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PROGRAM

**LITHOLOGIC LOG FOR GARY DEERING
MEADE COUNTY, SOUTH DAKOTA
NW NW SEC 34, T5N, R10E**

DEPTH	GENERAL LITHOLOGY	SAMPLE DESCRIPTION	COMMENTS
0-52	Top Soil	Gray Clay and Silts, gravels and cobbles	
PIERRE FORMATION			
52-535	Silty clay	multicolored silty calcareous clay - chips of pale and grayish yellow green silty clay with sand streaks. Yellowish gray to dusky yellow sandy clay with minor chips of v.f. grained dusky yellow sandstone	
535 - 960	Shale	Olive black shale, occasionally iron stained with interbedded olive black marl, yellowish gray non-calcareous shale and light gray to yellowish gray calcareous siltstone	
TOP OF NIOBRARA FORMATION			
960 - 1060	Chalk and shale Siltstone	Calcareous light gray shale. Abundant chalk siltstone containing v.f. sand, interbedded with marl. Abundant dusky yellow sand streaks	
TOP OF CARLILE FORMATION			
1060 - 1260	Shale	Dusky blue, fissile, non calcareous shale with biotite flakes, pale-dark yellowish brown noncalcareous shale, steaks of v.f. sand; fine angular calcareous sand	
1260 - 1382	Shale	Grayish black non-calcareous shale with minor v.f. sand on bedding planes, small shell fragments and brownish black shale interbedded with pale brownish yellow limestone	
TOP OF GREENHORN LIMESTONE			
1382 - 1450	Limestone	Dark gray with rounded white calcareous grains. light gray sandy limestone with fine yellowish gray lime mudstone; Brownish black, slightly fissile shale	
TOP OF BELLE FOURCHE SHALE			
1450 -1710	Shale	Brownish black, slightly fissile shale; abundant bentonite and minor yellowish brown calcareous shale	
TOP OF MOWRY SHALE			
1710 - 1900	Shale	Brownish black, fossiliferous shale, pyrite and oxidized iron stains; interbedded with white arkosic/calcareous sandstone, calcite veining and yellowish brown micaceous shale.	
TOP OF MUDDY FORMATION			
1900 - 2030	Interbedded shale, clay And sandstone stringers	Brownish black shale containing dolomite concretions, pyrite, calcite veining. Finely laminated brownish black and light olive gray shale with bentonite and calcite cemented v.f. sandstone	

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2030 - 2040	Sandstone,	Light brown to light gray sandstone, fine grained, calcite cemented, some iron staining, pyrite. Brownish black shale, calcite veining
TOP OF SKULL CREEK SHALE		
2040 -2284	Interbedded shale	Brownish black shale containing dolomite concretions, pyrite, calcite veining. Finely laminated brownish black and light olive gray shale with bentonite
TOP OF DAKOTA SANDSTONE		
2284 - 2312	Sandstone	Light olive gray v.f. to med. grained sub-angular to subrounded quartz sandstone. silica cemented sand friable.
2312 -2332	Sandstone, sandstone and shale	Fine grained, calcite cemented, light olive gray sandstone, with non-calcareous dark gray shale and olive black shale with iron staining in lower shales. Calcite cemented med sand size grains intermingled with pyrite.
TOP OF FUSON SHALE		
2332-2362	Shale interbedded	Dark gray calcareous-non-calcareous shale, with minor amounts of yellowish brown siltstone, pyrite
TOP OF LAKOTA SANDSTONE		
2362-2388	Sandstone, sandstone and shale	Fine grained, calcite cemented, light olive gray sandstone, Calcite cemented med sand size grains, Non-calcareous dark gray shale
2388 - 2416	Shale interbedded	Dark gray calcareous-non-calcareous shale, light gray fine grained sandstone, intermingled with white clay with black streaks
2416-2430	Sandstone, sandstone and shale	Fine grained, calcite cemented, light olive gray sandstone, with non-calcareous dark gray shale and olive black shale with iron staining in lower shales. Calcite cemented med sand size grains intermingled with pyrite.
2430 - 2487	Shale interbedded	Dark gray calcareous-non-calcareous shale, light gray fine grained sandstone, intermingled with white clay with black streaks
2487 - 2542	Sandstone	Light olive gray v.f. to med. grained sub-angular to subrounded quartz sandstone. silica cemented sand friable. More cemented at the top, Better porosity from 2665-2740
2542 - 2575	Shale interbedded	Dark gray calcareous-non-calcareous shale, light gray fine grained sandstone, intermingled with white clay with black streaks
2575 - 2604	Sandstone	Light olive gray v.f. to med. grained sub-angular to subrounded quartz sandstone. silica cemented sand friable
TOP OF MORRISON FORMATION		
2604 -2614	Shale	olive gray to light greenish waxy shale, white bentonite clay Dark gray calcareous-non-calcareous shale, light gray fine grained sandstone, intermingled with white clay with black streaks