
275.0	280.0	As above.
280.0	285.0	As above.
285.0	290.0	As above.
290.0	295.0	Marlstone, light brown, varved specked and veined with pyrite.
295.0	300.0	Oil shale, varved medium brown to dark brown, dolomitic, 75%; marlstone, light brown, varved 25%.
300.0	305.0	As above.
305.0	310.0	Marlstone, light brown, varved 60%; siltstone, light buff speckled with pyrite 30%; oil shale dark brown varved 10%.
310.0	315.0	Oil shale, dark brown, varved dolomitic.
315.0	320.0	As above.
320.0	325.0	Siltstone, medium brown, kerogenitic, varved grayish tint.
325.0	330.0	Marlstone, light gray brown, slightly varved, pyrite on most surfaces.
330.0	335.0	Marlstone, medium brown, kerogenitic, varved 60%; marlstone, gray brown, pyrite 40%.
335.0	340.0	Oil shale, dark brown varved dolomitic, 90%; marlstone, gray brown, pyrite 40%.

From	To	Description
340.0	345.0	Oil shale, varved light brown to dark brown, segregate crystals of calcite.
345.0	350.0	Oil shale (as above) no calcite, 85%; siltstone, light gray 15%.
350.0	355.0	Oil shale (as above) 90%, marlstone, light brown to tan, 10%.
355.0	360.0	Marlstone, light brown 60%, some marlstone light brown to gray brown with small pyrite crystals disseminated throughout.
360.0	365.0	Marlstone (as above).
365.0	370.0	Marlstone, medium brown slightly darker brown, kerogenitic, 80%; marlstone, medium brown, with clear crystals of calcite; 10% marlstone, gray brown, 10%.
370.0	375.0	Marlstone, medium brown (as above) 60%; marlstone, gray brown (as above) 30%; marlstone, with calcite crystals (as above) 10%.
375.0	380.0	As above.
380.0	385.0	Siltstone, gray, argillaceous 80%; marlstone, medium brown 20%.
385.0	390.0	Siltstone, as above, 90%; marlstone, brown 10%.
390.0	395.0	Siltstone, as above 70%; marlstone, brown, slightly kerogenitic 20%; marlstone, gray, some disseminated Pyrite, 10%.
395.0	400.0	Marlstone, gray, with disseminated Pyrite 70%; marlstone, light brown with Calcite crystals and some Pyrite crystals.
400.0	405.0	Marlstone, light brown to brown, slightly varved some disseminated pyrite crystals, some Calcite crystals, slightly kerogenitic, 65%; oil shale brown to dark brown, varved, 20%; siltstone, gray to medium gray, 15%.
405.0	410.0	Marlstone, as above, with more light brown material.
410.0	415.0	Oil shale, brown to dark brown, varved, 70%; marlstone, light brown to tan, slightly varved.
415.0	420.0	Oil shale, dark brown, varved 90%; marlstone brown to light brown, 10%.
420.0	425.0	Marlstone, brown to light brown, kerogenitic, slightly varved 80%; some siltstone gray, 20%.
425.0	430.0	Siltstone, dark gray, very argillaceous, almost a shale, calcareous.
430.0	435.0	Marlstone, light brown, very fine crystalline, 70%; marlstone light brown to brown sucrosic, with some Calcite crystals, 20%; siltstone, dark gray, 10%.

