

A report of all cores, drill stem tests and production tests on the Richardson & Bass #1 Cobb-Federal, 660 F A & W 1 Sec. 23 T. 20S R 31E. Elevation 3515 D F. The well was spudded 5-29-52 and completed 7-27-53. The cost of the well was slightly over \$1,000,000.00. The total depth was 16,459' by drillers measurements and 16,469' by Schl. measurements in the basement complex. The well was completed at a plug back total depth of 7173 three perfs 7003-7016 and 7022-7035 in the lower Delaware Sand.

This report was made possible through the courtesy of Richardson & Bass, Carlsbad, New Mexico.

The typing of this report was donated by the Roswell Sample Laboratory, Roswell, New Mexico.

The paper and reproduction was furnished by the New Mexico Oil Scouts Association, Hobbs, New Mexico.

The report was prepared for the New Mexico Oil Scouts Association by Bob Boling, The Superior Oil Company, Roswell, New Mexico.

DST #1 840-900 op 1 hr. Rec 122' saltwater (Looking for fresh water well. F P 90-110 SIP 110/15)

Diamond Core #1 2405-2465 Rec 60' being 8' dolo, anhy, buff, Suc to xln, tr P.F. poro, fair scat stain, sli fluor and cut; sulp odor. 2' as above except no poro. 2' as above except, fair P.F. poro; 7' as above w/gyp stylolites, no poro. 2' as above w/tr P.F. poro, no stain, fluor; or cut. 6' Dolo; anhydritic, gry to buff, suc w/dolo concretions, tr pp poro, light scat stain, dull fluor; light cut, tr sulp odor. 5' dolo, anhy, gry to buff, suc. tr pp poro, tr scat stain, dull fluor. Light cut, tr sulp odor. 3' as above w/tight vert frac., w/dead oil stain, gilsonite. no poro, light cut, and light sulp odor. 4' Dolo; anhy, gry to buff, suc., no poro tr scat stain, light spotted dull fluor; tr cut, on tr sulp odor. 3' as above except tr vuggy poro and light scat stain. 5' as above except no poro; stain, fluor or cut w/sulp odor. 1' as above except fair vuggy poro fair scat stain, fair spotted dull fluor., fair cut and odor. 10' Dolo, anhy, gry to blue to clear. no poro, stain, fluor or odor. 2' as above except tr scat stain, fluor, light cut and sulp odor. (No dip recognized in this core.)

Diamond Core #2 2465-2509. Rec 43' being 9' Dolo, anhy, gry to buff, xln, no poro., tr stain, tr dull fluor., light cut and sulp odor. 4' Dolo, tan to gry, suc w/calc xls, dead oil stain, fair vuggy poro light scat. stain tr dull spotted fluor., light cut, sulp odor. 6' as above except a few tight fractures and good vuggy poro., fair stain, light spotted dull fluor. fair cut, sulp odor. 4' as above except fair spotted dull fluor. 5' Dolo., gry to buff, Suc, w/calc xls, dead oil, good scat. vuggy poro., fair stain, fair spotted dull fluor., tr cut and sulp odor. 2' as above except fair scat vuggy poro., and light stain. 6' Dolo, gry to buff, suc to sub xln w/calc xls, gilsonite, good scat vuggy poro no stain or fluor tr cut and tr sulp odor. 3' as above except fair scat vuggy poro; fair stain, light spotted dull fluor., fair cut, sulp odor. 4' Dolo. gry to buff, suc. w/tr scat vuggy poro, no stain, fluor or cut sulp odor. (No dip recognized.)

DST #2 testing the Tansill 2390 in csg. to 2510 open 1 hr 45 min. Rec. 1808' muddy sulp wtr, 460' sulp wtr cut mud SIP 195-845 SIP failed

Diamond Core #3 2509-2559' Rec 43' being 2' Lime, dns, suc to xln, gilsonite, dead low gravity oil stain, good vuggy poro, tr scat stain, tr spotted dull fluor. tr cut, sulp odor. 6' lime, gry w/ stylolites, dead low gravity oil stain w/vert frac., tr vuggy poro, light stain in frac., light spotted dull fluor, light cut, sulp odor. 5' Dolo, limey, tan, Suc to xln., w/good cut. 5' Dolo, limey, tan, Suc. to xln, dead low gravity oil stain, gilsonite, good small vuggy poro, light spotted dull fluor., good cut, tr sulp odor. 4' Dolo, limey, tan to gry, suc to xln, dead low gravity oil stain, gilsonite tr scat vuggy poro, tr spt dull fluor., good cut., sulp odor. 1' same as above except light vuggy poro., fair stain. 7' Lime, gry, Suc to xln, gilsonite dead low gravity oil stain, tr scat vuggy poro tr scat stain, tr spt. dull fluor. good cut, tr sulp odor. 1' lime, gry, suc to amorphus, dead low gravity oil stain, gilsonite, fair vuggy poro. and fair cut 2' as above w/tight vert frac, formation slickensides, tr scat vuggy poro., tr stain in frac., no fluor or cut; sulp odor. 2' Lime, gry, suc to xln, dead oil and gilsonite, tr scat vuggy poro, tr scat stain, tr spotted dull fluor., fair cut., sulp odor. 8' Lime, gry to tan, Suc to xln, no poro, stain, fluor; cut or odor. (No dip recognized.)

