TECHNICAL PUBLICATION 84-10

November 1984

APPENDICES

PRELIMINARY WATER RESOURCE ASSESSMENT OF THE MID AND LOWER HAWTHORN AQUIFERS IN WESTERN LEE COUNTY, FLORIDA

TECHNICAL PUBLICATION #84-10
November 1984

APPENDICES

PRELIMINARY WATER RESOURCE ASSESSMENT OF THE MID AND LOWER HAWTHORN AQUIFERS IN WESTERN LEE COUNTY, FLORIDA

by

Michael S. Knapp
Wm. Scott Burns
Timothy S. Sharp
George Shih

This public document was promulgated at an annual cost of $507.00 or $1.01 per copy to inform the public regarding water resource studies of the District. RP 285 5C

Groundwater Division
Resource Planning Department
South Florida Water Management District
West Palm Beach, Florida

LIST OF APPENDICES

APPENDIX I

Lithologic Descriptions and Stratigraphic Columns of Test Wells from Western Lee County

APPENDIX II

Long Term Hydrographs

APPENDIX III

Number of Dwelling Units and Capacity of Planning Areas
- A. Planning Areas 1-11; Cape Coral
- B. Planning Area 12; Iona-McGregor
- C. Planning Area 13; South Fort Myers
- D. Planning Area 14; Fort Myers
- E. Planning Area 15; Pine Island
- F. Planning Area 16; North Fort Myers

APPENDIX IV

Examples of Water Use Computations

APPENDIX V

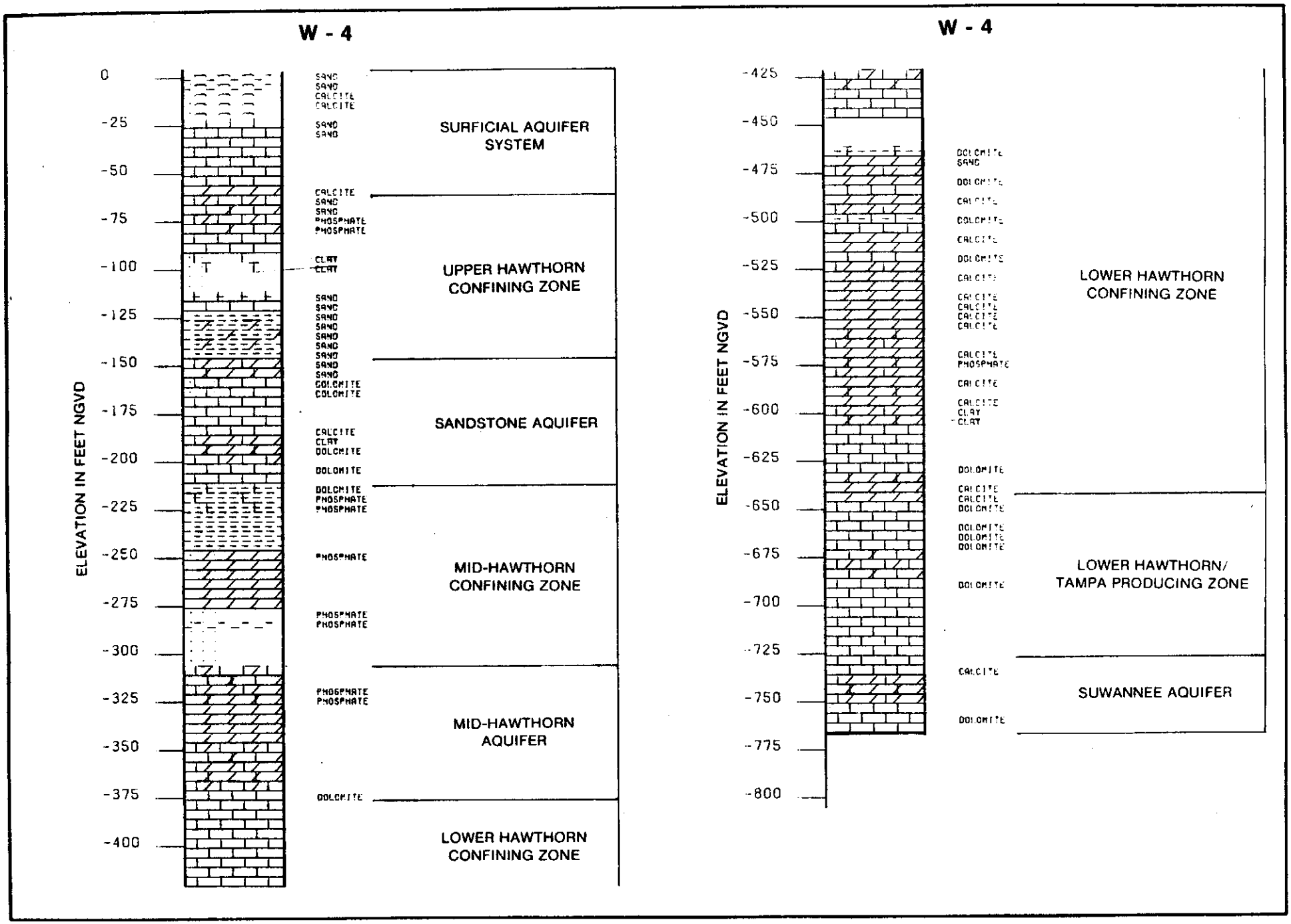
Data Set of Mid and Lower Hawthorn Aquifer Parameters

APPENDIX VI

Projected Potentiometric Surfaces of the Lower Hawthorn Aquifer for Wet and Dry Seasons (1985-1990)

APPENDIX I

Lithologic Descriptions and Stratigraphic Columns of Test Wells from Western Lee County


W - 4
ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
SAND
SAND
CALCITE
CALCITE
SAND
SAND
CALCITE
SAND
SAND
PHOSPHATE
PHOSPHATE
CLAY
CLAY
SAND
SAND
SAND
SAND
SAND
SAND
SAND
SAND
DOLOMITE
DOLOMITE
CALCITE
CLAY
DOLOMITE
DOLOMITE
DOLOMITE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
DOLOMITE
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
SANDSTONE AQUIFER
MID-HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE
W - 4
ELEVATION IN FEET NGVD
-425
-450
-475
-500
-525
-550
-575
-600
-625
-650
-675
-700
-725
-750
-775
-800
DOLOMITE
SAND
DOLOMITE
CALCITE
DOLOMITE
CALCITE
DOLOMITE
CALCITE
CALCITE
CALCITE
CALCITE
CALCITE
CALCITE
PHOSPHATE
CALCITE
CALCITE
CLAY
CLAY
DOLOMITE
CALCITE
CALCITE
DOLOMITE
DOLOMITE
DOLOMITE
DOLOMITE
DOLOMITE
CALCITE
DOLOMITE
LOWER HAWTHORN CONFINING ZONE
LOWER HAWTHORN/ TAMPA PRODUCING ZONE
SUWANNEE AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 04

LEE CO. T46S R22E SEC 28AB 26 26 42 N 82 07 02 W
TOTAL DEPTH- 774 FT. ELEV.- 4 FT. SAMPLES- 0- 774 FT.
COMPLETED- 81.02.05 DEPTH WORKED 774 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA

WELL NAME-
MISSIMER WELL LM987,REVERSE AIR
REMARKS-
SAMPLES WORKED BY MIKE KNAPP 2-5-81,QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0-	64.0	SURFICIAL AQUIFER SYSTEM
64.0-	151.0	UPPER HAWTHORN CONFINING ZONE
151.0-	224.0	SANDSTONE AQUIFER
224.0-	310.0	MID-HAWTHORN CONFINING ZONE
310.0-	378.0	MID-HAWTHORN AQUIFER
378.0-	648.0	LOWER HAWTHORN CONFINING ZONE
648.0-	732.0	LOWER HAWTHORN / TAMPA PRODUCING ZONE
732.0-	774.0	SUWANNEE AQUIFER

STRATIGRAPHIC FORMATIONS -

.0-	26.0	CALOOSAHATCHEE FORMATION
26.0-	64.0	OCHOPEE LIMESTONE MEMBER OF TAMIAMI FORMATION
64.0-	652.0	HAWTHORN FORMATION
648.0-	732.0	TAMPA LIMESTONE
732.0-	774.0	SUWANNEE LIMESTONE

LITHOLOGIC LOG
W- 04 . LEE CO. T46S, R22E, SEC 28AB

.0-	10.0	SHELL BED, LIGHT OLIVE GRAY, 20% POROSITY, INTERGRANULAR, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 02% CLAY, 20% QUARTZ SAND, MOLLUSKS,
10.0-	16.0	SHELL BED, LIGHT OLIVE GRAY, 25% POROSITY, INTERGRANULAR, POOR INDURATION, CALCILUTITE MATRIX, 10% CALCILUTITE, MOLLUSKS,
16.0-	20.0	SHELL BED, GRAYISH OLIVE, 18% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 10% CLAY, 05% QUARTZ SAND, MOLLUSKS, SPICULES,
20.0-	26.0	AS ABOVE,

LITHOLOGIC LOG
W- 04 . LEE CO. T46S, R22E, SEC 28AB

26.0- 33.0 LIMESTONE, MODERATE GRAY, 13% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, GRAIN TYPE: BIOGENIC, CRYSTALS, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, SPARRY CALCITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 01% CLAY, 10% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

33.0- 50.0 AS ABOVE,

50.0- 55.0 LIMESTONE, VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, 02% PHOSPHATIC SAND, 01% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

55.0- 62.0 AS ABOVE,

62.0- 64.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH BROWN, 11% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, 03% PHOSPHATIC SAND, FOSSIL MOLDS,

LOOKS LIKE HAWTHORN

64.0- 65.0 CLAY, LIGHT OLIVE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% CALCILUTITE, 20% DOLOMITE, 05% SILT,

65.0- 75.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 75% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: COARSE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 15% DOLOMITE, 01% PHOSPHATIC SAND, 06% QUARTZ SAND, 01% MICA, MOLLUSKS, BENTHONIC FORAMINIFERA,

75.0- 85.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT GREENISH GRAY, 11% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 45% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% DOLOMITE, 10% QUARTZ SAND, 06% PHOSPHATIC SAND, 01% MICA, MOLLUSKS, BENTHONIC FORAMINIFERA,

85.0- 95.0 AS ABOVE,

95.0- 105.0 SANDSTONE, YELLOWISH GRAY, 15% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 35% CALCILUTITE, 03% PHOSPHATIC SAND, 02% CLAY,

105.0- 115.0 AS ABOVE,

115.0- 124.0 LIMESTONE, YELLOWISH GRAY TO GRAYISH YELLOW, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 05% CLAY, 10% DOLOMITE, 20% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

124.0- 127.0 AS ABOVE,

127.0- 147.0 CLAY, YELLOWISH GRAY TO GRAYISH YELLOW, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 20% CALCILUTITE, 15% DOLOMITE, 15% QUARTZ SAND, 01% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

147.0- 151.0 AS ABOVE,

151.0- 159.0 DOLOMITE, YELLOWISH GRAY TO VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT, 30% CALCILUTITE, 08% CLAY, 08% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS,

159.0- 169.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 25% QUARTZ SAND, 10% DOLOMITE, MOLLUSKS,

169.0- 174.0 AS ABOVE,

174.0- 179.0 AS ABOVE WITH LESS SAND (08%)

179.0- 184.0 AS ABOVE,

184.0- 189.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% DOLOMITE, 02% QUARTZ SAND, MOLLUSKS,

189.0- 198.0 DOLO-SILT, LIGHT OLIVE GRAY TO LIGHT GRAYISH BROWN, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 35% CALCILUTITE, 10% CLAY, MOLLUSKS,

LITHOLOGIC LOG
W- 04 . LEE CO. 146S, R22E, SEC 28A8

196.0- 209.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% DOLOMITE, 01% PHOSPHATIC SAND, MOLLUSKS,

209.0- 216.0 AS ABOVE,

216.0- 224.0 AS ABOVE WITH QTZ SAND (3%)

224.0- 230.0 CLAY, GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 35% CALCILUTITE, 30% DOLOMITE, 06% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

230.0- 240.0 AS ABOVE WITH INCREASE IN PHOS. GRAVEL (4%)

240.0- 250.0 AS ABOVE,

250.0- 255.0 DOLO-SILT, GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 15% CLAY, 15% CALCILUTITE, 30% QUARTZ SAND, 08% PHOSPHATIC SAND, MOLLUSKS,

MUCH VERY COARSE PHOSPHATE (3%).

255.0- 264.0 AS ABOVE,

264.0- 282.0 AS ABOVE,

282.0- 290.0 SAND, GREENISH GRAY, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 10% CALCILUTITE, 25% DOLOMITE, 05% CLAY, 10% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

290.0- 310.0 AS ABOVE,

310.0- 320.0 LIMESTONE, WHITE, 13% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 04% PHOSPHATIC SAND, 02% QUARTZ SAND,

LIMESTONE IS ABOUT 2% OF WHOLE SAMPLE

320.0- 324.0 AS ABOVE WITH L/S(4%) AND SD (90%)

LITHOLOGIC LOG

W- 04 . LEE CO. T46S, R22E, SEC 28AB

324.0- 330.0 DOLOMITE, VERY LIGHT ORANGE TO WHITE, 13% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 35% CALCILUTITE, 07% PHOSPHATIC SAND, 07% QUARTZ SAND, MOLLUSKS,

330.0- 350.0 AS ABOVE,

350.0- 360.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 03% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS,

360.0- 370.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH BROWN, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% CALCILUTITE, 01% PHOSPHATIC SAND, 02% QUARTZ SAND,

370.0- 378.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 02% PHOSPHATIC SAND, 01% QUARTZ SAND, MOLLUSKS,

378.0- 425.0 AS ABOVE,

425.0- 430.0 AS ABOVE WITH INCREASE IN PHOS (10%) & SAND (4%)

430.0- 435.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 13% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% DOLOMITE, 03% PHOSPHATIC SAND, 02% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS, ECHINOID,

435.0- 450.0 AS ABOVE,

450.0- 465.0 NO SAMPLE,

465.0- 470.0 CLAY, YELLOWISH GRAY TO LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 25% CALCILUTITE, 25% DOLOMITE, 04% PHOSPHATIC SAND, 02% QUARTZ SAND,

470.0- 472.0 AS ABOVE,

LITHOLOGIC LOG
W- 04 . LEE CO. T46S, R22E, SEC 28AB

472.0- 475.0 DOLO-SILT, GRAYISH ORANGE TO YELLOWISH GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 25% CALCILUTITE, 15% CLAY, 02% PHOSPHATIC SAND, 12% QUARTZ SAND,

475.0- 480.0 DOLOMITE, GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% CALCILUTITE, 01% PHOSPHATIC SAND,

480.0- 483.0 AS ABOVE,

483.0- 485.0 LIMESTONE, YELLOWISH GRAY TO VERY LIGHT ORANGE, 13% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 15% DOLOMITE, 02% PHOSPHATIC SAND, MOLLUSKS, CORAL, FOSSIL MOLDS, BRYOZOA, ECHINOID,

485.0- 490.0 LIMESTONE, WHITE, 11% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, 01% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, POOR INDURATION, CALCILUTITE MATRIX, 01% PHOSPHATIC SAND, MOLLUSKS,

490.0- 495.0 DOLOMITE, GRAYISH ORANGE TO GRAYISH BROWN, 08% POROSITY, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 12% CALCILUTITE, 01% PHOSPHATIC SAND, FOSSIL MOLDS, MOLLUSKS,

495.0- 499.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 11% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 35% CALCILUTITE, 01% PHOSPHATIC SAND, FOSSIL MOLDS, MOLLUSKS,

499.0- 506.0 LIMESTONE, YELLOWISH GRAY, 09% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, 02% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 25% DOLOMITE, 15% CLAY, 01% PHOSPHATIC SAND,

506.0- 510.0 AS ABOVE,

510.0- 512.0 DOLOMITE, MODERATE LIGHT GRAY TO GRAYISH ORANGE, 09% POROSITY, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% CALCILUTITE, FOSSIL MOLDS, MOLLUSKS,

512.0- 522.0 AS ABOVE,

522.0- 525.0 LIMESTONE, MODERATE LIGHT GRAY TO VERY LIGHT ORANGE, 11% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 25% DOLOMITE, 01% PHOSPHATIC SAND, FOSSIL MOLDS, MOLLUSKS, ECHINOID,

525.0- 526.0 LIMESTONE, VERY LIGHT ORANGE TO YELLOWISH GRAY, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 45% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 25% DOLOMITE, 01% PHOSPHATIC SAND, 02% QUARTZ SAND, FOSSIL MOLDS, MOLLUSKS, ECHINOID,

ALSO CONTAINS FRAGS OF HIGHLY RECRYSTAL DOLO(35%)

526.0- 531.0 DOLOMITE, YELLOWISH GRAY TO GRAYISH BROWN, 12% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 01% PHOSPHATIC SAND, 01% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

531.0- 542.0 AS ABOVE,

542.0- 543.0 LIMESTONE, YELLOWISH GRAY TO GRAYISH BROWN, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 35% DOLOMITE, 08% PHOSPHATIC SAND, 01% QUARTZ SAND,

543.0- 546.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, 02% PHOSPHATIC SAND, FOSSIL MOLDS, BRYOZOA, MOLLUSKS,

546.0- 552.0 AS ABOVE,

552.0- 557.0 DOLOMITE, VERY LIGHT ORANGE TO YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 06% PHOSPHATIC SAND, 02% QUARTZ SAND,

557.0- 560.0 AS ABOVE,

LITHOLOGIC LOG
#- 04 . LEE CO. T46S, R22E, SEC 28AB

560.0- 569.0 DOLOMITE, VERY LIGHT ORANGE TO YELLOWISH GRAY, 11% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 02% PHOSPHATIC SAND, 01% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, FOSSIL MOLDS,

569.0- 574.0 AS ABOVE,

574.0- 578.0 DOLO-SILT, YELLOWISH GRAY TO VERY LIGHT ORANGE, 09% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 35% CALCILUTITE, 10% CLAY, 08% PHOSPHATIC SAND, 01% PHOSPHATIC GRAVEL,

578.0- 579.0 AS ABOVE WITH SOME WELL INDURATED FRAGS.

579.0- 584.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH BROWN, 08% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, 02% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, FOSSIL MOLDS, SHARK TEETH,

584.0- 588.0 AS ABOVE,

588.0- 589.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 11% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% DOLOMITE, 02% PHOSPHATIC SAND,

589.0- 595.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 02% PHOSPHATIC SAND, 01% QUARTZ SAND, FOSSIL MOLDS, MOLLUSKS,

595.0- 599.0 AS ABOVE,

599.0- 604.0 AS ABOVE WITH SOME GRAVEL PHOS (10%) AND SHARK TEETH

604.0- 606.0 DOLO-SILT, YELLOWISH GRAY TO VERY LIGHT ORANGE, 09% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 35% CALCILUTITE, 10% CLAY, 01% PHOSPHATIC SAND,

LITHOLOGIC LOG
W- 04 . LEE CO. T46S, R22E, SEC 28AB

608.0- 610.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH BROWN, 11% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 01% PHOSPHATIC SAND, FOSSIL MOLDS,

610.0- 616.0 AS ABOVE WITH SOME CRYSTALLINE DOLO.

616.0- 620.0 AS ABOVE WITH SOME GRAV. PHOS(1%)

620.0- 624.0 LIMESTONE, WHITE, 11% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, ECHINOID, MOLLUSKS,

ABUNDANT ECHINOID FRAGS

624.0- 632.0 AS ABOVE,

632.0- 635.0 LIMESTONE, WHITE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% DOLOMITE, 02% PHOSPHATIC GRAVEL, ECHINOID, MOLLUSKS,

635.0- 639.0 DOLOMITE, GRAYISH BROWN TO VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% CALCILUTITE, 02% PHOSPHATIC SAND, FOSSIL MOLDS,

639.0- 642.0 DOLOMITE, VERY LIGHT ORANGE, 11% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 40% CALCILUTITE, 01% PHOSPHATIC SAND,

642.0- 644.0 AS ABOVE,

644.0- 646.0 DOLOMITE, LIGHT OLIVE TO GRAYISH BROWN, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% CALCILUTITE,

LITHOLOGIC LOG
W- 04 . LEE CO. T46S, R22E, SEC 28AB

646.0- 652.0 LIMESTONE, VERY LIGHT ORANGE, 13% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 02% QUARTZ SAND, 01% PHOSPHATIC SAND, ECHINOID, MOLLUSKS,

652.0- 657.0 AS ABOVE WITH SOME FRAGS OF TAN DOLOMITE

657.0- 662.0 AS ABOVE,

662.0- 667.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 45% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 01% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, ECHINOID, FOSSIL MOLDS,

667.0- 672.0 AS ABOVE,

672.0- 677.0 AS ABOVE WITH SOME FRAGS OF PHOS/SANDY LIMESTONE

677.0- 682.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 45% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 10% DOLOMITE, MOLLUSKS, ECHINOID, BENTHONIC FORAMINIFERA, FOSSIL MOLDS,

SORITES

682.0- 687.0 LIMESTONE, VERY LIGHT ORANGE, 11% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 45% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% DOLOMITE, 01% PHOSPHATIC SAND, 02% QUARTZ SAND, MOLLUSKS, ECHINOID, BENTHONIC FORAMINIFERA,

SORITES

687.0- 692.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% DOLOMITE, 01% PHOSPHATIC SAND, 04% QUARTZ SAND, MOLLUSKS, ECHINOID, BENTHONIC FORAMINIFERA,

692.0- 702.0 AS ABOVE,

702.0- 707.0 AS ABOVE WITH MUCH SPAR XSTALS

707.0- 712.0 AS ABOVE,

712.0- 717.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 01% PHOSPHATIC SAND, 01% QUARTZ SAND, MOLLUSKS,

717.0- 726.0 AS ABOVE,

726.0- 732.0 AS ABOVE WITH ECHINOID FRAGS(2%), AND TRACE SAND AND PHOS.

732.0- 738.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 13% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 50% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, MOLLUSKS, ECHINOID, BENTHONIC FORAMINIFERA, CORAL, BRYOZOA,

738.0- 743.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH BROWN, 08% POROSITY, INTERCRYSTALLINE, INTERGRANULAR, LOW PERMEABILITY, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 30% CALCILUTITE, 15% SPAR, BENTHONIC FORAMINIFERA, MOLLUSKS,

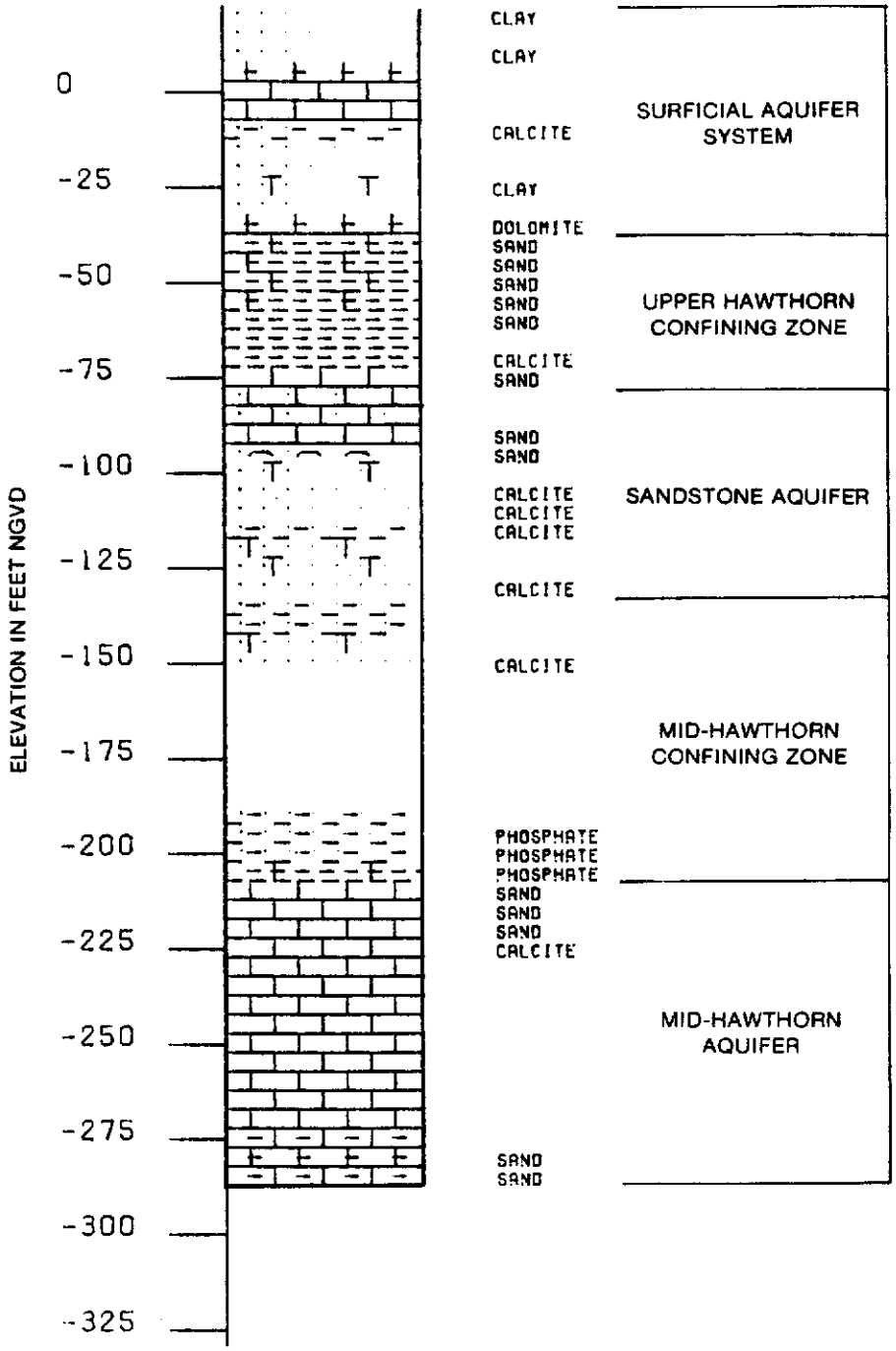
743.0- 749.0 AS ABOVE WITH SOME XSTALLINE DOLO

749.0- 754.0 DOLOMITE, GRAYISH BROWN, 10% POROSITY, INTERCRYSTALLINE, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, FOSSIL MOLDS, BENTHONIC FORAMINIFERA,

754.0- 759.0 LIMESTONE, VERY LIGHT ORANGE, 13% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 70% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, BENTHONIC FORAMINIFERA, FOSSIL MOLDS, MOLLUSKS, BRYOZOA, ECHINOID,

759.0- 764.0 LIMESTONE, VERY LIGHT ORANGE TO VERY LIGHT GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 60% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% DOLOMITE, MOLLUSKS, BENTHONIC FORAMINIFERA, ECHINOID,

764.0- 767.0 AS ABOVE,


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
CLAY
CLAY
CALCITE
CLAY
DOLOMITE
SAND
SAND
SAND
SAND
SAND
CALCITE
SAND
SAND
SAND
CALCITE
CALCITE
CALCITE
CALCITE
CALCITE
PHOSPHATE
PHOSPHATE
PHOSPHATE
SAND
SAND
SAND
CALCITE
SAND
SAND
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
SANDSTONE AQUIFER
MID-HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER

SOUTH FLORIDA WMD - LITHC LOG PRINTOUT

W- 20C
LEE CO. T46S R26E SEC 15CC 26 28 41 N 81 48 02 W
TOTAL DEPTH- 310 FT. ELEV.- 23 FT. 25 SAMPLES- 0-- 310 FT.
COMPLETED- 81.06.19 DEPTH WORKED 0 310 FT.

WELL NAME-
BUREAU OF GEOLOGY W14072,CORE,DRILLED BY JUSTIN HODGES
REMARKS-
WORKED BY MIKE KNAPP,12-21-80,QUAL.(GOOD).

INTERVAL FROM 0-17 IS FROM W14071.

