

Executive Summary  
ROMP Site No. 50  
Three Monitor Wells

Location - ROMP Site No. 50 is located approximately 300 feet west of Trinity Lakes Drive and 250 feet south of SR 674 in Sun City Center, Hillsborough County. The site is located in Section 12, Township 32 South, Range 19 East and at latitude  $27^{\circ}42'43''$ , longitude  $82^{\circ}21'15''$ .

Site Easement - This site was obtained from the W-G Development Corporation on December 14, 1973 for the sum of one dollar. The Perpetual Easement is 20 feet by 80 feet and is recorded in O.R. Book 2812 Pages 729 through 731 at the Hillsborough County Courthouse. A Temporary Construction Easement was not obtained for this site.

Geology - This site is located on the Penholoway terrace at an elevation of approximately 50 feet above mean sea level (MSL). All geologic data was obtained from drill cuttings that were collected from the surface to 1670 feet below land surface datum (LSD). These samples were described by the Tampa office of the U.S.G.S. and the general geology is as follows:

0-55' Sand and clay  
55'-138' Hawthorn formation  
138'-310' Tampa limestone  
310'-515' Suwannee limestone  
515'-730' Ocala Group  
730'-1420' Avon Park limestone  
1420'-1670' Lake City limestone

Hydrogeology - During the construction of the chloride monitor well at least 13 usable specific capacity tests were conducted on the well. The specific capacities ranged from as low as 2 gallons per minute per foot of drawdown (GPM/ft) to as high as 526 GPM/ft. These amounts can be

IIA

equated to transmissivities by various equations and fall in the range of approximately 2500 gallons per day per foot of aquifer thickness (GPD/ft) to 920,000 GPD/ft.

There are two separate artesian water systems at this site. The first is the upper Hawthorn formation and is separated from the water table by clays and a limestone and clay mixture and from the second artesian system by a mixture of limestone and clay. The second artesian system exists at a depth between 200 and 1400 feet in depth.

The upper artesian system has an estimated transmissivity between 95,000 and 240,000 GPD/ft. The lower artesian zone has a transmissivity between 150,000 and 920,000 GPD/ft. The zone of greatest transmissivity exists between the depths of 640 and 1240 feet below LSD. The estimated transmissivity is in excess of 900,000 GPD/ft. in this zone which is made up mostly of dolomite with some limestone.

Two specific capacity tests were conducted between 1400 and 1680 feet below LSD. The values obtained were around 4 GPM/ft. and the transmissivity is around 2500 to 5000 GPD/ft. These two tests were conducted in the Lake City limestone.

Well Construction - Three monitor wells have been constructed on this site. The deep well or chloride monitor was constructed under Contract while the two shallower wells were constructed by District personnel.

- A. Well No. 1 - This well was constructed under Contract with the Meridith Corporation between October 4, 1976 and February 16, 1977 at a cost of \$104,810.50 or \$62.76 per foot.

The well was constructed by using 29 feet of 24 inch steel work casing, 110 feet of 18 inch steel work casing, 645 feet of 10 inch PVC work casing, and 120 feet of 6 inch PVC which reduces down and is attached to 1273 feet of 4 inch PVC well casing. The 10, 18, and 24 inch casings are all grouted in place while the 4 inch PVC is grouted between 1100 and 1393 feet below LSD. The annular space between the 4 and 6 inch PVC casing and the 10 inch PVC casing is open from LSD to 1100 feet and 760 feet of 1/2 inch PVC casing has been implaced for water sampling purposes. This well is open to the Avon Park limestone near its contact with the Lake City limestone.

- B. Well No. 2 - This well was constructed by the District's Portadrill between October and December, 1975 at a cost of \$8,345 or \$14.85 per foot.

The well was constructed with approximately 60 feet of 14 inch steel work casing and 200 feet of 8 inch PVC well casing both of which were grouted in place. The hole was then drilled out to 512 feet and is 6 inches in diameter.

- C. Well No. 3 - This well was constructed by the District's Portadrill at a cost of \$550 or \$14.67 per foot in January, 1976.

