

"Standard-Lloyd-McCulloch-Bear Creek Unit" #1
(30-17S-19E)

C O R E R E C O R D

CORE #1 - 490-497 - Cut 7', Rec. 7' (Cut in 1-3/4 hrs)

7' Volcanic Agglomerate of andesitic to basaltic nature, mottled dark gray green to green, hard, granular to crystalline in texture, vitreous luster, minerals translucent on thin edges, quartz deficient, contains scattered but common phenocrysts of a pyroxene, probably augite, and sub-angular to rounded patches of brown, red, and rust brown feldspar or andesite. Core is highly fractured at irregular angles from vertical to 30 degrees off vertical, fractures exhibit common slickensides and most are filled with a white to light green mineral (not calcite and too soft for quartz), possibly a zeolite. Core appears altered from probable extensive fracturing and solution weathering.

CORE #2 - 3158-3165 - Cut 7', Rec. 7' (No flash to core barrel)

1/2' Conglomerate, greenish gray cast, hard, calcareously cemented, tight. Matrix of light gray to greenish gray sandstone, quartzose with common biotite and rounded black grains, fine to medium grained, containing sub-rounded to well rounded pebbles to 1". Pebbles are the light mottled greens, gray greens and browns, and black and gray cherts and argillites.

6 1/2' Interlaminated Sandstone and Silty Clay Shale, hard, tight, well bedded in laminations 1/32" to 1/2" thick, some good 3 degree dips, other dips vary between 3 and 5 degrees, highly fractured at high angles to bedding with common fracture fillings of white calcite. Sandstone is light gray, fine grained, well sorted, sub-rounded to rounded, quartzose with common black argillaceous grains and mica, contains patches of pyrite, is well cemented by calcium carbonate, NOSC. Shale is dense, somewhat silty, black, carbonaceous, has no visible forams. Core appears to be of marine to brackish water type.

CORE #3 - 3405-3415 - Cut 10', Rec. 2' (Cut in 1 hr. 55 min) (Core crushed to fragments by coring)

3' Volcanic Tuff, massive, exhibits no dips, green matrix speckled with white spots, firm but constituent minerals are soft and can be scratched by knife, highly fractured at all angles, and fractures filled with a white material, partly calcite. Green matrix contains scattered minor lath-like crystals of a black to blackish green mineral, possibly augite. White speckled minerals are mostly oval, are 2 to 3 MM in diameter, and commonly contain pyrite crystals at their centers or near their edges. Core appears to have been a basic ash ejecta which has been devitrified and altered either by deposition in water or by groundwater solution and alteration which has chloritized and/or serpentinized its basic ferro-magnesian minerals.

CORE #4 - 3489-3496 - Cut 7', Rec. 7' (Cut in 2 hrs., 15 min.)

7' Interlaminated Siltstone and Silty Sandstone, black to gray, dense, hard, tough, tight, fair bedding indicated by sandstone laminae show fair dips of 20°, high

angle fractures common with common calcite fillings, some erratic dips due to probable slumping, fracturing, some fracture surfaces highly polished. Siltstone is black, well indurated, with scattered possible carbonaceous material, no visible forams. Sandstone is light gray, silty, very fine grained, quartzose, micro-mica, well cemented with calcareous cement, with common specks and streaks of pyrite, NOSC.

CORE #5 - 3964-3976' - Cut 12', Rec. 9' (Cut in 4 hrs.)

- 2' Sandstone Conglomerate, matrix of light gray, hard quartzose sandstone, fine to medium grained, sub-angular to sub-rounded, micaceous, and calcareously cemented, containing well rounded vari-colored pebbles to 3/8" of quartz, chert, argillites and angular to well rounded boulders to 3" of black siltstone. Conglomerate has a few high angle fractures, some of which are cemented, is tight, NOSC, grades into -
- 7' Sandstone, light gray, hard to very hard, tough, fine to medium grained, sub-angular to sub-rounded, fairly well sorted, quartzose with common micro-mica and argillaceous grains, calcareously cemented, contains scattered black angular carbonaceous patches and scattered black siltstone fragments. The alignment of some fragments along bedding planes gives 23 degree approximate dips (near upper part of section). The sandstone is tight with NOSC. A 2" thick piece of black silty shale occurs at bottom of core, has no visible forams. No flash to core barrel.

CORE #6 - 4463-4475' - Cut 12', Rec. 12' (Cut in 5 hrs.)

- 12' Siltstone, black, hard, tough, massive, highly fractured with most fractures uncemented and showing slickensides, a few fractures are calcite filled. Contains rare scattered mega fossil pelecypods, no visible forams, probably micro carbonaceous. Scattered interbeds of a lighter color and more sandy nature suggest 20 to 23 degree dips. Core is tight, NOSC.

CORE #7 - 4936-4946' - Cut 10', Rec. 8 1/2' (Cut in 4 hrs)

- 8 1/2' "Greenstone", medium to dark green, massive, dense, finely granular crystalline matrix contains scattered clear crystalline grains which are harder than a knife blade and may be quartz. Matrix is easily scratched by knife, part can be scratched by a fingernail, and is chloritic and serpentized. Plagioclase indistinguishable. Foliation or lineation indistinct to non-existent. Core is highly fractured from irregularly vertical to fair 34° and 44° planes, fractures are commonly filled with white calcite and exhibit slickensides. Core appears hydrothermally altered.