Diamond Core #4 2559-2608 Rec 25' being 4' Lime, gry dns, Suc to amorphus, gilsonite and scat dead oil, tr scat vuggy poro, tr scat stain, tr spotted fluor, good cut sulp odor. 1' Dolo, limey, cream, suc, scat dead oil, tr scat vuggy poro, light scat stain, no fluor, tr cut, sulp odor. 2' Lime, gry amorphus, scat low gravity oil, tr vuggy poro., fair scat stain, tr spt, dull fluor. fair cut, sulp odor. 3' Lime, gry to cream, suc to amorphus, light scat vuggy poro, Lt scat stain, no fluor. Lt cut, sulp odor. 3' as above except no poro, stain, fluor., or cut sulp odor. 3' Lime, gry, amorphus, tight tight calc filled vert frac., good vuggy poro, tr scat stain, no fluor., tr cut, sulp odor. 4' Lime gry to cream, amorphus, light vuggy poro, no stain, fluor or cut, sulp odor. 3' Lime, gry, sub xln, tr vuggy poro; trace scat. stain, trace spt dull fluor. fair

fair cut, Sulp odor. 1' Lime, tan xln, no poro, stain, fluor or cut, Sulp odor. 6" Lime; gr, no poro, tr stain, no fluor. tr cut; Sulp odor. 6" Lime, cream, xln; calc concentrations in bedding plane, w/tr dead oil, no poro, stain, fluor. or cut, sulp odor. (No dip recognized)

Diamond Core 15 2608-2629 Recovered 18' being 1' Lime, tan, Suc, tight vert. frac., no poro, light stain in frac, light dull fluor in frac., tr cut; Sulp odor. 2' Lime, gry to buff, suc, tight vert frac., light spotted vuggy poro, fair scat. stain, light spotted fluor., fair cut, sulp odor. 1' Lime, gry to tan, amorphus, dead oil in vugs, fair large vuggy poro, no stain fluor, cut, sulp odor. 2' lime, gry, amor, tight vert frac good small vuggy poro, light scat stain, tr spotted fluor, light cut, sulp odor. 2' Lime, cream, Suc, dns, tight vert, frac., tr vuggy poro., no stain or fluor. 3' Lime, cream, suc, dns foss. tr vuggy poro 1S. 2' Lime, buff, suc, dns, tight vert frac. 1' Lime, buff to gry, suc. amor. No poro No show. 1' Lime, cream suc, tight vert. frac., good small vuggy poro, Light scat stain, tr spotted fluor., fair cut, Sulp odor. 3' Lime, buff, granular; dead oil in tight vert frac; tr large vuggy poro, no show, sulp odor. (No dip recognized.)

DST 3 4762-4816 testing the San Andres. open 2 hrs Rec 1270' mud cut salt water.

F P 205-630

20" SIP 1735

Diamond Core 6 5416-5436 Rec 20' being 10' sd, gry, V. F. G., Sli shaley, Sli Dolomitic to Silicon cement; fair poro, no stain or fluor., tr cut. no odor. 2' as above except light cut. 8' as above with very small shale partings and tr cut. (Good to fair 20 dip 5416-36 in sand w/scat shale partings.)

DST 4 6032-6058 open 1 hr 5 min Rec. 1000' WB / 10' Sli W C L.

F P 400-400

15" SIP 910

Diamond Core 7 6248-6268 Rec 20' being 12' sd, gry, Vfg; w/very thin shale laminations, sli calc. cement, tr poro, fair scat stain, good scat pale yellow fluor. excellent cut; good odor. 2' as above except very shaley, no poro, tr stain tr scat pale yellow fluor; fair cut; good odor. 2' as above except no poro, stain or fluor; tr cut and light odor. 3' shale, black, very sandy. 1' sd, gry, v f g w/very thin shale laminations, sli calc cement; tr poro; light scat stain, fair scat pale yellow fluor., light cut, good odor. (Fair to poor dil 00 6248-58 in sd and shale lam. good 50 dip 6264-68 in sd and shale lam.)

DST 5 6234-6268 1000' WB. open 1 hr. Rec 1000' WB. / 90' mud.

F P 435-435

15" SIP assumed to be zero since it did not exceed weight of water blanket.

Diamond Core 8 7014-7029 No recovery

DST 6 (tstg Delaware) 6983-7029 1000' WB open 2 hrs 40 min. g.t.s. 61" no gauge. Rec. 5282' of sweet gas in drill pipe, 1000' OGCWB / 694'

H O & G C M

F P 500-700

20" SIP 2450

Diamond Core 9 7029-7059 Rec 30 1/2 feet being 1 1/2' sd, gry, v f g sli calc cement, small blk sh. lamin., tr poro, no stain, light fluor in shale partings, no cut; tr odor; 2' 7" as above except w/large blk sh lamin, showing 170 dip, no poro, or stain, light fluor along shale partings, tr cut and tr odor. 4' sd, gry, vfg, calc. cement; light poro stain none, fluor. cut or odor. 2' as above w/very fine blk sh. lamin; no poro, stain, tr spt fluor along sh partings, no cut, tr odor. 1' as above except more shaley; no poro, tr of light stain, tr spt dead fluor; no cut or odor. 4' 2" sd, v f g sli calc cement, light poro. no stain, good fluor, cut and odor. 1' 1" sh; blk very sdy w/sd lamin. no poro., tr of light stain, tr spt fluor along shale partings, fair cut, no odor. 6" sd, gry, vfg., sli calc cement, light poro; no stain, excellent fluor., good cut and odor. 3' 4" as above except no fluor., cut or odor. 3" as above except excellent fluor; good cut and odor. 1 3/4" as above except no fluor, cut or odor. 1" as above except good fluor, cut and odor. 4" as above w/small blk sh lamin, no poro., tr of light stain, tr spt fluor., light cut, no odor. 8" sd, gry, v f g., Sli calc. cement; light poro., no stain, excellent fluor; good cut and odor. 1' 3" as above except no fluor; cut or odor. 3" as above except excellent fluor. and cut and good odor 4' 1" as above w/few scat P2G and no fluor; cut or odor. 3" sd, gry, v f g., Sli calc cement and few P2G, light poro., no stain, good fluor; cut and odor. (Good 15-250 dip 7030-32 in sand w/large sh streaks, good 40 dip 7035-48 in sand w/small shale streaks.)

DST 7 (testing Delaware Sd) 6981-7059. No water blanket open 4 hrs
16 min g.t.s. 33" gauged 140 H₂O 4 P D Recovered 305' H₂O & sli HC
oil, 40.9° grav. cor. / 876' H₂O & 33"
P P 300-600 20" SIF 2350'

Diamond Core #10 7059-7104 Rec 45' being 5" sd, gry, sli calc cement, w/few scat FQG, friable, no stain, good scat fluor., tr cut, light odor. 1' as above except silty and tight no poro, stain fluor cut or odor. 1' sd; gry, scat sli calc cement w/few scat FQG, friable, no stain, good fluor cut and odor. 5' as above except no fluor., cut or odor. 1.5' as above except good fluor, cut and odor. 5' as above except no fluor, cut or odor. 1' as above except tr stain, good spt fluor good cut and odor. 2' as above except no stain, fluor; cut or odor. 1' as above except tr stain, good scat fluor., good cut and odor. 6' as above except more silty, slightly tighter than above; no show. 1' as above except very tight no show. 8' sd, scat sli calc. cement w/few scat FQG, silty, slightly tight, no show. 1'5" sd, gry scat sli calc cement. w/few scat FQG, friable, tr stain, good spt fluor; good cut and odor. 4'5" as above except no show. 5'5" sd, gry, tight w/thin blk sh lamin., light stain, light fluor., along sh partings, no cut, light odor. 5" sd; gry, scat sli calc cement, w/few scat FQG, friable, light stain, good fluor; cut and odor. (Fair 20 dip 7085-39 in sand.)