This well was constructed by drilling a 12 inch open hole and installing 32.5 feet of 6 inch PVC with 5 feet of .020 slot PVC screen attached to the bottom for a total depth of 37.5 feet. The annulus was then pucked with course sand with a mean diameter greater than .020.

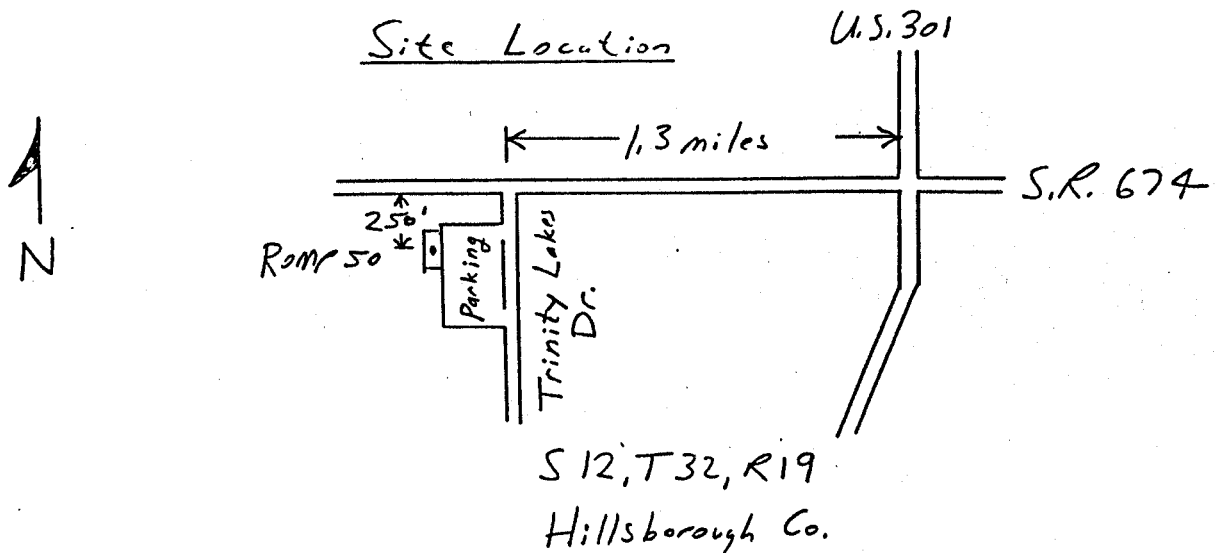
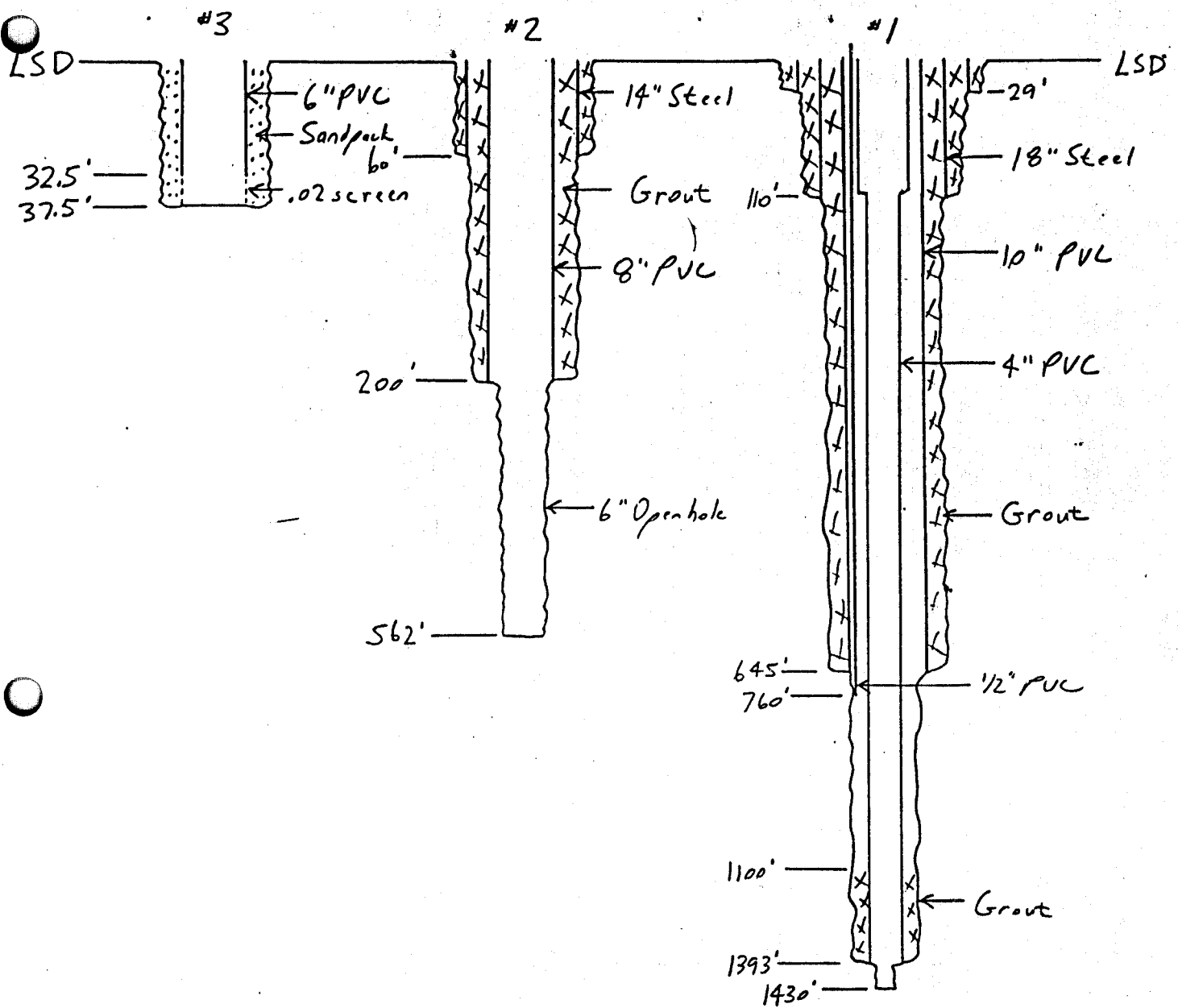
Geophysical Logs - Electric, caliper, gamma, fluid resistivity, and temperature logs were run on the chloride monitor well.