Note: In thin section this rock was determined to be an "altered quartz-bearing porphyritic diorite."

CORE #8 - 5311-5320' - Cut 9', Rec. 9' (Cut in 4 1/2 hrs.)

- 9' Silty shale, dark gray to black, hard, brittle, poorly bedded, poor fissility, upper two-thirds of core badly fractured and crushed in coring, lower one-third of core exhibits good to fair flat partings from 5° to 9°, one gray brown 3/4" thick pyritic streak gives a fair dip of 5° to 6°. Shale is silty, argillaceous, micro carbonaceous, contains much disseminated pyrite, has no visible forams, but contains rare megafossil pelecypod imprints. Core is highly fractured at many angles with minute to 3/8" wide calcite filled slickensided fractures. NOSC.

CORE #9 - 5826-5841' - Cut 15', Rec. 15'

15' Shale, slightly silty in part, black, hard, extremely fine grained and dense, massive to poorly bedded with some fair shaly partings 6° to 8°, without visible forams or megafossils, contains equivalent of $\frac{1}{2}$ ' of sandstone in lenses and streaks occurring approximately 1' and 3' below top of core. These sandstone lenses exhibit fair to good 10° to 11° dips. Sandstone is gray, silty to fine grained, hard, lime cemented, micromicaceous and microcarbonaceous. NOSC. Numerous fractures, some calcite filled, occur throughout the core. A highly fractured and crushed zone with calcite filled fractures and slickensides occurs in the shale approximately 5' from the bottom of the core and is probably a fault.

Core was badly crushed during coring and removal from barrel (The 15' of recovered material required 22' of tray space).

CORE #10 - 6304-6309 - Cut 5', Rec. 4' (Cut in 1 hrs)

4' Conglomerate, composed of a sandstone matrix containing pebbles and cobbles of quartzite and chert and cobbles and boulders of shale. Sandstone matrix is light gray, hard, fine to medium grained, tightly lime cemented, and micaceous. Shale cobbles and boulders are black, hard, silty in part, irregular to sub-angular to rounded, and are generally oriented parallel to bedding. One actual bed of shale 3" thick occurs in top 1' of core and gives a good 21 degree dip. Pebbles from $\frac{1}{8}$ " to $1\frac{1}{2}$ " of varicolored dark cherts and light colored quartzites are well rounded and occur intermixed with the shale cobbles and in separate streaks parallel bedding. Core has several high angle fractures which show slickensides and calcite vein fillings. Partings in shale also show evidence of slickensiding. Core has no odor or staining. No flash to core barrel.

CORE #11 - 6711-6722' - Cut 11', Rec. 10' (Cut in 3-3/4 hrs)

10' Graywacke sandstone, dark gray with a very slight brown cast, hard, massive, no dips, silty to fine grained, composition of quartz, argillaceous material, and probable plagioclase, abundant disseminated pyrite, translucent on thin sharp edges from its siliceous cement, secondary cementation of calcite, high angle to vertical fractures common with calcite coatings, some slickensides, lower 3' badly crushed in coring. No odor or staining and no flash to core barrel.

CORE #12 - 7161-7167' - Cut 6', Rec. 6' (Cut in 4 hrs)

6' Quartzose sandstone, medium gray, very hard, massive, no dips. Composed of well sorted, fine, angular grains of feldspar and argillaceous material, well cemented with silica. Secondary cementation with calcite. One fragment from lower portion of core is limey and contains megafossil shell fragments. Nearly vertical fractures are common, some filled with silica, and some newer ones filled with calcite (one instance of a calcite vein cutting a silica vein). Fine grained pyrite occurs locally along some calcite veins. Core is tight and impermeable. There is no odor or stain.

CORE #13 - 7631-7632' - Cut 1', Rec. 4" (Cut in 1 hr)

4" Calcareous graphitic chert and siliceous mudstone, very hard, no apparent bedding, core recovered in two fragments, each about 2" thick. Consists of white to gray amorphous chert with included irregular masses of highly contorted black fine grained siliceous mudstone. Core is commonly cut by 45 to 90° fractures filled

with calcite which has minute inclusions of graphite. (A thin section shows the following percentages: Chert 85%, Calcite 12%, Graphite 3%) Disseminated pyrite crystals are common along fractures and in the mudstone.

CORE #14 - 7719-7725' - Cut 6', Rec. 1' (Cut in 4 hrs)

- 1' Calcareous chert and mudstone, same as in Core #13 with the following exceptions: mudstone is soft when wet, flaky, and appears in greater percentage. Graphitic inclusions may or may not be present in the calcite of fractures.

CORE #15 - 7813-7822 = Cut 9', Rec. 2" (Cut in 3½ hrs)

- 2" Volcanic material(?), dark gray green, hard. Consists of a matrix of soft fine grained black material containing irregularly rounded phenocrysts of soft green mineral, the grains of which are easily cleavable. The material definitely appears to be a chloritized volcanic rock. This material may represent cavings from further up the hole.