

Georgia Geological Survey well no. 172

Emanuel County, Georgia

Beddingfield and Fallin, J. J. and Perry Kennedy no. 1

TD 1855

\* means a microfossil sample slide is included in the sample envelope.

datum: unclear; drilling floor 200' above sea level

logged by Whitfield C. Osgood, summer 1976.

note: 10-29-76. These samples seem hopelessly mixed. There are several numbering systems [5, 10, 20, 100 foot intervals] all intercalated, and some are clearly out of place, as the intercalated overlap depths are not the same lithology. It looks like the original sample preparator mixed the samples from one or more wells.

Do not rely upon these descriptions

Howard Cramer

G.G.S. 172

Emanuel County, Georgia

Lease name: J.J. & Perry Kennedy No. 1

Company: Beddingfield & Fallin

Elevation: 200 feet D.F.

Total Depth: 1855 feet

Completed: October 2, 1948

Remarks: Logged by Whitfield C. Osgood

An "\*" indicates that a slide is enclosed in the packet

- 0-5 Hard, loose, weathered, stained, light brown (5YR 5/6), slightly feldspathic, subangular to subrounded, poorly sorted, very fine grained to very coarse grained sand with some very well leached lime-cemented sand aggregates  
100% sand
- 5-10 the same with a couple of pieces of lignite  
100% sand
- 10-15 no change
- 15-20 the same except the grain size ranges from very fine grained to granular gravel with some iron-cemented aggregates  
100% sand
- 20-25 Hard, loose, weathered, stained, light brown (5YR 6/4), very slightly feldspathic, subrounded, dull, poorly sorted, very fine grained to granular sand with leached lime-cemented aggregates, and iron-cemented aggregates, and several 1-2mm. pieces of mottled, grayish yellow (5Y 8/4) to grayish pink (5 R 8/2) where weathered, dull to waxy, opaque to subtranslucent chert  
100% sand
- 25-30 Hard, loose, weathered, stained, moderate orange pink (10R 7/4) speckled with red brown (10R 3/4), subrounded to subangular, poorly sorted, very fine grained to granular very slightly cherty sand with some iron-cemented aggregates  
5% chert 95% sand
- 30-35 Hard, loose, weathered, stained, moderate orange pink (10R 7/4) speckled with dark reddish brown (10 R 3/4) iron cemented aggregates and grayish pink (5R 8/2) chert flakes, poorly sorted, very fine grained to granular cherty gravel chert up to 5mm. in size  
10% chert 90% gravel
- 35-40 Hard, loose, weathered, iron stained, moderate red orange (10r 6/6), poorly sorted, coarse grained sand with iron--cemented aggregates and some chert flakes; slightly cherty sand  
5% chert 95% sand

- 40-45 the same except very slightly fossiliferous and chert flakes larger ranging from 1 to 15mm. averaging 5mm. cherty sand  
10% chert 90% sand
- 45-50 Hard, loose, weathered, iron stained, moderate red orange (10R 6/6) speckled with pale greenish yellow (10Y 8/2) chert chips 3-5mm. in size, in a poorly sorted, medium grained, cherty sand  
30% chert 70% sand
- 40-50 (?) Appears to be out of place  
Hard, loose, slightly speckled, very light gray (N8), slightly feldspathic, very micaceous, sub-angular, vitreous, poorly sorted, coarse grained, very slightly silty sand  
5% siltstone 95% sand
- 55-57 Hard, loose, weathered, pale yellow orange (10YR 8/6) very slightly glauconitic, well sorted, granular, dull opaque, gravel chert gravel as polished, rounded, well sorted, granular quartz  
10% gravel 90% chert
- 57-60 no change
- 60 Hard, loose, weathered, pale yellow orange (10YR 8/6), glauconitic, poorly sorted, coarse grained cherty sand with several very porous, glauconitic, very pale orange (10YR 8/2) pieces of limestone  
5% limestone 40% chert 55% sand
- 60-65 Moderately hard, slightly weathered, very pale orange (10YR 8/2), glauconitic, slightly fossiliferous, micrograined, cherty sandy limestone sand poorly sorted, medium grained  
5% chert 10% sand 85% limestone
- 60-70 Hard, fresh, loose, yellow gray (5Y 8/1), slightly micaceous, fossiliferous, dull to vitreous, poorly sorted, coarse grained, silty limy sand limestone as fossil shell fragments and lime cement in sand aggregates  
5% siltstone 10% limestone 85% sand
- 60-85 Hard, fresh, loose, light gray (N7) speckled with very light gray (N8) shell fragments, phosphatic, fossiliferous, dull, subrounded, poorly sorted, coarse grained to granular limy sand  
2% phosphate 28% limestone 70% sand