Diamond Core #11 7104-7154 Rec 36' being 6" sd, fine grained, well cemented w/sli calc cement, silty, w/few FQG, sli tight, no show. 6" as above except good fluor; fair cut and odor. 5 1/2' sd, fine gr sli silty to shaley w/thin blk sh lamin, tight, no show. 3' shale black. 10 1/2' sd, fine grained, scat sli calc cement, silty, w/few scat FQG and some pyrite and 5' L" shale stringers, friable, no stain, good fluor, cut and odor. 1' sd, gry. fine grained, scat sli calc cement, silty, friable, no show w/few scat FQG and some pyrite, 15" sd, gry, fine grained, sli calc. cement, silty, friable, no stain, good fluor., cut and odor. 29" as above w/few small shale stringers, friable with no show. 19" sd, gry, fine grained, sli calc cement, sli silty, friable, no stain, good scat fluor., tr cut and fair odor. 15" sand as above except no show. 16" as above except good fluor, cut and odor. 10" as above tight w/no show. 4" as above except friable, no stain, good fluor., cut and odor. 6' sand as above w/sh breaks. 1' from top and bottom, no stain, fluor., tr cut and no odor. (Good to fair 50 dip 7104-54 in sd w/sh lamin.)

NOTE: The lost core interval is believed to have been at the bottom due to the mechanical failure of the core catcher.

DST 8 (test Delaware Sand) 7055-7154 open 3 hrs 21 min. Rec. 555' sli O & G C H

F P 2-330 55" SIF 2030

Diamond Core #12 7154-7209 Rec 34' being 2' sand, gry, v f g, tight, silty w/blk sh lamin., no stain, light spt fluor along sh partings, tr cut and odor 3' sd, fine grained, sli calc. cement, tight, hard silty, no show. 6' sd as above, sli tight, no show 3' sd, v f g., scat sli calc cement, silty, friable no show. 3' sd, fine grained, scat sli calc. cement, silty, friable, no show. 9' sd, gry, fine to med grained, silty, w/thin blk. shale lamin. Sli tight, no show. 3' sd, med grained, scat sli calc cement, silty, w/few scat FQG, friable, no show. 2 1/2' sd, gry, v f g., sli calc cement; silty w/few scat FQG, tight, no show. (poor 20 dip 7154-7209 in sand w/shale lamin.)

NOTE: Interval of core not recovered is believed to have been lost at the bottom.

Diamond Core #13 7209-7256 Rec 42' being 15' sd, gry, v f g, Scat calc cement; silty, friable, no show. 4 1/2' as above w/streaks of thin shale lamin and stringers, sli tight, no stain, light spt fluor along shale partings, no cut, fair odor. 1' shale, blk, w/very thin sd lamin. Light spt fluor along sh partings, Light cut, fair odor. 1' sd gry, fine to med grained, scat sli calc cement, silty w/few scat FQG, FRIABLE, NO SHOW, 1 1/2' sh, blk w/thin sd lamin. Light spt fluor along sh partings, tr cut fair odor. 3' sd, v f g. sli calc cement; silty tight, no show. 3' sh; blk, w/sd lamin. no show. 1 1/2' sd, gry, scat fluor. sli calc cement, silty w/10" scat fluor. friable, no stain, good fluor, cut and odor. 3 1/2' sd, gry, fine grained, sli calc cemeny silty, friable, no show. 3' sd as above except tight, no show. 5' sd as above except w.sh stringers scat throughout, tight, no show. 1' sd, gry, v f g, sli calc cement; silty w/scat minute particles of pyrite, tight no show.

Diamond Core #14 8784-8334 Rec 50' being 4' shale, gry, limey w/ thin lamin of silty sd; no poro or stain, light spt. fluor; good odor.

2' top 6" blk sh, Limestone dark brn, fine xln, very dns, foss. no show except light to good odor. 1' sh, dark gry to blk. limey no show except good odor. 1' Lime, dark brn to blk, v f xln, cherty no show 1' sh; blk very limey, no show except sli odor. 6' Lime, dark brn to blk, fine xln, scat chert w/very small calc filled tight vert frac., sli bleeding of oil, no poro, except frac. light to fair scat stain, good stain in frac., light to fair spt fluor, fair to good fluor in frac., good odor. 1' shale, blk limey, no show. 1' Limestone, drk brn to blk, fine xln, scat chert, no show. 2' sh; blk limey, no show. 1' Lime, drk brn to blk, no show. 3' sh; blk limey; no show. 9' shale, gry, limey w/scat carbonaceous material, no show except sli odor. 5' sd, lt gry, v f g, shaley w/thin sh. lamine, no show except sli odor. 1' Lime, tan granular, very dns, sdy; no show except tr odor. 4' sd, lt gry, v f g, very shly, w/thin blk sh lamin., very tight no stain, tr spt fluor in lamin. 8826, light to fair odor. 3' sh; blk, no show except light odor. 2' sh; blk, very sdy w/sd lamin, (sd is v f g and gry) very tight, no stain, very light spt fluor in lamin; light to fair odor. (Fair to poor 2° dip 8784-89 in sh w/lime lamin. Fair to poor 2° dip 8823-32 in sand & sh lamin.