HYDROGEOLOGIC UNITS

0.0-	60.0	SURFICIAL AQUIFER SYSTEM
60.0-	94.0	UPPER HAWTHORN CONFINING ZONE
94.0-	173.0	SANDSTONE AQUIFER
173.0-	230.0	MID-HAWTHORN CONFINING ZONE
230.0-	310.0	MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0-	17.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
17.0-	60.0	TAMIAMI FORMATION
60.0-	310.0	HAWTHORN FORMATION

LITHOLOGIC LOG
W- 20C. LEE CO. T46S, R26E, SEC 15CC

.0-	2.0	SAND, LIGHT BROWN, 32% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, 01% CLAY,
2.0-	9.5	AS ABOVE,
9.5-	11.5	SAND, LIGHT BROWN, 18% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, 02% CLAY,
11.5-	12.0	SAND, VERY LIGHT GRAY, 18% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 01% CLAY, 04% CALCILUTITE,
12.0-	15.0	AS ABOVE,
15.0-	16.5	SAND, VERY LIGHT GRAY, 18% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 06% CALCILUTITE, 01% CLAY, MOLLUSKS,
16.5-	17.0	LITHO GRADES INTO A LESS CALCAREOUS SAND (NO SHELL)

LITHOLOGIC LOG
W- 20C. LEE CO. T46S, R26E, SEC 15CC

17.0- 20.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% CLAY, FOSSIL MOLDS,

20.0- 25.0 LIMESTONE, VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, FOSSIL MOLDS, MOLLUSKS,

25.0- 30.0 AS ABOVE,

30.0- 35.0 SAND, VERY LIGHT ORANGE, 16% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 15% CALCILUTITE, 08% CLAY, MOLLUSKS,

35.0- 40.0 AS ABOVE,

40.0- 45.0 AS ABOVE,

45.0- 50.0 SAND, VERY LIGHT ORANGE, 18% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 40% CALCILUTITE, 04% CLAY, MOLLUSKS,

50.0- 55.0 AS ABOVE,

55.0- 60.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 20% CLAY, 20% DOLOMITE, MOLLUSKS, BENTHONIC FORAMINIFERA,

60.0- 80.0 CLAY, GRAYISH OLIVE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 30% CALCILUTITE, 15% QUARTZ SAND, 01% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, SPICULES, PLANKTONIC FORAMINIFERA,

80.0- 83.0 CLAY, GRAYISH OLIVE, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 30% CALCILUTITE, 12% QUARTZ SAND, MOLLUSKS, BENTHONIC FORAMINIFERA, PLANKTONIC FORAMINIFERA,

83.0- 92.0 AS ABOVE,

LITHOLOGIC LOG
W- 20C. LEE CO. T46S, R26E, SEC 15CC

92.0- 94.0 DOLO-SILT, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX, 30% CALCILUTITE, 30% CLAY, BENTHONIC FORAMINIFERA, MOLLUSKS, SHARK TEETH,

CLAY, LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX,

94.0- 100.0 LIMESTONE, WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, SKELETAL, BIOGENIC, 60% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 12% QUARTZ SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

100.0- 103.0 LIMESTONE, WHITE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, POOR INDURATION, CALCILUTITE MATRIX, 10% QUARTZ SAND,

103.0- 106.0 LIMESTONE, WHITE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, 45% QUARTZ SAND,

106.0- 113.0 AS ABOVE,

113.0- 116.0 SHELL BED, WHITE TO VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, POOR INDURATION, CALCILUTITE MATRIX, 30% QUARTZ SAND, MOLLUSKS,

116.0- 120.0 SANDSTONE, WHITE, 12% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, MODERATE INDURATION, CALCILUTITE MATRIX, 35% CALCILUTITE, FOSSIL MOLDS, MOLLUSKS,

120.0- 125.0 SANDSTONE, WHITE, 10% POROSITY, INTERGRANULAR, MOLDIC, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 20% CALCILUTITE, 20% SPAR, FOSSIL MOLDS, MOLLUSKS,

125.0- 126.0 AS ABOVE,

126.0- 132.0 SANDSTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 15% CALCILUTITE, 15% DOLOMITE, 02% PHOSPHATIC SAND, FOSSIL MOLDS, MOLLUSKS,

LITHOLOGIC LOG
W- 200. LEE CO. T46S, R26E, SEC 15CC

132.0- 140.0 SANDSTONE, YELLOWISH GRAY, 18% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 12% CLAY, 01% PHOSPHATIC SAND, MOLLUSKS,

140.0- 143.0 SANDSTONE, YELLOWISH GRAY TO VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 25% CALCILUTITE, 02% PHOSPHATIC SAND, FOSSIL MOLDS, MOLLUSKS, CORAL,

143.0- 152.0 SANDSTONE, VERY LIGHT ORANGE, 16% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, MODERATE INDURATION, CALCILUTITE MATRIX, 25% CALCILUTITE, FOSSIL MOLDS, MOLLUSKS,

152.0- 165.0 SAND, LIGHT OLIVE, 30% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, UNCONSOLIDATED, 01% CALCILUTITE, 01% CLAY,

165.0- 173.0 SANDSTONE, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, GOOD INDURATION, CALCILUTITE MATRIX, 20% CALCILUTITE, 01% PHOSPHATIC SAND, FOSSIL MOLDS, MOLLUSKS,

173.0- 210.0 NO SAMPLE,

210.0- 215.0 SAND, LIGHT OLIVE GRAY, 30% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 01% CALCILUTITE, 02% CLAY, NO FOSSIL,

215.0- 215.5 SAND, GRAYISH OLIVE, 15% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 01% CALCILUTITE, 20% CLAY, 03% PHOSPHATIC SAND, MOLLUSKS,

215.5- 225.0 SAND, GRAYISH OLIVE, 12% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, HIGH SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 04% CALCILUTITE, 05% CLAY, 03% PHOSPHATIC SAND, 04% PHOSPHATIC GRAVEL, MOLLUSKS,

225.0- 230.0 CLAY, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 40% CALCILUTITE, 20% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

LITHOLOGIC LOG
W- 200. LEE CO. T46S, R26E, SEC 15CC

230.0- 232.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, 00% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 20% QUARTZ SAND, 03% PHOSPHATIC SAND,

232.0- 235.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, 00% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, POOR INDURATION, CALCILUTITE MATRIX, 03% QUARTZ SAND,

235.0- 242.0 LIMESTONE, WHITE, 13% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, 15% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

242.0- 248.0 AS ABOVE,

248.0- 250.0 CLAY, YELLOWISH GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, CALCILUTITE MATRIX, 30% CALCILUTITE, 02% PHOSPHATIC SAND, OSTRACODS, BENTHONIC FORAMINIFERA,

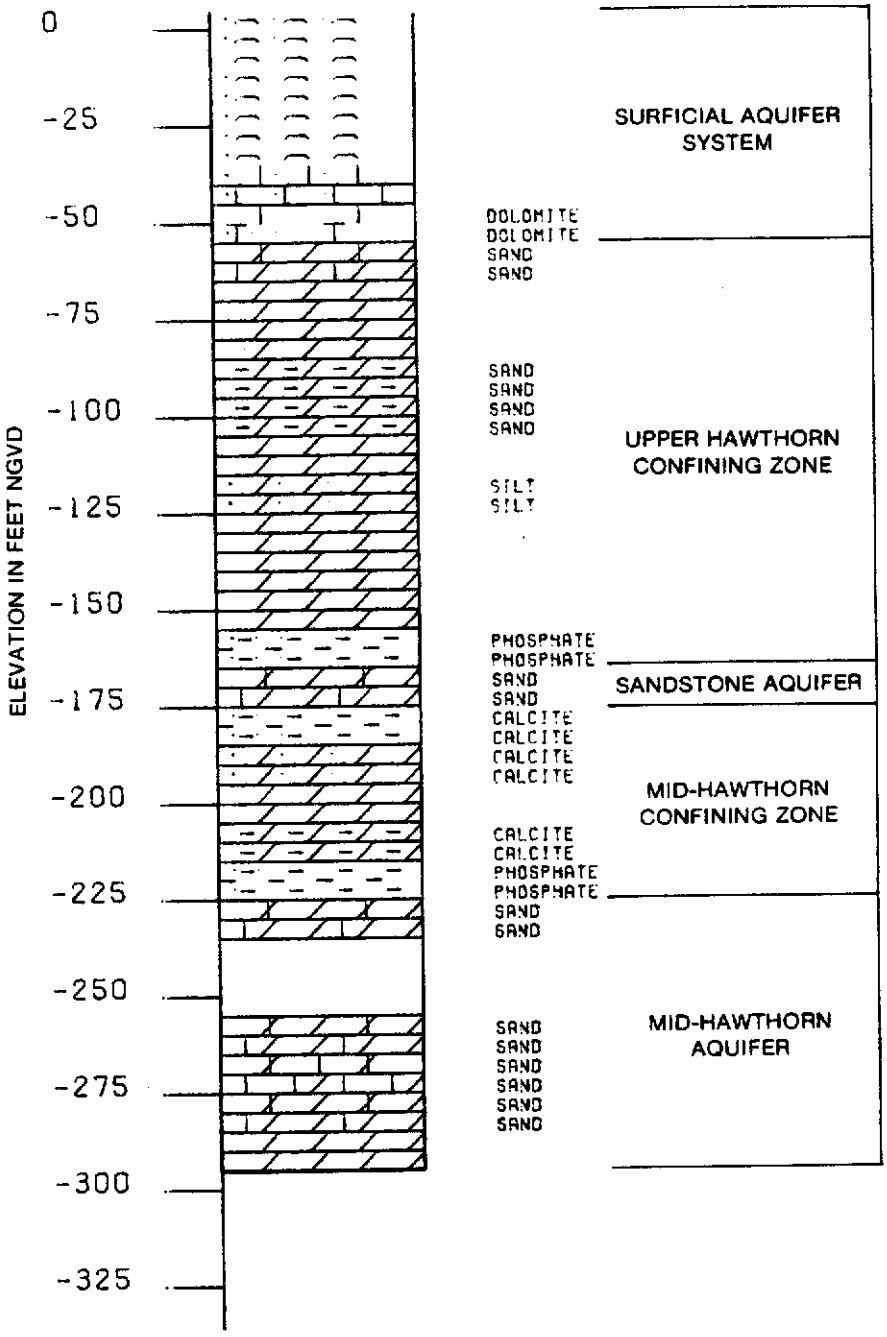
250.0- 293.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, 50% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, 01% PHOSPHATIC SAND, FOSSIL MOLDS, MOLLUSKS, BENTHONIC FORAMINIFERA, CORAL,

LIMESTONE IS A COQUINA OF MOLLUSKS - GOOD POROSITY

293.0- 295.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

295.0- 300.0 LIMESTONE, LIGHT OLIVE, 08% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 15% CLAY, 01% QUARTZ SAND, FOSSIL MOLDS, MOLLUSKS,

300.0- 310.0 LIMESTONE, YELLOWISH GRAY, GRAIN TYPE: CALCILUTITE, BIOGENIC, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 15% CLAY, 12% QUARTZ SAND, 03% PHOSPHATIC SAND,


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
DOLOMITE
DOLOMITE
SAND
SAND
SAND
SAND
SAND
SAND
SILT
SILT
PHOSPHATE
PHOSPHATE
SAND
SAND
CALCITE
CALCITE
CALCITE
CALCITE
CALCITE
CALCITE
PHOSPHATE
PHOSPHATE
SAND
SAND
SAND
SAND
SAND
SAND
SAND
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
SANDSTONE AQUIFER
MID-HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 21 LEE CO. T43S R21E SEC 05 26 35 55 N 82 13 02 W
TOTAL DEPTH- 300 FT. ELEV.- 5 FT. 28 SAMPLES- 0- 300 FT.
COMPLETED- 81.06.15 DEPTH WORKED 300 FT.

WELL NAME-
SAMPLES SUPPLIED BY MISS. ASSOC.,DRILLER E.MILLER
REMARKS-
WORKED BY MIKE KNAPP,6-15-81,SAMPLE QUAL.(FAIR).

HYDROGEOLOGIC UNITS

0.0- 60.0 SURFICIAL AQUIFER SYSTEM
60.0- 170.0 UPPER HAWTHORN CONFINING ZONE
170.0- 180.0 SANDSTONE AQUIFER
180.0- 230.0 MID-HAWTHORN CONFINING ZONE
230.0- 300.0 MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0- 40.0 CALOOSAHATCHEE FORMATION
40.0- 60.0 OCHOPEE LIMESTONE MEMBER OF TAMIAMI FORMATION
60.0- 300.0 HAWTHORN FORMATION

LITHOLOGIC LOG
W- 21 . LEE CO. T43S, R21E, SEC 05

.0- 10.0 SHELL BED, WHITE TO GREENISH GRAY, 20% POROSITY, INTERGRANULAR, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 50% QUARTZ SAND, MOLLUSKS,

10.0- 20.0 AS ABOVE,

20.0- 30.0 SHELL HASH

30.0- 40.0 AS ABOVE,

40.0- 50.0 LIMESTONE, MODERATE LIGHT GRAY TO WHITE, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, GRAIN TYPE: CALCILUTITE, CRYSTALS, 03% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 45% QUARTZ SAND,

SAMPLE IS PREDOMINANTLY SHELL FRAGS (80%) CAVINGS?.

50.0- 60.0 SANDSTONE, LIGHT GRAY, 12% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% CALCILUTITE, 20% SPAR, 10% DOLOMITE,

CAVINGS. SOME V.C. PHOSPHATE GRAINS.

LITHOLOGIC LOG
W- 21 . LEE CO. T43S, R21E, SEC 05

60.0- 70.0 DOLO-SILT, GREENISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 35% CALCILUTITE, 05% CLAY, 20% QUARTZ SAND, 04% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, PLANKTONIC FORAMINIFERA, MOLLUSKS,

MUCH SHELL INTERMIXED WITH SAMPLE.

70.0- 80.0 AS ABOVE,

80.0- 90.0 AS ABOVE,

90.0- 100.0 DOLO-SILT, GREENISH GRAY TO LIGHT OLIVE, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 20% CALCILUTITE, 10% CLAY, 05% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA, OSTRACODS, CORAL,

100.0- 110.0 DOLO-SILT, GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 15% CALCILUTITE, 15% CLAY, 10% QUARTZ SAND, 04% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA, PLANKTONIC FORAMINIFERA, OSTRACODS,

110.0- 120.0 AS ABOVE,

120.0- 130.0 DOLO-SILT, GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 05% CLAY, 25% QUARTZ SAND, 10% SILT, BENTHONIC FORAMINIFERA, PLANKTONIC FORAMINIFERA, MOLLUSKS,

130.0- 140.0 AS ABOVE,

140.0- 150.0 AS ABOVE WITH SOME V.COARSE PHOS.AND SAND.

150.0- 160.0 AS ABOVE,

160.0- 170.0 SAND, GREENISH GRAY TO LIGHT GREENISH GRAY, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% DOLOMITE, 05% CLAY, 15% CALCILUTITE, 08% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

170.0- 180.0 DOLOMITE, VERY LIGHT ORANGE TO GREENISH GRAY, 12% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 40% CALCILUTITE, 06% QUARTZ SAND, 04% PHOSPHATIC SAND, MOLLUSKS,

MUCH CAVING

LITHOLOGIC LOG
W- 21 . LEE CO. T43S, R21E, SEC 05

180.0- 190.0 SAND, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 15% CALCILUTITE, 25% DOLOMITE, 02% CLAY, 03% PHOSPHATIC SAND, MOLLUSKS,

190.0- 200.0 DOLO-SILT, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX, 15% CALCILUTITE, 02% CLAY, 02% PHOSPHATIC SAND, 35% QUARTZ SAND, MOLLUSKS,

200.0- 210.0 AS ABOVE,

210.0- 220.0 DOLO-SILT, VERY LIGHT ORANGE TO YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX, 12% CALCILUTITE, 01% CLAY, 01% PHOSPHATIC SAND, 04% QUARTZ SAND, MOLLUSKS,

220.0- 230.0 SAND, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX, 15% DOLOMITE, 05% CALCILUTITE, 02% CLAY, 05% PHOSPHATIC SAND, MOLLUSKS,

230.0- 240.0 DOLOMITE, VERY LIGHT ORANGE TO YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, 03% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

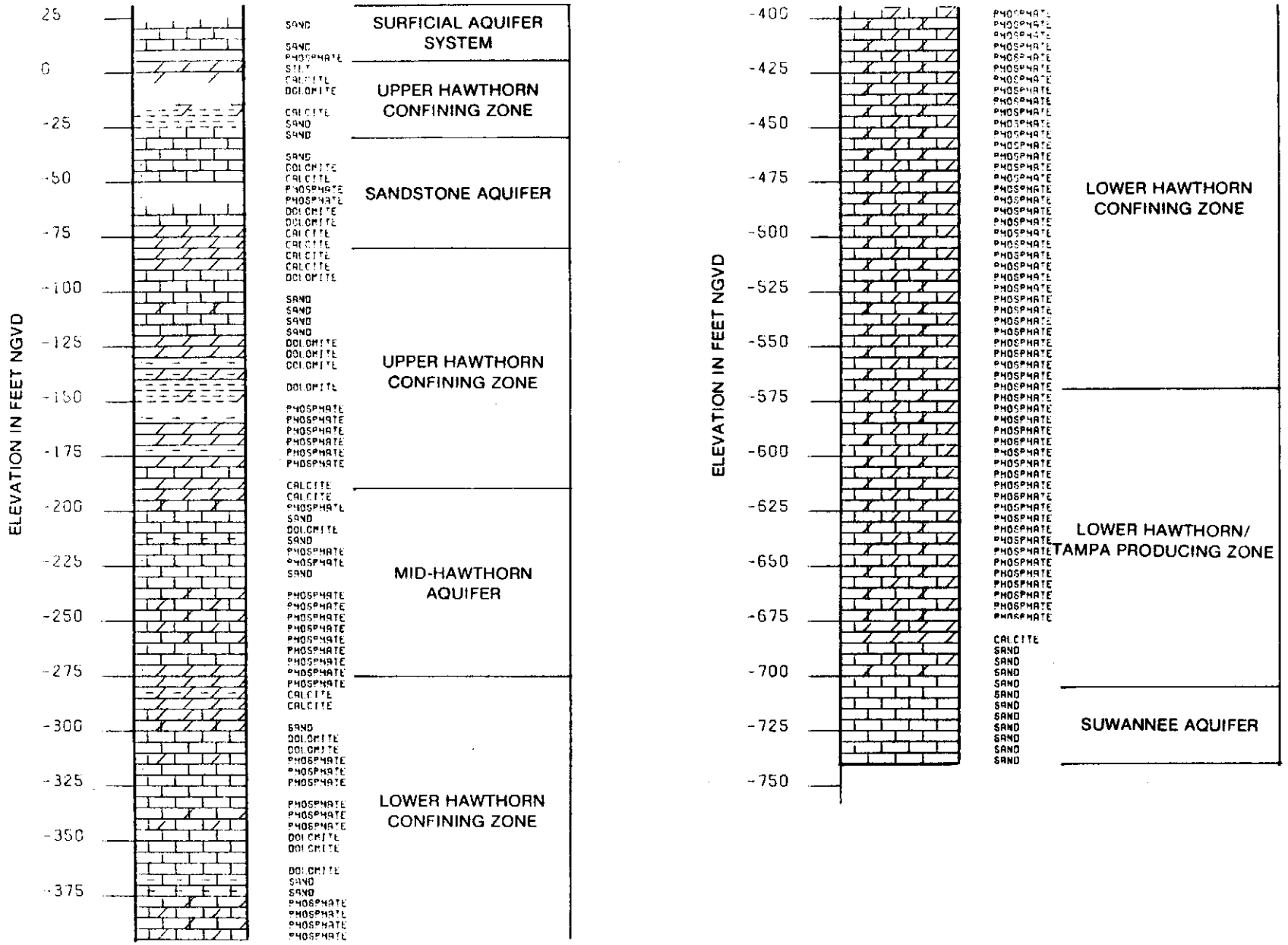
240.0- 260.0 NO SAMPLE,

260.0- 270.0 DOLOMITE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 02% PHOSPHATIC SAND, 15% QUARTZ SAND, MOLLUSKS,

270.0- 280.0 LIMESTONE, VERY LIGHT ORANGE, 13% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO CRYPTOCRYSTALLINE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 35% DOLOMITE, 01% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, CORAL,

280.0- 290.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH BROWN, 12% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 02% PHOSPHATIC SAND, 05% QUARTZ SAND, SUCROSIC, MOLLUSKS,

290.0- 300.0 AS ABOVE,


W - 28
ELEVATION IN FEET NGVD
25
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
SANDSTONE AQUIFER
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE
W - 28
ELEVATION IN FEET NGVD
-400
-425
-450
-475
-500
-525
-550
-575
-600
-625
-650
-675
-700
-725
-750
LOWER HAWTHORN CONFINING ZONE
LOWER HAWTHORN/ TAMPA PRODUCING ZONE
SUWANNEE AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 028

LEE CO. T44S R26E SEC 15 26 38 34 N 81 41 50 W
TOTAL DEPTH- 770 FT. ELEV.- 30 FT. 65 SAMPLES- 0- 770 FT.
COMPLETED- 82.04.06 DEPTH WORKED 770 FT.

WELL NAME-
BUCKINGHAM #1,CONTINUOS CORE,DRILLED BY JUSTIN HODGES(DNR).
REMARKS-
DESCRIBED BY MIKE KNAPP (AUG-SEPT 1982), SAMPLE QUILITY-EXCELLENT.

HYDROGEOLOGIC UNITS

0.0-	21.0	SURFICIAL AQUIFER SYSTEM
21.0-	56.0	UPPER HAWTHORN CONFINING ZONE
56.0-	104.0	SANDSTONE AQUIFER
104.0-	214.0	MID-HAWTHORN CONFINING ZONE
214.0-	300.0	MID-HAWTHORN AQUIFER
300.0-	591.0	LOWER HAWTHORN CONFINING ZONE
591.0-	732.0	LOWER HAWTHORN/TAMPA PRODUCING ZONE
732.0-	TD	SUWANNEE AQUIFER

REMARKS-THE SUWANNEE LIMESTONE WAS PICKED ON A DECREASE IN SAND AND PHOSPHATE. THIS UNIT,HOWEVER,DOES NOT RESEMBLE THE THE CHARACTERISTIC SUWANNEE BEDS IN CENTRAL AND NORTHERN FLORIDA. IT IS VERY SANDY (UP TO 20%) IN THIS CORE AND MAY BE A MIOCENE UNIT. THE TAMPA FORMATION, ALTHOUGH RECOGNIZED ON THIS LOG, IS INCLUDED IN THE HAWTHORN FORMATION BECAUSE OF THE HIGH PERCENTAGES OF PHOSPHATE PRESENT. THE FLORIDAN AQUIFER SYSTEM IS RECOGNIZED AT THE TOP OF THE LOWER HAWTHORN/TAMPA PRODUCING ZONE.

STRATIGRAPHIC FORMATIONS -

.0-	6.5	UNDIFFERENTIATED SAND, CLAY AND SHELLS
6.5-	21.0	TAMIAMI FORMATION
21.0-	591.0	HAWTHORN FORMATION
591.0-	732.0	TAMPA LIMESTONE
732.0-	744.0	SUWANNEE LIMESTONE

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

.0-	2.0	SAND, MODERATE LIGHT GRAY, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, ORGANICS,
2.0-	3.0	SAND, LIGHT GRAY, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED,
3.0-	4.0	SAND, MODERATE DARK GRAY, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED,

LITHOLOGIC LOG

W- 028 . LEE CO. T44S, R26E, SEC 13

4.0- 6.0 SAND, YELLOWISH GRAY, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, UNCONSOLIDATED,

6.0- 6.5 AS ABOVE,

6.5- 8.0 LIMESTONE, LIGHT YELLOWISH ORANGE, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, 15% QUARTZ SAND, MOLLUSKS,

8.0- 9.0 LIMESTONE, WHITE, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, 05% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS,

9.0- 17.0 LIMESTONE, WHITE, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, 03% QUARTZ SAND, CHALKY, MOLLUSKS, FOSSIL FRAGMENTS,

17.0- 19.0 AS ABOVE,

19.0- 21.0 LIMESTONE, VERY LIGHT ORANGE TO VERY LIGHT GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, INTRACLASTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, POOR INDURATION, CALCILUTITE MATRIX, 30% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, SHARK TEETH, FOSSIL FRAGMENTS,

BECOMES MORE PHOSPHATIC TOWARDS BOTTOM.

21.0- 22.0 SAND, LIGHT YELLOWISH ORANGE, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 35% CALCILUTITE, 02% CLAY, 08% PHOSPHATIC SAND, MOLLUSKS,

22.0- 23.0 SAND, GREENISH GRAY TO MODERATE YELLOWISH BROWN, 18% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, 10% CALCILUTITE, 06% PHOSPHATIC SAND, MOLLUSKS, SHARK TEETH,

23.0- 24.5 DOLO-SILT, GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, CLAY MATRIX, MOTTLED, 05% CLAY, 15% QUARTZ SAND, 10% SILT,

24.5- 26.0 SHELL BED, LIGHT GRAY TO VERY LIGHT ORANGE, 20% POROSITY, INTERGRANULAR, UNCONSOLIDATED, 10% QUARTZ SAND, MOLLUSKS,

MOSTLY OYSTERS AND CHIONE SP.

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

26.0- 27.3 DOLO-SILT, YELLOWISH GRAY TO LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, MOTTLED, 15% CLAY, 02% QUARTZ SAND, 15% SILT, 20% CALCILUTITE, FOSSIL FRAGMENTS,

27.3- 28.5 DOLO-SILT, GRAYISH OLIVE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, MOTTLED, 15% CLAY, 05% QUARTZ SAND, 15% SILT, 20% CALCILUTITE, BENTHONIC FORAMINIFERA,

MANY BENTHICS BULIMINA SP.,ROTALIA SP.

28.5- 29.2 SAND, MODERATE GRAYISH GREEN, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, INTERBEDDED, 03% CLAY, 10% DOLOMITE, 10% CALCILUTITE, 04% PHOSPHATIC SAND, MOLLUSKS,

29.2- 30.0 DOLO-SILT, YELLOWISH GRAY TO LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 15% CLAY, 05% CALCILUTITE, MOLLUSKS, BENTHONIC FORAMINIFERA,

30.0- 34.0 SAND, VERY LIGHT ORANGE TO WHITE, 14% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% CALCILUTITE, 35% DOLOMITE, 04% PHOSPHATIC SAND, NO FOSSIL,

CLAY BLEBS

34.0- 35.0 AS 34 FEET

35.0- 39.0 SAND, YELLOWISH GRAY, 14% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 05% CLAY, 20% DOLOMITE, 04% PHOSPHATIC SAND, CALCAREOUS, NO FOSSIL,

39.0- 43.0 AS ABOVE WITH MOLLUSK FRAGS.AND MORE PHOS.(7%).

43.0- 44.0 AS ABOVE,

44.0- 45.0 DOLO-SILT, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 20% QUARTZ SAND, 02% PHOSPHATIC SAND, 05% CLAY,

LITHOLOGIC LOG
#- 026 . LEE CO. T44S, R26E, SEC 15

45.0- 47.0 SAND, YELLOWISH GRAY, 14% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 25% DOLOMITE, 02% PHOSPHATIC SAND, MOLLUSKS,

47.0- 49.0 NO RECOVERY-DRILLER REPORTS SOFT CLAY.

49.0- 52.0 CLAY, GRAYISH OLIVE GREEN, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% DOLOMITE, 15% CALCILUTITE, 08% QUARTZ SAND, 02% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, OSTRACODS,

52.0- 52.5 GRADES INTO UNDERLYING SANDSTONE.

52.5- 53.0 SANDSTONE, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 35% DOLOMITE, 10% CALCILUTITE, 03% CLAY, FOSSIL FRAGMENTS,

53.0- 54.0 DOLOMITE, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 35% QUARTZ SAND, 01% PHOSPHATIC SAND,

54.0- 55.0 SANDSTONE, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 25% DOLOMITE, 25% CALCILUTITE, 05% CLAY, FOSSIL FRAGMENTS,

55.0- 56.0 LIMESTONE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% DOLOMITE, 25% QUARTZ SAND,

LOST CIRCULATION

56.0- 58.0 LIMESTONE, VERY LIGHT GRAY, 18% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: CALCILUTITE, CRYSTALS, SKELETAL, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 15% QUARTZ SAND, 02% PHOSPHATIC SAND, FOSSIL MOLDS, MOLLUSKS,

58.0- 59.0 AS ABOVE WITH VERY HIGH POROSITY AND PERMEABILITY.

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

59.0- 60.0 LIMESTONE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, SKELETAL, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, 20% QUARTZ SAND, 04% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

60.0- 61.0 AS ABOVE,

61.0- 62.0 LIMESTONE, YELLOWISH GRAY, 15% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: CALCILUTITE, CRYSTALS, SKELETAL, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 15% QUARTZ SAND, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS,

62.0- 66.0 AS ABOVE,

68.0- 69.0 LIMESTONE, YELLOWISH GRAY, 14% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 30% DOLOMITE, 08% QUARTZ SAND, 02% PHOSPHATIC SAND, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS,

69.0- 71.0 LIMESTONE, YELLOWISH GRAY, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: CALCILUTITE, CRYSTALS, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 30% DOLOMITE, 25% QUARTZ SAND, 03% PHOSPHATIC SAND, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS,

71.0- 72.0 LOST CIRCULATION-DRILLER REPORTS CAVITY

72.0- 74.0 AS 69 TO 71 FEET.

74.0- 76.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT GRAY, 12% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 20% DOLOMITE, 35% QUARTZ SAND, 01% PHOSPHATIC SAND, FOSSIL MOLDS,

76.0- 78.0 SANDSTONE, VERY LIGHT ORANGE TO GRAYISH BROWN, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, HIGH SPHERICITY, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 25% CALCILUTITE, 20% DOLOMITE, 02% PHOSPHATIC SAND, MOLLUSKS,

78.0- 80.0 NO RECOVERY-DRILLER REPORTS CLAY, SHELL, AND SAND.

LITHOLOGIC LOG
#- 028 . LEE CO. T44S, R26E, SEC 15

80.0- 81.0 LIMESTONE, YELLOWISH GRAY TO LIGHT GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 35% DOLOMITE, 35% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, FOSSIL MOLDS,

81.0- 82.0 AS ABOVE,

82.0- 87.0 SAND, YELLOWISH GRAY, 18% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO VERY COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 25% DOLOMITE, 05% CLAY, 06% PHOSPHATIC SAND, 01% PHOSPHATIC GRAVEL, MOLLUSKS,

QUARTZITE GRANULES

87.0- 88.0 SAND, YELLOWISH GRAY TO LIGHT OLIVE GRAY, 18% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 20% CALCILUTITE, 02% CLAY, 02% PHOSPHATIC SAND, MOLLUSKS,

88.0- 90.0 DOLOMITE, DARK GRAY TO DARK YELLOWISH BROWN, 15% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 04% PHOSPHATIC SAND, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS,

PHOSPHATE LINING FOSSIL MOLDS.

90.0- 91.0 DOLOMITE, GRAYISH ORANGE, 14% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 20% CALCILUTITE, 10% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

91.0- 92.0 AS ABOVE,

92.0- 94.0 LIMESTONE, GRAYISH ORANGE, 18% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CRYSTALS, CALCILUTITE, 55% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 35% DOLOMITE, 04% QUARTZ SAND, HIGH RECRYSTALLIZATION, COQUINA, MOLLUSKS, FOSSIL MOLDS,

94.0- 97.0 AS ABOVE,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

97.0- 101.0 LIMESTONE, GRAYISH BROWN, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CRYSTALS, CALCILUTITE, 55% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 25% DOLOMITE, HIGH RECRYSTALLIZATION, COQUINA, MOLLUSKS, FOSSIL MOLDS,

FRIABLE LIMESTONE

101.0- 101.3 LIMESTONE, WHITE, 10% POROSITY, INTERCRYSTALLINE, LOW PERMEABILITY, GRAIN TYPE: CRYSTALS, CALCILUTITE, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% DOLOMITE, MOLLUSKS,

101.3- 103.5 DOLOMITE, MODERATE YELLOWISH BROWN, 14% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 20% CALCILUTITE, 10% QUARTZ SAND, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS,

103.5- 104.0 DOLOMITE, WHITE TO VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

104.0- 106.0 DOLO-SILT, WHITE TO YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 25% CALCILUTITE, 10% SILT, 02% CLAY, MOLLUSKS,

106.0- 108.0 AS ABOVE WITH BLEBS OF PHOSPHATIC SAND AT 107 FT.

108.0- 109.0 AS ABOVE,

109.0- 112.0 AS ABOVE,

112.0- 114.0 DOLO-SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 05% CLAY, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

114.0- 116.0 DOLO-SILT, WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 35% CALCILUTITE, 01% CLAY, 03% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

116.0- 118.0 AS ABOVE,

118.0- 120.0 AS ABOVE,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

120.0- 122.0 LIMESTONE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% DOLOMITE, 01% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

122.0- 124.0 SLIGHTLY SANDY CARBONATE MUD

124.0- 129.0 AS ABOVE,

129.0- 132.0 AS ABOVE,

132.0- 134.0 LIMESTONE, WHITE TO YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, BIOGENIC, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 30% DOLOMITE, 08% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS,

134.0- 136.0 LIMESTONE, GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, BIOGENIC, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 20% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS,

136.0- 140.0 LIMESTONE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, BIOGENIC, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS,

140.0- 142.0 AS ABOVE,

142.0- 146.0 LIMESTONE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, BIOGENIC, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 15% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

146.0- 148.0 AS ABOVE,

148.0- 148.5 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% DOLOMITE, 10% QUARTZ SAND, 01% PHOSPHATIC SAND, 01% MICA, FOSSIL FRAGMENTS,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

148.5- 150.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 35% DOLOMITE, 05% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS,

150.0- 152.0 SAND, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 05% CLAY, 10% DOLOMITE, 04% PHOSPHATIC SAND,

152.0- 154.0 DOLO-SILT, GRAYISH OLIVE, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 15% CLAY, 06% QUARTZ SAND, 01% PHOSPHATIC SAND, 01% MICA, BENTHONIC FORAMINIFERA, MOLLUSKS,

TEXTULARIA SP.

154.0- 156.0 AS ABOVE,

156.0- 163.0 SAND, GRAYISH OLIVE, 14% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, INTERBEDDED, 15% DOLOMITE, 05% CLAY, 06% PHOSPHATIC SAND, 02% MICA, MOLLUSKS, FOSSIL FRAGMENTS,

SHELL BEDS INTERBEDDED - ROUND DOLOMITE PEBBLES (160').

163.0- 165.0 DOLO-SILT, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, INTERBEDDED, 10% CLAY, 04% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

165.0- 172.0 DOLO-SILT, GRAYISH OLIVE GREEN, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 20% CLAY, 01% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS,

172.0- 180.0 CLAY, GRAYISH OLIVE GREEN, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 03% QUARTZ SAND, 01% PHOSPHATIC SAND, 20% DOLOMITE, BENTHONIC FORAMINIFERA, MOLLUSKS, SHARK TEETH,

180.0- 182.0 AS ABOVE,

182.0- 188.0 SAND, GRAYISH OLIVE GREEN, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 10% DOLOMITE, 10% PHOSPHATIC SAND, MOLLUSKS, SHARK TEETH,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

188.0- 190.0 SAND, GRAYISH OLIVE GREEN, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 05% DOLOMITE, 15% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, MOLLUSKS, SHARK TEETH,

190.0- 194.0 DOLO-SILT, GRAYISH OLIVE GREEN, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, BIOTURBATED, 10% CLAY, 10% QUARTZ SAND, 08% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA, FOSSIL FRAGMENTS,

194.0- 197.0 AS ABOVE,

197.0- 199.0 DOLO-SILT, YELLOWISH GRAY, 05% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, BIOTURBATED, 20% CLAY, 08% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS,

199.0- 207.0 SAND, YELLOWISH GRAY TO LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 04% CLAY, 04% DOLOMITE, 15% PHOSPHATIC SAND, MOLLUSKS,

207.0- 207.5 SAND, YELLOWISH GRAY TO LIGHT GREENISH YELLOW, 15% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, DOLOMITE CEMENT, 05% DOLOMITE, 04% PHOSPHATIC SAND, MOLLUSKS,

207.5- 210.0 DOLO-SILT, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% CALCILUTITE, 06% PHOSPHATIC SAND, 06% QUARTZ SAND, MOLLUSKS,

210.0- 214.0 AS ABOVE WITH PHOS.LIMESTONE INTERBEDDED.,

214.0- 217.0 LIMESTONE, VERY LIGHT GRAY TO YELLOWISH GRAY, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 65% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, 02% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS, FOSSIL FRAGMENTS,

DRILLER REPORTS WELL FLOW (5-10GPM)

217.0- 222.0 OYSTER BED

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

222.0- 224.0 DOLO-SILT, LIGHT GREENISH YELLOW, 10% POROSITY, INTERGRANULAR, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, INTERBEDDED, 15% CALCILUTITE, 05% CLAY, 04% PHOSPHATIC SAND, 04% QUARTZ SAND, MOLLUSKS, BRYOZOA, CORAL,

224.0- 227.0 LIMESTONE, LIGHT GRAY, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 10% DOLOMITE, 04% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

227.0- 232.0 LIMESTONE, LIGHT GRAY, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 05% DOLOMITE, 10% PHOSPHATIC SAND, 20% QUARTZ SAND, MOLLUSKS,

232.0- 237.0 AS ABOVE,

237.0- 247.0 LIMESTONE, LIGHT OLIVE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CRYSTALS, SKELETAL, 75% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO VERY COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, INTERBEDDED, 03% CLAY, 15% DOLOMITE, 06% QUARTZ SAND, 04% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, CORAL, CRUSTACEA,

OYSTER BED TO 242'.