Type of Monitor - The deep well is utilized as a chloride monitor well near the Avon Park-Lake City contact while the intermediate well monitors the potentiometric head in the Tampa, Suwannee, and Ocala formations. The shallow well is a water table monitor.

Water Quality - The general water quality at this site is good down to a depth of  $\pm$  670 feet below LSD. At this depth, the sulfates reach the 250 milligram per liter (mg/L) level and steadily increase to around 5500 mg/L at 1550 feet below LSD. The chlorides reach the 250 mg/L mark at a depth of  $\pm$  1400 feet below LSD and increase to 33,000 mg/L at 1480 feet below LSD. The recommended maximum drinking water level for both constituents is 250 mg/L. The chloride concentrations indicate that the freshwater-saltwater interface is quite sharp since the chloride concentrations increase quite dramatically in less than 80 feet.

U.S.G.S. Notification - The U.S.G.S. has been notified that these wells are complete and all three are being monitored.

# As Built Well Diagrams



LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 13517

COUNTY - HILLSBORO

TOTAL DEPTH: ~~01430~~ FT. 565 ft.

LOCATION: T.32S R.19E S.12AD

SAMPLES - NONE

LAT = N 27D 42M 43

LON = W 82D 21M 15

COMPLETION DATE - 02/16/77

ELEVATION - 050 FT

OTHER TYPES OF LOGS AVAILABLE - CALIPER, GAMMA, FLUID COND, TEMP, NEUTRON

OWNER/DRILLER: SWFWMD; ROMP SITE 50.