(Tstg Done Springs) STD 8397 took DST #9 w/straddle packers set 8728-8897 open 2 hrs Rec. 336' mud.
FF 120-145 15 SIF 210

Diamond Core #15 8834-43 No recovery
Diamond Core #16 8843-44 No recovery
Diamond Core 17 8847-97 Recovery 50' being 1' Lime, drk brn to blk, suc to xln, shaley, w/thin blk sh stringers, very dns, no show. 1' sh; blk, 2' sd, gry to tan, v f g, very limey & shaley, very tight, no show. 4' sd, gry to tan, v f g, sli shly & limey very tight, no show. 1' sd, gry to tan v f g, very limey very tight, no show. 5' sd, gry, v f g, sli calc cement, w/thin sh, lamin. no show except sli odor. 2' sd, gry, v f g, calc cement, very tight, no show. 1' sd, gry, v f g, sli calc cement, w/very thin sh lamin, very tight, no show except good odor. 1' sd, gry, v f g, calc cement, sli limey, very tight, no show. 1' sd, gry, v f g, sli calc cement, w/very thin sh lamin, very tight w/no show except sli odor. 1' sd, gry, v f g, very calc. very tight, no show. 6' sd, gry to tan, v f g, w/scat blk sh or carb. material (not Lamin), very tight, no show except fair odor. 1' sh, blk; very tight, no show. 2' sh; blk, limey, very tight no show. 3' sd, gry to tan, v f g, sli calc. cement w/numerous very thin sh lamin, very tight no show. 2' sh, blk. very tight, no show. 4' sd, gry to tan, v f g, very calc. cement w/numerous very thin sh lamin., very tight, no show except tr odor. 1' Sh, blk. no show. 1' sd & sh., very thinly laminated, no show except tr odor, very tight 6' sd, gry, v f g, very calc cement, sli shaley, very tight, no show. 2' sd, gry to tan, sli calc cement, very shaley; very tight, no show except tr odor. 1' limes, drk brn to blk, granular cherty, very dns, no show. 1' Sh, blk limey, very dense, no show.

Diamond Core 18 9084-9109 Rec 25' being 5' Sh, blk, w/streaks of drk brn to blk. chert, transl. to opaque; no poro, no show. 5' Sh, blk w/streaks of chert as above and lime, drk brn to blk, suc, dns, shly and cherty. no poro, no show. 5' as above w/limey sh. no poro, no show. 7' Lime, drk brn to blk, suc, shaley w/streaks of chert as above. no poro no show. 3' sh, blk, limey, w/streaks of chert as above and lime as above, 9106 1/16" very tight vert frac. no poro, no show. (very poor 11 to 13° dip 9084-9109 in shale bedding planes.)
NOTE: very thin and tight vert frac throughout core.

Diamond Core 19 9523-9544 Rec. 21' being 3' Sd, gry, v f g, sli shaley, hard; well sorted, sli calc cement; tight, no show. 1' Sd, gry, v f g, Sli calc cement, well sorted w/very tight frac., tight, light scat stain, good fluor in frac, good cut and odor. 3' Sd, gry, v f g, very shaley, sli calc cement, well sorted, tight, no show. 2' Sd, gry, v f g, Sli calc cement, well sorted, tight, light stain, good scat fluor, good cut and odor. 1' Sd, as above except very shaley tight with no show. 1' Sd, gry, v f g, calc cement; well sorted, tight no show. 1' Sd as above, tight, tr scat stain, good scat fluor, good cut and odor. 1' Sd as above w/very tight frac., tight, no stain, good fluor in frac., light cut, good odor. 3' sd, as above w/no frac., tight, no show. (No dip recognized.)

Diamond Core 20 9563-9608 Rec 27' being 1' Sh, blk, sdy, no poro, no show, 2' sh, blk; no poro, no show. 8' Sh; blk, sdy, no poro, no show. 6' Sd, gry, very shly and calc., very tight, no show. 1' Sh, blk, calc., no show. 1' lime, brn to blk coarsely xln, foss & pyrite w/scat blk sh; very dense, no show. 1' Lime blk to brn, coarsely xln,

w/scat. blk sh; very dense; no show. 3' lime, blk to brn, sub xln, shly, very dense, no show. 1' lime, blk sub xln to amor shaley, w/co ch. frac. very dense, no show. 2' lime, blk to brn, sub xln to xln, Sli shaley very dense, no show.

DST #10 (Tstg Bone Springs) 9488-9608 open 1 hr. Recovered 90' mud
F P 30-30 15" SIP failed

Diamond Core 21 9663-9683 Rec 25' being 10' Sd, gry to tan, very silty & shaley, calc., very tight, no show except tr odor. 10' Sd, askabote except no odor. 1' Sh, blk w/top 5" sdy, no poro, no show. 1' Lime, brn, very coarsely xln. w/scat chert fragments and numerous foss; no poro, no show. 1' Lime, brn to blk., fine xln, very dense & sli shaley; no poro, no show. 2' Shale, blk, no show. (poor 14° dip 9679-83 in sd w/sh lamin.)

Diamond Core 22 9992-10,012 Rec 20' being 2' lime, blk to brn, f xln, shly, w/streaks blk sh; very dense, no poro, no show. 1' Sh, blk, limey, w/very thin streaks of lime, very dense, no poro, no show. 1 1/2' lime, brn to blk, med xln, pyritic, w/small streaks of blk sh, very dense, no poro, no show. 2 1/2' Sh, blk limey, no show. 1' lime, blk to brn, very shaley, w/ 2" streaks of blk opaque, chert at bottom, no poro, no show. 3' Sh, blk limey; no show. 5' Sh, blk, very limey, no poro, no show. 3' Sh as above. no show. (poor 0° dip 9992-10,012 in shale bedding planes.)

Diamond Core #23 10,012-021 Rec 9' being 6' Sh, blk, very limey, no show. 1' Lime, blk to brn, v f xln, Silic. w/conch fractures, no poro, no show. 2' Shale, blk, very limey w/small scat strks of lime, no poro, no show. (Very poor 0-4° dip in shale bedding planes.)

Diamond wire line Core #24 10,021-022 Recovered 1' being 5" Sh, blk, very limey, no show, 3" Lime, blk to brn, v f xln very shaley & dns, Sli silic no show, no poro. 2" chert, blk, transl to opaque, no show.