247.0- 252.0 AS ABOVE,BUT MODERATELY INDURATED,OYSTER BEDS

252.0- 257.0 LIMESTONE, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 20% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

257.0- 264.0 AS ABOVE,

264.0- 269.0 LIMESTONE, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 10% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, FOSSIL FRAGMENTS,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

269.0- 271.0 LIMESTONE, YELLOWISH GRAY TO YELLOWISH GRAY, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 20% DOLOMITE, 10% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

271.0- 273.0 DRILLER REPORTS CAVITY - GOOD FLOW (30GPM)

273.0- 282.0 LIMESTONE, YELLOWISH GRAY, 18% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 60% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 20% DOLOMITE, 10% QUARTZ SAND, 15% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

282.0- 290.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 06% PHOSPHATIC SAND, 10% QUARTZ SAND, BRYOZOA, MOLLUSKS, FOSSIL MOLDS,

CAVITIES AT 285'.

290.0- 300.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 05% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, FOSSIL FRAGMENTS,

300.0- 302.0 LIMESTONE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, SKELETAL, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 10% DOLOMITE, 20% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

302.0- 307.0 DOLO-SILT, GREENISH GRAY, 14% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 02% CLAY, 30% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

307.0- 308.5 AS ABOVE,

308.5- 310.0 DOLO-SILT, YELLOWISH GRAY, 14% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, BIOTURBATED, 04% CLAY, 10% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

LITHOLOGIC LOG
W- 028 . Lee CO. T44S, R26E, SEC 15

310.0- 319.0 DOLO-SILT, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, INTERBEDDED, 03% CLAY, 15% CALCILUTITE, MOLLUSKS, BENTHONIC FORAMINIFERA,

PHOSPHATE AND QUARTZ SAND INTERBEDDED

319.0- 321.0 AS ABOVE,

321.0- 326.0 DOLO-SILT, LIGHT OLIVE TO YELLOWISH GRAY, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 05% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA,

BRYOZOAN BIOHERM

326.0- 327.5 DOLO-SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% CALCILUTITE, 05% PHOSPHATIC SAND, 20% QUARTZ SAND, BRYOZOA, FOSSIL FRAGMENTS,

327.5- 329.0 DOLO-SILT, LIGHT GREENISH GRAY, 14% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 02% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS, BRYOZOA,

329.0- 332.0 AS ABOVE,

332.0- 335.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 15% DOLOMITE, 03% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS, BRYOZOA,

335.0- 337.0 AS ABOVE,

337.0- 342.0 AS ABOVE WITH MORE PHOSPHATE (07%)

342.0- 345.0 LIMESTONE, VERY LIGHT ORANGE, 18% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 15% DOLOMITE, 05% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, ECHINOID, BRYOZOA, FOSSIL FRAGMENTS,

345.0- 352.0 LIMESTONE, LIGHT OLIVE GRAY, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 25% PHOSPHATIC SAND, 25% QUARTZ SAND, MOLLUSKS,

LITHOLOGIC LOG
W- 026 . LEE CO. 144S, R26E, SEC 15

352.0- 362.0 AS ABOVE,

362.0- 367.0 LIMESTONE, LIGHT GRAY, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 10% PHOSPHATIC SAND, 20% QUARTZ SAND, MOLLUSKS,

367.0- 380.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, CRYSTALS, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, BIOTURBATED, 20% DOLOMITE, 02% PHOSPHATIC SAND, 02% QUARTZ SAND, MOLLUSKS,

380.0- 371.0 LIMESTONE, YELLOWISH GRAY, 18% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 35% DOLOMITE, 02% PHOSPHATIC SAND, 02% QUARTZ SAND, MOLLUSKS, ECHINOID,

371.0- 375.0 LIMESTONE, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 35% DOLOMITE, 08% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

375.0- 376.0 DOLOMITE, GRAYISH BROWN, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% CALCILUTITE, 12% PHOSPHATIC SAND, 08% QUARTZ SAND, MOLLUSKS,

376.0- 377.0 AS ABOVE WITH LARGE MOLLUSK MOLDS

377.0- 382.0 LIMESTONE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 30% DOLOMITE, 03% PHOSPHATIC SAND, 02% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS,

382.0- 392.0 AS ABOVE,

392.0- 397.0 AS ABOVE WITH MORE PHOSPHATE (07%)

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

397.0- 407.0 LIMESTONE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, BIOGENIC, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 35% DOLOMITE, 01% CLAY, 03% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, BRYOZOA,

407.0- 709.0 LIMESTONE, WHITE TO LIGHT GRAY, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 10% PHOSPHATIC SAND, 04% QUARTZ SAND, MOLLUSKS, ECHINOID, BRYOZOA,

709.0- 412.0 AS ABOVE WITH MORE PHOSPHATE (15%)

412.0- 415.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 12% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

415.0- 417.0 AS ABOVE WITH HEAVY PHOSPHATE CONCENTRATION AT 416.

417.0- 425.0 LIMESTONE, VERY LIGHT ORANGE TO VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 14% PHOSPHATIC SAND, 20% QUARTZ SAND, MOLLUSKS,

425.0- 429.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 45% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 10% DOLOMITE, 05% PHOSPHATIC SAND, 02% QUARTZ SAND, MOLLUSKS, BRYOZOA, FOSSIL FRAGMENTS,

429.0- 430.0 AS ABOVE WITH LESS ALLOCHEMS-PHOSPHATIC SAND INTERBEDS

430.0- 431.0 DOLO-SILT, GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 05% CLAY, 04% PHOSPHATIC SAND, 04% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS,

INTERBEDS OF HIGHLY PHOSPHATIC SANDS.

431.0- 433.0 AS ABOVE,

LITHOLOGIC LOG
#- 028 . LEE CO. T44S, R26E, SEC 15

433.0- 435.0 CLAY, MODERATE OLIVE BROWN, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% DOLOMITE, 04% CALCILUTITE, MOLLUSKS,

435.0- 440.0 AS ABOVE,

440.0- 442.0 DOLO-SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 05% CLAY, 10% PHOSPHATIC SAND, 05% QUARTZ SAND, FOSSIL FRAGMENTS,

442.0- 443.0 AS ABOVE,

443.0- 445.0 DOLO-SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 15% CALCILUTITE, 02% CLAY, 08% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, BRYOZOA,

BRYOZOAN BIOHERM

445.0- 446.0 DOLO-SILT, LIGHT GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 15% CALCILUTITE, 02% CLAY, 10% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, BRYOZOA, SHARK TEETH, FOSSIL FRAGMENTS,

446.0- 450.0 LIMESTONE, WHITE TO LIGHT GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 10% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

450.0- 452.0 LIMESTONE, MODERATE LIGHT GRAY, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, INTRACLASTS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 20% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

452.0- 457.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 08% PHOSPHATIC SAND, 04% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

PHOSPHATIC SAND INTERBEDDED

457.0- 463.0 AS ABOVE,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

463.0- 465.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, INTRACLASTS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 30% DOLOMITE, 03% PHOSPHATIC SAND, 01% QUARTZ SAND, BRYOZOA, MOLLUSKS,

465.0- 467.0 DOLOMITE, VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 03% PHOSPHATIC SAND, 01% QUARTZ SAND, BRYOZOA, MOLLUSKS,

467.0- 469.0 DOLOMITE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 01% PHOSPHATIC SAND, 01% QUARTZ SAND, BRYOZOA, MOLLUSKS,

469.0- 473.0 AS ABOVE,

473.0- 475.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 40% DOLOMITE, 01% PHOSPHATIC SAND, 01% QUARTZ SAND, BRYOZOA, MOLLUSKS, FOSSIL MOLDS,

475.0- 476.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 40% DOLOMITE, 06% PHOSPHATIC SAND, 04% QUARTZ SAND, BRYOZOA, MOLLUSKS,

476.0- 477.0 AS ABOVE WITH ZONED LAYERING OF HIGH % OF PHOSPHATE

477.0- 479.0 AS ABOVE,

479.0- 481.0 LIMESTONE, VERY LIGHT ORANGE, 18% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 60% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 35% DOLOMITE, 06% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS, BRYOZOA,

481.0- 483.0 AS ABOVE,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R20E, SEC 15

485.0- 485.0 DOLOMITE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 15% CALCILUTITE, 02% PHOSPHATIC SAND, 01% QUARTZ SAND, BRYOZOA, MOLLUSKS,

485.0- 493.0 DOLOMITE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 08% PHOSPHATIC SAND, 10% QUARTZ SAND, BRYOZOA, MOLLUSKS,

493.0- 496.0 AS ABOVE,

496.0- 500.0 DOLOMITE, WHITE TO MODERATE LIGHT GRAY, 10% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% CALCILUTITE, 10% PHOSPHATIC SAND, 10% QUARTZ SAND, BRYOZOA, MOLLUSKS,

500.0- 503.0 AS ABOVE WITH MORE PHOSPHATE (20%)

503.0- 506.0 DOLOMITE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% CALCILUTITE, 15% PHOSPHATIC SAND, 20% QUARTZ SAND, BRYOZOA, MOLLUSKS,

506.0- 514.0 AS ABOVE WITH INCREASING SAND AND PHOSPHATE %'S.

514.0- 523.0 DOLOMITE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% CALCILUTITE, 05% PHOSPHATIC SAND, 08% QUARTZ SAND, BRYOZOA, MOLLUSKS,

523.0- 524.0 DOLO-SILT, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 25% CALCILUTITE, 15% PHOSPHATIC SAND, 15% QUARTZ SAND, MOLLUSKS,

524.0- 528.0 DOLOMITE, WHITE TO VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 02% PHOSPHATIC SAND, 01% QUARTZ SAND, MOLLUSKS, BRYOZOA,

528.0- 530.0 DOLO-SILT, GREENISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 30% CALCILUTITE, 01% PHOSPHATIC SAND, 02% CLAY, 05% SILT, MOLLUSKS,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

530.0- 532.0 DOLO-SILT, DARK GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 10% CLAY, 02% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

532.0- 538.0 AS ABOVE WITH HIGHLY PHOSPHATIC DOLOMITE AT 538.

538.0- 540.0 DOLOMITE, YELLOWISH GRAY TO VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 35% CALCILUTITE, 07% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS, ECHINOID, BRYOZOA,

540.0- 541.5 DOLOMITE, YELLOWISH GRAY TO DARK GREENISH GRAY, 12% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 14% PHOSPHATIC SAND, 02% QUARTZ SAND, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS, BRYOZOA,

541.5- 554.0 DOLOMITE, YELLOWISH GRAY, 15% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 45% CALCILUTITE, 05% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, BRYOZOA, FOSSIL FRAGMENTS,

554.0- 556.0 GRADES INTO UNDERLYING LITHOLOGY

556.0- 560.0 DOLO-SILT, LIGHT OLIVE GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 05% CLAY, 10% CALCILUTITE, 01% PHOSPHATIC SAND, BRYOZOA, MOLLUSKS,

560.0- 561.0 DOLO-SILT, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE,

561.0- 563.0 DOLO-SILT, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% CALCILUTITE, 01% PHOSPHATIC SAND, BRYOZOA, MOLLUSKS,

563.0- 568.0 DOLOMITE, YELLOWISH GRAY, 14% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

LITHOLOGIC LOG
W- 026 . LEE CO. T44S, R26E, SEC 15

568.0- 572.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 14% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 30% DOLOMITE, MOLLUSKS, FOSSIL FRAGMENTS, BRYOZOA,

572.0- 574.0 AS ABOVE,

574.0- 575.0 DOLOMITE, LIGHT OLIVE GRAY, 14% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 20% CALCILUTITE, 02% PHOSPHATIC SAND, BRYOZOA, MOLLUSKS,

575.0- 579.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH BROWN, 16% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS,

DRILLER REPORTS INCREASE FLOW AT 576'-WATER SAMPLE

579.0- 582.0 AS ABOVE WITH CLAY BED 580.

582.0- 585.0 DOLO-SILT, YELLOWISH GRAY TO GREENISH GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% CALCILUTITE, 06% PHOSPHATIC SAND, SHARK TEETH,

585.0- 591.0 DOLOMITE, YELLOWISH GRAY, 12% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 01% PHOSPHATIC SAND, HIGH RECRYSTALLIZATION,

591.0- 597.0 LIMESTONE, VERY LIGHT ORANGE, 18% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 60% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 02% QUARTZ SAND, BRYOZOA, MOLLUSKS, BENTHONIC FORAMINIFERA, FOSSIL MOLDS,

597.0- 606.0 DOLOMITE, YELLOWISH GRAY TO LIGHT OLIVE GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 02% PHOSPHATIC SAND, 02% QUARTZ SAND, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS,

LITHOLOGIC LOG

W- 026 . LEE CO. T44S, R26E, SEC 15

606.0- 609.0 LIMESTONE, YELLOWISH GRAY TO VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 02% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

SORITES, QUINQUELOCULINA SP., PHOS. OCCURS IN THIN SEAMS

609.0- 612.0 LIMESTONE, VERY LIGHT ORANGE, 18% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CRYSTALS, SKELETAL, 75% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 01% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, CORAL, MOLLUSKS, FOSSIL MOLDS, ECHINOID,

DRILLER REPORTS INCREASE FLOW AT 612'-WATER SAMPLE

612.0- 617.0 LIMESTONE, VERY LIGHT ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CRYSTALS, SKELETAL, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 15% DOLOMITE, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

617.0- 627.0 LIMESTONE, VERY LIGHT ORANGE, 16% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% DOLOMITE, 02% PHOSPHATIC SAND, 02% QUARTZ SAND, ECHINOID, BENTHONIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS,

627.0- 632.0 AS ABOVE WITH ARCHIAS SP. AND SORITES

632.0- 637.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% DOLOMITE, 05% PHOSPHATIC SAND, 03% QUARTZ SAND, BENTHONIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS, ECHINOID,

637.0- 644.0 AS ABOVE,

LITHOLOGIC LOG
W- 020 . LEE CO. T44S, R26E, SEC 15

644.0- 647.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% DOLOMITE, 05% PHOSPHATIC SAND, 05% QUARTZ SAND, BENTHONIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS, ECHINOID,

DRILLER REPORTS INCREASED FLOW

647.0- 652.0 AS ABOVE,

652.0- 657.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 13% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 04% PHOSPHATIC SAND, 02% QUARTZ SAND, BENTHONIC FORAMINIFERA, ECHINOID, MOLLUSKS, FOSSIL MOLDS, CORAL,

MANY SORITES

657.0- 662.0 AS ABOVE WITH MORE PHOSPHATE (8%) AND QTZ SAND (8%)

662.0- 667.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 09% PHOSPHATIC SAND, 10% QUARTZ SAND, BENTHONIC FORAMINIFERA, MOLLUSKS, ECHINOID, FOSSIL MOLDS, BRYOZOA,

667.0- 670.0 AS ABOVE,

670.0- 672.0 LIMESTONE, VERY LIGHT ORANGE TO VERY LIGHT GRAY, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 02% PHOSPHATIC SAND, 02% QUARTZ SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

672.0- 673.0 AS ABOVE,

673.0- 677.0 LIMESTONE, LIGHT GRAY, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 01% PHOSPHATIC SAND, 03% QUARTZ SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

677.0- 681.0 AS ABOVE WITH MORE PHOSPHATE (7%) AND QTZ SAND (10%)

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

661.0- 685.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 06% PHOSPHATIC SAND, 07% QUARTZ SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

665.0- 687.0 SANDSTONE, LIGHT GRAY, 15% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, ANGULAR, MEDIUM SPHERICITY, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 35% CALCILUTITE, 05% SPAR, 06% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS,

APPEARS REWORKED AND/OR WEATHERED

687.0- 692.0 LIMESTONE, VERY LIGHT ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 45% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 04% PHOSPHATIC SAND, 02% QUARTZ SAND, BENTHONIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS, BRYOZOA,

DRILLER REPORTS INCREASED FLOW 682 TO 692.

692.0- 694.0 AS ABOVE,

694.0- 699.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 40% QUARTZ SAND, 05% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS,

699.0- 705.0 LIMESTONE, VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 04% QUARTZ SAND, 04% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS, FOSSIL MOLDS,

705.0- 707.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT GRAY, 14% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, 25% QUARTZ SAND, 06% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

707.0- 709.0 AS ABOVE,

709.0- 710.0 GRADES INTO UNDERLYING LITHO

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

710.0- 715.0 DOLOMITE, VERY LIGHT GRAY TO VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, LOW PERMEABILITY, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 03% QUARTZ SAND, 01% PHOSPHATIC SAND, HIGH RECRYSTALLIZATION,

715.0- 717.0 DOLOMITE, LIGHT GRAY, 14% POROSITY, INTERGRANULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, CALCILUTITE MATRIX, 20% CALCILUTITE, 15% QUARTZ SAND, 02% PHOSPHATIC SAND, HIGH RECRYSTALLIZATION, MOLLUSKS, FOSSIL MOLDS,

717.0- 722.5 LIMESTONE, VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 10% DOLOMITE, 20% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, ECHINOID, FOSSIL FRAGMENTS, FOSSIL MOLDS, CRUSTACEA,

722.5- 723.0 LIMESTONE, LIGHT GRAY TO VERY LIGHT ORANGE, 14% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 30% DOLOMITE, 35% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS, BRYOZOA,

723.0- 729.0 AS ABOVE WITH MORE SAND (45%)

729.0- 732.0 LIMESTONE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 14% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, LAMINATED, 10% DOLOMITE, 10% QUARTZ SAND, MOLLUSKS,

DRILLER REPORTS INCREASED FLOW AT 732'

732.0- 735.0 AS ABOVE WITH LENSE OF DOLOMITE AT 733'

735.0- 737.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, BRECCIATED, 15% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

LITHOLOGIC LOG
W- 028 . LEE CO. T44S, R26E, SEC 15

737.0- 742.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 08% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

742.0- 747.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, BRECCIATED, LAMINATED, 15% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

747.0- 752.0 AS ABOVE-DRILLER REPORTS VERY SOFT L/S AT 752'-NO REC.

752.0- 758.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, 10% QUARTZ SAND, MOLLUSKS,

758.0- 760.0 LIMESTONE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 10% DOLOMITE, 10% QUARTZ SAND, MOLLUSKS,

760.0- 762.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, POOR INDURATION, CALCILUTITE MATRIX, 10% QUARTZ SAND,

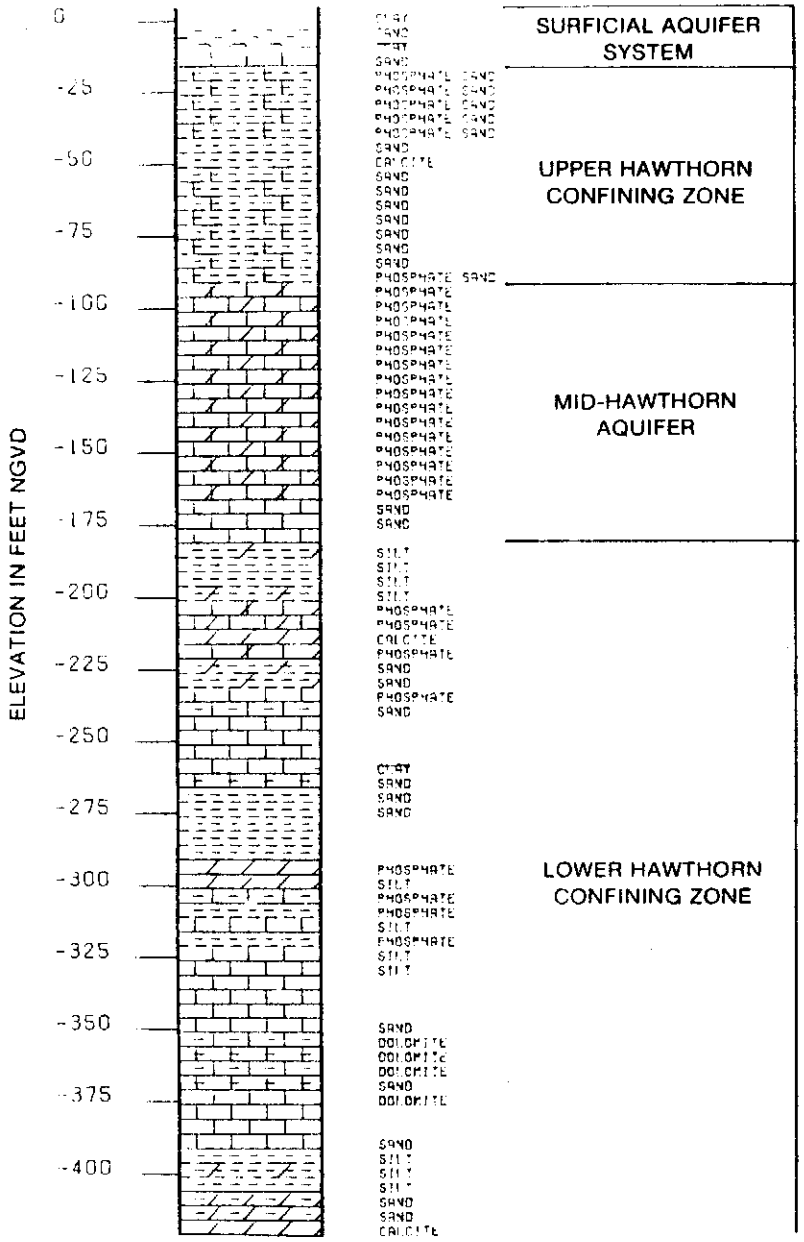
762.0- 764.0 LIMESTONE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 10% DOLOMITE, 12% QUARTZ SAND, MOLLUSKS,

764.0- 767.0 LIMESTONE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, 20% QUARTZ SAND, MOLLUSKS,

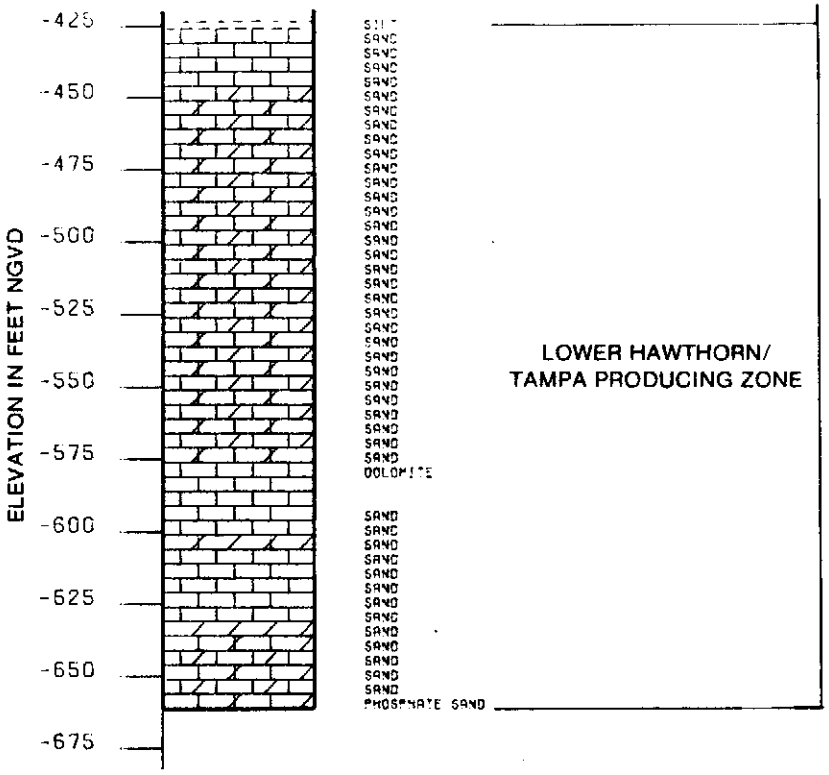
767.0- 770.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 05% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

TD

W - 29


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE

W - 29


ELEVATION IN FEET NGVD
-425
-450
-475
-500
-525
-550
-575
-600
-625
-650
-675
LOWER HAWTHORN/ TAMPA PRODUCING ZONE

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 0290

LEE CO. T45S R23E SEC 04AA 26 35 31 N 82 01 21 W
TOTAL DEPTH- 662 FT. ELEV.- 4 FT. 30 SAMPLES- 0- 662 FT.
COMPLETED- 82.07.06 DEPTH WORKED 662 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

FLUID CONDUCTIVITY
ELECTRIC
GAMMA
CALIPHER
TEMPERATURE

WELL NAME-
CAPE CORAL #1,CITY OF CAPE CORAL R.O. PLANT (OWNER),DRILLED BY J.HODGES
REMARKS-
CODED BY MIKE KNAPP (8-10-82),QUALITY EXCELLENT

HYDROGEOLOGIC UNITS

0.0	18.5	SURFICIAL AQUIFER SYSTEM
18.5	97.0	UPPER HAWTHORN CONFINING ZONE
97.0	185.0	MID-HAWTHORN AQUIFER (UPPER HAWTHORN U.S.G.S.)
185.0	429.0	LOWER HAWTHORN CONFINING ZONE
429.0	662.0	LOWER HAWTHORN/TAMPA PRODUCING ZONE (FLORIDAN AQUIFER)

THE LOWER HAWTHORN CONFINING ZONE IS PRIMARILY INTERBEDDED LIMESTONES AND DOLOSILTS. THE LIMESTONE BEDS ARE GENERALLY OF LOW PERMEABILITY,BUT SOME ARE OF HIGH POROSITY AND WILL PRODUCE VARIABLE QUANTITIES OF WATER.

STRATIGRAPHIC FORMATIONS -

.0-	13.5	UNDIFFERENTIATED SAND AND CLAY
13.5-	18.5	TAMIAMI FORMATION
18.5-	429.0	HAWTHORN FORMATION
129.0-	662.0	TAMPA LIMESTONE

LITHOLOGIC LOG
W- 0290. LEE CO. T45S, R23E, SEC 04AA

.0- 2.0 SAND, VERY LIGHT GRAY, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED,

2.0- 4.0 SAND, LIGHT BROWN, 30% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, CALCILUTITE MATRIX, CLAY MATRIX, 05% CALCILUTITE, 02% CLAY,

4.0- 8.0 SAND, WHITE TO LIGHT GRAY, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, CALCILUTITE MATRIX, CLAY MATRIX, 05% CALCILUTITE, 02% CLAY,

LITHOLOGIC LOG
W- 029C. LEE CO. 14SS, R23E, SEC C4AA

8.0- 13.5 SHELL BED, WHITE, 20% POROSITY, INTERGRANULAR, POOR INDURATION, CALCILUTITE MATRIX, 05% CALCILUTITE, 30% QUARTZ SAND, 02% CLAY, MOLLUSKS,

13.5- 18.5 LIMESTONE, VERY LIGHT GRAY, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: FINE, RANGE: VERY FINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

18.5- 20.0 SILT, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, CALCILUTITE MATRIX, 15% CLAY, 15% CALCILUTITE, 02% PHOSPHATIC SAND, MOLLUSKS,

20.0- 47.0 CLAY, YELLOWISH GRAY TO LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 05% DOLOMITE, 30% CALCILUTITE, 25% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

47.0- 54.0 AS ABOVE,

54.0- 89.0 CLAY, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 05% DOLOMITE, 30% CALCILUTITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

89.0- 97.0 CLAY, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 05% DOLOMITE, 30% CALCILUTITE, 25% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

97.0- 99.0 LIMESTONE, WHITE TO LIGHT GRAY, 10% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 15% DOLOMITE, 10% QUARTZ SAND, 15% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

99.0- 137.0 LIMESTONE, LIGHT GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 15% DOLOMITE, 10% QUARTZ SAND, 15% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

137.0- 149.0 LIMESTONE, LIGHT GRAY, 15% POROSITY, INTERGRANULAR, MOLDIC, VUGULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 25% DOLOMITE, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS, FOSSIL FRAGMENTS,

LITHOLOGIC LOG
W- 029C. LEE CO. T45S, R23E, SEC 04AA

149.0- 168.0 LIMESTONE, LIGHT GRAY, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS, FOSSIL FRAGMENTS,

DRILLER REPORTS LOST CIRCULATION ZONE AT 168'

168.0- 173.5 LIMESTONE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, SPARRY CALCITE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 05% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

173.5- 178.0 LIMESTONE, LIGHT GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

178.0- 185.0 LIMESTONE, WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, SPARRY CALCITE CEMENT, CALCILUTITE MATRIX, DOLOMITE CEMENT,

185.0- 194.0 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 25% DOLOMITE, 10% SILT, 20% QUARTZ SAND, MOLLUSKS,

194.0- 196.0 LIMESTONE, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX, 15% CLAY, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

196.0- 203.0 CLAY, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% CALCILUTITE, 20% DOLOMITE, 15% SILT, 20% QUARTZ SAND, MOLLUSKS,

VERY LITTLE RECOVERY

203.0- 215.0 LIMESTONE, WHITE TO LIGHT GRAY, 15% POROSITY, INTERGRANULAR, VUGULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 10% PHOSPHATIC SAND, 05% QUARTZ SAND, 15% DOLOMITE, MOLLUSKS, FOSSIL MOLDS,

LITHOLOGIC LOG
W- 0296. LEE CO. T45S, R23E, SEC 04AA

215.0- 218.0 DOLOMITE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, VUGULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, MOLLUSKS, FOSSIL MOLDS,

218.0- 220.0 AS ABOVE,

220.0- 225.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, VUGULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 10% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

225.0- 235.5 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 30% DOLOMITE, 02% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS,

235.5- 240.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, VUGULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS, FOSSIL FRAGMENTS,

240.0- 246.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS, FOSSIL FRAGMENTS,

246.0- 263.0 AS ABOVE,

263.0- 272.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS,

272.0- 275.0 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 10% QUARTZ SAND, 35% SILT, 02% PHOSPHATIC SAND, MOLLUSKS,

DOLOSILT PRIMARY LITHOLOGY

LITHOLOGIC LOG
W- 029C. LEE CO. T45S, R23E, SEC 04AA

275.0- 278.0 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 10% QUARTZ SAND, 35% SILT, 02% PHOSPHATIC SAND, MOLLUSKS,

278.0- 297.0 AS ABOVE,

297.0- 303.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, VUGULAR, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

303.0- 305.0 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 10% QUARTZ SAND, 35% SILT, 02% PHOSPHATIC SAND, MOLLUSKS,

305.0- 309.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

309.0- 314.0 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 15% QUARTZ SAND, 05% PHOSPHATIC SAND, 20% DOLOMITE,

314.0- 319.0 LIMESTONE, LIGHT GRAY, 15% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 10% QUARTZ SAND, 20% SILT, 05% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

319.0- 323.0 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 04% PHOSPHATIC GRAVEL, 05% PHOSPHATIC SAND, 15% QUARTZ SAND, 40% DOLOMITE, MOLLUSKS,

323.0- 327.0 LIMESTONE, LIGHT GRAY, 15% POROSITY, INTERGRANULAR, MOLDIC, VUGULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

LOST CIRCULATION

LITHOLOGIC LOG
W- 029C. LEE CO. T45S, R23E, SEC 04AA

327.0- 333.0 LIMESTONE, LIGHT GRAY, 10% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, 15% SILT, 05% CLAY, MOLLUSKS, FOSSIL MOLDS,

333.0- 349.5 AS ABOVE,

349.5- 353.5 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, VUGULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 30% DOLOMITE, 10% QUARTZ SAND, 04% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