WORKED BY: RICHARD GREEN FROM CUTTINGS 1/91.

0. - 35. UNDIFFERENTIATED SAND AND CLAY  
35. - 100. PEACE RIVER FM.  
100. - 305. TAMPA MEMBER OF ARCADIA FM.  
35. - 305. HAWTHORN GROUP  
305. - 520. SUWANNEE LIMESTONE  
520. - . OCALA GROUP

0 - 5 SAND; VERY LIGHT ORANGE TO GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; LOW SPHERICITY; UNCONSOLIDATED;  
ACCESSORY MINERALS: IRON STAIN- %;  
FOSSILS: NO FOSSILS;

5 - 10 SAND; VERY LIGHT ORANGE TO GRAYISH BROWN; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO VERY COARSE;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; LOW SPHERICITY; UNCONSOLIDATED;  
ACCESSORY MINERALS: IRON STAIN- %;  
FOSSILS: NO FOSSILS;

10 - 15 SAND; VERY LIGHT ORANGE; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;  
ACCESSORY MINERALS: IRON STAIN-01%;  
FOSSILS: NO FOSSILS;

15 - 20 SAND; VERY LIGHT ORANGE TO TRANSPARENT; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;  
ACCESSORY MINERALS: IRON STAIN-01%;  
FOSSILS: NO FOSSILS;

20 - 25 AS ABOVE

- 25 - 30 SAND; VERY LIGHT ORANGE TO TRANSPARENT; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO MEDIUM;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;  
FOSSILS: NO FOSSILS;
- 30 - 35 SAND; VERY LIGHT ORANGE TO TRANSPARENT; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;  
FOSSILS: NO FOSSILS;
- 35 - 40 SAND; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: COARSE; RANGE: VERY COARSE TO MEDIUM;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;  
ACCESSORY MINERALS: PHOSPHATIC SAND-02%;  
OTHER FEATURES: FROSTED;  
FOSSILS: NO FOSSILS;  
PHOSPHATE IS BLACK/BROWN, WELL ROUNDED.
- 40 - 45 SAND; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;  
ACCESSORY MINERALS: PHOSPHATIC SAND-01%;  
OTHER FEATURES: FROSTED;  
FOSSILS: NO FOSSILS;
- 45 - 50 AS ABOVE
- 50 - 55 SAND; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;  
ACCESSORY MINERALS: PHOSPHATIC SAND-02%;  
OTHER FEATURES: FROSTED;  
FOSSILS: NO FOSSILS;  
PHOSPHATE IS BLACK, WELL ROUNDED.
- 55 - 60 SAND; YELLOWISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: MEDIUM; RANGE: VERY COARSE TO FINE;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;  
ACCESSORY MINERALS: PHOSPHATIC SAND-02%, CLAY-05%, IRON STAIN- %;  
OTHER FEATURES: POOR SAMPLE;  
5% GREENISH GRAY SANDY, PHOSPHATIC, CLAY FRAGMENTS PRESENT.
- 60 - 65 AS ABOVE