From	To	Description
435.0	440.0	Marlstone, brown, fine crystalline, kerogenitic, 60%; oil shale, brown to dark brown, slightly varved, 30%; marlstone, brown, with Calcite crystals, 10%.
440.0	445.0	Marlstone, as above, with more disseminated Pyrite crystals; oil shale as above 40%, siltstone, gray, 10%.
445.0	450.0	Marlstone, light brown to light gray, some disseminated Pyrite; some Pyrite fine crystalline.
450.0	455.0	Dolomite, dark gray, blocky; traces of oil shale, dark brown; marlstone, light brown.
455.0	460.0	Dolomite (as above) 50%; oil shale, dark brown, varved 50%; traces of light brown marlstone.
460.0	465.0	As above.
465.0	470.0	Sandstone fine grained, light gray in color 30%; oil shale dark brown varved 30%; marlstone, light brown, slightly varved 40%. Trace (caving) of bright orange tuff. Pyrite.
470.0	475.0	As above.
475.0	480.0	Marlstone, medium brown (lean oil shale) 80%; oil shale, dark brown, varved 20%.
480.0	485.0	As above.
485.0	490.0	Marlstone, medium brown, slightly varved, (lean oil shale)
490.0	495.0	As above.
495.0	500.0	Marlstone, medium brown, varved (lean oil shale) 70%; oil shale, dark brown, varved 30%.
500.0	505.0	As above.
505.0	510.0	Oil shale, dark brown, dolomitic, varved. Traces of light gray siltstone.
510.0	515.0	As above.
515.0	520.0	Marlstone, medium brown, (lean oil shale), varved 50%; oil shale, dark brown, varved, dolomitic 50%.
520.0	525.0	Siltstone, light buff, calcareous, slightly varved.
525.0	530.0	Oil shale, dark brown, varved 70%; siltstone, light buff, calcareous, 30%.
530.0	535.0	Siltstone, light buff, 70%; oil shale (as above) 30%.
535.0	540.0	As above.
540.0	545.0	As above.
545.0	550.0	Oil shale, dark brown, varved, dolomitic, 95%; marlstone, light buff 5%.
550.0	555.0	As above.
555.0	560.0	Oil shale, dark brown, varved (very good oil shale) 90%; marlstone, light brown, 10%.

From	To	Description
560.0	565.0	Oil shale, dark brown, varved (very good) 40%; marlstone, light brown, 30%; siltstone, light buff, 30%.
565.0	570.0	Oil shale, dark brown varved, 90%; marlstone, medium brown, slightly varved 5%; siltstone, light buff, 5%.
570.0	575.0	As above.
575.0	580.0	Oil shale, dark brown, varved, 60%; marlstone, medium brown, 40%.
580.0	585.0	As above.
585.0	590.0	As above.
590.0	595.0	As above.
595.0	600.0	As above.
600.0	605.0	Oil shale, dark brown, dolomitic, varved, 60%; siltstone, light buff, 15%; marlstone, light brown, varved, 15%.
605.0	610.0	Marlstone, medium brown (lean oil shale), 40%; marlstone - dolomitic, light brown, 30%; siltstone, light gray to light buff, 30%.
610.0	615.0	As above.
615.0	620.0	As above.
620.0	625.0	As above.
625.0	630.0	Oil shale, dark brown, varved, dolomitic, 90%; marlstone, light brown, slightly varved, 10%.
630.0	635.0	Marlstone, medium brown varved (lean oil shale), 70%; oil shale, dark brown varved, 30%.
635.0	640.0	As above.
640.0	645.0	As above.
645.0	650.0	As above.
650.0	655.0	Oil shale, medium brown varved to light brown, dolomitic, 75%; marlstone, light brown, slightly varved, 25%.
655.0	660.0	Marlstone - dolomitic, medium brown, 80%; siltstone, light brown, speckled with minute crystals of Pyrite.
660.0	665.0	Oil shale, dark brown varved to medium brown, dolomitic, 90%; marlstone, light brown, 10%.
665.0	670.0	As above (only Pyrite veinlets throughout).
670.0	675.0	As above (with Pyrite veinlets).
675.0	680.0	As above (with Pyrite veinlets).
680.0	685.0	As above.
685.0	690.0	Oil shale, dark gray brown, dolomitic, varved, 80%; marlstone, medium brown, 10%; siltstone, medium brown, 10%.
690.0	695.0	Marlstone, medium brown, varved to gray brown.
695.0	700.0	As above.
700.0	705.0	Oil shale, dark brown, dolomitic, varved, 80%; marlstone (medium brown lean oil shale), 20%.