353.5- 355.0 AS ABOVE,

355.0- 367.0 LIMESTONE, LIGHT GREENISH GRAY, 15% POROSITY, INTERGRANULAR, VUGULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 25% DOLOMITE, 05% CLAY, MOLLUSKS, FOSSIL MOLDS,

367.0- 378.0 LIMESTONE, GRAYISH ORANGE, 15% POROSITY, INTERGRANULAR, VUGULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, CALCILUTITE MATRIX, 35% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, 05% CLAY, MOLLUSKS, FOSSIL MOLDS,

CLAY INTERBEDDED NEAR BOTTOM

378.0- 389.0 AS ABOVE,

389.0- 396.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, POOR INDURATION, CALCILUTITE MATRIX, 10% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

396.0- 401.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, CALCILUTITE MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 10% SILT, 10% CALCILUTITE, 02% PHOSPHATIC SAND, MOLLUSKS,

DOLOSILT

401.0- 408.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 40% DOLOMITE, 10% SILT, 10% CALCILUTITE, 01% PHOSPHATIC SAND, MOLLUSKS,

LITHOLOGIC LOG
W- C29C. LEE CO. T45S, R23E, SEC 04AA

408.0- 423.0 DOLOMITE, GRAYISH ORANGE, 15% POROSITY, INTERGRANULAR, VUGULAR, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 05% CLAY, 05% QUARTZ SAND, 04% PHOSPHATIC SAND, 20% CALCILUTITE, MOLLUSKS, FOSSIL MOLDS,

WEATHERED, CLAY FILLING SOLUTION CAVITIES

423.0- 429.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 40% DOLOMITE, 10% SILT, 10% CALCILUTITE, 02% PHOSPHATIC SAND, MOLLUSKS,

DOLOSILT

429.0- 449.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, MODERATE INDURATION, CALCILUTITE MATRIX, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

449.0- 463.0 LIMESTONE, VERY LIGHT ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

463.0- 473.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, VUGULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

473.0- 515.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 30% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

515.0- 538.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, VUGULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

LITHOLOGIC LOG
W- 029C. LEE CO. T45S, R23E, SEC 04AA

538.0- 558.0 LIMESTONE, GRAYISH ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 20% DOLOMITE, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

558.0- 583.0 LIMESTONE, GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, VUGULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 40% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

583.0- 593.0 AS ABOVE,

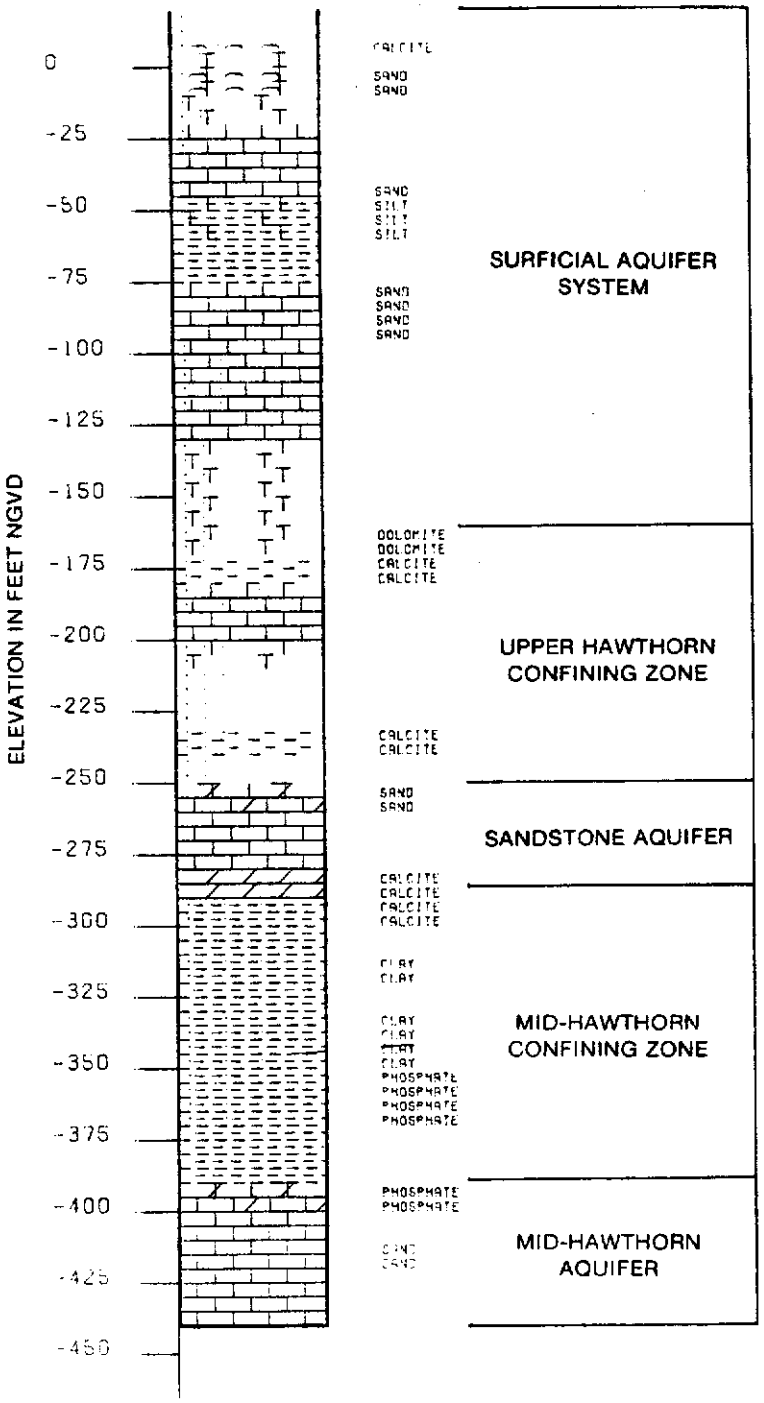
593.0- 603.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

603.0- 610.0 DOLOMITE, GRAYISH ORANGE, 15% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

610.0- 634.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

634.0- 638.0 DOLOMITE, GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, VUGULAR, LOW PERMEABILITY, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

638.0- 662.0 LIMESTONE, WHITE TO LIGHT GRAY, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
-425
-450
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
SANDSTONE AQUIFER
MID-HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 033

LEE CO. T47S R26E SEC 36 26 20 13 N 81 39 53 W
TOTAL DEPTH- 460 FT. ELEV.- 20 FT. 46 SAMPLES- 0- 460 FT.
COMPLETED- 07.26.83 DEPTH WORKED 460 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
CALIPHER
ELECTRIC
NEUTRON

WELL NAME-
BOB SOUTH,LE033,SFWMD-DRILLER (ALVIN WOOSTER)
REMARKS-
DESCRIBED BY MIKE KNAPP (1-10-84),SAMPLE QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	180.0	SURFICIAL AQUIFER SYSTEM
0.0	65.0	WATER TABLE AQUIFER
95.0	180.0	LOWER TAMIAMI AQUIFER
180.0	270.0	UPPER HAWTHORN CONFINING ZONE
270.0	310.0	SANDSTONE AQUIFER
310.0	410.0	MID-HAWTHORN CONFINING ZONE
410.0	460.0	MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0-	180.0	TAMIAMI FORMATION
180.0-	460.0	HAWTHORN FORMATION

LITHOLOGIC LOG
W- 033 . LEE CO. T47S, R26E, SEC 36

.0-	10.0	SAND, LIGHT GRAY, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED,
10.0-	15.0	SHELL BED, MODERATE ORANGE PINK TO WHITE, 30% POROSITY, INTERGRANULAR, UNCONSOLIDATED, 20% QUARTZ SAND, 15% CALCILUTITE, MOLLUSKS,
15.0-	20.0	SANDSTONE, MODERATE ORANGE PINK, 25% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, GOOD INDURATION, CALCILUTITE MATRIX, 40% CALCILUTITE, MOLLUSKS, CORAL,
20.0-	30.0	SHELL BED, MODERATE ORANGE PINK TO WHITE, 30% POROSITY, INTERGRANULAR, UNCONSOLIDATED, 15% QUARTZ SAND, 20% CALCILUTITE, MOLLUSKS, CORAL,

LITHOLOGIC LOG
W- 033 . LEE CO. 147S, R26E, SEC 36

30.0- 40.0 SANDSTONE, MODERATE ORANGE PINK TO WHITE, 30% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, MODERATE INDURATION, CALCILUTITE MATRIX, 20% CALCILUTITE, MOLLUSKS,

40.0- 50.0 LIMESTONE, VERY LIGHT ORANGE, 25% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 25% QUARTZ SAND, MOLLUSKS, CORAL, FOSSIL MOLDS,

50.0- 60.0 AS ABOVE,

60.0- 65.0 LIMESTONE, MODERATE LIGHT GRAY TO YELLOWISH GRAY, 20% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 15% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

65.0- 80.0 CLAY, GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% CALCILUTITE, 10% SILT, 15% QUARTZ SAND, MOLLUSKS,

80.0- 95.0 AS ABOVE,

95.0- 100.0 LIMESTONE, LIGHT GRAY, 20% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

100.0- 115.0 LIMESTONE, VERY LIGHT ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, CORAL, FOSSIL MOLDS,

115.0- 130.0 AS ABOVE- MORE SAND (25%)

130.0- 140.0 LIMESTONE, VERY LIGHT ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, SKELETAL, CALCILUTITE, 55% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 20% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, PLANT REMAINS, FOSSIL MOLDS,

140.0- 150.0 AS ABOVE,

LITHOLOGIC LOG
#- 035 . LEE CO. T47S, R26E, SEC 36

150.0- 160.0 SANDSTONE, VERY LIGHT ORANGE TO YELLOWISH GRAY, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 40% CALCILUTITE, MOLLUSKS, FOSSIL MOLDS,

160.0- 170.0 AS ABOVE (LARGE SHELL CEMENTED IN MATRIX)

170.0- 180.0 SANDSTONE, VERY LIGHT ORANGE TO YELLOWISH GRAY, 20% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 40% CALCILUTITE, MOLLUSKS,

180.0- 190.0 SANDSTONE, VERY LIGHT ORANGE TO YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% CALCILUTITE, 20% DOLOMITE, MOLLUSKS,

190.0- 200.0 SAND, VERY LIGHT ORANGE TO YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 05% CLAY, 20% DOLOMITE, 20% CALCILUTITE, 02% PHOSPHATIC SAND, MOLLUSKS,

200.0- 210.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, BIOGENIC, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, 35% QUARTZ SAND, MOLLUSKS,

210.0- 220.0 AS ABOVE,

220.0- 230.0 SAND, VERY LIGHT ORANGE TO YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, 40% CALCILUTITE, MOLLUSKS,

230.0- 240.0 AS ABOVE (LARGE SHELL FRAGS)

240.0- 250.0 AS ABOVE,

250.0- 260.0 SAND, YELLOWISH GRAY, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 02% PHOSPHATIC SAND, 02% CLAY, MOLLUSKS,

260.0- 270.0 AS ABOVE,

LITHOLOGIC LOG
W- 033 . LEE CO. T47S, R26E, SEC 36

270.0- 280.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 03% PHOSPHATIC SAND, 05% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, MOLLUSKS, FOSSIL MOLDS,

280.0- 290.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 03% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS, BRYOZOA,

290.0- 300.0 AS ABOVE,

300.0- 310.0 DOLOMITE, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, PIN POINT VUGS, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% CALCILUTITE, 03% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS,

310.0- 320.0 CLAY, GREENISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 15% CALCILUTITE, 35% QUARTZ SAND, MOLLUSKS,

320.0- 330.0 AS ABOVE,

330.0- 340.0 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 05% CLAY, 35% QUARTZ SAND, 04% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

340.0- 350.0 AS ABOVE,

350.0- 360.0 AS ABOVE-LESS SAND (05%)-PLANKTICS

360.0- 370.0 CLAY, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 05% CLAY, 25% QUARTZ SAND, 03% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

370.0- 380.0 AS ABOVE-INCREASE PHOSPHATE (06%)

380.0- 390.0 CLAY, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 05% CLAY, 10% PHOSPHATIC SAND, 05% PHOSPHATIC GRAVEL, 25% QUARTZ SAND, MOLLUSKS,

390.0- 400.0 PHOSPHATE RUBBLE

400.0- 410.0 AS ABOVE,

LITHOLOGIC LOG
W- 033 . LEE CO. T47S, R26E, SEC 36

410.0- 420.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% DOLOMITE, 05% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

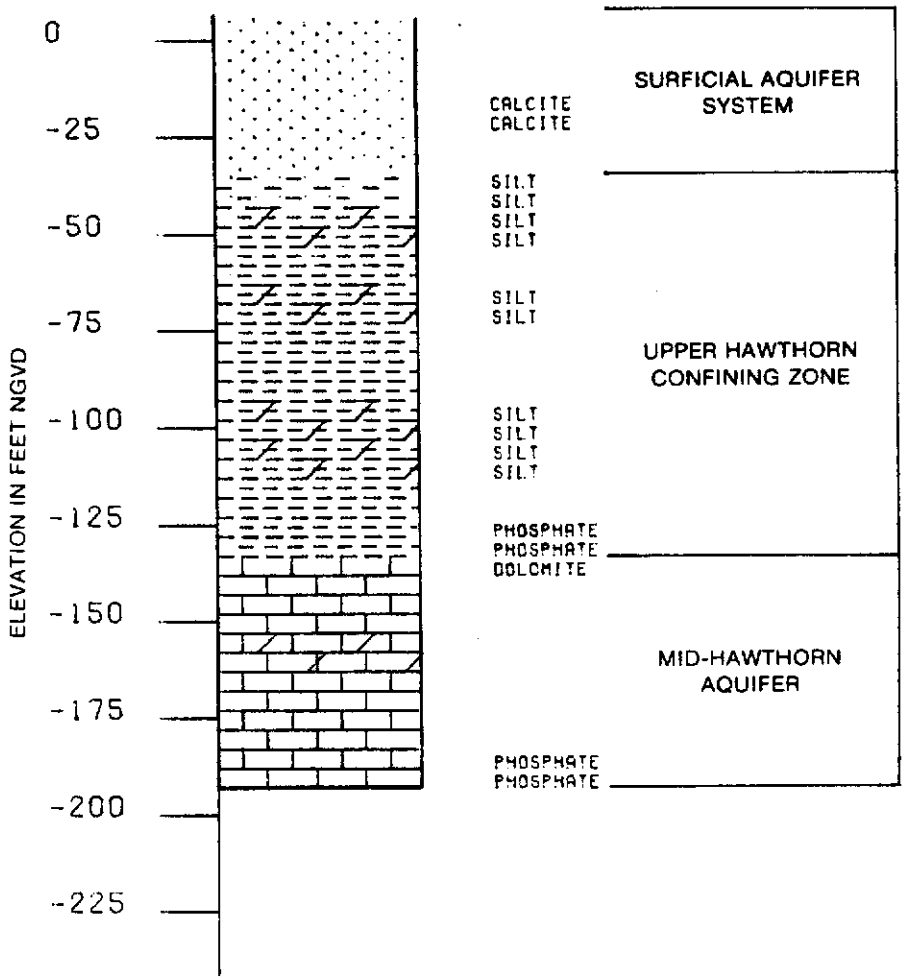
420.0- 430.0 AS ABOVE,

430.0- 440.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 05% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, CORAL, FOSSIL MOLDS,

440.0- 450.0 AS ABOVE,

450.0- 460.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 45% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 01% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, CORAL, FOSSIL MOLDS,

W - 34


0
-25
-50
-75
-100
-125
-150
-175
-200
-225
ELEVATION IN FEET NGVD
CALCITE
CALCITE
SILT
SILT
SILT
SILT
SILT
SILT
SILT
SILT
SILT
PHOSPHATE
PHOSPHATE
DOLOMITE
PHOSPHATE
PHOSPHATE
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 034

LEE CO. T45S R23E SEC 17CD 26 32 53 N 82 01 42 W
TOTAL DEPTH- 200 FT. ELEV.- 7 FT. 20 SAMPLES- 0- 200 FT.
COMPLETED- 78.05.01 DEPTH WORKED 200 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

ELECTRIC
GAMMA
CALIPHER

WELL NAME-
USGS 2643
REMARKS-
DESCRIBED BY MIKE KNAPP (7-30-64),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	40.0	SURFICIAL AQUIFER SYSTEM
40.0	140.0	UPPER HAWTHORN CONFINING ZONE
140.0	200.0	MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0-	40.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
40.0-	200.0	HAWTHORN FORMATION

LITHOLOGIC LOG
W- 034 . LEE CO. T45S, R23E, SEC 17CD

.0-	10.0	SAND, WHITE, 32% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, 01% HEAVY MINERALS, 02% CALCILUTITE, MOLLUSKS,
10.0-	20.0	AS ABOVE,
20.0-	30.0	SAND, WHITE TO VERY LIGHT ORANGE, 32% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, 01% HEAVY MINERALS, 10% CALCILUTITE, MOLLUSKS,
30.0-	40.0	AS ABOVE,
40.0-	50.0	SAND, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 20% SILT, 02% PHOSPHATIC SAND, MOLLUSKS,
50.0-	60.0	CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 10% SILT, 05% PHOSPHATIC SAND, MOLLUSKS,

60.0- 70.0 AS ABOVE,

70.0- 80.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 10% SILT, 03% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

80.0- 90.0 AS ABOVE,

90.0- 100.0 AS ABOVE,

100.0- 110.0 AS ABOVE (VERY LOW PERM)-DOLOSILT

110.0- 120.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 20% DOLOMITE, 10% SILT, 02% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

120.0- 130.0 AS ABOVE,

130.0- 140.0 CLAY, LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 20% CLAY, 05% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, 10% LIMESTONE, MOLLUSKS,

140.0- 143.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 25% DOLOMITE, 03% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS, BRYOZOA,

143.0- 160.0 AS ABOVE,

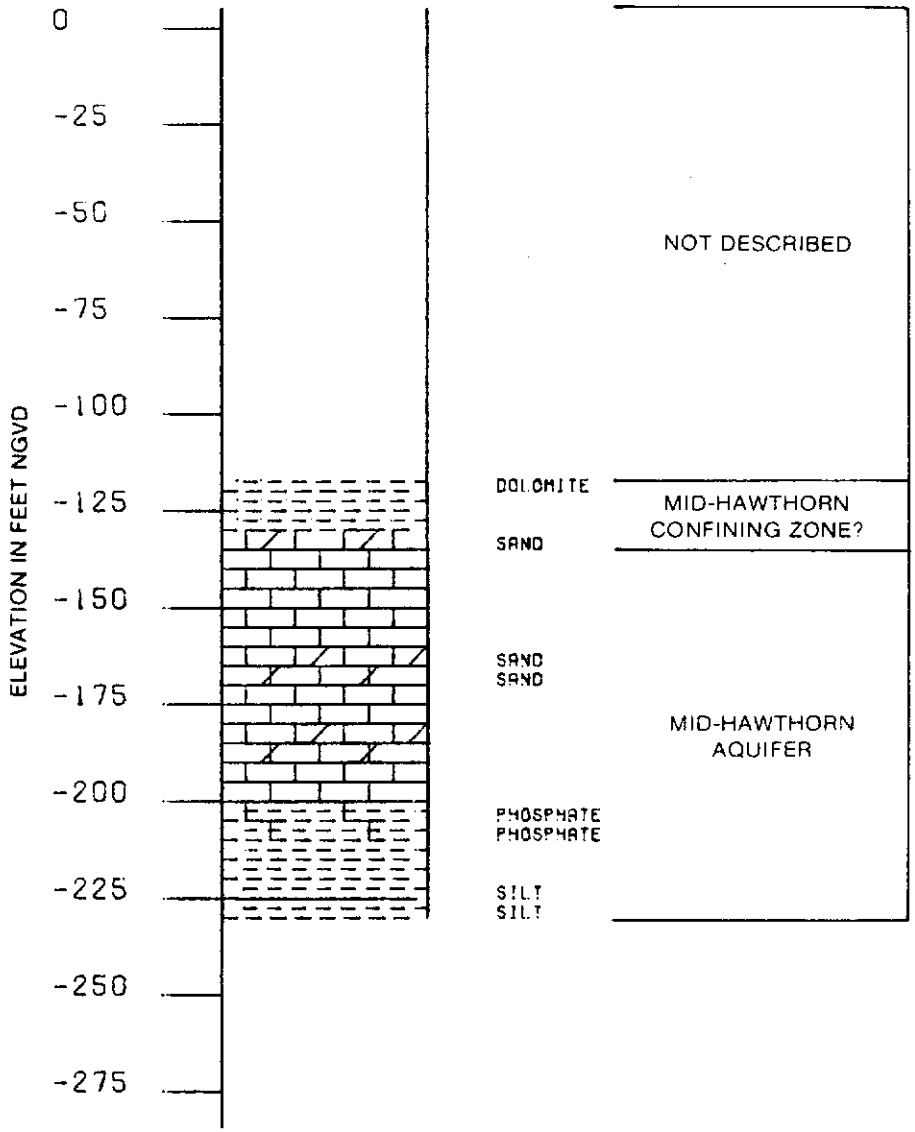
160.0- 170.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 02% QUARTZ SAND, 01% PHOSPHATIC SAND, 10% DOLOMITE, MOLLUSKS, FOSSIL MOLDS, BRYOZOA,

170.0- 180.0 AS ABOVE,

180.0- 190.0 AS ABOVE,

190.0- 200.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, MODERATE INDURATION, CALCILUTITE MATRIX, 05% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

W - 35


0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
ELEVATION IN FEET NGVD
NOT DESCRIBED
DOLOMITE
SAND
MID-HAWTHORN
CONFINING ZONE?
SAND
SAND
MID-HAWTHORN
AQUIFER
PHOSPHATE
PHOSPHATE
SILT
SILT

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 035

LEE CO. T45S R24E SEC 6AD 26 34 07 N 81 55 59 W
TOTAL DEPTH- 235 FT. ELEV.- 5 FT. 24 SAMPLES- 0- 235 FT.
COMPLETED- 77.03.01 DEPTH WORKED 704 FT. ?

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
ELECTRIC
CALIPHER

WELL NAME-
USGS 4235
REMARKS-
DESCRIBED BY MIKE KNAPP (7-30-84),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0 120.0 NOT DESCRIBED
120.0 225.0 MID-HAWTHORN AQUIFER

LITHOLOGIC LOG
W- 035 . LEE CO. T45S, R24E, SEC 6AD

.0- 120.0 NO SAMPLE,

120.0- 125.0 SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 10% CLAY, 03% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

125.0- 135.0 AS ABOVE,

135.0- 140.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 20% DOLOMITE, 15% QUARTZ SAND, 04% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

140.0- 155.0 AS ABOVE,

155.0- 165.0 AS ABOVE,

165.0- 175.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

175.0- 185.0 AS ABOVE,

DOLOSILT INTERMIXED

185.0- 195.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 15% DOLOMITE, 03% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

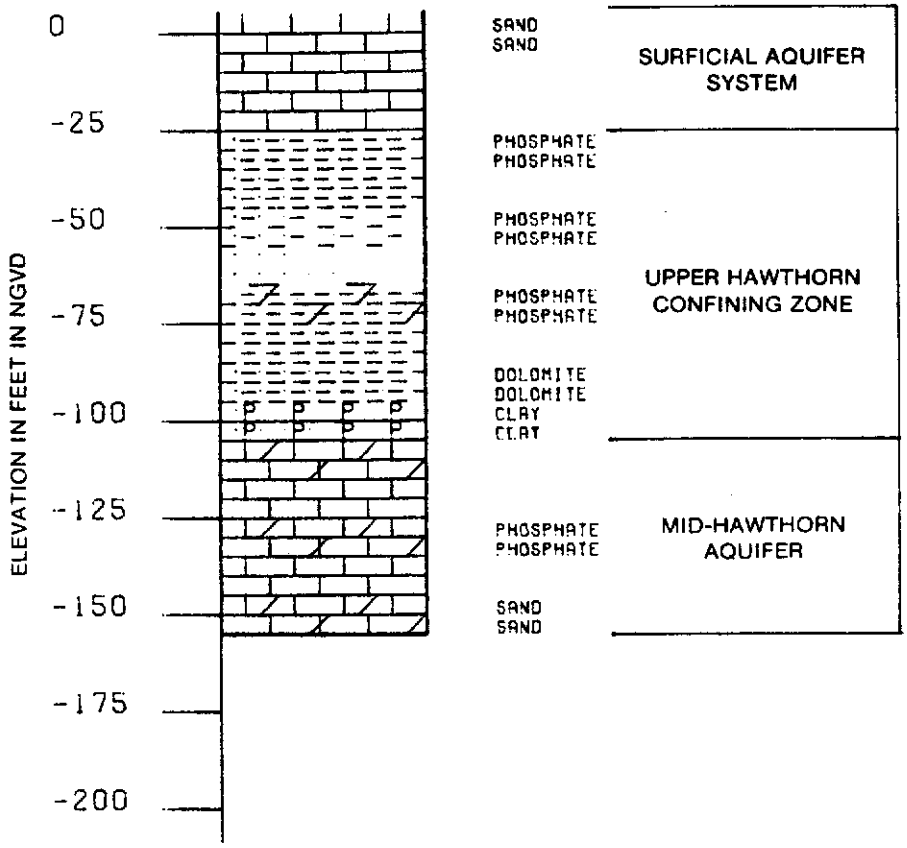
195.0- 205.0 AS ABOVE,

205.0- 215.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 05% CLAY, 25% CALCILUTITE, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

215.0- 225.0 AS ABOVE,

225.0- 235.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 10% SILT, 05% PHOSPHATIC SAND, MOLLUSKS,

W - 36


0
-25
-50
-75
-100
-125
-150
-175
-200
ELEVATION IN FEET IN NGVD
SAND
SAND
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
DOLOMITE
DOLOMITE
CLAY
CLAY
PHOSPHATE
PHOSPHATE
SAND
SAND
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 036

LEE CO. T45S R23E SEC 12CD 26 33 57 N 81 57 56 W
TOTAL DEPTH- 160 FT. ELEV.- 5 FT. 16 SAMPLES- 0- 160 FT.
COMPLETED- 78.10.01 DEPTH WORKED 160 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
ELECTRIC
CALIPHER

WELL NAME-
USGS 2705
REMARKS-
DESCRIBED BY MIKE KNAPP (7-31-84),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	30.0	SURFICIAL AQUIFER SYSTEM
30.0	110.0	UPPER HAWTHORN CONFINING ZONE
110.0	160.0	MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0-	30.0	TAMIAMI FORMATION
130.0-	165.0	HAWTHORN FORMATION

LITHOLOGIC LOG
W- 036 . LEE CO. T45S, R23E, SEC 12CD

.0- 10.0 LIMESTONE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 20% POROSITY, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

10.0- 20.0 AS ABOVE,

20.0- 30.0 AS ABOVE,

DOLOSILT IN SAMPLE

30.0- 40.0 SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, CLAY MATRIX, 20% CLAY, 20% DOLOMITE, 10% PHOSPHATIC SAND, MOLLUSKS,

40.0- 50.0 AS ABOVE,

LITHOLOGIC LOG
W- 036 . LEE CO. T45S, R23E, SEC 12CD

50.0- 60.0 SAND, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 10% DOLOMITE, 10% PHOSPHATIC SAND, MOLLUSKS,

60.0- 70.0 AS ABOVE,

70.0- 80.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 05% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

80.0- 90.0 AS ABOVE,

90.0- 100.0 SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 02% PHOSPHATIC SAND, 05% CLAY, MOLLUSKS,

100.0- 110.0 SAND, LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: COARSE, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, 05% CLAY, 20% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, MOLLUSKS,

110.0- 120.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 15% DOLOMITE, 03% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

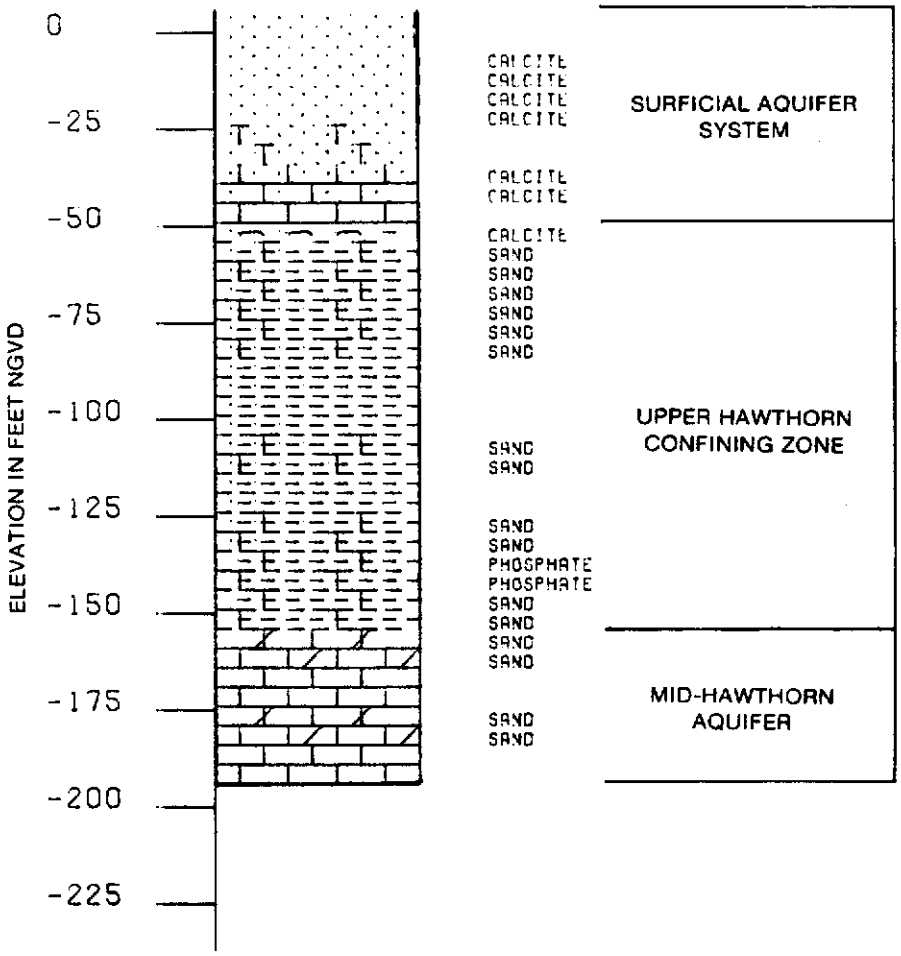
120.0- 130.0 AS ABOVE,

130.0- 140.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% PHOSPHATIC SAND, 10% QUARTZ SAND, 15% DOLOMITE, MOLLUSKS, FOSSIL MOLDS,

140.0- 150.0 AS ABOVE,

150.0- 160.0 LIMESTONE, WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 03% PHOSPHATIC SAND, 05% QUARTZ SAND, 10% DOLOMITE, MOLLUSKS, CORAL, BRYOZOA, FOSSIL MOLDS,

W - 37


0
-25
-50
-75
-100
-125
-150
-175
-200
-225
ELEVATION IN FEET NGVD
CALCITE
CALCITE
CALCITE
CALCITE
CALCITE
CALCITE
CALCITE
SAND
SAND
SAND
SAND
SAND
SAND
SAND
SAND
SAND
PHOSPHATE
PHOSPHATE
SAND
SAND
SAND
SAND
SAND
SAND
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 037

LEE CO. T44S R22E SEC 24AC 26 37 43 N 82 04 12 W
TOTAL DEPTH- 210 FT. ELEV.- 6 FT. 21 SAMPLES- 0- 210 FT.
COMPLETED- 78.05.01 DEPTH WORKED 210 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
ELECTRIC
CALIPHER

WELL NAME-
USGS L-2645
REMARKS-
DESCRIBED BY SCOTT BURNS (7-31-84),QUALITY (FAIR)

HYDROGEOLOGIC UNITS

0.0	55.0	SURFICIAL AQUIFER SYSTEM
55.0	160.0	UPPER HAWTHORN CONFINING ZONE
160.0	210.0	MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0-	40.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
40.0-	55.0	TAMIAMI FORMATION
55.0-	210.0	HAWTHORN FORMATION