- 70-80 Hard, loose, light olive gray (5Y 6/1) speckled with medium dark gray (N4) siltstone, very slightly micaceous, slightly phosphatic, slightly fossiliferous, dull, subrounded, poorly sorted, coarse grained silty sand  
15% siltstone 85% sand
- 85-90 like 60-85; hard, loose, fresh, medium light gray (N6), phosphatic, fossiliferous, dull, subrounded, poorly sorted, coarse grained to granular limy sand  
20% limestone 80% sand
- 90-130 no samples, except one marked 84-200 which is similar to a sample marked 100-160
- 84-200 Hard, loose, spotted, very light gray (N8), very slightly micaceous, very slightly fossiliferous (pelecypod fragments), very slightly phosphatic, slightly feldspathic, poorly sorted, coarse grained to granular, silty sand  
15% silt 85% sand
- \*100-160 the same as 84-200, except also speckled with dusky red (5R 3/4), iron (?) cemented aggregates with angular, vitreous, medium to coarse grained quartz, feldspar, and mica  
15% siltstone 85% sand
- 130-140 Hard, yellowish gray (5Y 7/2), phosphatic, micaceous, fossiliferous, dull, micrograined, sandy limestone  
40% sand 60% limestone
- 140-150 Hard, light gray (N7), very slightly phosphatic, fossiliferous, dull, micrograined, sandy limestone  
20% sand 80% limestone
- 150-160 Hard, loose, light gray (N7), phosphatic, slightly fossiliferous (shell fragments), dull to vitreous, poorly sorted, very fine grained to granular, slightly silty sand  
5% siltstone 95% sand
- 160-170 Hard, light gray (N7), dull, micrograined limestone  
100% limestone
- 170-180 the same except slightly sandy limestone  
5% sand 95% limestone

- 180-190 no sample
- 190-200 Hard, loose, light bluish gray (5B 9/1), speckled with medium bluish gray (5B 5/1) limestone, very slightly glauconitic, micaceous, fossiliferous, dull, poorly sorted, limy sand  
45% limestone 55% sand
- 200-210 Hard, very light gray (N\*) speckled with medium bluish gray (5B 5/1) limestone, very slightly phosphatic, fossil spines, medium sorted, medium grained, limy sand  
40% limestone 60% sand
- \*210-220 Hard, fresh, very light gray (N8), fossiliferous (pelecypod fragments and gastropod molds), dull micrograined, sandy limestone very little loose sand, mostly in lime-cemented aggregates  
45% sand 55% limestone
- 220-230 the same, however there are fewer aggregates and a greater percentage of loose sand possibly indicating more weathering than shown in the previous sample the sand is vitreous, angular, well sorted, medium grained limy sand  
40% limestone 60% sand
- 230-240 the same  
40% limestone 60% sand
- 228-240 Hard, loose, spotted, light gray (N7), phosphatic, dull, poorly sorted, very coarse grained sand  
2% phosphate 98% sand
- 260-280 Hard, loose, light gray (N7), speckled, very phosphatic, poorly sorted, coarse grained sand with a few micro-grained chips of limestone  
5% phosphate 95% sand
- 280-300 the same, only slightly more limestone chips, but still less than one percent  
5% phosphate 95% sand
- 300-320 Hard, loose, spotted, light gray (N7) and dark gray (N3), extremely phosphatic, poorly sorted, very fine grained to pebbles sand with several limestone chips  
25% phosphate 75% sand

- 310-320 (?) possibly out of place, resembles 230-240  
 Hard, yellowish gray (5Y 8/1), very slightly  
 glauconitic, slightly phosphatic, fossiliferous  
 (mega-fossils), one piece of pyrite, medium  
 sorted very fine grained to medium grained, limy  
 sand
- 320-340 Hard, loose, light gray (N7), very phosphatic,  
 subrounded, vitreous to dull smoky quartz, poorly  
 sorted, very fine grained to pebbly sand with  
 some limestone chips  
 5% phosphate 95% sand
- 340-360 the same only slightly more phosphate and no pebbles  
 6% phosphate 94% sand
- 340-350 Moderately hard, yellow gray (5Y 8/1), fossiliferous,  
 dull, micrograined sandy limestone possibly not in  
 place  
 30% sand 70% limestone
- 350-360 the same as 340-350  
 30% sand 70% limestone
- 360-380 the same as 340-360  
 Hard, loose, light gray (N7), very phosphatic,  
 subrounded, vitreous to dull smoky quartz, poorly  
 sorted very fine grained to granular sand with some  
 limestone chips  
 5% phosphate 95% sand
- 370-380 Hard, very light gray, (N8), fossiliferous, glauconitic,  
 dull, micrograined, sandy limestone possibly out of  
 place  
 20% sand 80% limestone
- 380-400 the same as 360-380 with slightly more limestone, but  
 still less limestone than phosphate  
 2% limestone 3% phosphate 95% sand
- 400-420 the same as 360-380  
 5% phosphate 95% sand
- 420-440 Hard, loose, speckled, light gray (N7), phosphatic,  
 dull to vitreous, subangular, poorly sorted, very  
 fine grained to very coarse grained dolomitic sand  
 dolomite as pale yellow brown (10YR 6/2) vitreous,  
 crystalline limy dolomite  
 10% dolomite 88% sand 2% phosphate
- 440-460 the same as 420-440 with white limestone shell  
 fragments  
 2% phosphate 7% limy dolomite 8% limestone 83% sand

