LITHOLOGIC WELL LOG PRINTOUT

SOURCE - fgs

WELL NUMBER: W- 16329
TOTAL DEPTH: 00740 FT.
56 SAMPLES FROM 0 TO 740 FT.

COMPLETION DATE - 04/24/89
OTHER TYPES OF LOGS AVAILABLE -

COUNTY - HENDRY
LOCATION: T.44S R.32E S.16 B
LAT = N 26D 39M 50
LON = W 81D 08M 18
ELEVATION - 25 FT

OWNER/DRILLER: FGS-JOHN MORRILL DRILLER.
OWNER/DRILLER:

WORKED BY: WORKED BY TOM SCOTT AND RICHARD GREEN.
HILLIARD #1
LOCATED APPROX. 0.6 MILES W OF E. LINE, APPROX. 250'S. OF N. LINE.
BE CAREFUL OF FORAMTION ASSIGNMENTS UNTIL OTHER HENDRY
CO. CORES ARE WORKED. THE ARCADIA HAS MORE SILICICLASTICS
IN IT THAN NOTED IN LEE COUNTY OR NORTHWARD. PEACE
RIVER IS STRANGE IF THE SANDS ABOVE 385' ARE PLACED IN IT.
NOTE: GAMMA LOG SUGGESTS TOP OF ARCADIA AT 450+/-, LITHO
SUGGESTS 442' OR 462' (THIS LOOKS BEST, CHECK CORE)
PEACE RIVER FM. SECTION IS UNCHARACTERISTIC IN THAT
IT HAS LESS CLAY AND CARBONATE IN MATRIX AND HAS VERY
COARSE SAND GRAIN SIZE. THE COARSE SAND HAS LITTLE
TO NO PHOSPHATE.
FORT THOMPSON/CALOOSAHATCHEE, AND PERHAPS SANDY PHASE OF
TAMIAMI MAY BE PRESENT IN 0-74.8' INTERVAL.

0. -	74.8	090UDSS	UNDIFFERENTIATED SAND, CLAY, AND SHELLS
748. -	TD.	122HTRN	HAWTHORN GROUP
748. -	442.5	122PCRV	PEACE RIVER FM.
4425. -	TD.	122ARCA	ARCADIA FM.

0 - 7.5 SAND; ; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: FINE; RANGE: MEDIUM TO FINE; UNCONSOLIDATED;
ACCESSORY MINERALS: ORGANICS-%;
VARYING COLOR AND VARIABLE ORGANIC CONTENT.

7.5- 7.8 SAND; BROWNISH GRAY; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; POOR INDURATION;
ACCESSORY MINERALS: CLAY-03%;

7.8- 10 SAND; ; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; POOR INDURATION;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS;
SHELL? FRAGMENTS AND WHOLE SHELLS 8-10 FEET.

10 - 25 SAND; LIGHT GREENISH GRAY; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: MICA-01%;
UNFOSS. EXCEPT FOR ONE THIN ZONE AT 11' W\SHELL FRAGS. AND CLAY, ANOTHER AT 16.75-17'.
COLOR VARIABLE MOD. GRAY TO LGT BROWNISH GRAY. DARK GRAINS-HEAVY MINS? PHOS? <1%. LOOKS BIOTURBATED.

25 - 47.7 SAND; GREENISH GRAY TO BROWNISH GRAY; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM; POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-02%, MICA-01%, CLAY-05%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS;
25-27.75' MORE CLAY; SMALL AMOUNT OF CARBONATE PRESENT, PROBABLY REMNANTS OF SHELL FRAGS(BADLY LEACHED) INCREASE IN ABUNDANCE W\DEPTH, ALSO BECOME LESS LEACHED. BARNACLE FRAGS PRESENT. MINOR PHOSPHATE.

47.7- 50 SAND; LIGHT GREENISH GRAY TO GREENISH GRAY; INTERGRANULAR;
RANGE: FINE TO MEDIUM; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, CLAY-02%, SHELL-20%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, MOLLUSKS;
LOOKS LIKE "LEAN GREEN"; FEW DISCOID GRAVEL PEBBLES PRESENT. ABUNDANT SHELL FRAGS., FEW WHOLE SHELLS, ABUNDANT TURRETELLIDS AT 50'; BARNACLES,PECTEN FRAGS.