- 65 - 70 SAND; WHITE TO YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; POOR INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: CALCILUTITE- %, PHOSPHATIC SAND-02%;  
OTHER FEATURES: POOR SAMPLE, DOLOMITIC, CALCAREOUS;  
FOSSILS: SHARKS TEETH, FOSSIL FRAGMENTS;  
ABUNDANT CAVINGS.
- 70 - 75 AS ABOVE
- 75 - 80 AS ABOVE
- 80 - 85 AS ABOVE  
LESS CAVINGS THAN ABOVE.
- 85 - 90 SILT; YELLOWISH GRAY TO LIGHT OLIVE GRAY; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;  
CEMENT TYPE(S): CLAY MATRIX;  
ACCESSORY MINERALS: CLAY- %, PHOSPHATIC SAND-01%, QUARTZ SAND-05%;  
OTHER FEATURES: CALCAREOUS, POOR SAMPLE;  
SOME CAVINGS.
- 90 - 95 SILT; WHITE TO YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY; POOR INDURATION;  
CEMENT TYPE(S): CLAY MATRIX, CALCILUTITE MATRIX;  
ACCESSORY MINERALS: CLAY- %, CALCILUTITE- %, PHOSPHATIC SAND-01%, QUARTZ SAND-05%;  
OTHER FEATURES: CALCAREOUS, POOR SAMPLE;  
VERY CALCAREOUS SILT-VERY SILTY CALCILUTITE.
- 95 - 100 LIMESTONE; WHITE TO YELLOWISH GRAY; INTERGRANULAR;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; POOR INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, QUARTZ SAND-03%;  
OTHER FEATURES: POOR SAMPLE;  
VARIABLY SANDY AND PHOSPHATIC.
- 100 - 105 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; MODERATE INDURATION;  
ACCESSORY MINERALS: PHOSPHATIC SAND-01%, QUARTZ SAND-02%;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
- 105 - 110 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; MODERATE INDURATION;  
ACCESSORY MINERALS: PHOSPHATIC SAND-03%, QUARTZ SAND-05%, IRON STAIN-01%;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;  
SAND IS WELL ROUNDED, PHOSPHATE IS BLK/BRN, F-M GRAINED.

- 110 - 115 AS ABOVE  
PHOSPHATE AND QTZ SAND ARE FINER THAN ABOVE.
- 115 - 120 AS ABOVE
- 120 - 125 SAND; VERY LIGHT GRAY TO YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: FINE; RANGE: VERY FINE TO FINE; POOR INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: CALCILUTITE-05%, PHOSPHATIC SAND-02%;  
OTHER FEATURES: CALCAREOUS, POOR SAMPLE;  
ABUNDANT COARSE-MEDIUM QTZ SAND--CAVINGS?.
- 125 - 130 LIMESTONE; ;  
LS AS IN 105-110' WITH ABUNDANT QTZ SAND CAVINGS.
- 130 - 135 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; POOR INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-08%, PHOSPHATIC SAND-03%;  
OTHER FEATURES: CALCAREOUS, CHALKY, UNWASHED SAMPLE;  
PHOSPHATE IS BLACK, MEDIUM-FINE GRAINED.
- 135 - 140 AS ABOVE
- 140 - 145 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: SILT- %, PHOSPHATIC SAND-01%, QUARTZ SAND-01%;  
OTHER FEATURES: CALCAREOUS, CHALKY, UNWASHED SAMPLE;
- 145 - 150 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO CRYPTOCRYSTALLINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: SILT- %, PHOSPHATIC SAND-01%, QUARTZ SAND-01%;  
OTHER FEATURES: CALCAREOUS, CHALKY, DOLOMITIC, MEDIUM RECRYSTALLIZATION, UNWASHED SAMPLE;
- 150 - 155 AS ABOVE
- 155 - 160 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, LOW PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO CRYPTOCRYSTALLINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: SILT- %, PHOSPHATIC SAND-01%, QUARTZ SAND-02%;  
OTHER FEATURES: CALCAREOUS, CHALKY, UNWASHED SAMPLE;  
VERY SILTY.

160 - 165 AS ABOVE

165 - 170 SAND; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM;  
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: CALCILUTITE-15%, PHOSPHATIC SAND-02%;  
OTHER FEATURES: CALCAREOUS, POOR SAMPLE, UNWASHED SAMPLE;

170 - 175 AS ABOVE  
MORE CALCILUTITE. VERY SANDY MICRITE TO A VERY CALC. SANDSTONE.