Diamond wire line Core #25 10,060-074 Rec. 14' being 1' lime, apparently homo, mixed w/argillaceous material, v drk brn, dns, hard massive, sub xln; no poro, no show. 1' as above. 1' as above w/foss. 1' as above except increased argil content. 1' as above 1/2' lime, brn to blk, very dense, amor, massive (chert blk in appearance w/no SIO2 noted.) this 1/2' highly broken; fragments only, no poro, no show. 1' Siltstone, brownish gry, highly dolomitic and arg., no poro, no show. 1' sh, brn to blk v dns, dolo, silty, no show. 1' as above except only sli silty; no show. 1' lime, drk brn, dns, hard, massive, sub xln, foss. no show. 1' lime, drk brn, dns, amor, w/very foss zones. (Silic and calc foss. replacement w/tr free milky chert.) no show. 1' Lime, very drk brn, dns amor, sub xln, foss., no show. 3' Sh, brn to blk., silty, very calc. (very poor 10-14° dip @ 10,068 in shale bedding plane.) NOTE: Entire core has numerous foss layers about 1/2" in thickness.

Diamond wire line Core 26 10,074-079 Rec 5' being 1' Shale, blk to brn, shaley, no show. 6" as above. 6" Lime, blk very foss and very dense. no show. 6" as above w/no foss. 6" as above except very foss. 2" as above, 10" sh, foss. 4" Sh as above 8" lime as above except w/milky brn chert disseminated throughout and only Sli foss. no show. (very poor 6-10° dip 10,074-79 in shale bedding.)

Diamond Core #27 10,983-998 Rec 15' being 2' lime, tan, c xln, w/scat sh, very dns w/very tight vert frac having a tr of calc filling, bleeding light brn oil, light scat pp to vuggy poro, good scat stain, good scat fluor, good odor. 1' Sh, blk w/scat lime strks and slickensides, no poro, no show. 1' lime tan, c xln to amor, w/scat sh, very dns, w/very tight vert frac. having tr of calc fill w/tr of pyrite and calc., bleeding light brn oil, no poro, tr scat stain, tr very dull scat fluor., fair odor. 1' lime, tan c xln. w/very tight very frac (no fill) heavily bleeding lt brn oil, very dns, fair vuggy poro, good scat stain good scat fluor. and good odor. 6' lime, tan sub xln, very dns, w/scat. sh; w/1' blk sh @ 10988, no poro, tr scat stain, tr very scat dull fluor, light odor. 1/2" Lime, tan tr brn, c xln, very dense, w/heavy bleeding of light brn oil and very tight vert frac. (no fill) Light scat vuggy poro, good scat stain & fluor and good odor. 1 1/2' Lime, tan to brn, & xln to sub xln; w/scat blk shale, no poro, tr scat stain & fluor. fair odor. 2' Lime & Shale no show. (Fair 23° dip @ 10,989 in shale bedding plane.)

DST #11 10,962-998 2000' WB open 1 hr. Rec 2000' WB / 10' mud no show.
F P 710-4355 15" SIP 4440

H S P. 5450

NOTE: Test was not conclusive in that fluid was evidently by passing the packer in some manner not known, giving erroneous pressures; also tool closed after being open several seconds.

DST #11 (Re-test) 10,962-998 2000' WB open 1 hr 30 min Rec 130'
mud cut water 2000' WB / 20' sli G & mud (no chlorides)
F P 1050-1050 17" SIP 1050 H S P 5430

Diamond Core #28 10,928-11,019 Rec. 10' being 1 1/2' Sh, blk., no show. 1/2' lime, tan to brn, & xln, to sub xln, dns w/blk sh fragments, no show except tr very dull scat fluor. 8' sh, blk; (very poor 2° dip 10,928-11,019 in shale bedding plane) NOTE: Core is believed to have been lost at the bottom.

Diamond Core #29 11,019-039 Rec 20' being 4' shale, blk, no show, 2' Lime, blk, xln, very dns and shaley, no poro, no show. 14' sh, blk, no show. (very poor 2° dip in shale bedding plane 11,019-039)

DST #13 11,121-11282 2159' WB open 1 hr 27 min. Rec 30' sli G & M
WB / 2120' Sli GC WB / 50' Sli GCM (Cl content) top 1000 FPM cl,
Middle 1200 FPM cl, bottom 1500 FPM cl.
F P 1015-1015 15" SIP 1015

HSP in 5515 out 5470

Diamond Core #30 11,282-307 Rec 20' being 19 1/2' Shale, blk dns, Sli foss, bleeding gas lightly from partings, no show except the bleeding gas. 1/2' lime brn, very dns, shly, sub xln; no poro, no show. (very poor 2° dip 11,282-307 in shale bedding planes.)

DST #14-A 12,482-558 2000' WB open 1 hr 49 min. gts 24" at end of 45" gas gu. 730 MCFGPD; at end of 80" gas gu. 1,000 MCFGPD WB TS 80" gas flow increased steadily until packer failed at the end of 1 hr 49 min. Reversed out 6 bbls WB / 55 bbls mud.
F P 920-1080 No SIP HSP 6440

DST #14-B (Re-Test) 12,471-558 1000' WB open 4 hrs 30 min. g.T.S. 14" no WB to surface. 3 end of 25" gas gu 370 MCFGPD 3 end 40" gas gu. 500 MCFGPD 3 end of 90" gas gu 460 MCFGPD, 3 end 120" gas gu. 418 MCFGPD and continued at this rate to end of test. 5/8" BHC and 1" THG on 3 1/2" dull pipe were used. Recovered 11,256' of very sweet gas in O.F. / 812' GC WB, / 30' GC & sli MC WB, / 160 HGCL / 160' HG & Sli Distillate C M
F P 390-570 30" SIP 4090 HSP 6170

Diamond Core #31 12,556-563 Rec 5' being 3' shale, blk, w/very thin scat gilsonite streaks, scat foss. no poro, no show. 2' Lime, brn, c xln w/scat small angular qtz grains & tr scat glauconite, lam, w/thin zones of gilsonite & shale, scat foss. no poro, no show except sub odor. (very poor 1° dip 12,556-563 in shale bedding planes.)
NOTE: Minute vert frac. well filled over 2" zone 12,559.

Diamond Core #32 12,812-829 Rec 14' 3' lime, tan, gran, very sdy, w/scat sh strks, no poro, no show. 4' sh, blk w/thin scat lime strks, as above, containing glauc. no show. 7' sd, large qtz, clear to milky, w/p.p. poro, partially filled w/very soft white gypsum, also containing scat glauconite and pyrite, no show oil good gas odor.