50 - 57 SAND; LIGHT GREENISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: SHELL-25%, CALCILUTITE-20%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS, MOLLUSKS;
CARBONATE CONTENT INCREASES FROM ABOVE. SOME ARAGONITIC SHELL FRAGS. PRESENT. LITHOCLASTS OF HARDENED SANDSTONE. SOME FRESH WATER SNAILS AT 50'. FORAMS? CARB. MUD CONTENT HIGHEST 54-57', SAND IS MORE COARSE.

57 - 59 NO SAMPLES

59 - 73 SAND; LIGHT GREENISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
RANGE: FINE TO VERY COARSE;
ROUNDNESS:ROUNDED; ; UNCONSOLIDATED;
ACCESSORY MINERALS: PHOSPHATIC SAND-02%, PHOSPHATIC GRAVEL-03%;
FOSSILS: FOSSIL FRAGMENTS;
CUTTINGS; POOR TO UNCONSOLIDATED. SOME GRAVEL, PHOS. MOSTLY COARSE SAND TO GRAVEL SIZE(BLACK), FEW LITHOCLASTS OF PEACE RIVER LOOKING ROCK. FEW SHELL FRAGS. SAMPLES IN CUTTINGS BAGS SEEM TO GET MORE COARSE OVERALL TO 70 OR 71' THEN MORE FINE. SAND OCCURS MIXED WITH THE COARSE. GRAVEL (V.C. SAND) IS MILKY IN COLOR.

73 - 74.7 SAND; LIGHT GREENISH GRAY TO GREENISH GRAY; INTERGRANULAR,
POSSIBLY HIGH PERMEABILITY; RANGE: FINE TO VERY COARSE; UNCONSOLIDATED;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, MICA-01%;
FOSSILS: NO FOSSILS;
COLOR RANGES FROM LT-MOD. GRN GRAY TO LT BRN. GRAY.. MINOR GRAVEL. POOR TO UNCONSOLIDATED.

74.7- 142 SAND; MODERATE GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
RANGE: MEDIUM TO VERY COARSE; POOR INDURATION;
ACCESSORY MINERALS: CLAY-01%, PHOSPHATIC SAND-04%, MICA- %;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL FRAGMENTS;
LOOKS LIKE GOOD PEACE RIVER. CLAY CLASTS PRESENT. SOME THIN ZONES ARE V.C. W\MINOR FINER SIZES.; MORE COARSE BETWEEN 82-89'(IN CUTTINGS BAGS), THEN AS 81'. MANY BURROWS FILLED WITH CLEAN QTZ SAND 89-94'. SAND BECOMES FINER GRAINED ON AVERAGE BELOW 90' (F-M W\ FEW COARSE GRAINS) THEN LOSES COARSE GRAINS ALTOGETHER BY 95'. GRADES INTO VF-F SAND W\ PHOS. 1-2%. THIN CLAY BEDS. VC CAVINGS ON OUTSIDE OF CORE 113-115.5' SAMPLES ABSENT 117-122' BUT SAME BELOW.

142 - 143.7 SAND; LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
RANGE: COARSE TO VERY COARSE;
ROUNDNESS:ROUNDED; ; UNCONSOLIDATED;
OTHER FEATURES: FROSTED;
SOME COARSE PHOSPHATE.

143.7- 212 SAND; LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; UNCONSOLIDATED;
ACCESSORY MINERALS: PHOSPHATIC SAND-02%, MICA-01%, CLAY-01%;
SCATTERED THIN CLAY BEDS. COARSE BED (MIXED VC COARSE TO FINE) AT 152-153' THEN BACK TO VF-F. ANOTHER ZONE OF VC-C SAND AT 160-161.25'. BECOMES SLIGHTLY CALCAREOUS AROUND 173+/- (NO VISIBLE CARBONATE) INTERMITTENT. SEEMS TO HAVE INCREASING % OF COARSE SAND BETWEEN 198-204'

212 - 234 SAND; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: COARSE TO FINE; POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%;
OTHER FEATURES: CALCAREOUS;
WHITE SLIGHTLY CALC. TO CALC. CEMENT.; FINER GRAINED 223-224.5'. SILTY CLAYEY ZONE 224.5-225+/- THEN BACK TO COARSER SAND. VARIABLE CALC. SILTY ZONE 231-231.75', AND 233-233.75'. THIN HARD CALCAREOUS CEMENTED SANDSTONE AT 233.75'-234'.

234 - 251 SAND; LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; UNCONSOLIDATED;
VARIABLE COARSENESS. CALC. MATRIX. THIN CLAYEY,SILTY ZONE WITH CALCAREOUS CEMENT AT 250'.