LITHOLOGIC LOG
W- 037 . LEE CO. T44S, R22E, SEC 24AC

.0-	10.0	SAND, LIGHT GRAY, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: FINE TO MEDIUM, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, UNCONSOLIDATED, 01% PHOSPHATIC SAND, FROSTED, MOLLUSKS, FOSSIL FRAGMENTS,
10.0-	20.0	SAND, LIGHT GRAY, 30% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, 05% CALCILUTITE, 01% PHOSPHATIC SAND, FROSTED, MOLLUSKS, FOSSIL FRAGMENTS, 25% PELYCPOD & GASTROPOD FRAGMENT; PEAT BED AT -12 TO -14 FT
20.0-	30.0	SANDSTONE, LIGHT GRAY TO WHITE, 25% POROSITY, MOLDIC, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, 10% CALCILUTITE, 05% SPAR, FROSTED, FOSSIL FRAGMENTS, MOLLUSKS, ECHINOID, 30% SHELL FRAGMENT

LITHOLOGIC LOG
W- 037 . LEE CO. T44S, R22E, SEC 24AC

30.0- 40.0 SANDSTONE, LIGHT GRAY TO WHITE, <0% POROSITY, MOLDIC, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 15% CALCILUTITE, 05% SPAR, FROSTED, FOSSIL FRAGMENTS, MOLLUSKS,

35% SHELL FRAGMENTS

40.0- 50.0 LIMESTONE, LIGHT GRAY, 20% POROSITY, MOLDIC, INTERGRANULAR, VUGULAR, GRAIN TYPE: SKELETAL, CALCILUTITE, INTRACLASTS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE, GOOD INDURATION, 15% SPAR, 20% QUARTZ SAND, 02% PHOSPHATIC SAND, FOSSIL FRAGMENTS, MOLLUSKS, ECHINOID,

50.0- 55.0 AS ABOVE,

55.0- 60.0 SHELL BED, OLIVE GRAY, 15% POROSITY, MOLDIC, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CALCILUTITE, 10% CLAY, 10% DOLOMITE, 02% PHOSPHATIC SAND, FOSSIL FRAGMENTS, MOLLUSKS, BENTHONIC FORAMINIFERA,

SHELL FRAG. IN 30% SILT MATRIX

60.0- 70.0 SILT, GREENISH GRAY, 06% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 40% CALCILUTITE, 30% QUARTZ SAND, 15% CLAY, 15% DOLOMITE, FOSSIL FRAGMENTS,

70.0- 80.0 SILT, GREENISH GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 40% CALCILUTITE, 10% QUARTZ SAND, 20% CLAY, 15% DOLOMITE, FOSSIL FRAGMENTS, BENTHONIC FORAMINIFERA,

80.0- 90.0 SILT, LIGHT YELLOWISH GREEN, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 40% CALCILUTITE, 20% CLAY, 15% QUARTZ SAND, 02% PHOSPHATIC SAND, PLATY, PLASTIC, BENTHONIC FORAMINIFERA,

90.0- 100.0 AS ABOVE,

100.0- 110.0 AS ABOVE,

110.0- 120.0 SILT, LIGHT YELLOWISH GREEN, POROSITY, NONE OBSERVED, POOR INDURATION, 40% CALCILUTITE, 20% CLAY, 05% QUARTZ SAND, PLATY, PLASTIC, BENTHONIC FORAMINIFERA,

120.0- 130.0 AS ABOVE,

130.0- 139.0 SILT, LIGHT YELLOWISH GREEN, POROSITY, NONE OBSERVED, POOR INDURATION, 40% CALCILUTITE, 20% CLAY, 05% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, PLATY, PLASTIC, BENTHONIC FORAMINIFERA,

LITHOLOGIC LOG
W- 037 . LEE CO. T44S, R22E, SEC 24AC

139.0- 150.0 CLAY, LIGHT YELLOWISH GREEN, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 30% CALCILUTITE, 20% QUARTZ SAND, 05% PHOSPHATIC SAND, 05% PHOSPHATIC GRAVEL, PLASTIC, FOSSIL FRAGMENTS, MOLLUSKS, BENTHONIC FORAMINIFERA,

150.0- 160.0 CLAY, LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 40% CALCILUTITE, 15% QUARTZ SAND, 03% PHOSPHATIC SAND, CHALKY, SUCROSIC, FOSSIL FRAGMENTS, MOLLUSKS,

160.0- 170.0 CALCILUTITE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, INTRACLASTS, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 20% DOLOMITE, 15% QUARTZ SAND, 03% PHOSPHATIC SAND, POOR SAMPLE,

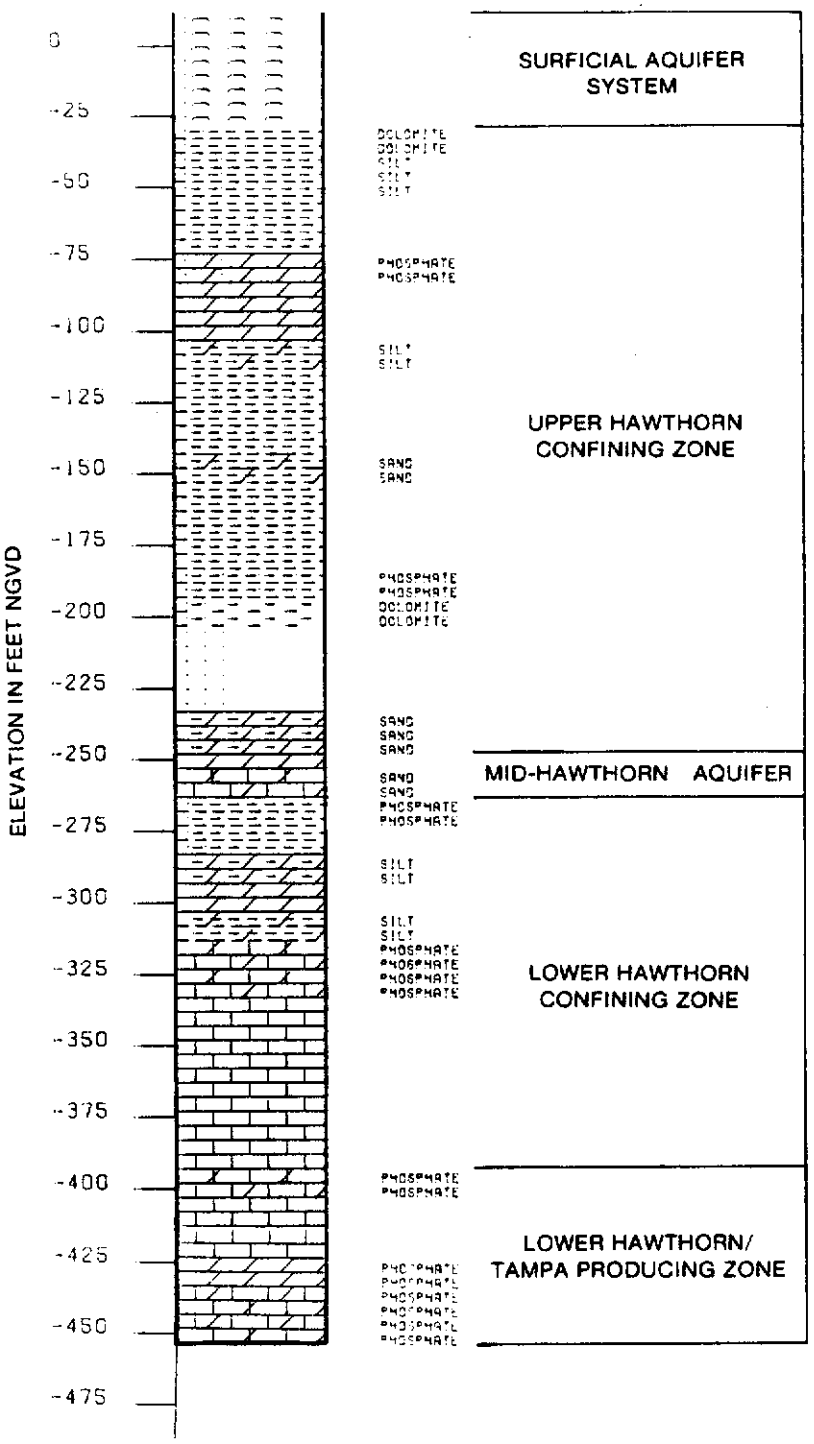
170.0- 180.0 AS ABOVE,

180.0- 190.0 CALCILUTITE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, INTRACLASTS, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 20% DOLOMITE, 15% QUARTZ SAND, 04% PHOSPHATIC SAND, POOR SAMPLE, FOSSIL FRAGMENTS,

SAMPLE CONSISTS OF WHITE SANDY MICRITE IN A GREEN GRAY SUCROSIC DOLOSILT(AS 160TO180)

190.0- 200.0 AS ABOVE, FOSSIL FRAGMENTS,

200.0- 210.0 AS ABOVE,LESS SILT


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
-425
-450
-475
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE
LOWER HAWTHORN/ TAMPA PRODUCING ZONE

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 038

LEE CO. T44S R23E SEC 11CC 26 39 07 N 81 59 27 W
TOTAL DEPTH- 465 FT. ELEV.- 12 FT. 47 SAMPLES- 0- 465 FT.
COMPLETED- 76.01.01 DEPTH WORKED 465 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

ELECTRIC
CALIPHER
GAMMA

WELL NAME-
USGS L-2528
REMARKS-
DESCRIBED BY MIKE KNAPP (7-30-84),QUALITY (FAIR)

HYDROGEOLOGIC UNITS

0.0	40.0	SURFICIAL AQUIFER SYSTEM
40.0	265.0	UPPER HAWTHORN CONFINING ZONE
265.0	275.0	MID-HAWTHORN AQUIFER
275.0	405.0	LOWER HAWTHORN CONFINING ZONE
405.0	405.0	LOWER HAWTHORN/TAMPA PRODUCING ZONE

STRATIGRAPHIC FORMATIONS -

.0-	40.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
40.0-	445.0	HAWTHORN FORMATION
445.0-	465.0	TAMPA LIMESTONE

LITHOLOGIC LOG
W- 038 . LEE CO. T44S, R23E, SEC 11CC

.0-	10.0	SHELL BED, VERY LIGHT ORANGE, 30% POROSITY, INTERGRANULAR, UNCONSOLIDATED, 40% QUARTZ SAND, MOLLUSKS, CORAL,
10.0-	20.0	AS ABOVE,
20.0-	40.0	AS ABOVE,
40.0-	50.0	SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 15% DOLOMITE, 20% CLAY, 02% PHOSPHATIC SAND, MOLLUSKS,
50.0-	65.0	CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 30% QUARTZ SAND, 10% SILT, 04% PHOSPHATIC SAND, MOLLUSKS,
65.0-	75.0	AS ABOVE,
		MUCH SHELL IN SAMPLE

75.0- 85.0 AS ABOVE,

85.0- 95.0 DOLO-SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 25% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

95.0- 105.0 AS ABOVE,

105.0- 115.0 AS ABOVE,

115.0- 125.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 35% DOLOMITE, 10% SILT, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

125.0- 135.0 AS ABOVE,

135.0- 145.0 AS ABOVE,

145.0- 155.0 AS ABOVE,

155.0- 165.0 CLAY, DARK BROWN, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 03% PHOSPHATIC SAND, 10% QUARTZ SAND, 20% DOLOMITE, MOLLUSKS,

165.0- 185.0 AS ABOVE,

185.0- 195.0 AS ABOVE,

195.0- 205.0 CLAY, DARK BROWN, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, 30% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

205.0- 215.0 SAND, DARK BROWN, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 30% CLAY, 10% DOLOMITE, 03% PHOSPHATIC SAND, MOLLUSKS,

215.0- 225.0 AS ABOVE,

225.0- 245.0 AS ABOVE,

245.0- 260.0 DOLO-SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

260.0- 265.0 AS ABOVE,

SANDY LIMESTONE INTERMIXED

LITHOLOGIC LOG
W- 038 . LEE CO. T44S, R23E, SEC 11CC

265.0- 275.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% DOLOMITE, 05% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

DOLOSILT PRIMARY LITHOLOGY (LOW PERM)

275.0- 285.0 SILT, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 10% CLAY, 05% PHOSPHATIC SAND, 10% LIMESTONE, MOLLUSKS,

265.0- 295.0 AS ABOVE,

295.0- 305.0 DOLO-SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 15% SILT, 20% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

305.0- 315.0 AS ABOVE,

315.0- 325.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 20% SILT, 05% PHOSPHATIC SAND, 10% CALCILUTITE, MOLLUSKS,

325.0- 345.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% DOLOMITE, 05% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

345.0- 365.0 AS ABOVE,

MUCH DOLOSILT IN SAMPLE

365.0- 385.0 AS ABOVE,

385.0- 405.0 AS ABOVE,

405.0- 415.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, INTERCRYSTALLINE, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 40% DOLOMITE, 03% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS, BRYOZOA,

415.0- 425.0 AS ABOVE,

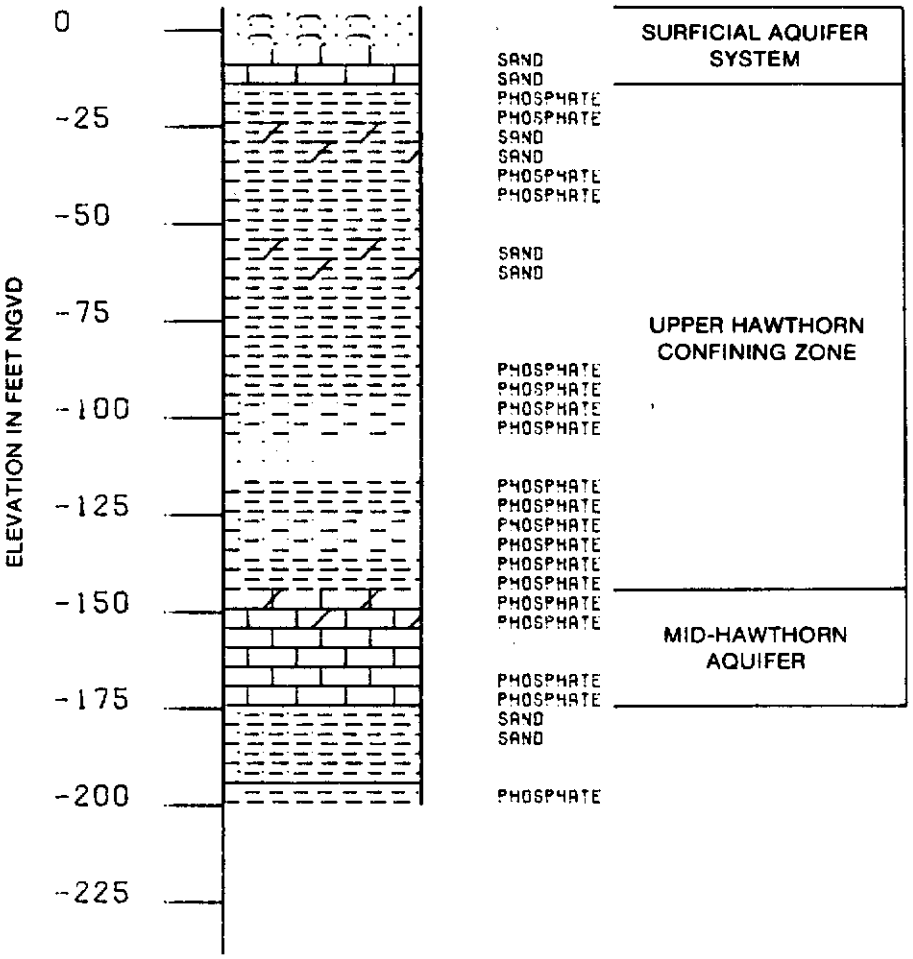
LITHOLOGIC LOG
W- 038 . LEE CO. T44S, R23E, SEC 11CC

425.0- 435.0 AS ABOVE,

435.0- 445.0 DOLOMITE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MEDIUM, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 08% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

445.0- 465.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% DOLOMITE, 05% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

W - 39


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
SAND
SAND
PHOSPHATE
PHOSPHATE
SAND
SAND
PHOSPHATE
PHOSPHATE
SAND
SAND
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
SAND
SAND
PHOSPHATE
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 039

LEE CO. T44S R23E SEC 05DD 26 40 02 N 082 01 28 W
TOTAL DEPTH- 205 FT. ELEV.- 6 FT. 21 SAMPLES- 0- 205 FT.
COMPLETED- 78.10.01 DEPTH WORKED 205 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
ELECTRIC
CALIPHER

WELL NAME-
USGS L-2700
REMARKS-
DESCRIBED BY MIKE KNAPP (7-30-84),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	20.0	SURFICIAL AQUIFER SYSTEM
20.0	150.0	UPPER HAWTHORN CONFINING ZONE
150.0	180.0	MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0-	10.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
10.0-	20.0	TAMIAMI FORMATION
20.0-	205.0	HAWTHORN FORMATION

LITHOLOGIC LOG
W- 039 . LEE CO. T44S, R23E, SEC 05DD

.0-	10.0	SHELL BED, WHITE TO VERY LIGHT ORANGE, 35% POROSITY, INTERGRANULAR, UNCONSOLIDATED, 40% QUARTZ SAND, MOLLUSKS,
10.0-	20.0	LIMESTONE, GRAYISH ORANGE, 15% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 15% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,
20.0-	30.0	SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 10% CLAY, 05% PHOSPHATIC SAND, MOLLUSKS,
30.0-	40.0	CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 20% DOLOMITE, 10% CALCILUTITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

LITHOLOGIC LOG
W- 039 . LEE CO. T44S, R23E, SEC 05DD

40.0- 50.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 05% QUARTZ SAND, 05% CLAY, 05% PHOSPHATIC SAND, MOLLUSKS,

50.0- 60.0 AS ABOVE,

60.0- 70.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 40% DOLOMITE, 08% QUARTZ SAND, 04% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

70.0- 80.0 AS ABOVE,

80.0- 90.0 AS ABOVE,

90.0- 100.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 15% CLAY, 03% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

100.0- 110.0 SAND, LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 05% CLAY, 10% DOLOMITE, 02% PHOSPHATIC GRAVEL, 05% PHOSPHATIC SAND, MOLLUSKS,

110.0- 120.0 AS ABOVE,

LIMESTONE INTERMIXED

120.0- 130.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 05% CALCILUTITE, 10% PHOSPHATIC SAND, MOLLUSKS,

130.0- 140.0 SAND, LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 05% CLAY, 05% DOLOMITE, 02% PHOSPHATIC GRAVEL, 15% PHOSPHATIC SAND, MOLLUSKS,

140.0- 150.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 10% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS,

150.0- 160.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 25% DOLOMITE, 10% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

LITHOLOGIC LOG
W- 039 . LEE CO. T44S, R23E, SEC 0500

160.0- 170.0 AS ABOVE,

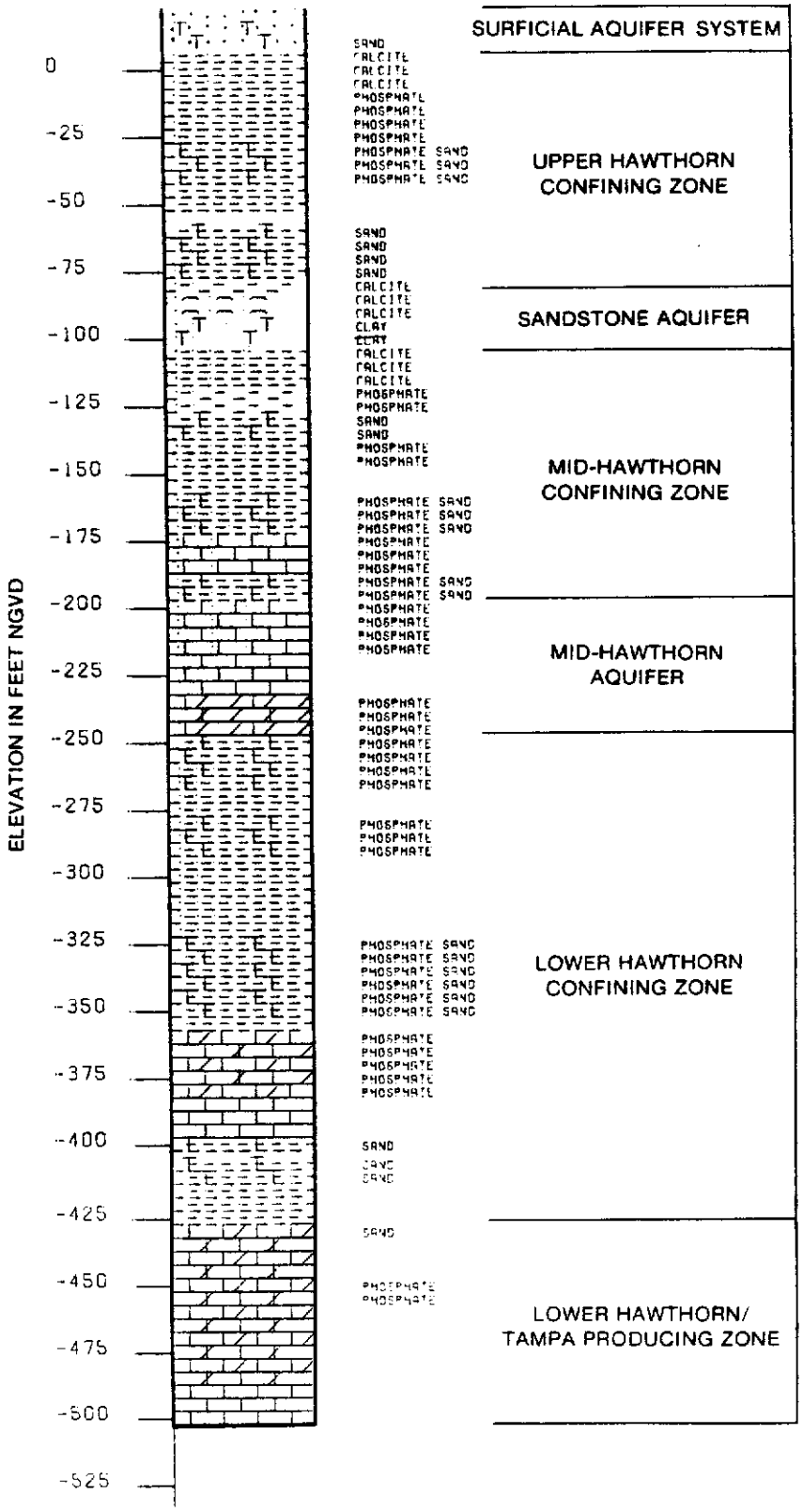
170.0- 180.0 AS ABOVE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 05% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, ECHINOID, FOSSIL MOLDS,

180.0- 190.0 SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 05% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

190.0- 200.0 AS ABOVE,

200.0- 205.0 CLAY, GRAYISH ORANGE TO LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

W - 40


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
-425
-450
-475
-500
-525
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
SANDSTONE AQUIFER
MID-HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE
LOWER HAWTHORN/ TAMPA PRODUCING ZONE

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 040

LEE CO. T43S R25E SEC 07AA 26 45 17 N 81 51 32 W
TOTAL DEPTH- 525 FT. ELEV.- 23 FT. 53 SAMPLES- 0- 525 FT.
COMPLETED- 76.09.01 DEPTH WORKED 525 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
CALIPHER
ELECTRIC

WELL NAME-
USGS L-2341
REMARKS-
DESCRIBED BY SCOTT BURNS (7-30-84),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	13.0	SURFICIAL AQUIFER SYSTEM
13.0	115.0	UPPER HAWTHORN CONFINING ZONE
115.0	125.0	SANDSTONE AQUIFER
125.0	220.0	MID-HAWTHORN CONFINING ZONE
220.0	270.0	MID-HAWTHORN AQUIFER
270.0	455.0	LOWER HAWTHORN CONFINING ZONE
455.0	525.0	LOWER HAWTHORN/TAMPA PRODUCING ZONE

STRATIGRAPHIC FORMATIONS -

.0-	13.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
13.0-	450.0	HAWTHORN FORMATION
450.0-	525.0	TAMPA LIMESTONE

LITHOLOGIC LOG
W- 040 . LEE CO. T43S, R25E, SEC 07AA

.0-	5.0	SAND, MODERATE YELLOWISH BROWN, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO MEDIUM, SUB-ANGULAR, ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, IRON STAIN, FROSTED, FOSSIL FRAGMENTS,
5.0-	13.0	SANDSTONE, LIGHT GRAYISH BROWN, 15% POROSITY, INTERGRANULAR, VUGULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, MEDIUM SPHERICITY, MODERATE INDURATION, SPARRY CALCITE CEMENT, CALCILUTITE MATRIX, 20% CALCILUTITE, 15% SPAR, FROSTED, FOSSIL FRAGMENTS, MOLLUSKS,
13.0-	30.0	SILT, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, MOLDIC, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 35% QUARTZ SAND, 30% CALCILUTITE, 10% DOLOMITE, 03% PHOSPHATIC SAND, CALCAREOUS, FOSSIL FRAGMENTS, CRUSTACEA,

LITHOLOGIC LOG
W- 040 . LEE CO. T43S, R25E, SEC 07AA

30.0- 35.0 CLAY, LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% QUARTZ SAND, 20% CALCILUTITE, 03% PHOSPHATIC GRAVEL, 04% PHOSPHATIC SAND, CALCAREOUS, SUCROSIC, FOSSIL FRAGMENTS, CRUSTACEA, MOLLUSKS,

35.0- 50.0 SILT, OLIVE GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, CALCILUTITE MATRIX, 20% CALCILUTITE, 10% CLAY, 03% PHOSPHATIC GRAVEL, 06% PHOSPHATIC SAND, MOLLUSKS, FOSSIL FRAGMENTS, CRUSTACEA,

50.0- 65.0 CLAY, OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 30% CALCILUTITE, 15% CLAY, 25% QUARTZ SAND, 09% PHOSPHATIC SAND, SUCROSIC, CALCAREOUS, MOLLUSKS, ECHINOID, PLANT REMAINS,

65.0- 75.0 AS ABOVE,

75.0- 80.0 NO SAMPLE,

80.0- 90.0 CLAY, OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 30% CALCILUTITE, 15% CLAY, 15% QUARTZ SAND, 03% PHOSPHATIC SAND, CALCAREOUS, MOLLUSKS, ECHINOID, BENTHONIC FORAMINIFERA,

ABUNDANT PELYCPOD FRAGMENTS(35%)

90.0- 95.0 CLAY, OLIVE GRAY, POROSITY, NONE OBSERVED, POOR INDURATION, 35% CALCILUTITE, 20% CLAY, 05% QUARTZ SAND, 03% PHOSPHATIC SAND, CALCAREOUS, PLATY, BENTHONIC FORAMINIFERA, MOLLUSKS,

95.0- 100.0 SILT, GRAYISH GREEN, 05% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 40% CALCILUTITE, 35% DOLOMITE, 20% QUARTZ SAND, 10% CLAY, CALCAREOUS, MOLLUSKS,

100.0- 105.0 SAND, GRAYISH GREEN, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO MEDIUM, SUB-ANGULAR, HIGH SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 20% CALCILUTITE, 10% CLAY, MOLLUSKS,

105.0- 115.0 SHELL BED, GRAYISH GREEN, 12% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, 20% CALCILUTITE, 05% CLAY, 02% PHOSPHATIC SAND, 30% QUARTZ SAND, MOLLUSKS,

SHELL FRAGMENTS REPLACED W/CALCITE;BED HAS REWORKED

115.0- 125.0 SANDSTONE, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, HIGH SPHERICITY, MODERATE INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 30% CALCILUTITE, 05% CLAY, MOLLUSKS, CRUSTACEA,

LITHOLOGIC LOG
W- C40 . LEE CO. T43S, R25E, SEC 07AA

120.0- 140.0 SILT, LIGHT OLIVE GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 30% CALCILUTITE, 10% CLAY, 35% QUARTZ SAND, 02% PHOSPHATIC SAND, CALCAREOUS, MOLLUSKS, CRUSTACEA,

140.0- 150.0 SAND, LIGHT OLIVE GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO FINE, SUB-ANGULAR, HIGH SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 15% CALCILUTITE, 10% CLAY, 05% PHOSPHATIC SAND, MOLLUSKS,

150.0- 160.0 CLAY, GRAYISH GREEN, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, 30% QUARTZ SAND, 30% CALCILUTITE, 10% CLAY, 04% PHOSPHATIC GRAVEL, CALCAREOUS, SUCROSIC, MOLLUSKS, BENTHONIC FORAMINIFERA,

160.0- 170.0 CLAY, GRAYISH GREEN, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 30% QUARTZ SAND, 20% CALCILUTITE, 08% PHOSPHATIC SAND, CALCAREOUS, SUCROSIC, MOLLUSKS, BENTHONIC FORAMINIFERA,

170.0- 180.0 AS ABOVE,

180.0- 195.0 SILT, LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 40% CALCILUTITE, 20% DOLOMITE, 25% QUARTZ SAND, 10% PHOSPHATIC SAND, ECHINOID, MOLLUSKS,

195.0- 210.0 CALCILUTITE, YELLOWISH GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, SKELETAL, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, POOR INDURATION, 20% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, ECHINOID,

210.0- 220.0 SILT, YELLOWISH GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 20% DOLOMITE, 25% QUARTZ SAND, 10% PHOSPHATIC SAND,

3% PHOSPHATIC GRAVEL

220.0- 230.0 LIMESTONE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, SKELETAL, INTRACLASTS, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, 15% DOLOMITE, 30% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, ECHINOID, WORM TRACES,

230.0- 240.0 LIMESTONE, VERY LIGHT GRAY, 11% POROSITY, INTERGRANULAR, PIN POINT VUGS, MOLDIC, GRAIN TYPE: CALCILUTITE, SKELETAL, INTRACLASTS, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, 05% DOLOMITE, 25% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, WORM TRACES, ECHINOID,

LITHOLOGIC LOG
W- 040 . LEE CO. T43S, R25E, SEC 07AA

240.0- 255.0 AS ABOVE,

255.0- 270.0 DOLOMITE, VERY LIGHT GRAY, 12% POROSITY, INTERGRANULAR, PIN POINT VUGS, MOLDIC, 90-100% ALTERED, EUHEDRAL, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO VERY FINE, MODERATE INDURATION, 35% CALCILUTITE, 20% QUARTZ SAND, 10% PHOSPHATIC SAND, 01% PHOSPHATIC GRAVEL, SUCROSIC, CALCAREOUS, FOSSIL FRAGMENTS,

270.0- 280.0 CLAY, GRAYISH GREEN, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 15% QUARTZ SAND, 05% PHOSPHATIC SAND, FOSSIL FRAGMENTS,

280.0- 290.0 SILT, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 40% CALCILUTITE, 35% DOLOMITE, 20% QUARTZ SAND, 05% PHOSPHATIC SAND, CALCAREOUS, SUCROSIC, CHALKY, FOSSIL FRAGMENTS, ECHINOID,

290.0- 300.0 AS ABOVE,

300.0- 315.0 SILT, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 40% CALCILUTITE, 35% DOLOMITE, 15% QUARTZ SAND, 05% PHOSPHATIC SAND, CALCAREOUS, SUCROSIC, CHALKY,

315.0- 330.0 AS ABOVE,MODERATELY INDURATED;WORM TUBES

330.0- 345.0 AS ABOVE,

345.0- 360.0 CLAY, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 30% QUARTZ SAND, 10% PHOSPHATIC SAND, CALCAREOUS, CHALKY, SUCROSIC, WORM TRACES,

360.0- 375.0 CLAY, VERY LIGHT GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 35% QUARTZ SAND, 12% PHOSPHATIC SAND, CALCAREOUS, CHALKY, SUCROSIC,

375.0- 380.0 AS ABOVE,

380.0- 390.0 CALCILUTITE, VERY LIGHT GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, INTRACLASTS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE, POOR INDURATION, 30% DOLOMITE, 20% QUARTZ SAND, 10% PHOSPHATIC SAND, CALCAREOUS, CHALKY, SUCROSIC,

390.0- 405.0 CALCILUTITE, VERY LIGHT GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, INTRACLASTS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE, POOR INDURATION, 40% DOLOMITE, 20% QUARTZ SAND, 10% PHOSPHATIC SAND, 06% PHOSPHATIC GRAVEL, CALCAREOUS, CHALKY, SUCROSIC,