Diamond Core #33 12,830-853 Rec. 23' sd, large qtz grains, clear, to milky, w/good poro, partially filled w/soft white gyp. and shale, contained scat strks of gilsonite and one 1/2" shale streak 12,840, no stain, fluor or cut, tr scat odor. (no dip recognized.)

Diamond Core #34 12,985-920 Rec. 25' being 1' Sd, tan, v f g. calc. scat glauc w/thin paper lamine of lignitic, very tight, no show; 2' Sh, blk, lignitic, no show. 1/2' Lignite, blk bituminous coal, 2 1/2' sd as above, micaceous w/lignitic sh, disseminations, very tight, no show. 1' Sh, drk gry, w/disseminated lignite no show. 4' sd, tan, large grains very calc. w/many oolitic-like concretionary particles smaller than sd., very tight, no show. 1' sd as above with drk gry sh matrix & Dissem. lignite, very tight. 1' Sd as above but, brn to tan, micaceous, w/strks of brn sh; very tight, no show. 3' sd, lt, tan, v f, silc cement, very micaceous w/dissem., glauconite; very tight, no show. 5' Sd, very light tan; large qtz grains, w/sil cement & traces of Gyp., tr of mica & glauconite, very tight, no show except sli odor. 4' Sd, very light tan, very large qtz grains w/numerous fillins of Gyp., silic cement; very tight, sli odor.
(Fair 10° dip 12,901-02 in Sh and lignite partings)

NOTE: all lignites shown above are black bituminous coal and have a very high Methane content.

DST #15 12,782-12,922 989' WB. open 3 hrs 30 min. Recovered WB / 2356' G₂ Sli MC salt water. (cl content: top 2000 PPM cl; middle 44,000 PPM cl; Bottom 46,000 PPM cl)
F P 503-1510 30" SIF 5480 HSF in 6505 out 6450

DST #16 13,691-964 2500' WB open 2 hrs. gTS 51" @ end of 61" gas gu. 96 MCTGPD, @ end of 84" gas gu. 113 MCTGPD @ end 120" gas gu 113 MCTGPD NOTE: Halliburton tool failed immediately after build up i.e. while pulling packer loose. Filled annulus with mud, after mud equalized, unloaded sli gas cut WB by small heads for 14". Rec. 2024' GCB and 11,631' Sli GCH (mud came from annulus when tool failed) no show of oil or distillate. (Halliburton T. C. valve failed (washed out and failed when tried to unseat packer))
F P 1325-1325 15" SIF 3680 HSF in 7145 out 7195.

Diamond Core #35 13,966-981 Rec 15' Lime, drk brn to gry, f xln to gran, w/thin streaks of chert (approx. 20-30%) a few very thin strks. of shaley lime, w/entire core containing multipied near vert. frac. some with no fill and some filled w/calicle seams of 1/16 to 1/18", chert is blk to drk brn opaque no poro, no show.

Diamond Core #36 14,409-434 Rec 25' being 3' lime, very lt tan, sub xln to suc., very dns, sulp odor. 3' Dolo., very lt tan, med xln, w/good large Dolo xls in vugs, good vuggy poro., no show oil or gas, sulp odor. 4' Lime as above, very dns. 2' Dolo as above, med xln, tr of vugular poro, sulp odor. 2' Lime as above, very dns, sulp odor. 2' Dolo as above, f to med xln, tr of vuggy poro., Sulp odor. 1' Lime as above; very dns, sulp odor. 1' Dolo as above, f to med xln, no poro, sulp odor. 7' Lime as above very dns, sulp odor. (No dip recognized.) NOTE: The entire core has multiple fractures, both vertical and off-vertical. All fractures calcite filled and are 1/16" or less. Overage good vug is 1/16" in diameter, one 1/4" vug seen and one calcite filled space was 5/8" across.

DST #17 14 387-14 434 2200' WB open 1 hr. Rec WB / 5' mud
F P 958-925 15" SIF 1250 HSF 7320

Diamond Core #37 14,435-460 Rec 25' being 3' lime, lt tan to cream, c xln, very dns, w/3" streaks of dolo w/good vuggy poro) Lime had no poro, sulp odor. 5' Dolo, lt tan to gry, med to a xln poro, fair vuggy poro, sulp odor. 5' Dolo, lt tan to gry, med to a xln poro, fair vuggy poro, sulp odor. 9' Dolo as above except good vuggy poro 3' Dolo as above except excellent vuggy poro. (No dip recognized.) NOTE: Entire core contained numerous fractures (Horizontal & vertical filled w/calcite. vugs ranged from pin point to 3/4" in diameter w/excellent crystalline growth.

DST 14,437-14,460 2500' WB open 2 hrs 15 min. Rec 2320' WB, / 180' MC WB / 463' MC brackish water / 737 SW (13,000 PPM cl)
F P 1170-1695 30" SIF 6240 HSF in 7000 out 7145

Diamond Core #38 14,460-14,473 Rec 13' being 2' Dolo., lt gry to tn, med to a xln., fair vuggy poro., slup odor. 11' Dolo as above good vuggy poro, sulp odor. (No dip recognized.) NOTE: Fracturing was encountered throughout core, the majority being vertical and tight calcite filled. vugs varied from pin point to 1/2" in diameter and had good crystal growth. poro does not appear to be any better connected than in core # 37.

Diamond Core #39 14,532-14,582 Rec 50" being 23' Dolo, brn, med xln w/approx. 30% scat homey comb poro, scat shale stylolites, good vuggy poro, sulp odor. 13' Dolo, brn, f xln, very dns, w/scat sli shaley ly streaks, good 1/2" vug poro, completely filled w/calcite. Fossiliferous, brachiopods mostly very large and some small, no poro, sulp odor. 14' Lime, tan to gry, f to med xln, very dns, w/paper thin irregularly disseminated blk shale, no poro, no odor. (No dip recognized.)