251 - 260 SILT; LIGHT GREENISH GRAY TO GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY;
POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, MICA-01%, QUARTZ SAND-10%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: BENTHIC FORAMINIFERA;
AT 252' NANNOS OF NO YOUNGER THAN MID-MIDDLE MIOCENE AGE. THIN SILT BEDS-VERY SANDY (VF) SAND BECOMES MORE COARSE WITH DEPTH. POOR RECOVERY (3/10).

260 - 270 SANDSTONE; LIGHT GRAY; INTERGRANULAR; RANGE: VERY FINE TO COARSE;
CEMENT TYPE(S): CALCILUTITE MATRIX;
VERY CALC. SANDSTONE OR VERY SANDY LS. AT APPROX. 260', SAND W\ BEDS OF VERY FINE CALC. MUD W\ MINOR SAND, LITTLE OR NO PHOS. 5/10 RECOVERY.

270 - 273.5 SAND; LIGHT GREENISH GRAY TO LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: COARSE; RANGE: MEDIUM TO COARSE; POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, CALCILUTITE-10%;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS;
POOR-UNCONSOLIDATED. SOME FOSSIL FRAGS AND CALC. MATRIX. INTERBEDDED W\ VERY SANDY LS BELOW 271- 273.5'. MOLLUSK MOLDS IN LS.,FEW FOSSIL FRAGS REMAIN, OSTREA, BALANUS (TAMIOSOMA).

273.5- 289 LIMESTONE; LIGHT GRAY; INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: SKELETAL, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
ACCESSORY MINERALS: QUARTZ SAND-30%;
FOSSILS: FOSSIL MOLDS;
POOR-GOOD INDURATION. SOFTER ZONES LOST. SOME ZONES ARE COQUINA, NOW JUST MOLDS. SAND IS VC-C. SOME BEDS ARE CALC. CEMENTED SANDSTONE. VC-C. POOR RECOVERY 273.5-322'.

289 - 310 SAND; LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: COARSE; RANGE: COARSE TO VERY COARSE; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
ACCESSORY MINERALS: SPAR-02%, CALCILUTITE-05%;
FOSSILS: FOSSIL MOLDS;
BY 289' BECOMES SAND, POOR-MOD. INDURATION, THE POORER CONSOLIDATED BEDS HAVE WASHED OUT DURING DRILLING.MOLDS OF FOSSILS PRESERVED BY RIMS OF CALCITE.

310 - 385 SAND; LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: CALCILUTITE-05%, PHOSPHATIC SAND-01%;
OTHER FEATURES: CALCAREOUS;
BAG SAMPLE-310-320' M-C SAND W\CALC MATRIX, TRACE OF PHOS., BECOMES F-C, MODE MEDIUM AT 325' BAG, F-C,MEDIUM AVG. W\ FEW COARSE GRAINS BY 340', M-C,C 370-375', M-VC, COARSE AVG. 375-385'.

385 - 421 LIMESTONE; LIGHT GRAY;
GRAIN TYPE: CALCILUTITE;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: QUARTZ SAND-15%, PHOSPHATIC SAND-05%;
CUTTINGS 385-421'; APPEARS TO BE PEACE RIVER TOP. PHOSPHATE INCREASES OVER <385' LEVELS. PROBABLY IS A LS. VARIABLE PERCENTAGES OF SAND, SAND IS GENERALLY FINE, CHUNKS OF HARDER LS/DOLOMITE PRESENT. PHOSPHATE IS V.F., BLACK.

421 - 424.5 SAND; MODERATE GRAY TO LIGHT GRAYISH GREEN; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-10%, PHOSPHATIC SAND-15%, CALCILUTITE-02%;
FOSSILS: BRYOZOA, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS;
FOSSIL FRAGS IN LOWER 1.5'.

424.5- 430 LIMESTONE; WHITE TO LIGHT GREENISH GRAY; INTERGRANULAR;
GRAIN TYPE: BIOGENIC, SKELETAL;
POOR INDURATION;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-25%, PHOSPHATIC SAND-04%, SILT- %;
FOSSILS: FOSSIL FRAGMENTS, BRYOZOA, BENTHIC FORAMINIFERA, MOLLUSKS;
POOR-MOD. INDURATION. SILTY., ABUNDANT BRYOZOANS FORAMS, FEW OYSTER FRAGS., VERY SILTY (DOLO?) ZONE 429-430. ABUNDANT SHELL FRAGMENTS 429 AND 430-30.5'.