- 460-480 the same only more limestone fossil fragments and less limy dolomite  
2% phosphate 5% dolomite 10% limestone 83% sand
- 480-500 the same with fewer limestone fossil fragments  
1% phosphate 5% limestone 6% dolomite 88% sand
- 500-520 Hard, loose, light gray (N7), phosphatic, slightly fossiliferous, vitreous, poorly sorted, very fine grained to granular limy sand with several limy dolomite chips as in previous sample
- 500-510 Hard, loose, light gray (N7), speckled with very light gray (N8) shell fragments, phosphatic, fossiliferous, vitreous, poorly sorted, very fine grained to very coarse grained limy sand with several sandy siltstone chips  
25% limestone 75% sand
- 520-540 Hard, loose, light gray (N7), phosphatic, vitreous, poorly sorted, very fine grained to granular, averaging coarse grained, slightly dolomitic sand  
2-5% phosphate 5% dolomite 90% sand
- \*540-560 Hard, loose, medium gray (N6), medium sorted, very coarse grained, dolomitic limy sand; phosphatic, fossiliferous  
10% dolomite 15% limestone 75% sand
- 550-560 Hard, loose, very light gray (N8), very slightly phosphatic, fossiliferous, vitreous, poorly sorted, very fine grained to very coarse grained, limy sand with only a few dolomite chips  
10% limestone 90% sand
- 560-572 the same only slightly more pelecypod shell fragments  
10% limestone 90% sand
- 560-580 the same as 540-560: Hard, loose, medium gray (N6), medium sorted, very coarse grained, dolomitic limy sand; phosphatic and fossiliferous  
10% dolomite 15% limestone 75% sand
- 580-600 Hard, loose, speckled, light gray (N7), phosphatic, vitreous, poorly sorted, fine grained to very coarse grained, averaging coarse grained, dolomitic limy sand  
5% dolomite 15% limestone 80% sand
- 590-600 Hard, loose, very light gray (N8), slightly phosphatic, fossiliferous (gastropods and pelecypods), poorly sorted, coarse grained, rounded, limy sand with less than one percent dolomite chips  
10% limestone 90% sand
- 595-600 the same except less limestone  
3% limestone 97% sand

- 600-610 Hard, loose, very light gray (N8), phosphatic, vitreous, rounded, poorly sorted, coarse grained, sand with less than one percent limestone fragments.  
100% sand
- \*610 Hard, loose, yellow gray (5Y 8/1), phosphatic, micaceous, fossiliferous, dull, micrograined, sandy limestone sand is poorly sorted, fine grained to granular  
40% sand 60% limestone
- 610-620 the same with some lignite and several dolomite chips; the sand is poorly sorted, very coarse grained  
45% sand 55% limestone
- \*620-630 Hard, loose, yellow gray (5Y 8/1), phosphatic, very fossiliferous (spines, gastropods, and peld-cypods), dull, micrograined, sandy limestone  
25% sand 75% limestone
- 620-640 Hard, loose, very light gray (N8), phosphatic, very slightly fossiliferous, poorly sorted very coarse grained, rounded sand with less than one percent limestone fossil fragments  
100% sand
- 630-640 the same only more limestone fossil fragments and a few extraneous iron (?) cemented sand aggregates  
2% limestone 98% sand
- 640-660 similar to 620-630; Hard, loose, yellow gray (5Y 8/1), phosphatic, very fossiliferous, dull, micrograined, sandy limestone  
25% sand 75% limestone
- 650-660 Hard, loose, very light gray (N8), phosphatic, sub-rounded, polished, vitreous, poorly sorted, coarse grained sand with several limestone fragments  
100% sand
- \*660-670 Hard, loose, very pale orange (10YR 8/2), phosphatic, very fossiliferous (echinoids (?) and bryozoans), dull, micrograined, sandy limestone  
45% sand 55% limestone
- 650-690 Hard, loose, very light gray (N8) mottled with light gray (N7), phosphatic, fossiliferous, dull, poorly sorted, fine grained to very coarse grained limy sand  
40% limestone 60% sand