175 - 180 AS ABOVE

180 - 185 LIMESTONE; YELLOWISH GRAY TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-10%, PHOSPHATIC SAND-01%;

185 - 190 LIMESTONE; VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-01%;

190 - 195 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: HEAVY MINERALS-01%, PHOSPHATIC SAND-01%, QUARTZ SAND-05%;  
OTHER FEATURES: CHALKY, UNWASHED SAMPLE;

195 - 200 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-01%;  
OTHER FEATURES: CHALKY, UNWASHED SAMPLE;

200 - 205 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-25%, PHOSPHATIC SAND-02%;  
OTHER FEATURES: CHALKY, UNWASHED SAMPLE;

- 205 - 210 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-08%, PHOSPHATIC SAND-01%;  
OTHER FEATURES: CHALKY, UNWASHED SAMPLE;
- 210 - 215 AS ABOVE
- 215 - 220 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-05%, PHOSPHATIC SAND-01%;  
OTHER FEATURES: CHALKY, UNWASHED SAMPLE;
- 220 - 225 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-01%;  
OTHER FEATURES: CHALKY, UNWASHED SAMPLE;
- 225 - 230 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-02%;  
OTHER FEATURES: CHALKY, UNWASHED SAMPLE;  
FOSSILS: FOSSIL FRAGMENTS;
- 230 - 235 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; POOR INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-02%, PHOSPHATIC SAND-01%;  
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS;  
SORITES, OTHER FORAMS.
- 235 - 240 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; POOR INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-03%, PHOSPHATIC SAND-01%;  
OTHER FEATURES: CHALKY, UNWASHED SAMPLE;
- 240 - 245 AS ABOVE

- 245 - 250 LIMESTONE; WHITE TO VERY LIGHT GRAY; INTERGRANULAR;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MICROCRYSTALLINE TO FINE; MODERATE INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-04%, PHOSPHATIC SAND-02%;
- 250 - 255 LIMESTONE; LIGHT GRAY TO LIGHT OLIVE GRAY; LOW PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CALCILUTITE;  
GOOD INDURATION;  
ACCESSORY MINERALS: QUARTZ SAND-04%, PHOSPHATIC SAND-01%;  
OTHER FEATURES: HIGH RECRYSTALLIZATION, UNWASHED SAMPLE;
- 255 - 260 LIMESTONE; VERY LIGHT GRAY TO LIGHT OLIVE GRAY; LOW PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: CRYSTALS;  
GRAIN SIZE: VERY FINE; RANGE: MEDIUM TO MICROCRYSTALLINE; GOOD INDURATION;  
ACCESSORY MINERALS: QUARTZ SAND-08%, PHOSPHATIC SAND-01%;  
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
- 260 - 265 AS ABOVE
- 265 - 270 LIMESTONE; VERY LIGHT GRAY TO LIGHT OLIVE GRAY; LOW PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: CRYSTALS;  
GRAIN SIZE: VERY FINE; RANGE: MEDIUM TO MICROCRYSTALLINE; GOOD INDURATION;  
ACCESSORY MINERALS: QUARTZ SAND-08%;  
OTHER FEATURES: HIGH RECRYSTALLIZATION, SUCROSIC;
- 270 - 275 LIMESTONE; VERY LIGHT GRAY; LOW PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: CRYSTALS, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MEDIUM TO MICROCRYSTALLINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-08%, PHOSPHATIC SAND-01%;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
- 275 - 280 LIMESTONE; VERY LIGHT GRAY; LOW PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: CRYSTALS, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MEDIUM TO MICROCRYSTALLINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-10%;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
- 280 - 285 LIMESTONE; VERY LIGHT GRAY; LOW PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: CRYSTALS, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MEDIUM TO MICROCRYSTALLINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-05%;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, HIGH RECRYSTALLIZATION;