430 - 435 SAND; LIGHT GREENISH GRAY TO LIGHT GRAY; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: CALCILUTITE-15%, PHOSPHATIC SAND-15%, PHOSPHATIC SAND-20%;
FOSSILS: FOSSIL FRAGMENTS, BRYOZOA, BENTHIC FORAMINIFERA;
NEARLY ALL SEDS ARE BIOTURBATED.

435 - 437 LIMESTONE; LIGHT GREENISH GRAY; INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
MODERATE INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-30%, PHOSPHATIC SAND-03%;
FOSSILS: FOSSIL MOLDS, FOSSIL FRAGMENTS, BRYOZOA;

437 - 439 SAND; LIGHT GREENISH GRAY TO VERY LIGHT GRAY; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-10%, CALCILUTITE-30%;
GRADES INTO VERY SANDY LS, SOME DOLOMITE?, GRADES TO WHITE LS W/DEPTH. GRADES BACK INTO VERY CALCAREOUS SAND.

439 - 442.5 LIMESTONE; WHITE; INTERGRANULAR;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE; 10% ALLOCHEMICAL CONSTITUENTS;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO MEDIUM; MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, SPAR-02%;
THEN TO WHITE LIMESTONE. PHOS VARIES FROM 3-10% LS HARDER 442-442.5'.

442.5- 461 LIMESTONE; MODERATE GRAY; MOLDIC;
GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-25%, PHOSPHATIC SAND-04%, PHOSPHATIC SAND-20%;
FOSSILS: FOSSIL FRAGMENTS, MOLLUSKS, BRYOZOA;
BLACK, IRREGULAR, WEATHERED SURFACE AT 442.5'. LS. SOFTER BELOW 443', VERY SANDY LS TO VERY CALC. SANDSTONE. PHOS. 4-20%, AVG 10%. MED GRAY TO LIGHT GRAY GREEN SCATTERED LITHOCLASTS AROUND 455'. 457-58' VERY SHELLY, OSTREA. PHOS. IS VF, BLACK.

461 - 462 SAND; GREENISH GRAY; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO MICROCRYSTALLINE; POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-10%;
FOSSILS: FOSSIL FRAGMENTS;
SAND WITH CLAY. DOLOMITIC?. DISTINCT CHANGE FROM ABOVE.

462 - 467 LIMESTONE; LIGHT GRAY TO WHITE;
GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-01%, CLAY- %;
FOSSILS: FOSSIL FRAGMENTS;
FEW MOLDS., THIN CLAY LAMINAE AND STRINGERS, CLAY CONTENT INCREASES W\DEPTH.

467 - 467.5 DOLOMITE; GREENISH GRAY TO LIGHT GRAY; 10-50% ALTERED;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
ACCESSORY MINERALS: CLAY- %, SILT- %;
HARD, BORED CLAST OF DOLO. THIN HARD CLAYEY DOLOSILT OR DOLOSILTY CLAY W\ VF TO SILT SIZED QTZ SAND.

467.5- 468 SILT; GREENISH GRAY TO LIGHT GRAY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
ACCESSORY MINERALS: DOLOMITE-15%, CLAY- %;
OTHER FEATURES: DOLOMITIC;

468 - 476.7 CLAY; GREENISH GRAY TO MODERATE GRAY; POOR INDURATION;
ACCESSORY MINERALS: SILT-10%, QUARTZ SAND-05%, PHOSPHATIC SAND-02%;
SILTY, VF SAND?, DOLOSILT, PHOS?, VARIABLE DOLOMITE CONTENT AND SILT. BECOMES SANDIER AND MORE PHOS. 472.3'. 473.5' SHELL FRAGS (LEACHED), MORE CALCAREOUS. 474-SAND DECREASES, DIATOM MOLDS PRESENT. BIOTURBATED -BURROWS NOTED THROUGHOUT, OFTEN FILLED WITH SANDIER MORE PHOSPHATIC SEDIMENT.

476.7- 481 SAND; LIGHT GREENISH GRAY TO LIGHT GRAY;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO MICROCRYSTALLINE; POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: CALCILUTITE-25%, PHOSPHATIC SAND-15%;
FOSSILS: BENTHIC FORAMINIFERA, PLANKTONIC FORAMINIFERA, FOSSIL FRAGMENTS, FOSSIL MOLDS;
POOR-MOD. INDURATION. CALC MUD TO 25%, SILTY, PHOS. TO 15%; VARIABLE CARB. MUD CONTENT.
SANDIER NEAR 476.7, MORE CARBONATE 478'.