- 660-680 Hard, loose, light gray (N7), speckled with very pale orange (10YR8/2), lignite, slightly phosphatic, fossiliferous (bryozoans), subrounded, poorly sorted, medium grained to pebbly limy sand  
40% limestone 60% sand
- 670-680 Hard, loose, light gray (N7), slightly phosphatic, very slightly pyritic, very slightly fossiliferous, angular to subrounded, vitreous, some polishing, poorly sorted, very fine grained to very coarse grained sand with less than one percent limestone fossil fragments  
100% sand
- 680-700 Hard, loose, very pale orange (10YR 8/2) limestone mottled with medium light gray (N6) sand, phosphatic, fossiliferous, vitreous to dull smoky gray quartz, medium sorted, medium grained to very coarse grained, limy sand  
45% limestone 55% sand
- 700-720 Hard, loose, yellow gray (5Y 8/1), very slightly phosphatic, a couple of pieces of glauconite in limestone aggregates, fossiliferous, dull, micrograined sandy limestone with a couple of pieces of siltstone chips  
45% sand 55% limestone
- 720-730 Hard, loose, very pale orange (10YR 8/2) limestone mottled with medium light gray (N6) sand, phosphatic, micaceous, fossiliferous, vitreous, subangular, poorly sorted, very fine grained to very coarse grained limy sand  
40% limestone 60% sand
- 730-740 Hard, fresh, very light gray to white (N8-N9), fossiliferous, dull, micrograined, limestone with less than one percent sand  
100% limestone
- 740-750 Hard, loose, speckled yellow gray (5Y 8/1) sand with white (N9) limestone, slightly phosphatic, very slightly pyritic, fossiliferous, subrounded to subangular, poorly sorted, fine grained to granular limy sand with less than one percent siltstone  
25% limestone 75% sand
- 740-760 Hard, loose, light gray (N7), speckled with medium gray (N5), phosphatic, dull to vitreous, subrounded to subangular, polished, poorly sorted sand  
100% sand

- 750-760 Hard, loose, yellow gray (5Y 8/1), slightly iron stained, mega-fossils, micaceous, very slightly phosphatic, dull, poorly sorted, very fine grained to very coarse grained limy sand with some iron (?) cemented, moderate red brown (10R 4/6) micaceous, sandy aggregates as found in sample 100-160  
20% limestone 80% sand
- 750-780 similar to 750-760; limy sand with some lignite slightly more phosphate, and poorly sorted sand medium grained to granular averaging very coarse grained with several siltstone chips  
25% limestone 75% sand
- 760-770 Hard, loose, very pale orange (10YR 8/2) mottled with medium light gray (N6), phosphatic, fossiliferous, poorly sorted, medium grained to granular averaging very coarse grained limy sand  
45% limestone 55% sand
- 770-780 no change
- 776-800 Hard, loose, light gray (N7), very slightly feldspathic, phosphatic, dull to vitreous, poorly sorted, coarse grained, limy dolomitic sand dolomite as hard gray orange (10YR 7/4) resinous, and crystalline
- 780-790 Hard, loose, light gray (N7), speckled with limestone, phosphatic, micaceous, fossiliferous, poorly sorted, coarse grained, limy sand  
40% limestone 60% sand
- 790-800 the same except sandy limestone  
40% sand 60% limestone
- 790 Hard, loose, spotted very pale orange (10YR 8/2), very slightly glauconitic, slightly feldspathic, a few pieces of phosphate, pelecypod fossils, poorly sorted, fine grained to very coarse grained, slightly frosted, dull to vitreous, silty limy sand  
5% siltstone 20% limestone 75% sand.
- 800-810 Hard, loose, medium gray (N5) speckled with white limestone, very phosphatic, micro-fossils, vitreous to dull smoky gray quartz, subrounded, poorly sorted, medium to granular averaging very coarse grained limy sand  
25% limestone 75% sand