DST #19 14,503-14,582 2570' WB open 2 hrs Rec 2570' WB / 1018' WCH / 9607' black brackish water w/sour odor. (14,000 PPM cl)
F P 1340-5830 30" SIF 6240 HSF 7725

Diamond Core #40 14,582-605 Rec 23' lime, very dns sub xln, tan to gry brn, w/very numerous calc foss replacements, occasional tr drk gry chert and blk sh in very thin horizontal layers; no poro, sli sulp odor. (no dip recognized.)

Diamond Core #41 14,611-659 Rec 48' lime, drk gry to grayish tan,

med to f xln, very dns, w/approx 30% drk gry to blk chert nodules occasional thin shale strks disseminated in a near horiz. position, occasional very tight frac. scat throughout w/a few scat foss, very dns, no poro, no show. (No dip recognized.)

Diamond Core #42 14,667-715 Rec 48' being, 28' lime, brn, dns, sub xln, to v f xln; massive, w/scat gry to milky chert interlayered w/paper thin shale zones disseminated throughout. 20' Lime, tan dns, med xln, hard, sli foss, cherty and shaley as above.

NOTE: All very tight, hard, cherty, Stylotitic. (No dip recognized)

DST #20 14,710-829 (Tstg Devonian) 2500' WB open 2 hrs Rec 'WB / 370' mud.

F P. 1285-1385

30" SIP 6020

HSF in 7605 out 7465

Diamond Core #43 14,834-850 Rec 15' being 6' lime, brn, xln, dns, to massive w/very thin heavy shale partings. 3' Lime & Dolo, lime as above w/thin irregular zone of tan, med, xln, dns Dolo. 1' chert milky to lt gray, frac, w/tan Dolo in fillings and between chert. 1' Dolo as above, sli fractured w/trace of chert. 4' chert as above w/multiple frac and Dolo filling. 1' (Lost) due to fractured nature (No dip recognized.) No show, sulp odor.

DST #21 (Tstg Devonian) 14,908-15075 3270' WB, open 2 hrs Rec.

WB / 2230' sli 10M / 8970' black, brackish wtr. (14,000 FFM cl)

Total fluid recovery 14,470 feet.

F P 2370-6480

30" SIP 6480

HSF in 7930# out 7845#

Diamond Core #44 15,116-15,166 Rec 50' being 3' Dolo, cream, med to g xln, w/multiple vert frac. partings filled (1/64" to paper thin), scat fair vuggy poro, no stain or fluor, no odor. 19' Dolo, as above only not fractured; scat fair vuggy poro, no show. 24' Dolo as above w/scat irregular streaks of white xln anhy. This material is believed to fill material deposited in large open frac. No poro, no show. 4' Dolo., cream, g xln, very broken due to extreme amount of porosity. Excellent vuggy to cavernous porosity, no stain or fluor., sulp odor. (No dip recognized.)

Diamond Core #45 15,794-15,830 Rec 34' being 1' Sd, white to grn, med to c grained w/phosphatic nodules, shaley, not calc., very tight, no show. 2' Shale, green no show. 5' Shale, green to gry, green, very sdy w/thoroughly disseminated sand spots, no show. 1' shale, w/a few sd spots, no show. 5' Shale drk green to green-Blk, tr sd no show, 2' shale, drk green. no show. 1' Dolo., drk gry, f xln, dns, sli limey. no show no poro. 4' sh. drk grn to gry, very dns & sli dolomitic; no show. 1½' shale & Dolo., drk gry to grn shale and drk gry shaley Dolo. no poro, no show. 2½' shale, drk grn, sdy, pyritic, w/scat thick Dolomitic streaks no show. 2' Dolo med to c xln, dns, drk gry, w/sli acid reaction, no poro, no show. 1½' Shale, drk grn, w/intermingled med sd spots. very dns, no show. 3½' Shale, drk grn w/a trace of sd spots and a few sd lam., very dns, no show. 2' Dolo, drk gry, f xln w/6" of drk grn shale in the middle, no poro, no show. NOTE: Top 2' of core lost, dip 0° fair at 15,827, no other dip evidence in core.)

Diamond Core #46 15,830-869 Rec. 37' being 8' Shale, green 6' sand, white to clear, med grained w/scat pyrite (Layers and nodules) very tight perm. 4 to 2.2 millidarcys, no show. 1' Sd; clear, c grained, w/gilsonite cementing material, perm. 6.9 millidarcys. no show. 6' Sd white to clear; med grained w/scat pyrite (mostly layers) w/scat very thin green sh. streaks, perm. 0.2 to 5.8 millidarcys, no show. 3' Sd white to clear; med grained, w/scat phosphate nodules and irregular grn shale streaks, perm. 2.9 millidarcys no show. 6' sd, white to clear w/greenish tint, med grained very shaley, w/phosphate nodules, perm. 4.2 to 5.5 millidarcys, no show. 1' Sd, clear, c grained w/gilsonite cementing material, perm. 4.4 millidarcys, no show. 6' Sd, clear to white to greenish tint, med to c grained w/numerous scat irregular shale streaks, w/4" streak of green shale ½' from bottom perm. 2.7 to 3.9 millidarcys, no show. 2' Lost core. NOTE: Multiple vertical fractures from 15,839-46, very tight with no fill material. (No dip recognized.)

Diamond Core #47 15,906-908 Rec 1½' Sand, clear to green, med to c grained, calc to shaley, green shale mixed throughout sand. NOTE: No dip recognized very tight, no show.

Diamond Core 48 15,908-910 Rec 1½' sand, white to clear, c grained sli calc cement w/sploches of grn shaley sand. Highly fractured,

both vert and horiz. fractures. Very tight, no show. (No dip recognized.)

Diamond Core #49 15,973-16,013 Rec. 40' being 3' Dolo, gry to tan f to med xln. w/scat floating sd grains, v dns, no show. 1' Dolo, drk gry to brn, f xln., v dns, no show. 1' Dolo, gry f to c xln w/ floating sd grains, v dns, no show. 2' Dolo, tan to gry, f xln. no poro, no show. 3' Dolo, drk tan to gry, f xln. no poro, no show. 20' Dolo, drk, tanto gry, med xln. no poro, no show. 3' Dolo, gry to tan, f to med xln, no poro, no show. 7' Dolo, drk brn to gry, f to med xln., no poro, no show. (No dip apparent) NOTE: Multiple vertical and 45° frac, very tight for entire core. Most frac are calcite filled, although there is a trace of incompletely filled frac

Diamond Core 150 16,013-16,038 Rec. 24' Dolo, drk gry brn, f to med xln, w/a few scat calcite filled spots that may have been vugular porosity at one time. (Dip very poor, (color layers in dns frac dolo) FRACTURES: Entire core has multiple thin tight calcite filled, near vertical fractures. No show.