481 - 481.8 LIMESTONE; VERY LIGHT GRAY TO LIGHT GRAY;
GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-10%, SILT-05%, PHOSPHATIC SAND-10%;
FOSSILS: FOSSIL FRAGMENTS, MOLLUSKS;
BECOMES A SANDY,SILTY, PHOS.(15%), LS. LARGE PECTEN FRAGS. NEAR 481.8'.

481.8- 483.7 MIXTURE OF SAND W\CARB. MATRIX, PHOS., CLAYS IN THIN LAMINAE AND SANDY
PHOS. LS- ALL WITH FOSSIL FRAGS AND MOLDS AND CASTS.

483.7- 497 LIMESTONE; LIGHT GRAY TO LIGHT GREENISH GRAY;
MODERATE INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-25%, PHOSPHATIC SAND-15%, CLAY- %;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS;

PHOS., AND DOLO.; VARIES TO SAND, MED GRAY, VF, F-SILT, POOR IND., LS. DOLO MATRIX, PHOS 25-30%, DOLOMITE CLAY BECOMES MORE CALCAREOUS BELOW 486'. 492-494' IS VERY PHOS. >25% (TO 40%). HIGHLY BIOTURBATED. 497-DOLOMITIC LS TO DOLOMITE AS ABOVE.

497 - 500 AS ABOVE
NOTE: PHOS. IN THIS SECTION 476.7-508' OCCURS AS VF. TO MED SAND SIZED ROUNDED GRAINS, W\ SOME IRREGULARLY SHAPED COARSE GRAINS TO FINE GRAVEL SIZE. COARSER FRACTION APPEARS TO BE PRIMARILY A PHOS. REPLACEMENT OF FOSSIL DEBRIS. COLORS RANGE FROM SHINY BLACK TO BROWN AND AMBER, W\ BLACK MOST COMMON. PHOS. FISH BONES, GASTROPODS, BRYOZOANS. GRADES FROM DOLO. TO LS. 499-500'.

500 - 512.5 LIMESTONE; WHITE TO MODERATE GRAY; MOLDIC;
GRAIN TYPE: SKELETAL, BIOGENIC;
POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-03%, PHOSPHATIC SAND-15%, QUARTZ SAND-03%,
QUARTZ SAND-15%;
FOSSILS: FOSSIL MOLDS, BRYOZOA, MOLLUSKS, FOSSIL FRAGMENTS;
MOLLUSKS, BRYOZOANS, MINOR CLAY CONTENT, MORE INDURATED (MOD.) 502 AND BELOW. SAND AND PHOS. DECREASE BUT REMAIN HIGHLY VARIABLE. APPEARS TO BE DOLOMITIC BELOW 504 TO 506'. MUCH LESS SAND AND PHOS. 509', GRADES INTO DOLOMITE.

512.5- 514 DOLOMITE; GREENISH GRAY; INTERCRYSTALLINE;
GRAIN SIZE: MICROCRYSTALLINE; RANGE: MICROCRYSTALLINE TO VERY FINE; MODERATE INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-07%;
FOSSILS: FOSSIL FRAGMENTS;
BURROWED NEAR 514', BURROWS FILLED WITH VF QTZ SAND AND PHOSPHATE.

514 - 526 LIMESTONE; LIGHT GRAY TO WHITE; POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
MODERATE INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-20%, PHOSPHATIC SAND-10%;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL MOLDS, MOLLUSKS;
ZONE OF DOLO. 2-3" THICK 515.5'; SAND AND PHOS. CONTENT INCREASE BELOW 516' VERY PHOS. (20%), SANDY (30%), 522' W\ SCATTERED DOLO.

526 - 534.5 SAND; GREENISH GRAY TO DARK GRAY; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO MICROCRYSTALLINE; POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-35%, CLAY-05%;
FOSSILS: FOSSIL FRAGMENTS;
BURROWS. VARIABLE TO PHOSPHATIC, SANDY DOLOMITE. AT 528.5-9'/ SHARP CONTACT W\ UNDERLYING UNITS. SCATTERED OYSTER SHELL FRAGMENTS.

534.5- 540.5 LIMESTONE; LIGHT GRAY; LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, QUARTZ SAND-02%, SILT-%;
POOR-MOD. INDURATION. SILTY, SOME INTERBEDDED ZONES AS 526'. SAND AND PHOS INCREASE AROUND 535.5', -536', BURROWS FILLED WITH OVERLYING SEDIMENT TYPE. GRADES INTO UNDERLYING UNIT.