- 800-810 (b) Hard, loose, very pale orange (10YR 8/2) speckled with dusky red (5R 3/4) cemented sand aggregates, slightly feldspathic, pelecypod fossils, poorly sorted, coarse grained, slightly frosted, vitreous, subangular, limy sand aggregates as mentioned previously are possibly iron cemented, subspherical and about 1mm. across  
10% limestone 90% sand
- 800-830 Hard, loose, very pale orange (10YR 8/2), feldspathic, micaceous, vitreous, angular, poorly sorted, fine to very coarse grained sand with some aggregates as in last sample and possibly two percent limestone fossils  
2% limestone 98% sand
- 800 Hard, loose, spotted, yellow gray (5Y 8/1) sand with medium dark gray (N4) siltstone, feldspathic, slightly micaceous, very slightly phosphatic, fossiliferous, subangular, vitreous, poorly sorted, very fine grained to very coarse grained limy silty sand  
5% limestone 35% siltstone 60% sand
- 810-820 similar to 800-810 (b); limy sand with red aggregates, limestone predominately as pelecypod fragments, but with some micrograined, very slightly glauconitic, limestone  
30% limestone 70% sand
- 810 Hard, loose, light gray (N7) sand mottled with yellow gray (5Y 8/1) dolomite, phosphatic, very slightly feldspathic, subangular to subrounded, poorly sorted, very coarse grained dolomitic sand with 1-2% limestone  
45% dolomite 55% sand
- 830-840 Hard, loose, speckled light gray (N7) with white limestone, phosphatic, subrounded, medium sorted, very coarse grained limy sand with several pieces of dolomite  
45% limestone 55% sand
- 867-877 similar to 810; Hard, loose, spotted light gray (N7) with yellow gray (5Y 8/1) dolomite, phosphatic, feldspathic, some lignite, subrounded, poorly sorted, coarse grained to granular limy dolomitic sand  
5% limestone 40% dolomite 55% sand
- 880-890 Hard, loose, spotted very pale orange (10YR 8/2), very slightly feldspathic, a few pieces of phosphate, fossiliferous, poorly sorted fine grained to coarse grained silty limy sand  
1% siltstone 20% limestone 79% sand

- 890-900 Hard, loose, yellowish gray (5Y 8/1), phosphatic, slightly feldspathic, vitreous, subangular, poorly sorted, very fine grained to very coarse grained slightly limy dolomitic sand  
2% limestone 15% dolomite 80% sand
- 900-910 Hard, loose grayish orange (10YR 7/4), phosphatic, dull to vitreous, non-porous, crystalline sandy dolomite  
30% sand 70% dolomite
- 906 Hard, loose, yellow gray (5Y8/1), slightly phosphatic, slightly micaceous, very slightly feldspathic, angular, dull, frosted, poorly sorted, fine grained to very coarse grained sand with less than one percent limestone  
100% sand
- 910-920 the same as 900-910  
20% sand 80% dolomite
- 900-930 Hard, loose, yellow gray (5Y 8/1), micaceous, slightly lignitic, slightly feldspathic, frosted, angular, poorly sorted, coarse grained slightly silty sand  
5% siltstone 95% sand
- 920-930 (?) the same as 900-930  
5% siltstone 95% sand
- 920-930 (b) Hard, loose, very light gray (N8) speckled with grayish black (N2) phosphate, fossiliferous (spines) subrounded, dull, well sorted very coarse grained sand  
5% phosphate 5% limestone 90% sand
- 930-970 Hard, loose, medium light gray (N6) speckled with yellow gray (5Y 8/1) dolomite, phosphatic, subangular to subrounded, vitreous, poorly sorted, coarse grained dolomitic sand  
25% dolomite 75% sand
- 940-950 the same only very dolomitic sand  
45% dolomite 55% sand
- 960-970 Hard, loose yellow gray (5Y 8/1), micaceous, very slightly fossiliferous, dull, subangular, poorly sorted, very fine to very coarse grained limy sand with several siltstone chips  
8% limestone 92% sand
- 970-980 Hard, loose, light gray (N7), speckled with medium gray (N5) siltstone, very slightly phosphatic, micaceous, dull, subrounded, poorly sorted very fine to very coarse grained limy silty sand  
5% limestone 10% siltstone 85% sand

- 980-998 Hard, loose, medium light gray (N6), speckled, slightly micaceous, very slightly fossiliferous, poorly sorted, limy silty sand  
5% limestone 10% siltstone 85% sand
- 900 Hard, loose, medium gray (N5), unknown accessory, subangular, vitreous, poorly sorted, very fine grained to granular, limy silty sand  
10% limestone 40% siltstone 50% sand
- 990-1000 the same only very slightly phosphatic, very slightly feldspathic, and poorly sorted to pebbles  
10% limestone 42% siltstone 48% sand
- 1000-1010 Fresh, brittle, fissile, medium dark gray (N4), slightly micaceous, dull, limy sandy siltstone with limestone pelecypod fossil fragments possibly from caving  
2% limestone 43% sand 55% siltstone
- 1000-1020 the same with limestone mega-fossils
- 1020-1030 Hard, fresh, loose, light gray (N7) speckled with (N5) to (N6) siltstone, slightly phosphatic, slightly feldspathic, pelecypod fossils, subrounded, polished, poorly sorted, very fine grained to granular limy silty sand  
5% limestone 35% siltstone 60% sand
- 1000-1040 the same only more fossil fragments  
10% limestone 30% siltstone 60% sand
- 1000-1050 Hard, loose, speckled (N7) light gray, feldspathic, fossiliferous, angular, poorly sorted, very fine grained to granular limy silty sand with some iron cemented aggregates  
15% limestone 25% siltstone 60% sand
- 1000-1060 Hard, loose, light gray (N7), phosphatic, with dull reddish brown unknown accessory mineral, mega-fossils, dull, subrounded, poorly sorted, very fine grained to granular limy silty sand  
10% limestone 15% siltstone 75% sand
- 1030-1040 Hard, loose, light gray (N7), phosphatic, feldspathic, slightly fossiliferous, subrounded, poorly sorted, coarse grained, limy silty sand
- 1060-1070 Hard, loose, light gray (N7) sand speckled with medium dark gray (N4) siltstone, very slightly feldspathic, couple of mica flakes, angular, frosted, vitreous, poorly sorted, very fine grained to very coarse grained averaging coarse grained silty sand with less than one percent limestone and a few iron cemented aggregate 35% siltstone 65 sand