DST #22 15,923-16038 4500' WB open 1 hr 10 min. Rec WB / 171' mud F F 2430-2430 15" SIF 2520 HSP in 8302 out 8302.

Diamond Core 151 16,078-16,112 Rec 34' Dolo, grayish brn, f to med xln, v dns w/scat floating sd grains, some large calc fill in old poro. vugs, one 1/2" green to blk sh streak was found @ 16,082'. Dolo from 16,089-092 had an oolitic appearance. poro was found at the following depths:

- 16,084-86 good poro, vugs very small.
- 16,091-92 good oolitic poro.
- 16,095-96 fair very small vuggy poro. w/1" isolated xln lined
- 16,097-99 fair v small vuggy poro w/2" isolated xln lined vug.
- 16,100-101 fair v small vuggy poro.
- 16,108-112 fair scat very small vuggy poro.

NOTE: Entire core was highly fractured, partially filled w/calcite to 1/2" calcite fill. (poor to fair 33° dip @ 16,082')

Diamond Core #52 16,112-16,140 Rec 28' Dolo, tanish gry, f to med xln. w/white secondary dolo fill in frac. one 2" vug w/large 1/8" to 1/4" curried secondary Dolo xls and a few scat qtz xls one foot of very small scat vuggy poro 16,123-124. NOTE: Entire core was highly fractured (no apparent dip), no show, sulp. odor.

DST #23 16,036-16,140 4500' WB open 1 hr. Rec. WB / 171' mud. F F 2195-2240 15" SIF 4770 HSP in 8395 out 8350

Diamond Core 53 16,140-16,190 Rec 50' Dolo; brn, f to med xln, v dns, w/scat calc and white Dolo fill in frac a 3" streak of xln anhy. @ 16,164 1/2' w/thin irregular streaks of xln pyrite. A few scat floating sd grains and tr of blue-gry cht @ bottom 6". @ 16,160-161 1/2' Dolo has oolitic appearance w/calc fill porosity was found in the following zones:

- 16,145-146 Sli vuggy poro. v small vugs
- 16,160-161 1/2' fair oolitic poro.
- 16,166-168 fair v small vuggy poro w/salt xls formed from
- 16,188-189 fair poro in small to med vugs. bleed.

NOTE: Entire core was fractured, partly filled to v tight (no apparent dip) No show., sulp odor.

Diamond Core #54 16,190-212 Rec. 22' Dolo., tan to brn, to drk gry f to med xln, w/1' of milky to gry opaque cht 16,198-99 and a 3" streak of c sd, Dolo @ 16,201 no show, sulp odor. NOTE: Entire core was highly fractured. (No apparent dip.)

Diamond Core 155 16,212-16,219 Rec. 7' Dolo, gry to tan, med xln, only slightly frac. w/a tr of calc fill a 3" streak of drk brn to blk opaque cht @ 16,214 1/2'. No show. sulp odor. (No noticeable dip.)

Diamond Core #56 16,219-16,249 Rec. 28' Dolo, brn to gry, f to c xln, w/scat thin strks of blk. sh and a few scat streaks of blk opaque cht. very tight multiple frac w/tr of calc fill some of the thin shale streaks have appearance of flowage zone. no show sulp. odor. (No noticeable dip.)

Diamond Core #57 16,249-253 Rec. 4' Dolo, gry to tan, f to med xln, very dns w/ multiple fracturing, very tight, some calc fill, small pieces of blk cht in bottom of core. No show. sulp odor. (No apparent dip.)

Diamond Core #58 16,253-16,278 Rec. 25' being 1' cht, gryish-brn to milky opaq., highly frac. w/3" streak of dolo in middle. no show 13' Dolo, brn to gry, sub xln w/sct v thin sh streaks and a few scat milky cht nodules, no show, sulp odor. 11' Dolo, drk gry to brn to blk, med xln w/2' of very small vuggy poro from 16,271-273 w/tr qtz xls and scat pyrite in last 5', no show, sulp odor. NOTE: Bottom 5' was highly fractured w/calc and secondary dolo. fill (1/16" to 1/32" top 1' was also highly fractured w/Dolo fill. Rest of core in only slightly fractured. (No apparent dip.)

DST #24 16,140-16,363 4600' WB open 1 hr. Rec WB / 165' mud
T F 2095-2095 30" SIF 3405 HSF in 8490 out 8465

Diamond Core 59 16,457-16,459½ Rec. 2½' Granite, pnk, minerals include: Quartz, feldspar; Biotite, hornblende and Basic ferro-magnesian. NOTE: Vertical fracture or joint planes throughout which have secondary Biotite.

Schl T D 16,469 Ran. Schl., Gamma Ray and neutron also ran. Velcity survey and dip meter. Spotted 300 sx cement plug top of cement found 12,582, drilled out to 12,625.

Set 7" liner 9419-12,621 w/600 sx. perf w/128 12,492-524
w/72 12,536-554

rng 2" thg w/pkr @ 12,394

Gel frac w/2000 gal.

used 186 BBLs of load oil and recovered 79 BBLs and swb. dry max gas vol. 110 MCFGPD ½" TC TF 45

AV/750 M A

Swb load and sli show gas (TSTM) and swb dry.

spotted 20 sx cement 12,563.

P. B. 7163 w/25 sx.

perf w/78 Jets 7003-7016

w/78 Jets 7022-7035

Swb. 37 B rusty water 24 H no oil fluid level 4000'

Swb. 7½ BF 4 H 10% oil 90% fresh water. Sli show gas

Sd frac w/2500 perfs 7003-16

7022-35

Swb. 115 Bf 7 H. being 27 B water plus 88 Boil 35.2 grav.

fl 105.8 E O / 7.1 B wtr. 15 H 3/8" TF 100-150 GOR 737 grav 39.3

I. P. P. 215 BO / 35 BSW 24 H.

GOR 576/1 40.5 Grav.