540.5- 544 SILT; MODERATE GRAY; POOR INDURATION;
ACCESSORY MINERALS: DOLOMITE- %, CLAY- %, PHOSPHATIC SAND-05%, QUARTZ SAND-0Y%;
FOSSILS: FOSSIL FRAGMENTS;
POOR-MOD IND., MINOR VF SAND AND PHOS., SCATTERED BURROWS. FOSSIL FRAGS APPEAR 543', MORE CALCITIC TOWARDS 544' GRADES INTO UNDERLYING UNIT.

544 - 546.5 LIMESTONE; WHITE TO LIGHT GRAY;
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-01%;
FOSSILS: BRYOZOA, FOSSIL FRAGMENTS, MOLLUSKS;
BECOMES DOLOMITIC W\DEPTH. MORE PHOS. W\ DEPTH, (IRREGULAR FRAGS.) GRADES INTO UNDERLYING UNIT. INCREASING SILT, VF SAND AND CLAY TO 546.5'.

546.5- 552 CLAY; GREENISH GRAY TO MODERATE BLUISH GRAY; LOW PERMEABILITY; MODERATE INDURATION;
CEMENT TYPE(S): CLAY MATRIX;
ACCESSORY MINERALS: SILT- %, MICA-01%, PHOSPHATIC SAND-02%;
FOSSILS: FOSSIL FRAGMENTS;
BURROWS FILLED WITH SILTY CLAY W\ PHOS.,FOSSIL FRAGS, MICA.

552 - 552.7 ZONE OF GRADATIONAL CHANGE FROM CLAY TO CARBONATE. VERY ABUNDANT PHOS. TO 35%, MUCH OF IT IS REPLACED FOSSIL DEBRIS. OSTREA.

552.7- 553 DOLOMITE; WHITE TO LIGHT BROWNISH GRAY;
MODERATE INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-05%, QUARTZ SAND-10%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: BRYOZOA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
DOLOMITE AND LIMESTONE. BRYOZOANS HAVE SOME PHOS. NUCLEATING IN STRUCTURE, MOLLUSK MOLDS AND FRAGS., DOLO. IS MORE COMMON IN THE BURROW FILL IN THIS INTERVAL.

553 - 561.8 LIMESTONE; LIGHT GREENISH GRAY; MOLDIC;
GRAIN TYPE: BIOGENIC, SKELETAL;
MODERATE INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-02%, SILT- %, QUARTZ SAND- %;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, BRYOZOA;
ABUNDANT VF FOSSIL FRAGS., NUMEROUS BURROWS, WHICH STOP AT 557'., VF SAND INCREASES W\ DEPTH. DRILLER REPORTS FLOW BEGAN AT 550-554'. BURROW FILLED WITH MORE SANDY, PHOS. LS., (SAND-20%, PHOS.-30%) FOSSIL FRAGS. MORE ABUNDANT IN BURROWS.

561.8- 566 LIMESTONE; LIGHT GREENISH GRAY;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-30%, SILT- %, PHOSPHATIC SAND-05%;
FOSSILS: FOSSIL FRAGMENTS, SPICULES;

566 - 568 DOLOMITE; LIGHT GREENISH GRAY;
POOR INDURATION;
ACCESSORY MINERALS: SILT-30%, PHOSPHATIC SAND-01%, CLAY-08%;
FOSSILS: FOSSIL FRAGMENTS, BRYOZOA;
VERY SILTY, MANY BRYOZOANS, FOSSIL FRAGS., CLAYEY, MORE CALCAREOUS W\ DEPTH, GRADATIONAL.

568 - 573 LIMESTONE; LIGHT GREENISH GRAY;
GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL;
POOR INDURATION;
ACCESSORY MINERALS: SILT- %, QUARTZ SAND-10%, PHOSPHATIC SAND-05%, PHOSPHATIC GRAVEL-01%;
FOSSILS: FOSSIL FRAGMENTS, BRYOZOA, MOLLUSKS;
SAND IS VF., FOSSIL FRAGS ARE VF., MORE INDURATED WITH DEPTH, ZONES OF DOLOMITE, GRADATIONAL CONTACT WITH UNDERLYING UNIT.