- 1080-1090 similar to the previous sample; lignitic, very slightly feldspathic, slightly micaceous, angular to subangular, poorly sorted, very fine grained to granular silty sand with less than one percent limestone and several rosy quartz grains  
35% siltstone 65% sand
- 1090-1100 the same only slightly more siltstone  
49% siltstone 51% sand
- 1100-1120 Hard, loose, yellow gray (5Y 8/1) sand speckled with medium dark gray (N4) siltstone, micaceous, feldspathic, lignitic, unknown brown accessory mineral, angular to subangular, frosted to vitreous, poorly sorted, very fine grained to granular silty sand  
20% siltstone 80% sand
- 1100 Hard, loose, very light gray (N8), slightly micaceous, slightly feldspathic, frosted poorly sorted, very coarse grained slightly silty sand  
5% siltstone 95% sand
- 1100-1200 similar to 1100; feldspathic, unknown accessory mineral (resinous), subangular, poorly sorted coarse grained, sand with some siltstone chips  
5% siltstone 95% sand
- 1200-1210 no change only less siltstone and slightly more mica  
2% siltstone 98% sand
- 1200-1220 Hard, loose, light gray (N7) sand speckled with siltstone, feldspathic, very slightly micaceous, couple of phosphatic nodules, unknown accessory mineral, dull, angular, poorly sorted, very fine grained to granular silty sand with less than one percent limestone  
30% siltstone 70% sand
- 12\_\_-1240 Hard, loose, yellow gray (5Y 8/1), feldspathic, slightly micaceous, dull to vitreous, poorly sorted, slightly silty sand with some brown iron cemented aggregates  
5% siltstone 95% sand
- 1200-1250 the same only far fewer iron cemented aggregates  
5% siltstone 95% sand
- 1200-1260 Hard, loose, medium light gray (N6) sand speckled with medium dark gray (N4) silty limestone, feldspathic, dull, subangular, medium sorted, coarse grained to granular gravel with many iron cemented aggregates and about five percent loose silt

- 1200-1270 Hard, loose, yellow gray (5Y 8/1) speckled with feldspar and dark yellow orange (10YR 6/6) quartz grains, feldspathic, dull, subangular, poorly sorted, fine grained to granular averaging very coarse grained to granular sand to gravel with some siltstone  
5% siltstone 95% sand
- 1200-1280 Hard, loose, yellow gray (5Y 8/1), slightly micaceous, feldspathic, one piece of pyrite, dull to vitreous, subangular, poorly sorted, coarse grained silty sand  
5% siltstone 95% sand
- 1200-1290 Hard, loose, very light gray (N8), feldspathic, with a couple of mica chips, unknown accessory mineral (iron oxide (?)), frosted angular, medium sorted, coarse grained to granular silty sand with less than one percent limestone fossil fragments and some iron cemented aggregates  
5% siltstone 95% sand
- 1310-1320 Hard, loose, yellow gray (5Y 8/1) speckled with grayish red (10R 4/2) iron cemented aggregates, feldspathic, very very slightly micaceous, fossiliferous, very slightly pyritic, dull, subangular, poorly sorted, fine grained to granular, slightly silty limy sand  
5% siltstone 10% limestone 85% sand
- 1320-1330 the same with lignite and slightly less limestone fossil fragments
- 1320-1360 Hard, loose, yellow gray (5Y 8/1), feldspathic, unknown black glassy accessory mineral, unknown red accessory, iron cemented aggregates, fossiliferous, dull, slightly frosted, subangular, poorly sorted, medium grained to granular averaging very coarse grained silty limy sand  
2% siltstone 5% limestone 90% sand
- 1340-1350 no change
- 1350-1360 no change
- 1370-1380 the same only slightly micaceous, greater percentage of siltstone, and poorly sorted fine grained to granular  
5% siltstone 5% limestone 90% sand
- 1380-1390 no change
- 1390-1400 no change