- 285 - 290 LIMESTONE; VERY LIGHT GRAY; LOW PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: CRYSTALS, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MEDIUM TO MICROCRYSTALLINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-02%;  
OTHER FEATURES: HIGH RECRYSTALLIZATION;
- 290 - 295 LIMESTONE; VERY LIGHT GRAY; LOW PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: CRYSTALS, CALCILUTITE;  
GRAIN SIZE: MICROCRYSTALLINE; RANGE: VERY FINE TO MICROCRYSTALLINE; GOOD INDURATION;  
ACCESSORY MINERALS: QUARTZ SAND-01%;  
OTHER FEATURES: HIGH RECRYSTALLIZATION;  
MUDSTONE.
- 295 - 300 LIMESTONE; VERY LIGHT GRAY; LOW PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: CRYSTALS, CALCILUTITE;  
GRAIN SIZE: VERY FINE; RANGE: MEDIUM TO MICROCRYSTALLINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: QUARTZ SAND-05%;  
OTHER FEATURES: HIGH RECRYSTALLIZATION;
- 300 - 305 LIMESTONE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: MEDIUM; RANGE: COARSE TO MEDIUM; POOR INDURATION;  
OTHER FEATURES: HIGH RECRYSTALLIZATION, POOR SAMPLE;  
FOSSILS: ECHINOID, MILIOLIDS;  
ABUNDANT QTZ SAND CAVINGS. LOOKS LIKE A POORLY INDURATED GRAINSTONE BROKEN UP BY DRILLING.
- 305 - 310 WACKESTONE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, INTERCRYSTALLINE;  
GRAIN TYPE: BIOGENIC, SKELETAL, CRYSTALS;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; MODERATE INDURATION;  
ACCESSORY MINERALS: SPAR-05%;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;  
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, MOLLUSKS;
- 310 - 315 LIMESTONE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CRYSTALS;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; MODERATE INDURATION;  
ACCESSORY MINERALS: SPAR-05%;  
OTHER FEATURES: HIGH RECRYSTALLIZATION;  
FOSSILS: ECHINOID, FOSSIL FRAGMENTS;  
RECRYSTALLIZED WACKESTONE-WACKESTONE.
- 315 - 330 NO SAMPLES

- 330 - 335 WACKESTONE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CRYSTALS;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; GOOD INDURATION;  
CEMENT TYPE(S): SPARRY CALCITE CEMENT;  
ACCESSORY MINERALS: SPAR-08%;  
OTHER FEATURES: HIGH RECRYSTALLIZATION;  
FOSSILS: ECHINOID, FOSSIL FRAGMENTS, MOLLUSKS;
- 335 - 340 AS ABOVE
- 340 - 345 AS ABOVE  
MORE OF A GRAINSTONE. SPAR COATS MOST SURFACES.
- 345 - 350 AS ABOVE  
ARCHAIAS SP.?, SORITES NOTED; ABUNDANT MILLIOLIDS. FORAM RICH GRAINSTONE-PACKSTONE.
- 350 - 355 AS ABOVE  
PACKSTONE.
- 355 - 360 WACKESTONE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, CRYSTALS, SKELETAL;  
GRAIN SIZE: MEDIUM; RANGE: COARSE TO FINE; GOOD INDURATION;  
CEMENT TYPE(S): SPARRY CALCITE CEMENT;  
ACCESSORY MINERALS: SPAR- %;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;  
FOSSILS: MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS, MILLIOLIDS;
- 360 - 365 AS ABOVE
- 365 - 370 AS ABOVE
- 370 - 375 AS ABOVE  
PACKSTONE-WACKESTONE.
- 375 - 380 AS ABOVE
- 380 - 385 PACKSTONE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, MOLDIC;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: VERY FINE TO MEDIUM; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: SPAR- %;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;  
FOSSILS: ECHINOID, FOSSIL FRAGMENTS, MOLLUSKS, FOSSIL MOLDS, MILLIOLIDS;  
PACKSTONE-WACKESTONE.
- 385 - 390 AS ABOVE
- 390 - 395 AS ABOVE

395 - 400 AS ABOVE

400 - 405 AS ABOVE

405 - 410 AS ABOVE

410 - 415 AS ABOVE

415 - 420 AS ABOVE

420 - 420 WACKESTONE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, INTRAGRANULAR;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: MEDIUM; RANGE: VERY FINE TO MEDIUM; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
ACCESSORY MINERALS: SPAR- %;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;  
FOSSILS: MILIOLIDS, ECHINOID, MOLLUSKS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS;

420 - 425 AS ABOVE

425 - 430 AS ABOVE

430 - 435 AS ABOVE

435 - 440 AS ABOVE  
SLIGHTLY MUDDIER THAN ABOVE.