573 - 583.5 LIMESTONE; WHITE TO LIGHT GRAY;
GRAIN TYPE: BIOGENIC, SKELETAL;
POOR INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-02%, SILT- %;
FOSSILS: FOSSIL FRAGMENTS, MOLLUSKS, BRYOZOA;
FRAGMENTAL LS., ABUNDANT FOSSIL FRAGMENTS, POOR- MOD. INDURATION., BRYOZOANS, MOLLUSKS, MOST PHOS. IS REPLACEMENT OF FOSSIL MATERIAL. 580-82' INCREASE IN SILT (DOLO?). THIN ZONES OF HIGHER CLAY CONTENT 1-3" THICK.

583.5- 596 LIMESTONE; WHITE TO LIGHT GREENISH GRAY;
MODERATE INDURATION;
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, SILT- %;
FOSSILS: BRYOZOA, FOSSIL FRAGMENTS;
SILTY, SOME FOSSIL FRAGS; REXTALLIZED TO DOLO? IN MATRIX, CLAYEY AT BASE GRADING INTO UNDERLYING UNIT WITH INCREASE IN COARSE PHOS.

596 - 597.5 CLAY; MODERATE GRAY; LOW PERMEABILITY; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
ACCESSORY MINERALS: SILT- %, PHOSPHATIC SAND-05%;
OTHER FEATURES: DOLOMITIC, FOSSILIFEROUS;
VERY SILTY, PHOS. INTRACLASTS.

597.5- 605 DOLOMITE; MODERATE GRAY TO GREENISH GRAY; MOLDIC; 50-90% ALTERED;
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
ACCESSORY MINERALS: SILT- %, QUARTZ SAND-02%, PHOSPHATIC SAND-01%;
FOSSILS: FOSSIL MOLDS, MOLLUSKS;
GOOD-MOD. INDURATION, SILTY, SAND (VF), TURRITELLIDS.

605 - 613 LIMESTONE; WHITE TO LIGHT GRAY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-25%, PHOSPHATIC SAND-03%;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS;
SORITES NOTED, REXTALLIZED FOSSIL FRAGS., NICE BURROW STRUCTURE AT 607', PHOS INCREASES TO 7-10% AROUND 609.5', INDURATION DECREASES TO MOD. BELOW 609-612', 612' BACK TO GOOD IND., BARNACLES.

613 - 618 LIMESTONE; LIGHT GRAY; MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL;
GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-10%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL MOLDS, MOLLUSKS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS;

618 - 621 DOLOMITE; LIGHT GRAY TO MODERATE GRAY; MOLDIC;
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-07%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: MOLLUSKS, FOSSIL MOLDS, ECHINOID, BENTHIC FORAMINIFERA, CRUSTACEA;
MOTTLED AT TOP OF INTERVAL. ECHINOID PLATE, CRAB CLAW, GRADES INTO UNDERLYING UNIT.

621 - 626.5 LIMESTONE; LIGHT GRAY TO MODERATE GRAY; MOLDIC, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: BIOGENIC, SKELETAL;
MODERATE INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-30%, PHOSPHATIC SAND-07%, PHOSPHATIC SAND-10%;
FOSSILS: FOSSIL MOLDS, MOLLUSKS, FOSSIL FRAGMENTS;
TURRITELLIDS COMMON, GRADES INTO DOLOMITE. MODERATE TO GOOD INDURATION.

626.5- 629 DOLOMITE; MODERATE GRAY TO DARK GRAY; MOLDIC, POSSIBLY HIGH PERMEABILITY;
50-90% ALTERED;
RANGE: MICROCRYSTALLINE TO VERY FINE; GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-15%, PHOSPHATIC SAND-05%, PHOSPHATIC SAND-07%;
MOLLUSK MOLDS ARE ABUNDANT.

629 - 632 NO SAMPLES
DRILLER REPORTS SOFT ROCK OR CLAY.

632 - 632.5 SAND; MODERATE GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
ACCESSORY MINERALS: PHOSPHATIC SAND-25%;

632.5- 638 `SAME AS 626..5'.

638 - 642 POOR RECOVERY-ROCK CHIPS FROM WASHING HOLE, PROBABLY SOFT SAND.

642 - 643 AS 632-632.5'.

643 - 646.7 DOLOMITE; MODERATE GRAY; MOLDIC, POSSIBLY HIGH PERMEABILITY;
10-50% ALTERED;
RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-30%, PHOSPHATIC SAND-10%;
OTHER FEATURES: FOSSILIFEROUS;
SAND AND PHOS. DECREASE AS MOLLUSK MOLDS INCREASE.