405.0- 420.0 AS ABOVE,

LITHOLOGIC LOG
W- 040 . LEE CO. T43S, R25E, SEC 07AA

420.0- 435.0 CLAY, VERY LIGHT GRAY, 06% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 30% CALCILUTITE, 20% QUARTZ SAND, 01% PHOSPHATIC SAND, 03% PHOSPHATIC GRAVEL, CALCAREOUS, CHALKY, SUCROSIC, MOLLUSKS,

435.0- 450.0 AS ABOVE,

450.0- 455.0 CALCILUTITE, VERY LIGHT GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: CRYPTOCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO FINE, POOR INDURATION, 25% DOLOMITE, 10% QUARTZ SAND, 01% PHOSPHATIC SAND,

455.0- 470.0 LIMESTONE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: CRYPTOCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 25% DOLOMITE, 02% QUARTZ SAND, 02% PHOSPHATIC SAND,

470.0- 480.0 LIMESTONE, VERY LIGHT GRAY, 11% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: CRYPTOCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 30% DOLOMITE, 02% QUARTZ SAND, 03% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, FOSSIL FRAGMENTS,

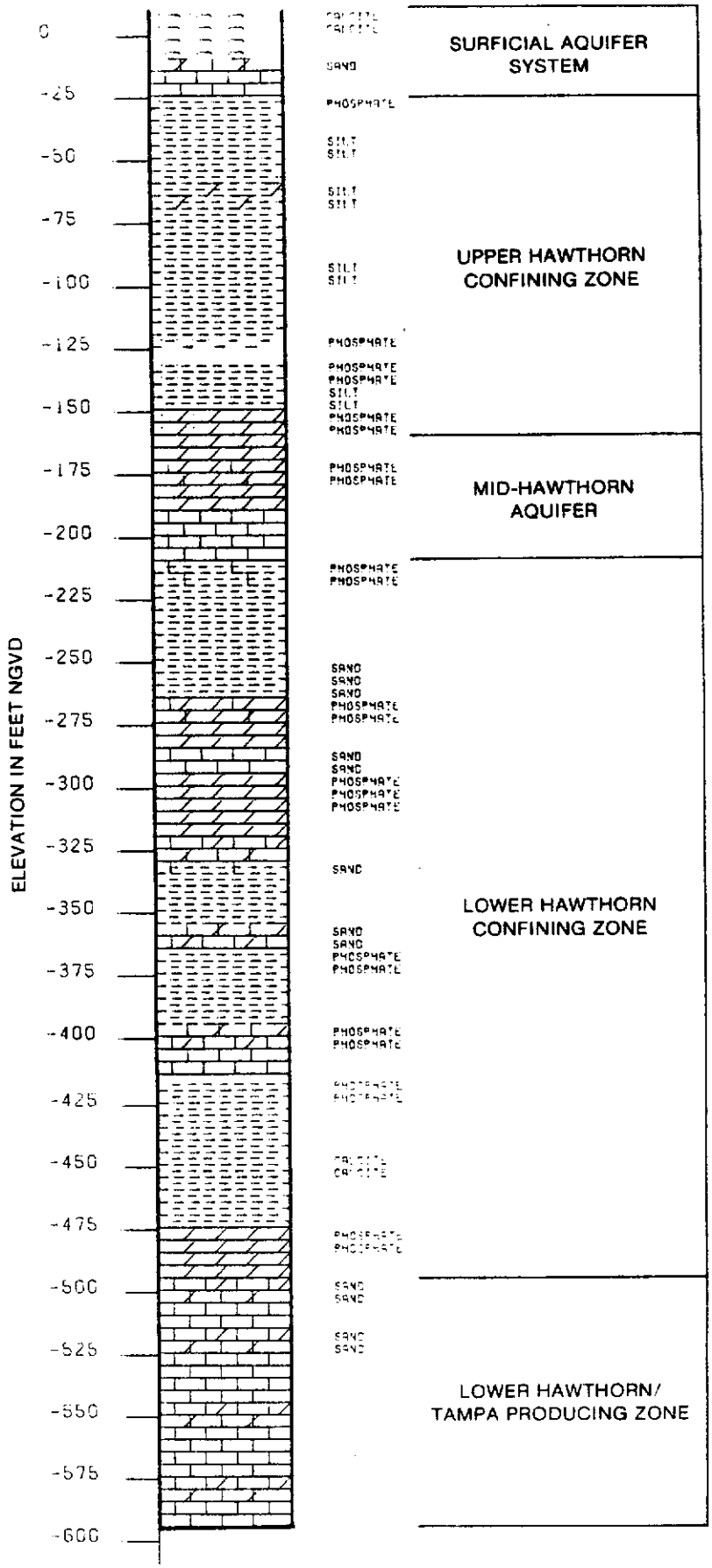
480.0- 495.0 LIMESTONE, WHITE, 13% POROSITY, INTERGRANULAR, PIN POINT VUGS, VUGULAR, GRAIN TYPE: CALCILUTITE, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO COARSE, GOOD INDURATION, 30% DOLOMITE, 02% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, FOSSIL FRAGMENTS,

SOME WELL DEVELOPED CALCITE CRYSTALS INDICATE LARGE VUGS

495.0- 510.0 LIMESTONE, WHITE, 13% POROSITY, INTERGRANULAR, PIN POINT VUGS, VUGULAR, GRAIN TYPE: CALCILUTITE, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO COARSE, GOOD INDURATION, 20% DOLOMITE, 02% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, FOSSIL FRAGMENTS,

510.0- 525.0 AS ABOVE,

W - 41


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
-425
-450
-475
-500
-525
-550
-575
-600
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE
LOWER HAWTHORN/ TAMPA PRODUCING ZONE

SOUTH FLORIDA WMD - LITHC LOG PRINTOUT

W- 041

LEE CO. T43S R23E SEC 07BB 26 45 17 N 82 02 21 W
TOTAL DEPTH- 605 FT. ELEV.- 11 FT. 61 SAMPLES- 0- 605 FT.
COMPLETED- 78.01.01 DEPTH WORKED 605 FT.

WELL NAME-
USGS L-2526
REMARKS-
DESCRIBED BY MIKE KNAPP (7-30-84),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	35.0	SURFICIAL AQUIFER SYSTEM
35.0	170.0	UPPER HAWTHORN CONFINING ZONE
170.0	220.0	MID-HAWTHORN AQUIFER
220.0	505.0	LOWER HAWTHORN CONFINING ZONE
505.0	605.0	LOWER HAWTHORN/TAMPA PRODUCING ZONE

STRATIGRAPHIC FORMATIONS -

.0-	20.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
20.0-	35.0	TAMIAMI FORMATION
35.0-	505.0	HAWTHORN FORMATION
505.0-	605.0	TAMPA LIMESTONE

LITHOLOGIC LOG
W- 041 . LEE CO. T43S, R23E, SEC 0788

.0-	10.0	SHELL BED, WHITE TO VERY LIGHT ORANGE, 30% POROSITY, INTERGRANULAR, UNCONSOLIDATED, CALCILUTITE MATRIX, 20% CALCILUTITE, 25% QUARTZ SAND, MOLLUSKS,
10.0-	20.0	AS ABOVE,
20.0-	25.0	LIMESTONE, VERY LIGHT ORANGE TO LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% DOLOMITE, 10% QUARTZ SAND, MOLLUSKS,
25.0-	35.0	AS ABOVE,
35.0-	40.0	SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 40% DOLOMITE, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,
40.0-	50.0	AS ABOVE,
50.0-	51.0	CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 05% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS,

LITHOLOGIC LOG
W- 041 . LEE CO. T43S, R23E, SEC 07BB

51.0- 60.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 05% QUARTZ SAND, 10% SILT, 03% PHOSPHATIC SAND, MOLLUSKS,

60.0- 70.0 AS ABOVE,

70.0- 80.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 15% SILT, 05% QUARTZ SAND, 03% PHOSPHATIC SAND, MOLLUSKS,

80.0- 90.0 AS ABOVE,

90.0- 100.0 AS ABOVE,

100.0- 110.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 15% SILT, 03% PHOSPHATIC SAND, MOLLUSKS,

110.0- 120.0 AS ABOVE,

120.0- 125.0 AS ABOVE,

125.0- 130.0 AS ABOVE,

130.0- 135.0 SAND, GRAYISH OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 15% DOLOMITE, 10% CLAY, 10% PHOSPHATIC SAND, MOLLUSKS,

135.0- 140.0 AS ABOVE,

140.0- 150.0 SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 30% DOLOMITE, 10% CLAY, 05% PHOSPHATIC SAND, MOLLUSKS,

150.0- 160.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 20% SILT, 08% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

160.0- 170.0 DOLOMITE, VERY LIGHT ORANGE TO LIGHT OLIVE, 20% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, POSSIBLY HIGH PERMEABILITY, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% SPAR, 15% PHOSPHATIC SAND, 30% QUARTZ SAND, MOLLUSKS,

170.0- 180.0 AS ABOVE,

435.0- 445.0 AS ABOVE,

445.0- 455.0 AS ABOVE,

455.0- 465.0 CLAY, VERY LIGHT ORANGE TO LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, CALCILUTITE MATRIX, 05% CLAY, 02% PHOSPHATIC SAND, 02% QUARTZ SAND, 10% CALCILUTITE, MOLLUSKS,

465.0- 475.0 AS ABOVE,

475.0- 485.0 AS ABOVE,

485.0- 495.0 DOLOMITE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 02% PHOSPHATIC GRAVEL, 03% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

495.0- 505.0 AS ABOVE,

505.0- 515.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

515.0- 525.0 AS ABOVE,

525.0- 535.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 05% QUARTZ SAND, MOLLUSKS,

535.0- 545.0 AS ABOVE,

545.0- 555.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 02% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

LITHOLOGIC LOG
W- 041 . LEE CO. T43S, R23E, SEC 0788

555.0- 565.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 20% DOLOMITE, 02% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

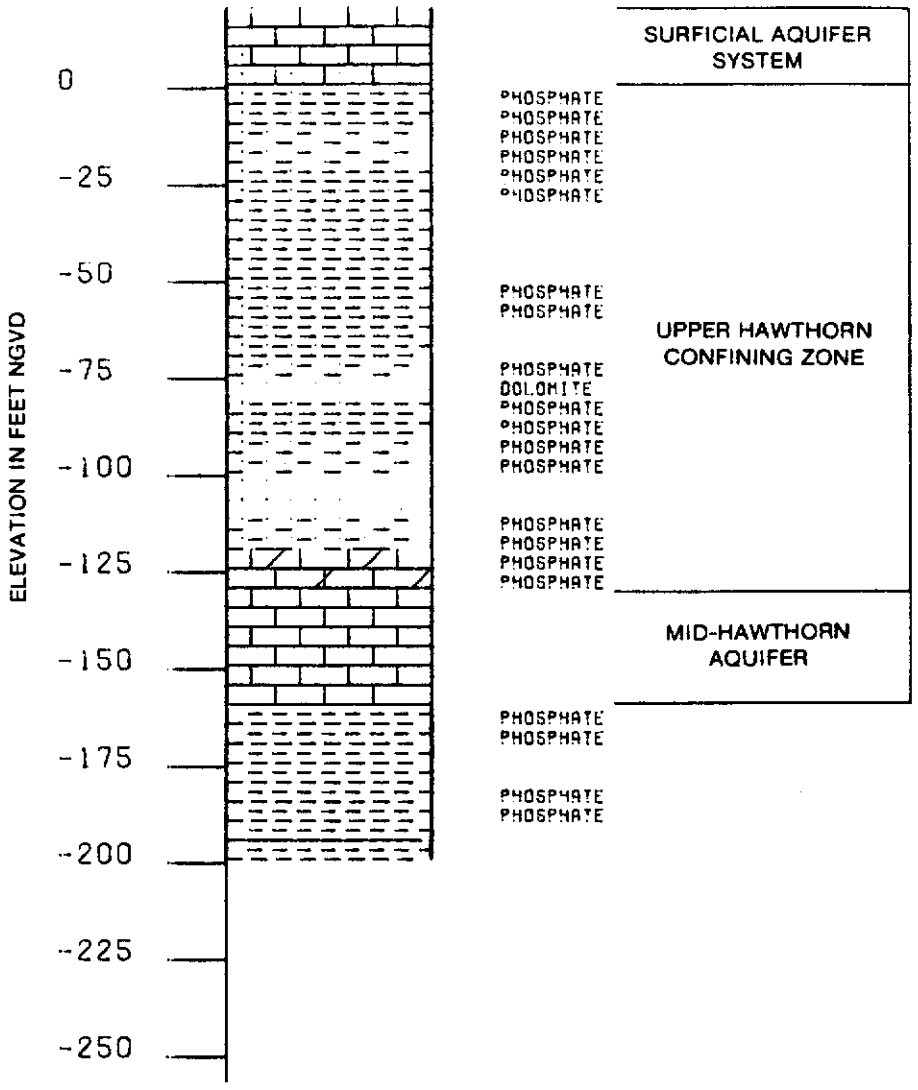
565.0- 575.0 AS ABOVE,

575.0- 585.0 AS ABOVE,

585.0- 595.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 25% DOLOMITE, 02% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

595.0- 605.0 AS ABOVE,

W - 42


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
SURFICIAL AQUIFER SYSTEM
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
UPPER HAWTHORN CONFINING ZONE
PHOSPHATE
DOLOMITE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
MID-HAWTHORN AQUIFER
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE

LITHOLOGIC LOG
W- C41 . LEE CO. T43S, R23E, SEC 0788

180.0- 190.0 DOLOMITE, VERY LIGHT ORANGE TO LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% CALCILUTITE, 05% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

190.0- 195.0 AS ABOVE,

195.0- 200.0 AS ABOVE,

200.0- 210.0 LIMESTONE, WHITE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, 02% PHOSPHATIC SAND, 02% QUARTZ SAND, MOLLUSKS,

210.0- 220.0 AS ABOVE,

220.0- 230.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, 05% PHOSPHATIC SAND, 02% QUARTZ SAND, 05% CLAY, MOLLUSKS,

230.0- 240.0 AS ABOVE,

240.0- 250.0 AS ABOVE,

250.0- 260.0 CLAY, VERY LIGHT ORANGE TO LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 05% CLAY, 03% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS,

260.0- 275.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 04% PHOSPHATIC SAND, 10% QUARTZ SAND, SUCROSIC, MOLLUSKS,

275.0- 285.0 DOLOMITE, VERY LIGHT ORANGE TO LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 10% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

285.0- 295.0 AS ABOVE,

PHOSPHATIC SAND (15%)

295.0- 305.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CRYSTALS, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

LITHOLOGIC LOG
#- 042 LEE CO. T43S, R24E, SEC 04AC

40.0- 50.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 35% DOLOMITE, 25% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, VERTBRATE,

50.0- 60.0 AS ABOVE,

60.0- 70.0 AS ABOVE,

70.0- 80.0 SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% CLAY, 30% DOLOMITE, 05% PHOSPHATIC SAND, MOLLUSKS,

80.0- 90.0 AS ABOVE,

90.0- 97.0 SAND, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 30% DOLOMITE, 20% CLAY, 10% PHOSPHATIC SAND, MOLLUSKS,

97.0- 100.0 AS ABOVE,

100.0- 110.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 30% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

110.0- 120.0 SAND, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, 05% CLAY, 15% PHOSPHATIC SAND, MOLLUSKS,

120.0- 130.0 AS ABOVE,

130.0- 140.0 SAND, LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, 05% CLAY, 03% PHOSPHATIC GRAVEL, 15% PHOSPHATIC SAND, MOLLUSKS,

RUBBLE BED

140.0- 150.0 LIMESTONE, VERY LIGHT ORANGE TO LIGHT OLIVE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 25% DOLOMITE, 05% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

150.0- 160.0 AS ABOVE,

160.0- 170.0 AS ABOVE,

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 042

LEE CO. T43S R24E SEC 04AC 26 45 37 N 81 55 22 W
TOTAL DEPTH- 220 FT. ELEV.- 21 FT. 22 SAMPLES- 0- 220 FT.
COMPLETED- 7.80.50 DEPTH WORKED 220 FT.

WELL NAME-
USGS L-2646
REMARKS-
DESCRIBED BY MIKE KNAPP (7-30-84),QUALITY(GOOD)

HYDROGEOLOGIC UNITS

0.0 20.0 SURFICIAL AQUIFER SYSTEM
20.0 140.0 UPPER HAWTHORN CONFINING ZONE
140.0 160.0 MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0- 20.0 TAMIAMI FORMATION
20.0- 220.0 HAWTHORN FORMATION

LITHOLOGIC LOG
W- 0421. LEE CO. T43S, R24E, SEC 04AC

.0- 10.0 LIMESTONE, GRAYISH ORANGE, 25% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CRYSTALS, SKELETAL, 50% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, SPARRY CALCITE CEMENT, 04% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

10.0- 20.0 LIMESTONE, GRAYISH ORANGE, 20% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 20% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

DOLOSILT AND LOOSE SHELL IN SAMPLE

20.0- 30.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 35% DOLOMITE, 35% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS,

30.0- 40.0 SAND, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 30% DOLOMITE, 10% CLAY, 05% PHOSPHATIC SAND, MOLLUSKS,

LITHOLOGIC LOG
W- 041 . LEE CO. T43S, R23E, SEC 07BB

305.0- 320.0 DOLOMITE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 05% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

320.0- 330.0 AS ABOVE,

330.0- 340.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, SPARRY CALCITE CEMENT, 15% DOLOMITE, 02% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

340.0- 345.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, 04% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

345.0- 355.0 AS ABOVE,

355.0- 365.0 AS ABOVE,

365.0- 375.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

375.0- 385.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 10% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS,

385.0- 395.0 AS ABOVE,

395.0- 405.0 AS ABOVE,

405.0- 415.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% DOLOMITE, 20% QUARTZ SAND, 10% PHOSPHATIC SAND, MOLLUSKS,

415.0- 425.0 AS ABOVE,

425.0- 435.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 05% CLAY, 10% PHOSPHATIC SAND, 05% CALCILUTITE, 05% QUARTZ SAND,

170.0- 180.0 AS ABOVE,

DOLOSILT INTERMIXED (POSSIBLY LOW PERM)

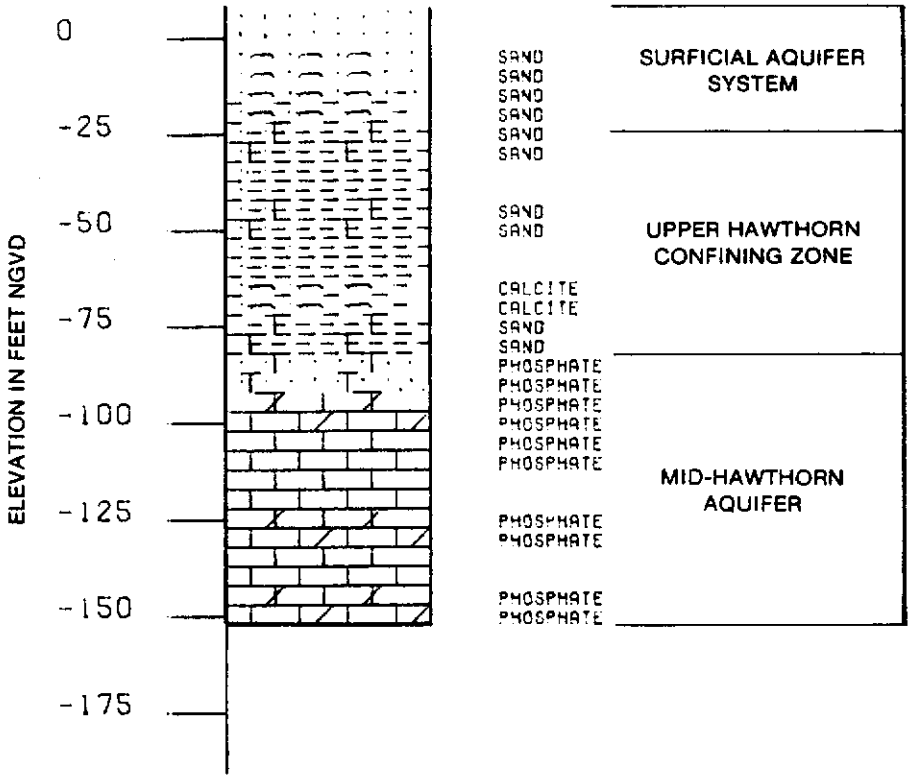
180.0- 190.0 CLAY, LIGHT OLIVE, 10% POROSITY, LOW PERMEABILITY, INTERGRANULAR, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, SUCROSIC, MOLLUSKS,

190.0- 200.0 AS ABOVE,

200.0- 210.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 05% CLAY, 10% PHOSPHATIC SAND, 10% QUARTZ SAND, MOLLUSKS,

210.0- 220.0 AS ABOVE,

W - 43


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
SAND
SAND
SAND
SAND
SAND
SAND
SAND
SAND
CALCITE
CALCITE
SAND
SAND
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
PHOSPHATE
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 043

LEE CO. T44S R24E SEC 31BB 26 3o 21 N 81 56 37 W
TOTAL DEPTH- 16O FT. ELEV.- 8 FT. 16 SAMPLES- O- 160 FT.
COMPLETED- 78.10.01 DEPTH WORKED 160 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
CALIPHER
ELECTRIC

WELL NAME-
USGS L-2702
REMARKS-
DESCRIBED BY SCOTT BURNS (7-31-84),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	3O.0	SURFICIAL AQUIFER SYSTEM
3O.0	90.0	UPPER HAWTHORN CONFINING ZONE
90.0	160.0	MID-HAWTHORN AQUIFER

STRATIGRAPHIC FORMATIONS -

.0-	30.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
3.0-	160.0	HAWTHORN FORMATION

LITHOLOGIC LOG
W- 043 . LEE CO. T44S, R24E, SEC 31BB

.0- 10.0 SAND, VERY LIGHT ORANGE, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: FINE TO MEDIUM, ROUNDED, SUB-ANGULAR, HIGH SPHERICITY, UNCONSOLIDATED, FROSTED,

10.0- 20.0 SHELL BED, VERY LIGHT GRAY TO WHITE, 35% POROSITY, INTERGRANULAR, MOLDIC, UNCONSOLIDATED, 05% CALCILUTITE, 10% QUARTZ SAND, FOSSIL FRAGMENTS, MOLLUSKS, BENTHONIC FORAMINIFERA, CRUSTACEA,

2O.0- 3O.0 SHELL BED, LIGHT OLIVE GRAY, 20% POROSITY, INTERGRANULAR, MOLDIC, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 15% QUARTZ SAND, 15% CALCILUTITE, 02% CLAY, FOSSIL FRAGMENTS, MOLLUSKS, BENTHONIC FORAMINIFERA,

3O.0- 4O.0 SILT, LIGHT OLIVE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 15% QUARTZ SAND, 40% CALCILUTITE, 15% CLAY, CALCAREOUS, PLASTIC, BENTHONIC FORAMINIFERA, MOLLUSKS,

4O.0- 5O.0 AS ABOVE,

LITHOLOGIC LOG
W- 043 . LEE CO. T44S, R24E, SEC 31BB

50.0- 60.0 SILT, LIGHT OLIVE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 40% CALCILUTITE, 15% CLAY, 05% QUARTZ SAND, 03% PHOSPHATIC SAND, CALCAREOUS, PLASTIC, BENTHONIC FORAMINIFERA, MOLLUSKS,

60.0- 70.0 AS ABOVE,

70.0- 80.0 SHELL BED, LIGHT OLIVE TO VERY LIGHT GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 20% CALCILUTITE, 10% CLAY, 03% PHOSPHATIC SAND, BENTHONIC FORAMINIFERA, MOLLUSKS,

80.0- 90.0 CLAY, LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, MODERATE INDURATION, 30% CALCILUTITE, 30% QUARTZ SAND, 05% CLAY, 04% PHOSPHATIC SAND, CALCAREOUS, MOLLUSKS,

90.0- 100.0 SANDSTONE, LIGHT OLIVE GRAY, 13% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN SIZE: FINE, RANGE: VERY FINE TO MEDIUM, SUB-ANGULAR, ROUNDED, HIGH SPHERICITY, GOOD INDURATION, CALCILUTITE MATRIX, 30% CALCILUTITE, 08% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, MOLLUSKS,

100.0- 110.0 LIMESTONE, VERY LIGHT GRAY, 13% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, INTRACLASTS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, 20% DOLOMITE, 20% QUARTZ SAND, 08% PHOSPHATIC SAND, FOSSIL FRAGMENTS,

110.0- 120.0 LIMESTONE, VERY LIGHT GRAY, 12% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, INTRACLASTS, MODERATE INDURATION, 10% QUARTZ SAND, 08% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA,

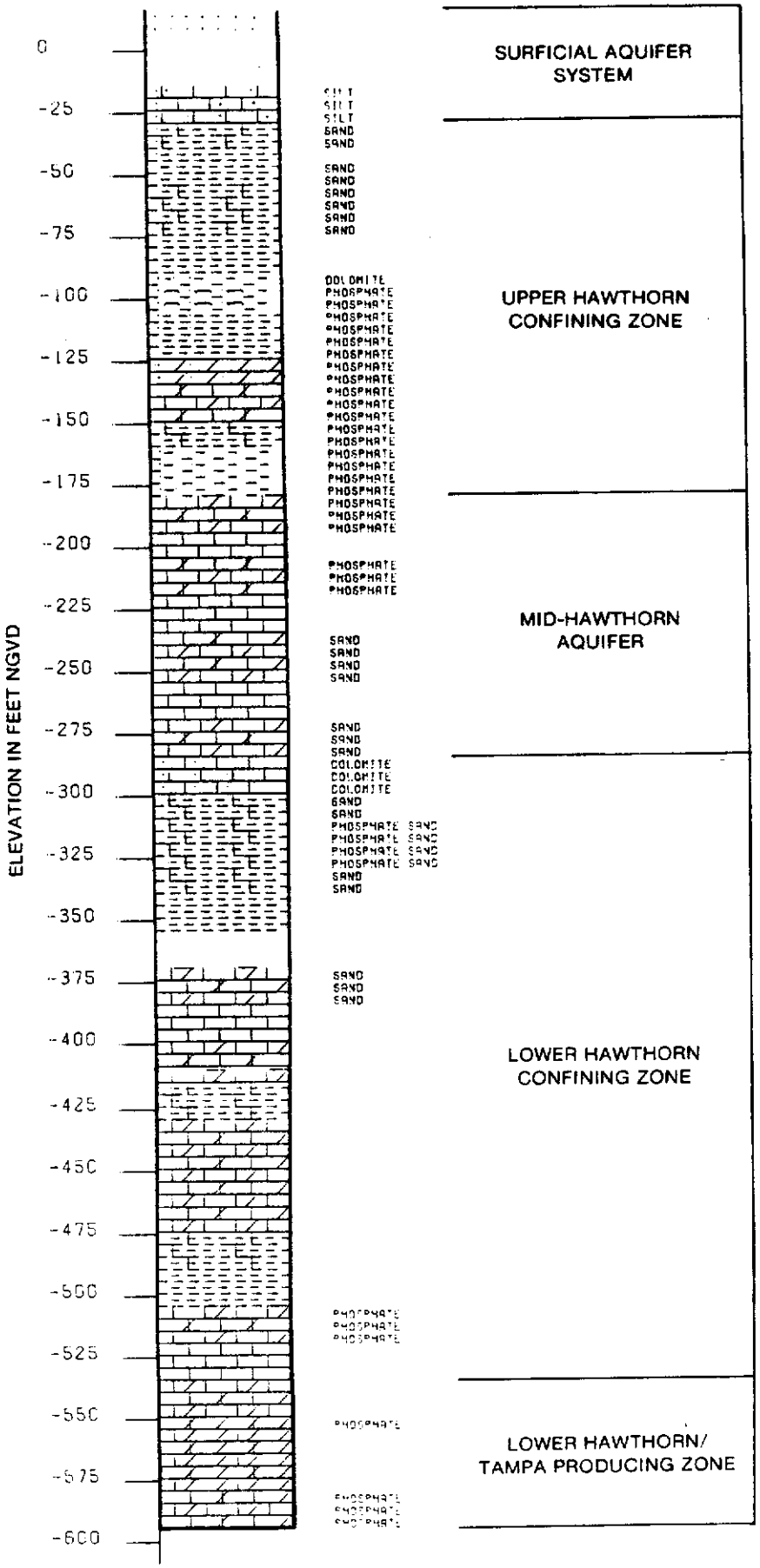
120.0- 130.0 AS ABOVE,

130.0- 140.0 LIMESTONE, VERY LIGHT GRAY, 12% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, INTRACLASTS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, 10% DOLOMITE, MOLLUSKS, BRYOZOA, ECHINOID,

140.0- 150.0 AS ABOVE,

150.0- 160.0 LIMESTONE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, INTRACLASTS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, 10% DOLOMITE, MOLLUSKS, BRYOZOA, ECHINOID,

W - 44


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
-425
-450
-475
-500
-525
-550
-575
-600
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE
LOWER HAWTHORN/ TAMPA PRODUCING ZONE

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 044

LEE CO. T46S R25E SEC 33BA 26 25 52 N 81 48 57 W
TOTAL DEPTH- 610 FT. ELEV.- 16 FT. 61 SAMPLES- C- 610 FT.
COMPLETED- 76.07.01 DEPTH WORKED 610 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
CALIPHER
ELECTRIC

WELL NAME-
USGS L-2255
REMARKS-
DESCRIBED BY SCOTT BURNS (7-30-84),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	45.0	SURFICIAL AQUIFER SYSTEM
45.0	200.0	UPPER HAWTHORN CONFINING ZONE
200.0	305.0	MID-HAWTHORN AQUIFER
305.0	550.0	LOWER HAWTHORN CONFINING ZONE
550.0	610.0	LOWER HAWTHORN/TAMPA PRODUCING ZONE

STRATIGRAPHIC FORMATIONS -

.0-	30.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
30.0-	45.0	TAMIAMI FORMATION
45.0-	550.0	HAWTHORN FORMATION
550.0-	610.0	TAMPA LIMESTONE

LITHOLOGIC LOG
W- 044 . LEE CO. T46S, R25E, SEC 33BA

.0-	10.0	SAND, MODERATE YELLOWISH BROWN, 30% POROSITY, INTERGRANULAR, GRAIN SIZE: FINE, RANGE: VERY FINE TO FINE, ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, IRON STAIN, NO FOSSIL,
10.0-	30.0	NO SAMPLE,
30.0-	45.0	LIMESTONE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, 40% QUARTZ SAND, 35% SILT, 02% PHOSPHATIC SAND, MOLLUSKS, CRUSTACEA,
45.0-	55.0	SILT, LIGHT OLIVE GRAY, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% QUARTZ SAND, 35% CALCILUTITE, 02% PHOSPHATIC SAND, 10% CLAY, CALCAREOUS,
55.0-	60.0	AS ABOVE,

LITHOLOGIC LOG
W- 044 . LEE CO. T46S, R25E, SEC 33BA

60.0- 70.0 CLAY, GRAYISH GREEN, POROSITY, NONE OBSERVED, POOR INDURATION, 15% QUARTZ SAND, 20% CALCILUTITE, 02% PHOSPHATIC SAND, 10% CLAY, BENTHONIC FORAMINIFERA,

70.0- 80.0 AS ABOVE WITH 10% SAND OSTER&BARNACLE FRAGMENTS

80.0- 90.0 CLAY, LIGHT OLIVE, POROSITY, NONE OBSERVED, 05% QUARTZ SAND, 30% CALCILUTITE, 02% PHOSPHATIC SAND, 10% CLAY, CALCAREOUS, CRUSTACEA, BENTHONIC FORAMINIFERA, PLANKTONIC FORAMINIFERA,

90.0- 105.0 AS ABOVE,

105.0- 110.0 SAND, LIGHT GRAYISH GREEN, 13% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO FINE, SUB-ANGULAR, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 35% SILT, 04% PHOSPHATIC SAND, 20% DOLOMITE, FOSSIL FRAGMENTS,

30% PELYCPOD FRAGMENTS REPLACED WITH DOLOMITE

110.0- 120.0 SHELL BED, LIGHT GRAYISH GREEN, 20% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 20% QUARTZ SAND, 30% SILT, 05% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, CALCAREOUS, FOSSIL FRAGMENTS, PLANT REMAINS,

120.0- 130.0 CLAY, OLIVE GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, LOW PERMEABILITY, POOR INDURATION, 35% QUARTZ SAND, 05% PHOSPHATIC SAND, FOSSIL FRAGMENTS,