- 1400-1410 Hard, loose, yellow gray (5Y8/1), feldspathic, very very slightly micaceous, mega-fossils, unknown accessory mineral, dull, subangular, medium sorted, coarse grained to granular silty gravel with less than one percent limestone  
15% siltstone 85% sand
- 1400-1420 the same only slightly more micaceous  
15% siltstone 85% sand
- 1400-1430 Hard, loose, light gray (N7) sand speckled with medium gray (N5) siltstone, slightly feldspathic, iron cemented aggregates, lignite, fossiliferous, very slightly micaceous, slightly frosted, subangular, poorly sorted, fine grained to very coarse grained averaging coarse grained, silty sand  
20% siltstone 80% sand
- 1400-1440 Hard, loose, light gray (N7) sand with medium gray (N5) siltstone, slightly feldspathic, iron cemented aggregates, one piece of phosphate, very slightly micaceous (one big pack), slightly fossiliferous (more so than sample 1400-1430), subangular, slightly frosted to vitreous, poorly sorted, very coarse grained, limy silty sand  
5% limestone 20% siltstone 75% sand
- \*1400-1450 similar to previous sample; feldspathic, no mica or phosphate, and less siltstone  
5% limestone 10% siltstone 85% sand
- 1400-1460 Hard, loose, yellow gray (5Y 8/1), slightly feldspathic, very few iron cemented aggregates, concoidal fracture resinous unknown accessory mineral, frosted, fine grained to very coarse grained averaging coarse grained, slightly silty sand  
2% siltstone 98% sand
- 1400-1470 similar to previous sample; feldspathic, black glassy accessory mineral, frosted, poorly sorted, very coarse grained sand  
100% sand
- 1400-1480 Hard, loose, very light gray (N8) speckled with medium gray (N5) siltstone, very slightly micaceous, feldspathic, iron cemented aggregates, subangular, frosted, poorly sorted, very coarse grained silty sand  
10% siltstone 90% sand



1400-1490 Hard, loose, yellow gray (5Y 8/1), slightly phosphatic, feldspathic, one piece of lignite, black unknown accessory mineral, a few iron cemented aggregates, frosted, subangular, poorly sorted, very coarse grained silty sand  
10% siltstone 90% sand

apparent change

1515-1525 Hard, loose, mottled grayish orange (10YR 7/4) with some iron staining, very slightly phosphatic, iron cemented aggregates, slightly feldspathic, a couple of mica chips, slightly fossiliferous (mega-fossils), unknown accessory mineral, dull, 95% well sorted, very coarse grained, 5% medium grained to coarse grained, gravel with 2% siltstone  
2% siltstone 98% gravel

1520-1530 the same with more siltstone  
5% siltstone 95% gravel

1530-1540 Hard, loose, very pale orange (10YR 8/2), slightly iron stained, slightly feldspathic, iron cemented aggregates, unknown accessory mineral, angular, frosted, poorly sorted, very fine to very coarse grained sand  
100% sand

1540-1550 the same sand with 10% siltstone, silty sand  
10% siltstone 90% sand

1550-1560 the same as the previous sample with a couple of mega-fossils and a couple of mica chips  
10% siltstone 90% sand

1560-1567 Hard, loose, grayish orange (10YR 7/4) slightly iron stained, feldspathic, unknown accessory mineral, subangular, slightly frosted, poorly sorted, very coarse grained, sand with less than one percent siltstone fragments  
100% sand

1565-1575 Hard, loose, yellow gray (5Y8/1), slightly iron stained, feldspathic, unknown accessory mineral, subangular, slightly frosted, poorly sorted, very coarse grained sand with a couple of siltstone fragments  
100% sand

1578-1585 similar to the previous sample with a couple of pieces of phosphate, couple of limestone fossils, a pack of mica, medium sorted, very coarse grained silty sand  
5% siltstone 95% sand