646.7- 647.2 SAND; ;
AS 642'.

647.2- 652 DOLOMITE; MODERATE GRAY;
RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: QUARTZ SAND-40%, PHOSPHATIC SAND-05%;
FOSSILS: FOSSIL MOLDS, MOLLUSKS;
BIOTURBATION VERY EVIDENT, VARIABLY FOSSILIFEROUS.

652 - 660 LIMESTONE; WHITE TO LIGHT GRAY; MOLDIC;
GRAIN TYPE: SKELETAL, BIOGENIC;
MODERATE INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-15%;
OTHER FEATURES: FOSSILIFEROUS;
FOSSILS: FOSSIL MOLDS, MOLLUSKS;
RECRYSTALLIZED, MOD-GOOD INDURATION, MOLLUSK MOLDS, POOR RECOVERY.

660 - 661 DOLOMITE; MODERATE GRAY TO GRAYISH BROWN; 50-90% ALTERED;
RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
ACCESSORY MINERALS: QUARTZ SAND-15%, PHOSPHATIC SAND-10%;
FOSSILS: FOSSIL MOLDS;
FEW MOLDS.

661 - 680 SAND; MODERATE GRAY TO GREENISH GRAY; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; POOR INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, CLAY MATRIX;
ACCESSORY MINERALS: CLAY-05%, DOLOMITE-35%, PHOSPHATIC SAND-02%, PHOSPHATIC SAND-08%;
FOSSILS: FOSSIL MOLDS;
FEW MOLDS, POOR-GOOD INDURATION, THIN ZONES OF VERY SANDY DOLOMITE, VERY BIOTURBATED.
HARDER NEAR BASE, NO RECOVERY 674-77'. BORED, HARD DOLOMITE CLASTS PRESENT AT 661.5'.
DRILLER REPORTS FLOW AT 678' = 100GPM.

680 - 684.5 DOLOMITE; MODERATE GRAY;
RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-02%, QUARTZ SAND-25%;
FOSSILS: FOSSIL MOLDS;
MOLLUSK MOLDS. SAND CONTENT VARIABLE.

684.5- 689 SAND; ;
AS 661'; GRADES INTO CLAYEY SAND.

689 - 692 NO SAMPLES
DRILLER SAYS SANDY CLAY, PROBABLY AS 684.5'.

692 - 698 SAND; MODERATE GRAY; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
ACCESSORY MINERALS: PHOSPHATIC SAND-02%, DOLOMITE-30%, CLAY- %;
FOSSILS: FOSSIL MOLDS;
MOD-POOR INDURATION. FEW FOSSIL MOLDS. BURROWS, INTRACLASTS. MAY VARY TO VERY SANDY
SLIGHTLY CLAYEY DOLOMITE. LARGE (2") HARD, BORED DOLOMITE INTRACLAST AT 694'.

698 - 713 SAND; MODERATE GRAY; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO VERY FINE; MODERATE INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: PHOSPHATIC SAND-02%, DOLOMITE-20%;
FOSSILS: FOSSIL MOLDS;
MOD-POOR INDURATION., DOLOMITE TO 20%; VERY FEW FOSSIL MOLDS. BIOTURBATED. BECOMES MORE
CLAYEY 713-717'.

713 - 736 SAND; GREENISH GRAY TO DARK GREENISH GRAY; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO MICROCRYSTALLINE; POOR INDURATION;
CEMENT TYPE(S): CLAY MATRIX, DOLOMITE CEMENT;
ACCESSORY MINERALS: CLAY-50%, PHOSPHATIC SAND-03%, DOLOMITE-10%;
FOSSILS: FOSSIL FRAGMENTS;
POOR-MOD. INDURATION; CLAY TO 50%; PHOS. DECREASES WITH INCREASING CLAY CONTENT; ZONES OF SILTY, SANDY CLAY. MORE INDURATED 722-25'; ZONE W\ FEW FOSSIL FRAGS 727-28'; ABUNDANT INTRACLASTS 734-36'? (POOR RECOVERY) SOME WITH BORINGS.

736 - 737 DOLOMITE; GREENISH GRAY;
GRAIN SIZE: CRYPTOCRYSTALLINE; GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
ACCESSORY MINERALS: SILT-10%, QUARTZ SAND-05%, PHOSPHATIC SAND-02%, CLAY-%;

737 - 740 SAND; ;

CLAY. HAS THIN SAND STRINGERS AND BURROW FILL.

740 TOTAL DEPTH