440 - 445 DOLOSTONE; BROWN TO LIGHT BROWN; INTERGRANULAR, INTERCRYSTALLINE,  
POSSIBLY HIGH PERMEABILITY; 50-90% ALTERED; EUHEDRAL;  
GRAIN SIZE: MEDIUM; RANGE: FINE TO COARSE; GOOD INDURATION;  
CEMENT TYPE(S): DOLOMITE CEMENT;  
OTHER FEATURES: POOR SAMPLE;  
10% OF SAMPLE IS DOLOSTONE COMPOSED ENTIRELY OF MED-COARSE SAND SIZED DOLOSPAR. VERY GOOD  
POROSITY.

445 - 450 AS ABOVE  
ABUNDANT CAVINGS OF LS FROM ABOVE.

450 - 455 AS ABOVE

455 - 460 AS ABOVE

460 - 465 AS ABOVE

465 - 470 AS ABOVE

470 - 475 AS ABOVE

475 - 480 AS ABOVE

- 480 - 485 AS ABOVE
- 485 - 490 DOLOSTONE; BROWN; INTERCRYSTALLINE, LOW PERMEABILITY; 50-90% ALTERED;  
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;  
CEMENT TYPE(S): DOLOMITE CEMENT;  
OTHER FEATURES: SUCROSIC, POOR SAMPLE;  
DOLOMITIZED MUDSTONE-WACKESTONE.
- 490 - 495 DOLOSTONE; GRAYISH BROWN; INTERCRYSTALLINE, LOW PERMEABILITY;  
10-50% ALTERED;  
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; GOOD INDURATION;  
CEMENT TYPE(S): DOLOMITE CEMENT;  
OTHER FEATURES: SUCROSIC, POOR SAMPLE;  
POOR SAMPLE-- ABUNDANT CAVINGS. NOTE-- IT IS POSSIBLE THAT THE SEQUENCE FROM 445'-495' IS  
A SERIES OF INTERBEDDED DOLOMITES AND LIMESTONES. THE SET OF CUTTINGS IS VERY POOR THROUGH  
THIS INTERVAL. IT LOOKS LIKE 445-475' MAY BE DOLOMITE, 475-485' MAY BE LS, AND 485-495'  
MAY BE DOLOMITE.
- 495 - 500 WACKESTONE; YELLOWISH GRAY; INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
FOSSILS: MILIOLIDS, ECHINOID, FOSSIL FRAGMENTS, BRYOZOA;
- 500 - 505 AS ABOVE
- 505 - 510 AS ABOVE
- 510 - 515 AS ABOVE  
SOME CAVINGS.
- 515 - 520 PACKSTONE; YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;  
FOSSILS: MILIOLIDS, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, BRYOZOA, ECHINOID;  
WACKESTONE-PACKSTONE.
- 520 - 525 AS ABOVE
- 525 - 530 AS ABOVE
- 530 - 535 AS ABOVE
- 535 - 540 AS ABOVE
- 540 - 545 AS ABOVE  
ABUNDANT ECHINOID SPINES, FRAGMENTS, AND FORAMS.

545 - 550 PACKSTONE; YELLOWISH GRAY; INTERGRANULAR, LOW PERMEABILITY;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, POOR SAMPLE;  
FOSSILS: ECHINOID, BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS;  
ABUNDANT CAVINGS. LEPIDOCYCLINA SP.? FRAGMENTS.

550 - 555 AS ABOVE

555 - 560 LIMESTONE; YELLOWISH GRAY; INTERGRANULAR;  
GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE;  
GRAIN SIZE: FINE; RANGE: MEDIUM TO VERY FINE; GOOD INDURATION;  
CEMENT TYPE(S): CALCILUTITE MATRIX;  
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, POOR SAMPLE;  
FOSSILS: ECHINOID, FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA;  
NUMMULITES VANDERSTOKI; AMPHISTEGINA, LEPS COMMON.

560 - 565 AS ABOVE  
FORAMS VERY COMMON.

565 TOTAL DEPTH