From	To	Description
705.0	710.0	Siltstone, light brown, 40%; oil shale, dark brown dolomitic varved, 30%; marlstone, medium brown, slightly varved, 30%.
710.0	715.0	Bladed, clay, brown (associated with solution cavities in core samples), 40%; siltstone, medium brown, pyrite, 30%; oil shale, dark brown varved dolomitic, 30%.
715.0	720.0	Oil shale, dark brown varved, dolomitic 50%; clay, bladed brown, 25%; marlstone, light brown, 25%.
Note:	718'	- Put diamond drill bit on, very poor samples, small and often not much there.
720.0	725.0	As above, only Pyrite on marlstone, and evidence of minute solution cavities.
725.0	730.0	Marlstone, light brown, varved some Pyrite, 40%; siltstone, light gray, 30%; oil shale, dark brown, varved dolomitic 30%; crystal (small, of calcite).
730.0	735.0	As above except for the Calcite.
735.0	740.0	Marlstone, light brown, 60%; marlstone, light gray, 20%; oil shale dark brown, dolomitic, 20%.
740.0	745.0	As above.
745.0	750.0	As above.
750.0	755.0	Oil shale, dark brown, dolomitic, varved, 60%; marlstone, light brown, 20%; marlstone, light gray, 20%.
755.0	760.0	<u>Samples worthless</u> , taken (by drillers helpers) from mud pit. Contain cuttings of surface hole and cotton seed hulls, entire sample stuck together with quick gel.
760.0	765.0	As above.
765.0	770.0	As above.
770.0	775.0	As above.
775.0	780.0	Marlstone, light brown, some Pyrite, 80%; marlstone, medium brown, 10%; oil shale, dark brown, 10%.
780.0	785.0	As above.
785.0	790.0	Marlstone, medium brown, varved (lean oil shale), 60%; marlstone, light brown, 20%; oil shale, dark brown, 20%.
790.0	795.0	Marlstone, light brown, 95%; oil shale, dark brown, 5%.
795.0	800.0	Marlstone, light brown, 40%; marlstone, medium brown (lean oil shale), 30%; oil shale, dark brown, varved 30%.
800.0	805.0	Marlstone, light brown, 75%; marlstone, medium brown, 20%; oil shale, dark brown, 5%.

From	To	Description
805.0	810.0	Marlstone, light brown, 60%; marlstone, medium brown, 20%; sandstone, fine grained red and orange, 15%. Oil shale, dark brown, 5.
810.0	815.0	As above.
815.0	820.0	Marlstone, light brown 60%; oil shale, dark brown to medium brown, 40%.
820.0	825.0	Oil shale, dark brown, 50%; marlstone, light to medium brown, 50%.
825.0	830.0	Marlstone, light brown to medium brown, slightly varved, 60%; oil shale, dark brown, varved, 40%.
830.0	835.0	As above.
835.0	840.0	As above.
840.0	845.0	As above.
845.0	850.0	As above.
850.0	855.0	As above.
855.0	860.0	Marlstone, light brown to medium brown, varved, 40%; oil shale, dark brown, dolomitic, varved, 40%; dolomite, light buff orange, 20%; trace of brown clay flakes which are characteristic of solution cavities.
860.0	865.0	Oil shale, dark brown, dolomite, varved, 65%; marlstone, light brown to medium brown, 35%.
865.0	870.0	As above.
870.0	875.0	Sample, out of mud pit, aqua gel, circulation material, <u>no good</u> .
875.0	880.0	Oil shale, dark brown, dolomitic, varved, 65%; marlstone, light brown to medium brown, 35%.
880.0	885.0	As above.
885.0	890.0	As above.
890.0	895.0	Marlstone, light brown, slightly varved, 40%; oil shale, dark brown, varved, 35%; siltstone, light buff, 25%.
895.0	900.0	Oil shale, dark brown, dolomitic, 60%; marlstone, light brown, 25%; siltstone, light brown, 15%.
900.0	905.0	As above only trace of bladed clays (indicitive of solution cavities).
905.0	910.0	As above.
910.0	915.0	Shale, medium gray, 60%; marlstone, light brown-medium brown, 20%; oil shale, dark brown, dolomitic, 20%/
915.0	920.0	Sandstone, orange-red, fine grained, 90%; marlstone - oil shale, 10%.
920.0	925.0	Oil shale, dark brown, 40%; marlstone, light brown, 40%; shale, medium gray - dark gray, 20%; trace of bladed clays (brown).
925.0	930.0	Shale, medium dark gray, 35%; oil shale, dark brown, 35%; marlstone, light medium brown, 30%; trace of light buff and orange siltstone - sandstone.