25% SHELL FRAGMENTS

130.0- 140.0 CLAY, LIGHT OLIVE GRAY, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 20% CALCILUTITE, 10% CLAY, 05% PHOSPHATIC SAND, 01% PHOSPHATIC GRAVEL,

140.0- 150.0 DOLOMITE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, MOLDIC, PIN POINT VUGS, 50-90% ALTERED, SUBHEDRAL, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE, POOR INDURATION, 20% QUARTZ SAND, 05% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, CALCAREOUS, FOSSIL FRAGMENTS,

150.0- 165.0 CALCILUTITE, VERY LIGHT GRAY, 10% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MICROCRYSTALLINE, POOR INDURATION, 20% QUARTZ SAND, 05% PHOSPHATIC SAND, 15% DOLOMITE, 02% PHOSPHATIC GRAVEL,

165.0- 175.0 CLAY, GRAYISH OLIVE GREEN, POROSITY, NONE OBSERVED, POOR INDURATION, 10% QUARTZ SAND, 05% PHOSPHATIC SAND, 35% CALCILUTITE, 02% PHOSPHATIC GRAVEL, CALCAREOUS, BENTHONIC FORAMINIFERA, FOSSIL FRAGMENTS,

LITHOLOGIC LOG
W- 044 . LEE CO. T46S, R25E, SEC 33BA

175.0- 185.0 SAND, GRAYISH OLIVE GREEN, 12% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 20% CALCILUTITE, 10% CLAY, 10% PHOSPHATIC SAND, 04% PHOSPHATIC GRAVEL, FOSSIL FRAGMENTS,

25 LMS FRAGMENTS

185.0- 195.0 SAND, DARK GRAYISH GREEN, 15% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: FINE, RANGE: VERY FINE TO FINE, SUB-ANGULAR, ROUNDED, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 10% CALCILUTITE, 12% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL,

195.0- 200.0 AS ABOVE WITH WHITE LMS & SHELL FRAG(10%)

200.0- 210.0 LIMESTONE, VERY LIGHT GRAY, 13% POROSITY, INTERGRANULAR, MOLDIC, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, SKELETAL, INTRACLASTS, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, 15% QUARTZ SAND, 15% DOLOMITE, 08% PHOSPHATIC SAND, FOSSIL FRAGMENTS,

210.0- 220.0 AS ABOVE,

220.0- 235.0 LIMESTONE, LIGHT GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, SKELETAL, INTRACLASTS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, 20% QUARTZ SAND, 25% DOLOMITE, 05% PHOSPHATIC SAND, FOSSIL FRAGMENTS, BRYOZOA, WORM TRACES,

235.0- 250.0 AS ABOVE,

250.0- 270.0 LIMESTONE, VERY LIGHT GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, SKELETAL, INTRACLASTS, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 15% QUARTZ SAND, 25% DOLOMITE, 03% PHOSPHATIC SAND, FOSSIL FRAGMENTS, WORM TRACES, BRYOZOA,

270.0- 285.0 AS ABOVE,

285.0- 300.0 LIMESTONE, VERY LIGHT GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, SKELETAL, INTRACLASTS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 20% QUARTZ SAND, 15% DOLOMITE, 03% PHOSPHATIC SAND, FOSSIL FRAGMENTS,

LITHOLOGIC LOG
W- 044 . LEE CO. T46S, R25E, SEC 33BA

300.0- 305.0 LIMESTONE, VERY LIGHT GRAY, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: CALCILUTITE, INTRACLASTS, SKELETAL, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: FINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 35% QUARTZ SAND, 15% DOLOMITE, 04% PHOSPHATIC SAND, FOSSIL FRAGMENTS, BRYOZOA, SPICULES,

305.0- 315.0 CALCILUTITE, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, SKELETAL, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO MEDIUM, POOR INDURATION, 30% QUARTZ SAND, 15% DOLOMITE, 02% PHOSPHATIC SAND, FOSSIL FRAGMENTS, BRYOZOA,

315.0- 325.0 CLAY, LIGHT GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 20% QUARTZ SAND, 03% PHOSPHATIC SAND, 05% CLAY, SUCROSIC, CALCAREOUS, CHALKY, FOSSIL FRAGMENTS, BRYOZOA, FOSSIL MOLDS,

325.0- 345.0 CLAY, GRAYISH OLIVE GREEN, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 35% QUARTZ SAND, 05% PHOSPHATIC SAND, 10% CLAY, SUCROSIC, CALCAREOUS, CHALKY, FOSSIL FRAGMENTS, BRYOZOA, CRUSTACEA,

345.0- 355.0 CLAY, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 10% QUARTZ SAND, 02% PHOSPHATIC SAND, CALCAREOUS, CHALKY, FOSSIL FRAGMENTS, WORM TRACES, BENTHONIC FORAMINIFERA, ECHINOID,

355.0- 370.0 AS ABOVE,

370.0- 385.0 NO SAMPLE,

385.0- 400.0 CALCILUTITE, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, POOR INDURATION, 35% DOLOMITE, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, CHALKY, ECHINOID, WORM TRACES,

400.0- 415.0 AS ABOVE,

415.0- 430.0 CALCILUTITE, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, POOR INDURATION, 35% DOLOMITE, 02% QUARTZ SAND, ECHINOID, WORM TRACES, FOSSIL FRAGMENTS,

430.0- 445.0 CLAY, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 01% PHOSPHATIC GRAVEL, CALCAREOUS, SUCROSIC, CHALKY, ECHINOID, FOSSIL FRAGMENTS,

LITHOLOGIC LOG
W- 044 . LEE CO. T46S, R25E, SEC 33BA

445.0- 460.0 CALCILUTITE, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, SKELETAL, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, POOR INDURATION, 30% DOLOMITE, 02% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, CHALKY, FOSSIL FRAGMENTS, WORM TRACES,

460.0- 475.0 AS ABOVE WITH 3% PHOSPHATIC GRAVEL
475.0- 490.0 CALCILUTITE, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, SKELETAL, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO COARSE, POOR INDURATION, 35% DOLOMITE, 02% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, 02% PHOSPHATIC SAND, CHALKY, FOSSIL FRAGMENTS,

490.0- 505.0 CLAY, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, 35% CALCILUTITE, 02% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, CALCAREOUS, SUCROSIC, CHALKY, FOSSIL FRAGMENTS, ECHINOID,

505.0- 520.0 AS ABOVE,

520.0- 535.0 CALCILUTITE, WHITE, 08% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: CALCILUTITE, SKELETAL, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, POOR INDURATION, 40% DOLOMITE, 05% QUARTZ SAND, 05% PHOSPHATIC GRAVEL, CHALKY, FOSSIL FRAGMENTS, ECHINOID,

535.0- 550.0 AS ABOVE,

550.0- 565.0 LIMESTONE, WHITE, 12% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 30% DOLOMITE, 01% QUARTZ SAND, 02% PHOSPHATIC GRAVEL, FOSSIL FRAGMENTS,

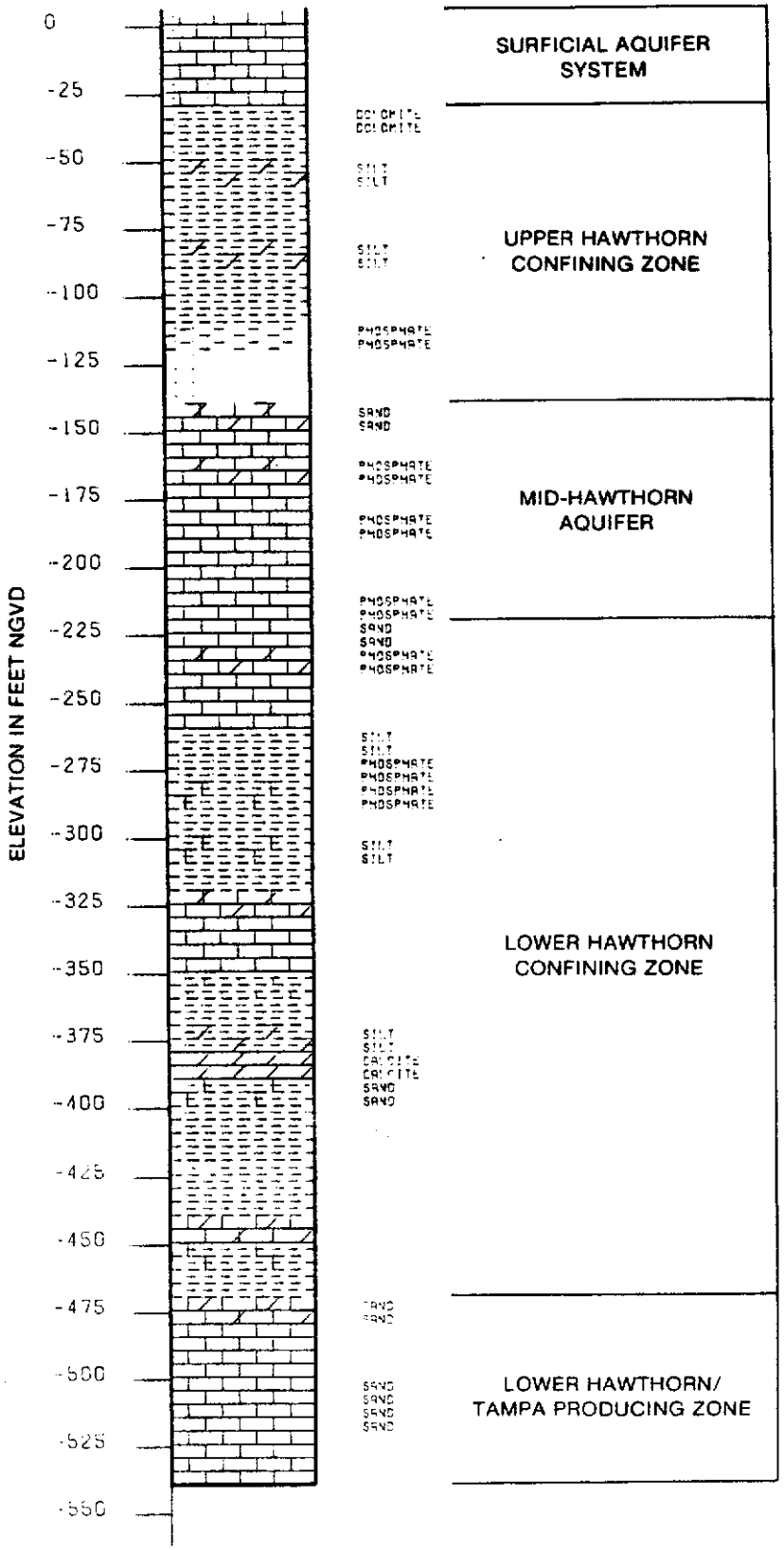
SHELL FRAGMENTS HIGHLY REPLACED W/ DOLOMITE

565.0- 580.0 AS ABOVE,

580.0- 595.0 DOLOMITE, WHITE, 12% POROSITY, INTERGRANULAR, PIN POINT VUGS, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, MODERATE INDURATION, 30% CALCILUTITE, 01% QUARTZ SAND, 01% PHOSPHATIC GRAVEL, CHALKY, CALCAREOUS, SUCROSIC, FOSSIL FRAGMENTS, BRYOZOA,

595.0- 610.0 LIMESTONE, WHITE, 12% POROSITY, INTERGRANULAR, PIN POINT VUGS, GRAIN TYPE: CALCILUTITE, SKELETAL, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: CRYPTOCRYSTALLINE TO MEDIUM, MODERATE INDURATION, 30% DOLOMITE, 05% QUARTZ SAND, 04% PHOSPHATIC SAND, 02% PHOSPHATIC GRAVEL, FOSSIL FRAGMENTS, BRYOZOA, ECHINOID,

W - 45


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
-425
-450
-475
-500
-525
-550
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE
LOWER HAWTHORN/ TAMPA PRODUCING ZONE

SOUTH FLORIDA WMD - LITHO LOG PRINTOUT

W- 045

LEE CO. T45S R24E SEC 078C 26 29 13 N 81 56 25 W
TOTAL DEPTH- 545 FT. ELEV.- 6 FT. 50 SAMPLES- 0- 545 FT.
COMPLETED- 79.11.02 DEPTH WORKED 545 FT.

WELL NAME-
USGS L-2529
REMARKS-
DESCRIBED BY MIKE KNAPP (7-31-84),QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	35.0	SURFICIAL AQUIFER SYSTEM
35.0	145.0	UPPER HAWTHORN CONFINING ZONE
145.0	225.0	MID-HAWTHORN AQUIFER
225.0	475.0	LOWER HAWTHORN CONFINING ZONE
475.0	545.0	LOWER HAWTHORN/TAMPA PRODUCING ZONE

STRATIGRAPHIC FORMATIONS -

.0-	35.0	TAMIAMI FORMATION
35.0-	475.0	HAWTHORN FORMATION
475.0-	545.0	TAMPA LIMESTONE

LITHOLOGIC LOG
W- 045 . LEE CO. T45S, R24E, SEC 078C

.0-	10.0	LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 30% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA,
10.0-	20.0	AS ABOVE,
20.0-	25.0	AS ABOVE,
25.0-	35.0	LIMESTONE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 20% POROSITY, INTERGRANULAR, GRAIN TYPE: CALCILUTITE, BIOGENIC, SKELETAL, 35% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 35% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,
35.0-	45.0	SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% CLAY, 15% DOLOMITE, 03% PHOSPHATIC SAND, MOLLUSKS,
45.0-	55.0	AS ABOVE,

LITHOLOGIC LOG
W- 045 . LEE CO. T45S, R24E, SEC 07BC

55.0- 65.0 CLAY, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 20% SILT, 04% PHOSPHATIC SAND, MOLLUSKS,

65.0- 75.0 AS ABOVE,

75.0- 85.0 AS ABOVE,

85.0- 95.0 CLAY, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% DOLOMITE, 20% SILT, 05% PHOSPHATIC SAND, MOLLUSKS, BENTHONIC FORAMINIFERA,

95.0- 105.0 AS ABOVE,

105.0- 115.0 AS ABOVE,

115.0- 125.0 SAND, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 25% CLAY, 25% DOLOMITE, 05% PHOSPHATIC GRAVEL,

125.0- 145.0 AS ABOVE,

RUBBLE ZONE

145.0- 155.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 10% DOLOMITE, 03% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS,

155.0- 165.0 AS ABOVE,

165.0- 175.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, 05% PHOSPHATIC SAND, 05% QUARTZ SAND, 05% DOLOMITE, MOLLUSKS, FOSSIL MOLDS,

175.0- 185.0 AS ABOVE,

185.0- 195.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, POSSIBLY HIGH PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 03% QUARTZ SAND, 05% PHOSPHATIC SAND, MOLLUSKS, BRYOZOA, CORAL, FOSSIL MOLDS,

195.0- 205.0 AS ABOVE,

205.0- 215.0 AS ABOVE,

215.0- 225.0 LIMESTONE, VERY LIGHT ORANGE, 12% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

225.0- 235.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, 05% QUARTZ SAND, 03% PHOSPHATIC SAND,

235.0- 245.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 05% QUARTZ SAND, 05% PHOSPHATIC SAND, 10% DOLOMITE, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS,

245.0- 255.0 AS ABOVE,

255.0- 265.0 LIMESTONE, WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, MOLLUSKS,

265.0- 275.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 05% PHOSPHATIC SAND, 10% SILT, MOLLUSKS,

275.0- 285.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 25% SILT, 02% PHOSPHATIC GRAVEL, 10% PHOSPHATIC SAND, MOLLUSKS,

285.0- 295.0 CLAY, LIGHT OLIVE TO WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 10% CLAY, 30% CALCILUTITE, 20% PHOSPHATIC SAND, MOLLUSKS,

295.0- 305.0 AS ABOVE,

305.0- 315.0 CLAY, VERY LIGHT ORANGE TO LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 35% CALCILUTITE, 25% SILT, 01% PHOSPHATIC SAND, MOLLUSKS,

315.0- 325.0 AS ABOVE,

325.0- 335.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 25% DOLOMITE, MOLLUSKS,

335.0- 345.0 AS ABOVE,

345.0- 355.0 AS ABOVE,

355.0- 365.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% MANGANESE OXIDE, MOLLUSKS,

365.0- 375.0 AS ABOVE,

375.0- 385.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% DOLOMITE, 20% CALCILUTITE, 05% PHOSPHATIC SAND, 10% SILT, MOLLUSKS,

385.0- 395.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 15% POROSITY, INTERGRANULAR, INTERCRYSTALLINE, MOLDIC, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: MICROCRYSTALLINE TO VERY FINE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 10% CALCILUTITE, 03% PHOSPHATIC SAND, 02% QUARTZ SAND, HIGH RECRYSTALLIZATION, MOLLUSKS,

395.0- 405.0 CLAY, VERY LIGHT ORANGE TO LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 35% CALCILUTITE, 03% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

405.0- 425.0 AS ABOVE,

425.0- 445.0 AS ABOVE,

445.0- 455.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, 25% DOLOMITE, 02% PHOSPHATIC SAND, MOLLUSKS,

455.0- 465.0 CLAY, VERY LIGHT ORANGE TO WHITE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 30% CALCILUTITE, MOLLUSKS,

465.0- 475.0 AS ABOVE,

LITHOLOGIC LOG
W- 045 . LEE CO. T45S, R24E, SEC 07BC

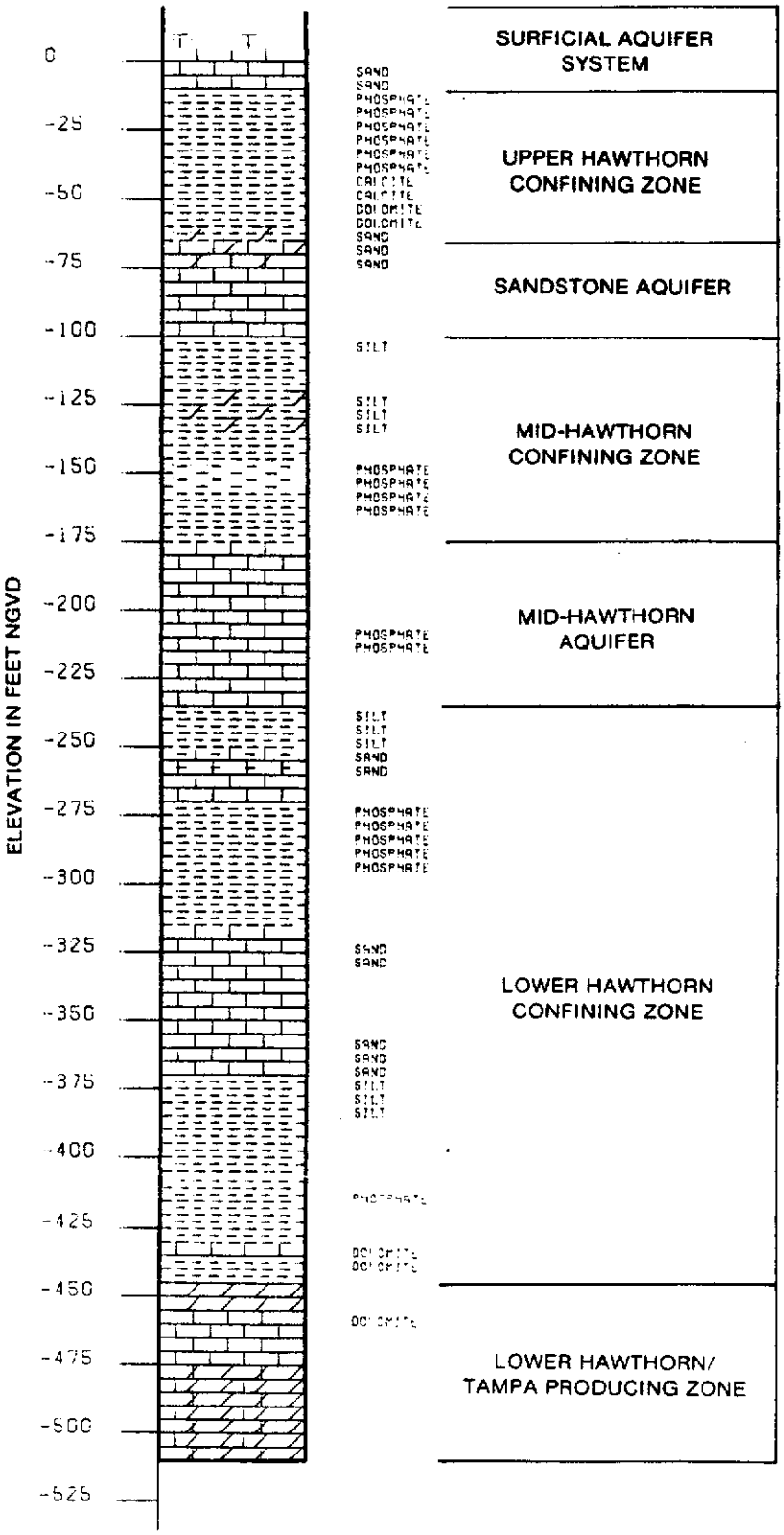
475.0- 485.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 40% DOLOMITE, 05% QUARTZ SAND, MOLLUSKS,

485.0- 495.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 30% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 02% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

495.0- 505.0 AS ABOVE,

505.0- 525.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, INTERCRYSTALLINE, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 40% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 05% QUARTZ SAND, 01% PHOSPHATIC SAND, MOLLUSKS, FOSSIL MOLDS,

525.0- 545.0 AS ABOVE,


ELEVATION IN FEET NGVD
0
-25
-50
-75
-100
-125
-150
-175
-200
-225
-250
-275
-300
-325
-350
-375
-400
-425
-450
-475
-500
-525
SURFICIAL AQUIFER SYSTEM
UPPER HAWTHORN CONFINING ZONE
SANDSTONE AQUIFER
MID-HAWTHORN CONFINING ZONE
MID-HAWTHORN AQUIFER
LOWER HAWTHORN CONFINING ZONE
LOWER HAWTHORN/ TAMPA PRODUCING ZONE

SOUTH FLORIDA WMD - LITHC LOG PRINTOUT

W- 046

LEE CO. T44S R25E SEC 28BC 26 37 18 N 81 48 50 W
TOTAL DEPTH- 616 FT. ELEV.- 20 FT. SAMPLES- 0- 526 FT.
COMPLETED- 80.04.15 DEPTH WORKED 526 FT.

OTHER GEOPHYSICAL LOGS AVAILABLE -

GAMMA
CALIPHER
ELECTRIC

WELL NAME-
USGS L-2292
REMARKS-
DESCRIBED BY MIKE KNAPP (7-30-84), QUALITY (GOOD)

HYDROGEOLOGIC UNITS

0.0	30.0	SURFICIAL AQUIFER SYSTEM
30.0	83.0	UPPER HAWTHORN CONFINING ZONE
83.0	120.0	SANDSTONE AQUIFER
120.0	195.0	MID-HAWTHORN CONFINING ZONE
195.0	255.0	MID-HAWTHORN AQUIFER
255.0	466.0	LOWER HAWTHORN CONFINING ZONE
466.0	526.0	LOWER HAWTHORN/TAMPA PRODUCING ZONE

STRATIGRAPHIC FORMATIONS -

.0-	16.0	UNDIFFERENTIATED SAND, CLAY AND SHELLS
16.0-	30.0	TAMIAMI FORMATION
30.0-	466.0	HAWTHORN FORMATION
46.6-	526.0	TAMPA LIMESTONE

LITHOLOGIC LOG
W- 046 . LEE CO. T44S, R25E, SEC 28BC

.0- 10.0 SAND, GRAYISH ORANGE, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, MEDIUM SPHERICITY, UNCONSOLIDATED, 01% HEAVY MINERALS, MOLLUSKS,

10.0- 16.0 SAND, WHITE, 35% POROSITY, INTERGRANULAR, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, UNCONSOLIDATED, 20% CALCILUTITE, MOLLUSKS,

16.0- 30.0 LIMESTONE, WHITE TO VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, 05% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

LITHOLOGIC LOG
W- 046 . LEE CO. T44S, R25E, SEC 28BC

30.0- 45.0 CLAY, GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 05% PHOSPHATIC SAND, MOLLUSKS,

45.0- 60.0 SILT, GRAYISH ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 05% PHOSPHATIC SAND, 40% DOLOMITE, MOLLUSKS,

60.0- 70.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% CLAY, 20% DOLOMITE, 10% CALCILUTITE, 03% PHOSPHATIC SAND, MOLLUSKS,

70.0- 83.0 SILT, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 20% CLAY, 20% DOLOMITE, 02% HEMATITE, MOLLUSKS,

83.0- 95.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO MEDIUM, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 30% DOLOMITE, 15% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

95.0- 110.0 AS ABOVE,

110.0- 120.0 AS ABOVE,

120.0- 125.0 CLAY, LIGHT OLIVE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 20% CLAY, 10% SILT, 10% CALCILUTITE, 10% QUARTZ SAND, MOLLUSKS,

125.0- 140.0 AS ABOVE,

140.0- 155.0 CLAY, PINKISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 05% PHOSPHATIC SAND, 10% SILT, MOLLUSKS,

155.0- 165.0 AS ABOVE,

165.0- 175.0 SAND, PINKISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN SIZE: MEDIUM, RANGE: VERY FINE TO COARSE, SUB-ANGULAR, ROUNDED, MEDIUM SPHERICITY, POOR INDURATION, CLAY MATRIX, 20% CLAY, 10% PHOSPHATIC SAND, 03% PHOSPHATIC GRAVEL, MOLLUSKS,

175.0- 185.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CLAY MATRIX, DOLOMITE CEMENT, 20% CLAY, 10% PHOSPHATIC SAND, MOLLUSKS,

185.0- 195.0 AS ABOVE,

LITHOLOGIC LOG
W- 040 . LEE CO. T44S, R25E, SEC 28BC

195.0- 200.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, SKELETAL, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MEDIUM, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, 04% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS,

200.0- 215.0 AS ABOVE,

215.0- 225.0 AS ABOVE,

225.0- 235.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, MODERATE INDURATION, CALCILUTITE MATRIX, 05% PHOSPHATIC SAND, 03% QUARTZ SAND, MOLLUSKS,

235.0- 245.0 AS ABOVE,

245.0- 255.0 AS ABOVE,

255.0- 270.0 CLAY, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, CALCILUTITE MATRIX, CLAY MATRIX, DOLOMITE CEMENT, 10% CLAY, 05% PHOSPHATIC SAND, 05% QUARTZ SAND, 15% SILT, MOLLUSKS,

270.0- 280.0 LIMESTONE, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, GRAIN TYPE: BIOGENIC, CALCILUTITE, 05% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO FINE, POOR INDURATION, CALCILUTITE MATRIX, DOLOMITE CEMENT, 10% DOLOMITE, 05% CLAY, 05% QUARTZ SAND, 02% PHOSPHATIC SAND, MOLLUSKS,

280.0- 289.0 AS ABOVE,

289.0- 315.0 CLAY, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 10% PHOSPHATIC SAND, 05% QUARTZ SAND, MOLLUSKS,

315.0- 333.0 AS ABOVE,

333.0- 336.0 AS ABOVE,

336.0- 316.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 05% CLAY, 02% PHOSPHATIC SAND, 05% QUARTZ SAND, 15% SILT, MOLLUSKS,

316.0- 351.0 LIMESTONE, VERY LIGHT ORANGE TO WHITE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 25% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 05% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

351.0- 356.0 AS ABOVE,

356.0- 376.0 AS ABOVE,

376.0- 391.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 10% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, 10% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

391.0- 406.0 CLAY, YELLOWISH GRAY, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 20% SILT, 10% PHOSPHATIC SAND, MOLLUSKS,

406.0- 419.0 AS ABOVE,

419.0- 429.0 AS ABOVE,

429.0- 436.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, 05% PHOSPHATIC SAND, MOLLUSKS,

436.0- 446.0 AS ABOVE,

446.0- 451.0 AS ABOVE,

451.0- 457.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: PELLET, CALCILUTITE, CRYSTALS, 15% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, CLAY MATRIX, 25% DOLOMITE, 05% QUARTZ SAND, MOLLUSKS, FOSSIL MOLDS,

457.0- 466.0 CLAY, VERY LIGHT ORANGE, 10% POROSITY, INTERGRANULAR, LOW PERMEABILITY, POOR INDURATION, DOLOMITE CEMENT, CLAY MATRIX, 10% CLAY, MOLLUSKS,

466.0- 471.0 DOLOMITE, VERY LIGHT ORANGE TO GRAYISH ORANGE, 20% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, 02% QUARTZ SAND, SUCROSIC, MOLLUSKS,

471.0- 476.0 AS ABOVE,

476.0- 481.0 LIMESTONE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, MOLDIC, GRAIN TYPE: BIOGENIC, CALCILUTITE, CRYSTALS, 20% ALLOCHEMICAL CONSTITUENTS, GRAIN SIZE: MICROCRYSTALLINE, RANGE: MICROCRYSTALLINE TO COARSE, GOOD INDURATION, CALCILUTITE MATRIX, SPARRY CALCITE CEMENT, DOLOMITE CEMENT, 25% DOLOMITE, MOLLUSKS, FOSSIL MOLDS,