- 1585-1590 similar to the previous sample with no phosphate and very little mica  
5% siltstone 95% sand
- 1590-1595 similar to the previous sample; well sorted, very coarse grained to granular silty sand  
5% siltstone 95% sand
- 1595-1600 Hard, loose, pale yellow brown (10YR 6/2), slightly iron stained, slightly feldspathic, unknown black glassy accessory, subangular, slightly frosted, poorly sorted, medium grained to granular silty sand  
45% siltstone 55% sand
- 1600-1605 Hard, loose, yellow gray (5Y 8/1), feldspathic, unknown accessory, very slightly micaceous, slightly frosted, subangular, poorly sorted, very coarse grained, slightly silty sand  
5% siltstone 95% sand
- 1600-1623 no change
- 1605-1608 the same only slightly coarser grained, very coarse grained to granular silty sand  
5% siltstone 95% sand
- 1608-1612 Hard, loose, light gray (N7) with some iron staining, feldspathic, unknown black accessory, very slightly micaceous, subangular, dull, poorly sorted, granular, silty gravel  
8% siltstone 92% gravel
- 1620-1628 Hard, loose, yellow gray (5Y8/1), iron stained, feldspathic, slightly micaceous, one piece of phosphate, unknown accessory mineral, subangular, slightly frosted, medium sorted, fine to coarse grained slightly silty sand  
5% siltstone 95% sand
- 1629-1637 Hard, loose, yellow gray (5Y8/1), iron stained, feldspathic, unknown black accessory and unknown red accessory mineral, dull, subangular, poorly sorted, very coarse grained silty sand  
15% siltstone 85% sand
- 1645-1654 the same with some granules  
10% siltstone 90% sand

- 1654-1661 the same as the previous sample, poorly sorted, medium grained to granular silty sand  
5% siltstone 95% sand
- 1668-1676 Hard, loose, speckled grayish orange (10YR 7/4), very feldspathic, very slightly micaceous, unknown accessory, subangular, slightly frosted, poorly sorted, very fine grained to granular silty sandy gravel  
15% siltstone 85% sandy gravel
- 1676-1684 the same only less siltstone and fewer granules  
10% siltstone 90% sand
- 1684-1693 Hard, loose, grayish orange (10YR 7/4), iron stained, feldspathic, very very slightly micaceous, unknown red accessory mineral, subangular, slightly frosted, poorly sorted, coarse grained slightly silty sand  
5% siltstone 95% sand
- 1694-1703 the same poorly sorted fine grained to granular silty sand  
5% siltstone 95% sand
- 1703-1711 Hard, loose, moderate orange pink (5YR 8/4), feldspathic, a couple of mica flakes, unknown red accessory, unknown black accessory, subangular, slightly frosted, poorly sorted, fine grained to granular averaging coarse grained slightly silty sand  
less than 5% siltstone 95% sand
- 1710-1726 no change  
5% siltstone 95% sand
- 1726-1734 Hard, loose, grayish orange (10YR 7/4), feldspathic, a couple of pieces of phosphate, unknown red and unknown black accessory minerals, subangular, slightly frosted, well sorted very coarse grained sand  
100% sand
- 1744-1753 no change  
100% sand
- 1750-1761 Hard, loose, very pale orange (10YR 7/4), feldspathic, unknown black and unknown red accessory mineral, subangular, dull, poorly sorted, granular, very slightly silty sandy gravel  
5% siltstone 95% gravel
- 1761-1770 the same with slightly less siltstone and a greater percentage of coarse grained sand silty gravel  
2% siltstone 98% gravel

- 1770-1778 Hard, loose, pale yellow brown (5YR 6/2), feldspathic, slightly micaceous, unknown red and unknown black accessory minerals, subangular, dull, poorly sorted, fine to very coarse grained, very slightly silty sand  
2% siltstone 98% sand
- 1770-1792 no change
- 1806-1811 Hard, loose, moderate yellow brown (10YR 5/4), very strongly iron stained, feldspathic, very slightly micaceous, iron cemented aggregates, unknown red and unknown black accessory minerals, subangular, dull, poorly sorted, fine to very coarse grained, slightly silty sand  
5% siltstone 95% sand
- 1811-1816 Hard, loose, pale yellow brown (10YR 6/2), iron stained, very feldspathic, unknown red accessory, subangular, slightly frosted, dull, poorly sorted fine to very coarse grained, slightly silty sand  
2% siltstone 98% sand
- 1815-1820 Hard, loose, light olive gray (5Y8/1), feldspathic, very slightly micaceous, dull, poorly sorted, very fine grained to granular silty gravel  
35% siltstone 65% gravel
- 1816-1821 the same as the previous sample only slightly coarser gravel with several pieces of limestone  
35% siltstone 65% gravel
- 1821-1826 Hard, loose, grayish orange (10YR 7/4), iron stained, feldspathic, one piece of glauconite, unknown red accessory mineral, dull, subangular, poorly sorted, fine grained to granular, slightly silty sand with less than one percent limestone  
5% siltstone 95% sand
- 1836-1841 Hard, loose, pale red (10R 6/2), iron stained, feldspathic, unknown elongated subhedral brown crystal, unknown green accessory mineral, dull, subangular, poorly sorted, coarse grained sand with less than one percent siltstone  
100% sand
- 1851-1855 Hard, loose, grayish orange (10YR 7/4), feldspathic, very slightly micaceous, magnetic iron cemented aggregates, one 1 1/2 mm. metal sphere, subangular, dull, poorly sorted, fine grained to granular silty sand  
5% siltstone 95% sand