From	To	Description
930.0	935.0	As above.
935.0	940.0	As above.
940.0	945.0	Shale, dark gray, 60%; oil shale, dark brown, 30%; marlstone, light brown - medium brown, slight varved, 10%.
945.0	950.0	As above, only trace of brown dolomite.
950.0	955.0	Shale, gray (medium - dark) 70%; shale, paper shale, (very lean oil shale), 15%; oil shale, dark brown, partially argillaceous, 15%.
955.0	960.0	As above.
960.0	965.0	As above.
965.0	970.0	As above.
970.0	975.0	As above.
975.0	980.0	Shale, dark brown - black, to medium gray - dark gray, carbonaceous, 70%; oil shale, dark brown, dolomitic, 10%; marlstone, light brown to light buff, 20%.
980.0	985.0	As above.
985.0	990.0	As above.
990.0	995.0	As above.
995.0	1000.0	As above except few large pieces of brown paper shale, possible cavings.
1000.0	1005.0	As above.
1005.0	1010.0	As above.
1010.0	1015.0	As above.
1015.0	1020.0	As above.
1020.0	1025.0	As above.
1025.0	1030.0	Marlstone, light brown to medium brown (some dolomite), 70%; oil shale, dark brown, varved, 30%; trace of light buff siltstone.
1030.0	1035.0	Oil shale, medium brown, varved, 60%; mudstone, light gray, 30%; shale, dark gray, 10%. Trace of light buff siltstone with limonite staining.
1035.0	1040.0	As above.
1040.0	1045.0	As above.
1045.0	1050.0	As above.
1050.0	1055.0	As above (sample, extremely calcareous).
1055.0	1060.0	As above (some calcite possibly from bedding planes or fine veinlets).
1060.0	1065.0	As above.
1065.0	1070.0	As above.
1070.0	1075.0	As above.
1075.0	1080.0	As above,
1080.0	1085.0	As above, some paper shale.
1085.0	1090.0	As above.
1090.0	1095.0	As above.
1095.0	1100.0	As above.

From	To	Description
1100.0	1105.0	As above.
1105.0	1110.0	As above.
1110.0	1115.0	As above.
1115.0	1120.0	Shale, medium dark gray, 100%. Traces of oil shales, siltstone, marlstone.
1120.0	1125.0	Shale, dark brown to dark gray, some very slightly kerogenitic, 90%. Marlstone, light brown to medium brown, 10%.
1125.0	1130.0	Shale, as above, 70%; marlstone - dolomite, light brown to medium brown, 30%.
1130.0	1135.0	Shale, as above, 80%; marlstone, as above, 20%.
1135.0	1140.0	Shale, as above, 70%; marlstone, as above, 30%.
1140.0	1145.0	Shale, as above, 90%; marlstone, as above, 10%.
1145.0	1150.0	As above.
1150.0	1155.0	As above.
1155.0	1160.0	As above.
1160.0	1165.0	As above.
1165.0	1170.0	As above.
1170.0	1175.0	As above.
1175.0	1180.0	As above.
1180.0	1185.0	As above.
1185.0	1190.0	As above.
1190.0	1195.0	As above.
1195.0	1200.0	As above.
1200.0	1205.0	As above.
1205.0	1210.0	As above.
1210.0	1215.0	As above.
1215.0	1220.0	As above.
1220.0	1225.0	As above.
1225.0	1230.0	As above.
1230.0	1235.0	As above.
1235.0	1240.0	As above.
1240.0	1245.0	As above.
1245.0	1250.0	As above.
1250.0	1255.0	As above.
1255.0	1260.0	As above.
1260.0	1265.0	As above.
1265.0	1270.0	As above.
1270.0	1275.0	As above.
1275.0	1280.0	As above, though percentage of gray shale increasing.
1280.0	1285.0	As above.
1285.0	1290.0	As above.
1290.0	1295.0	As above.
1295.0	1300.0	As above.
1300.0	1305.0	As above.
1305.0	1310.0	As above.

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From	To	Description
1310.0	1315.0	As above.
Note: Rock bit back on		
1315.0	1320.0	Shale, gray, some very fine laminae.
1320.0	1325.0	As above.
1325.0	1330.0	As above.
1330.0	1335.0	As above.
1335.0	1340.0	Shale, as above.