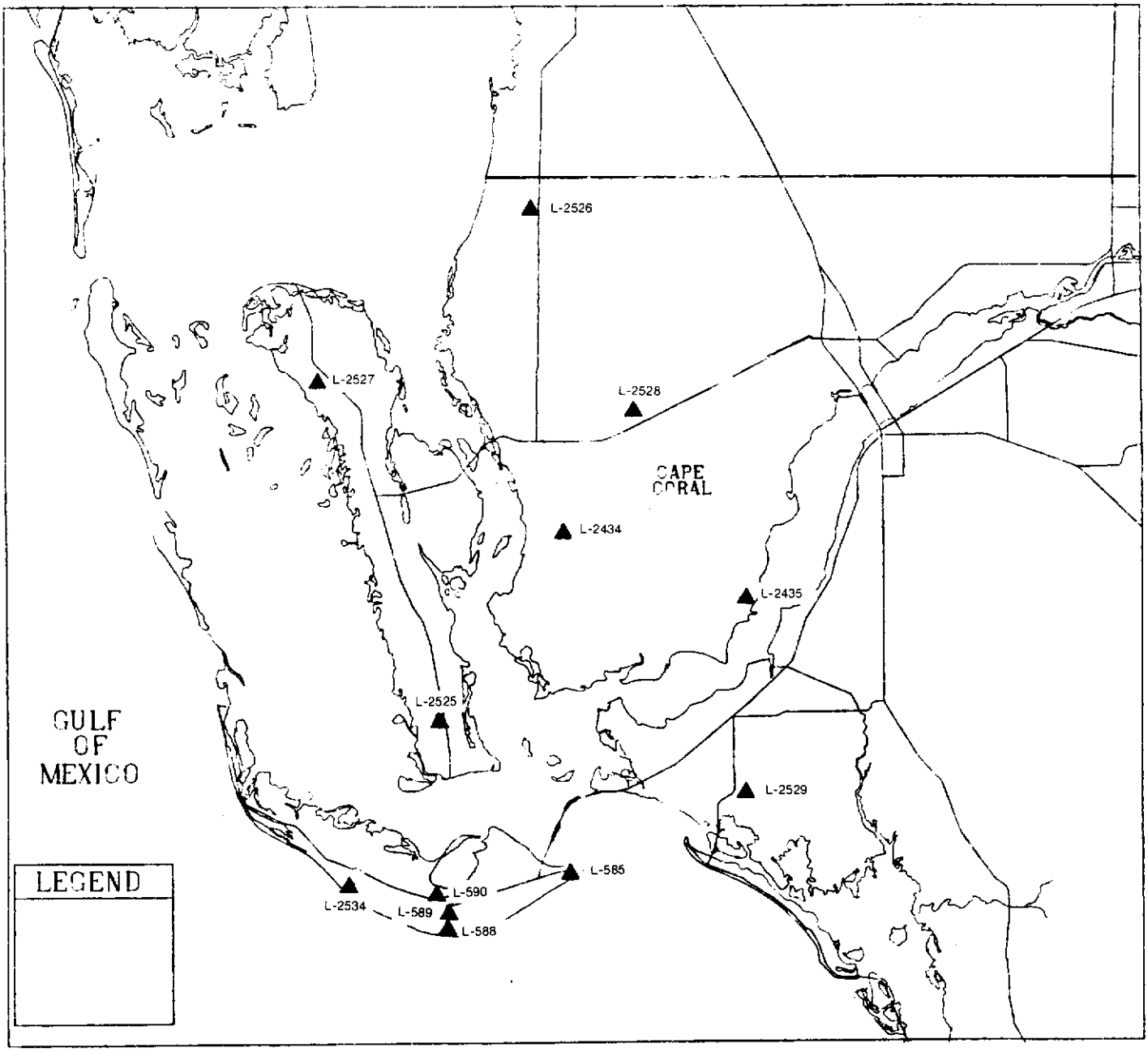
481.0- 490.0 AS ABOVE,

LITHOLOGIC LOG
W- 046 . LEE CO. T44S, R25E, SEC 28BC

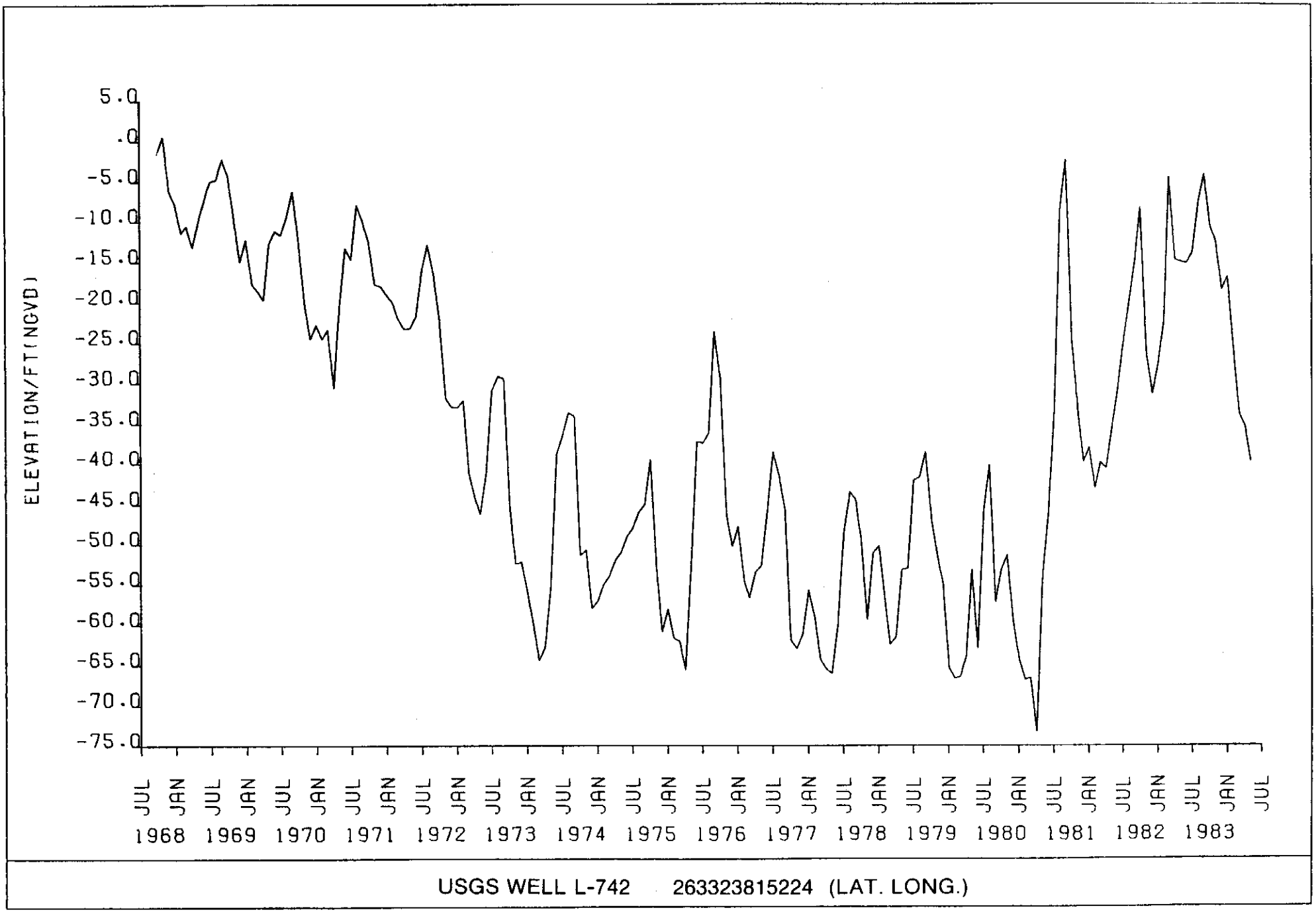
496.0- 526.0 DOLOMITE, VERY LIGHT ORANGE, 15% POROSITY, INTERGRANULAR, 50-90% ALTERED, EUHEDRAL, GRAIN SIZE: VERY FINE, RANGE: VERY FINE TO MICROCRYSTALLINE, MODERATE INDURATION, DOLOMITE CEMENT, CALCILUTITE MATRIX, 25% CALCILUTITE, MOLLUSKS,

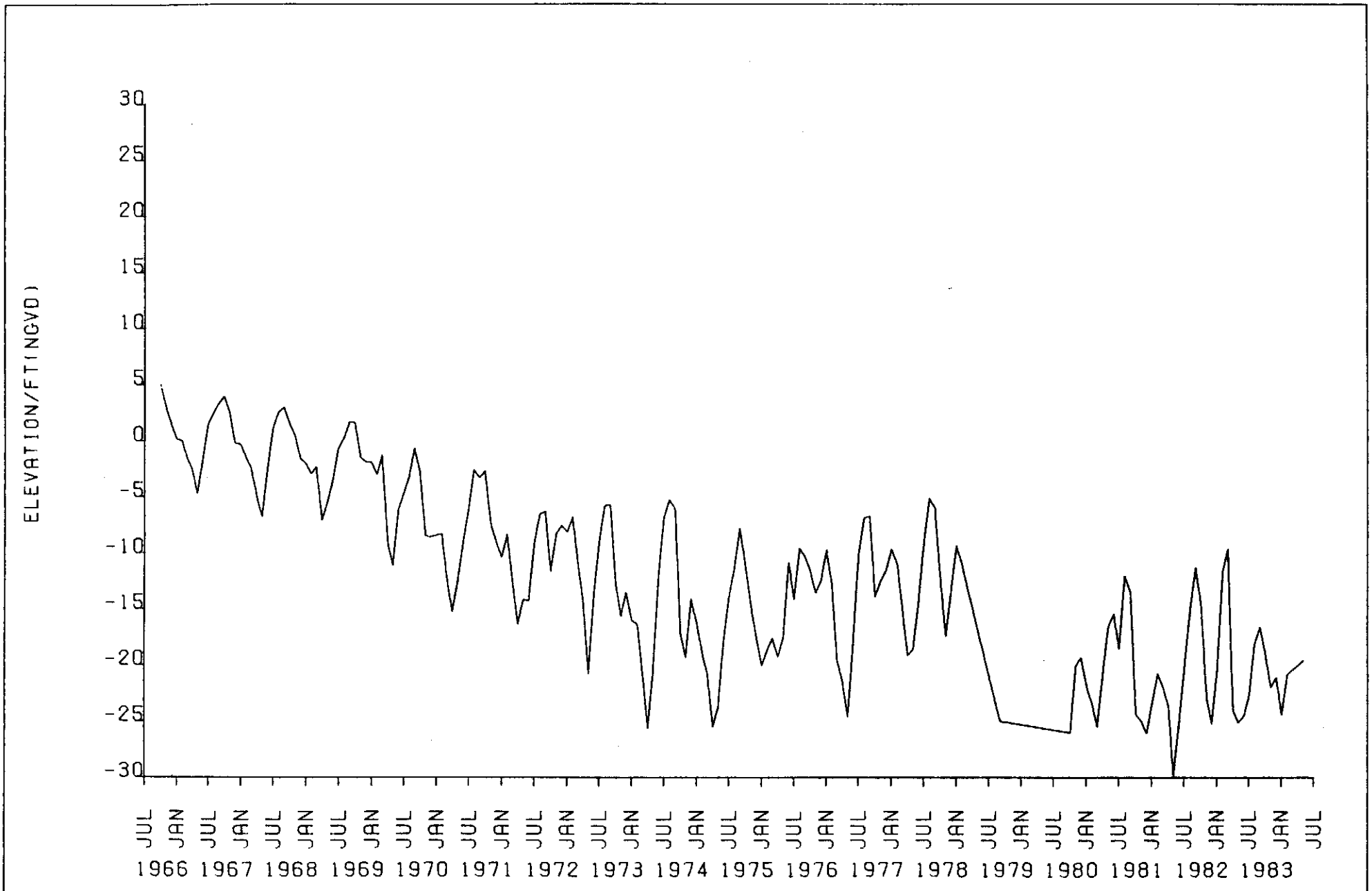
APPENDIX II

Long Term Hydrographs

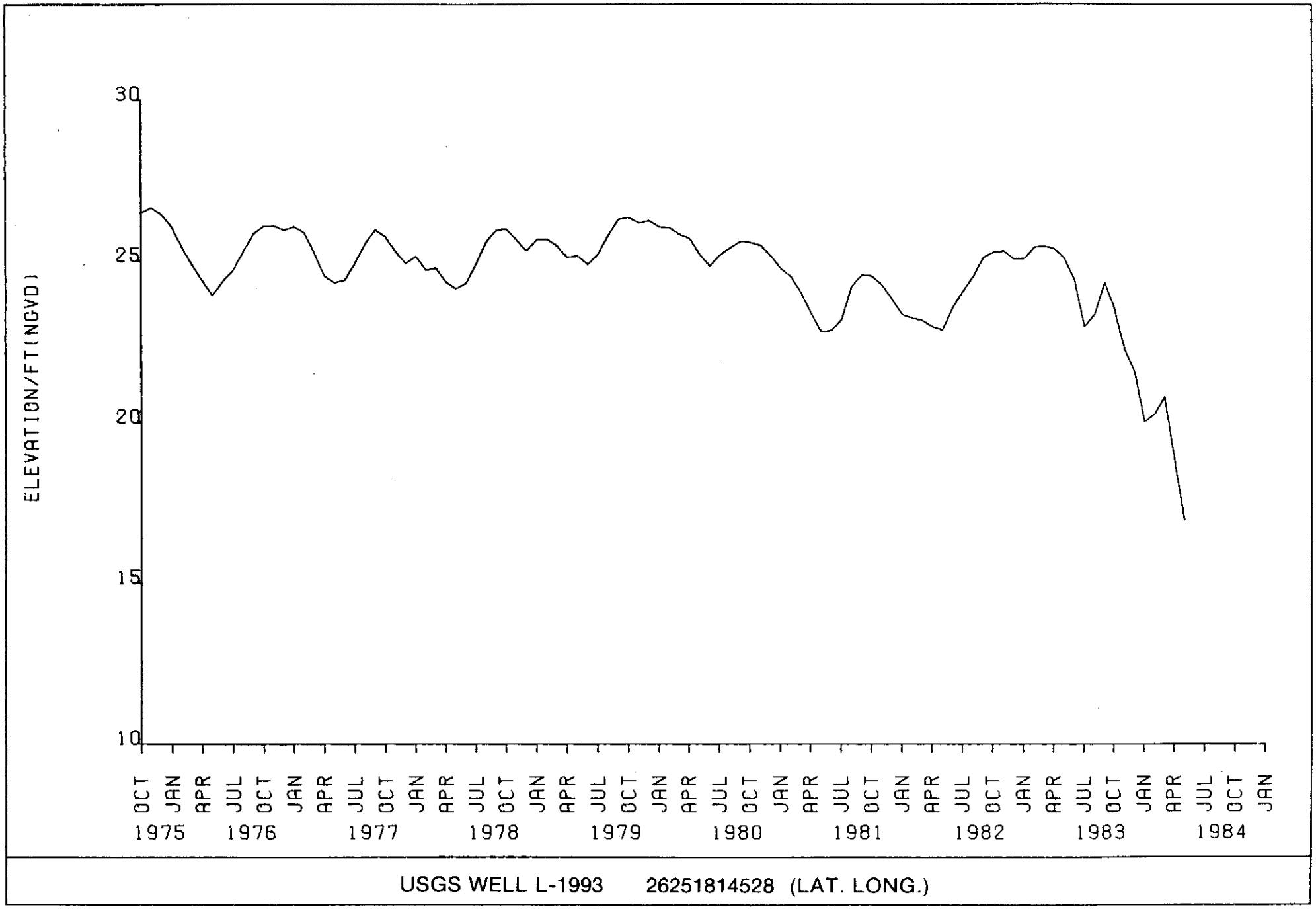


LOCATION OF EXISTING USGS MONITOR WELLS FOR THE LOWER HAWTHORN AQUIFER

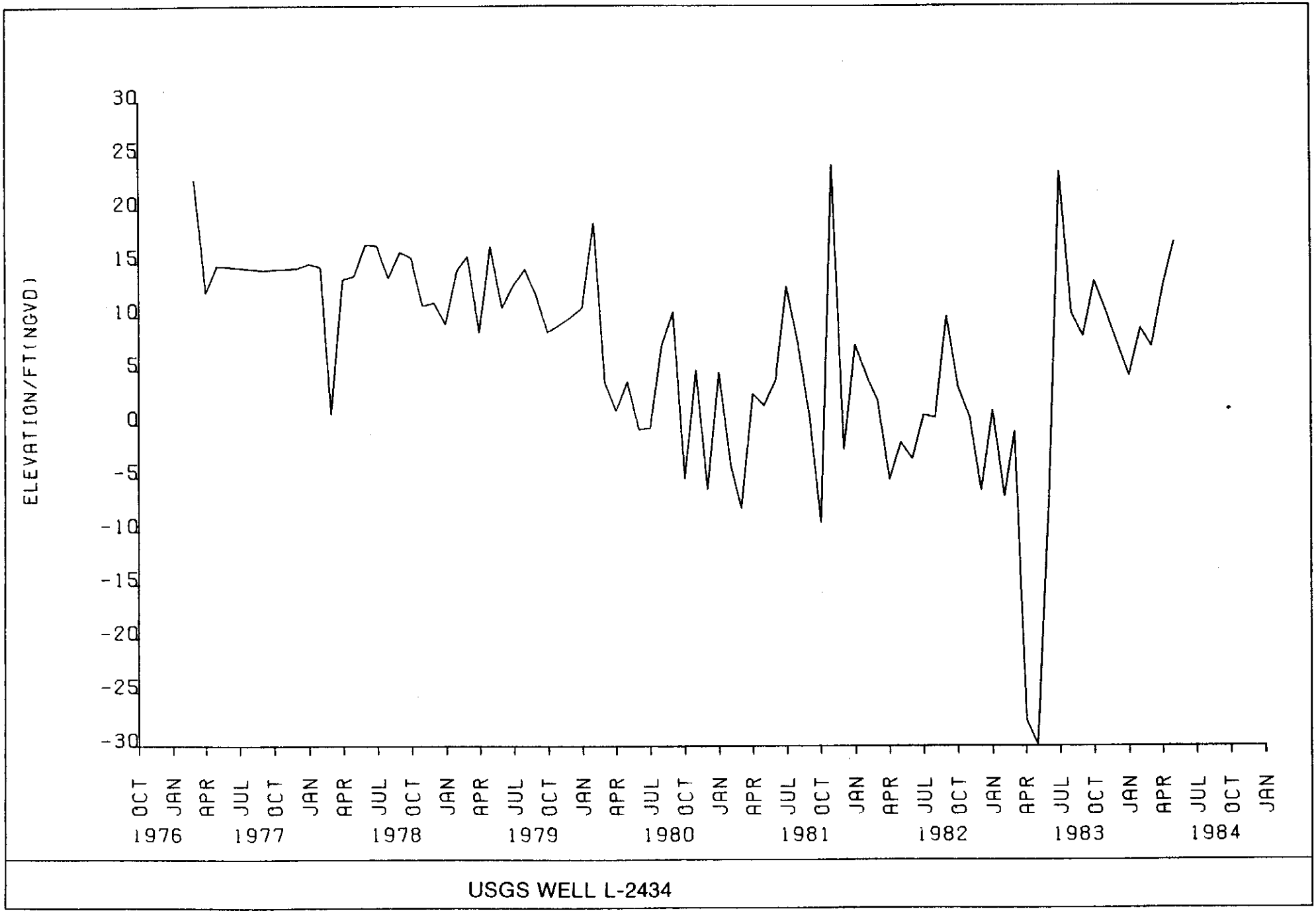

ELEVATION/FT(NGVD)
5.0
.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
-50.0
-55.0
-60.0
-65.0
-70.0
-75.0
JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL
1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983
USGS WELL L-742 263323815224 (LAT. LONG.)



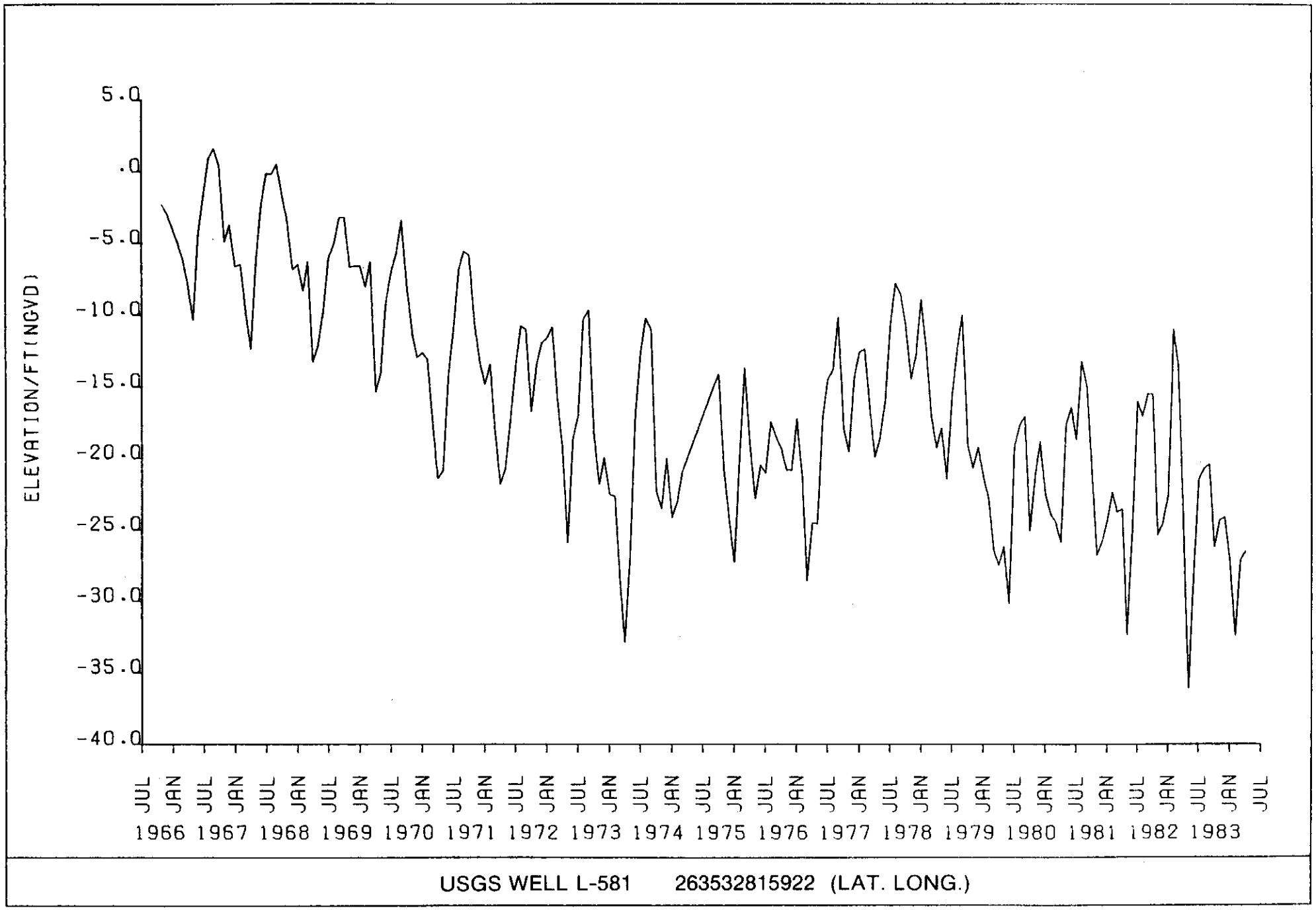
USGS WELL L-2702 2636621815637 (LAT. LONG.)

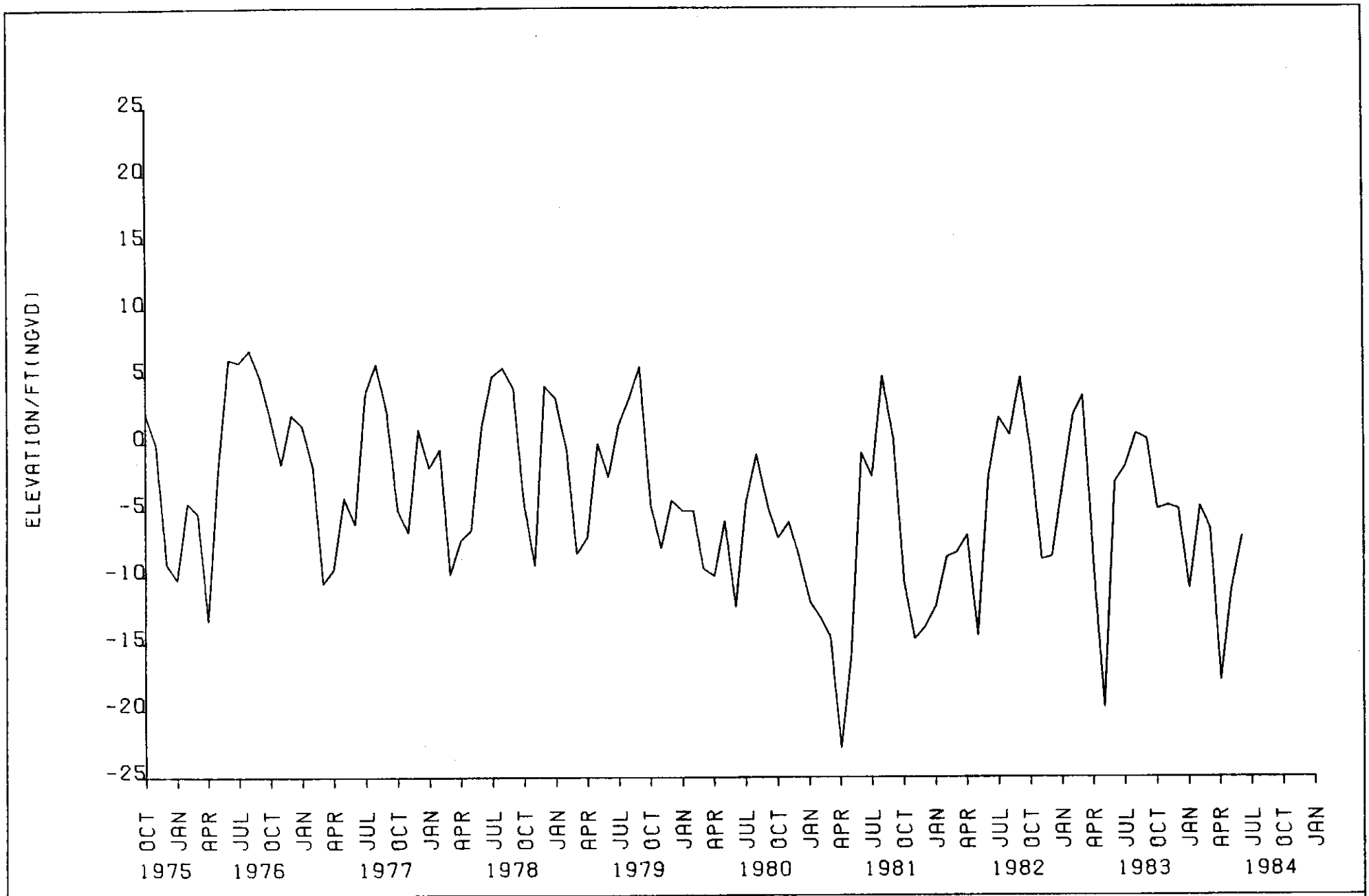


USGS WELL L-1993 26251814528 (LAT. LONG.)

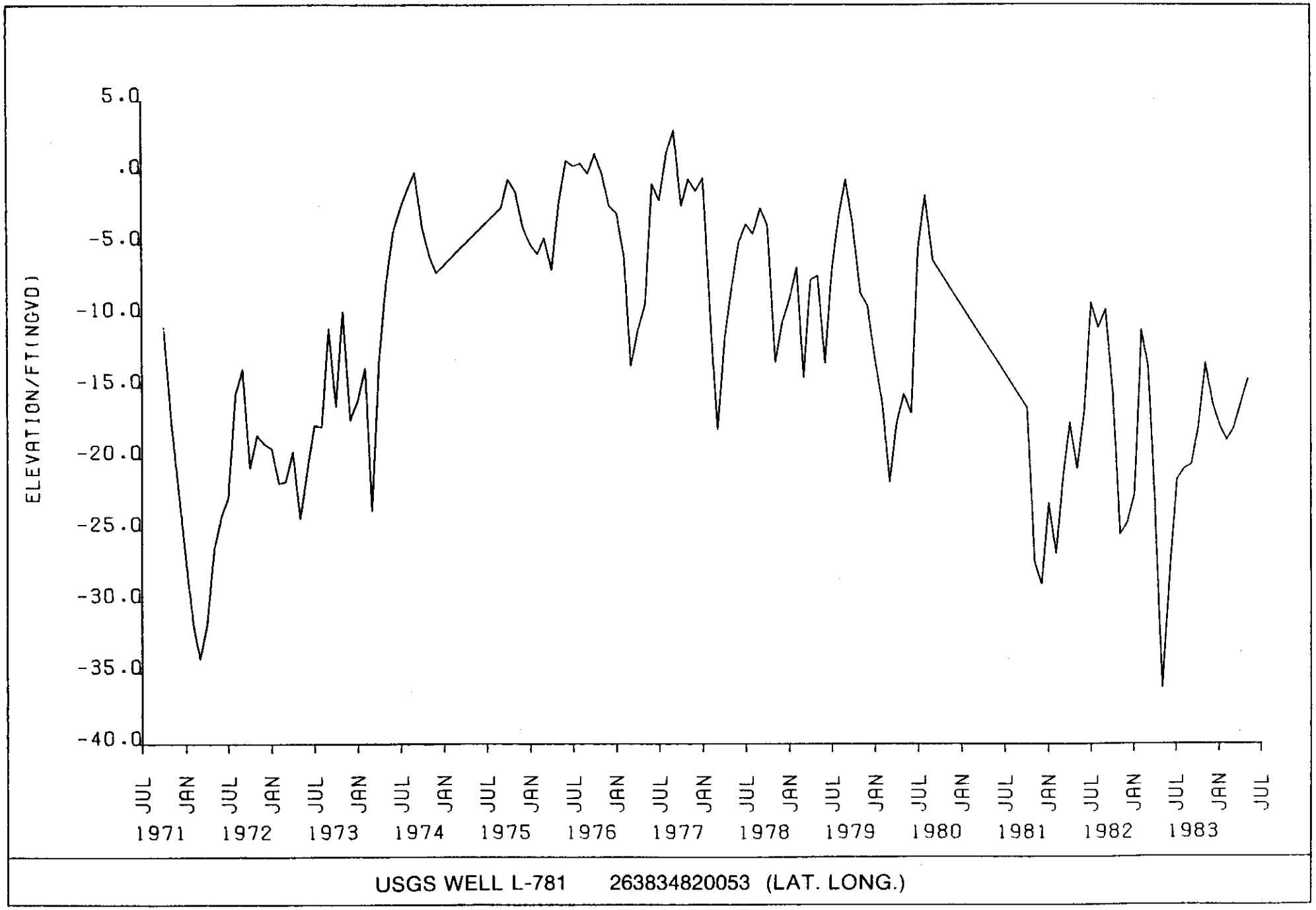


USGS WELL L-2434


ELEVATION/FT(NGVD)
5.0
.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL JAN JUL
1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983
USGS WELL L-581 263532815922 (LAT. LONG.)



USGS WELL L-1598 263233815503 (LAT. LONG.)


ELEVATION/FT(NGVD)
5.0
.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
JUL
JAN
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
USGS WELL L-781 263834820053 (LAT. LONG.)

APPENDIX III

Number of Dwelling Units and Capacity of Planning Areas

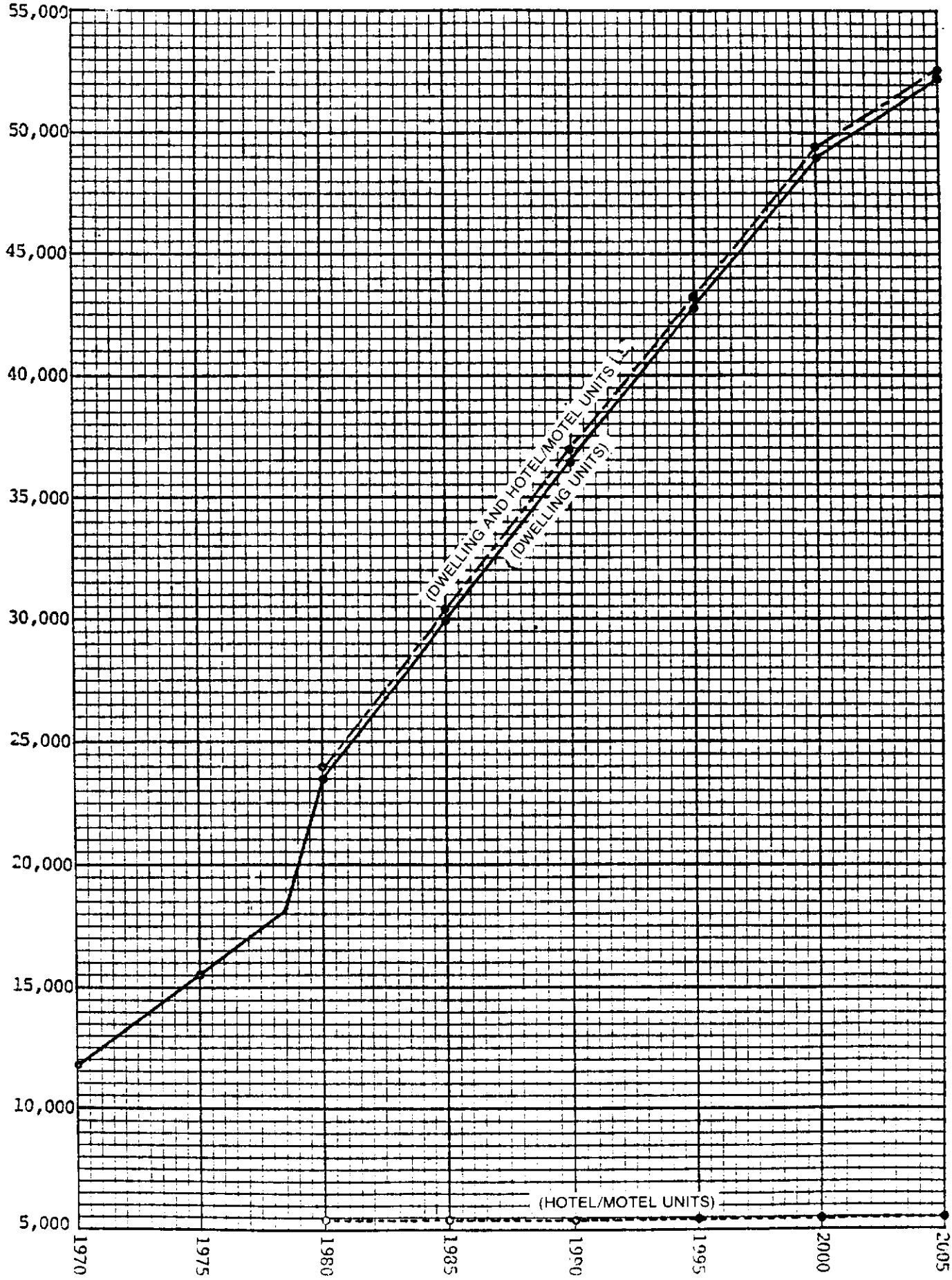


Figure A PLANNING AREA 1-11; CAPE CORAL
(From Lee County Division of Community Development, 1983)

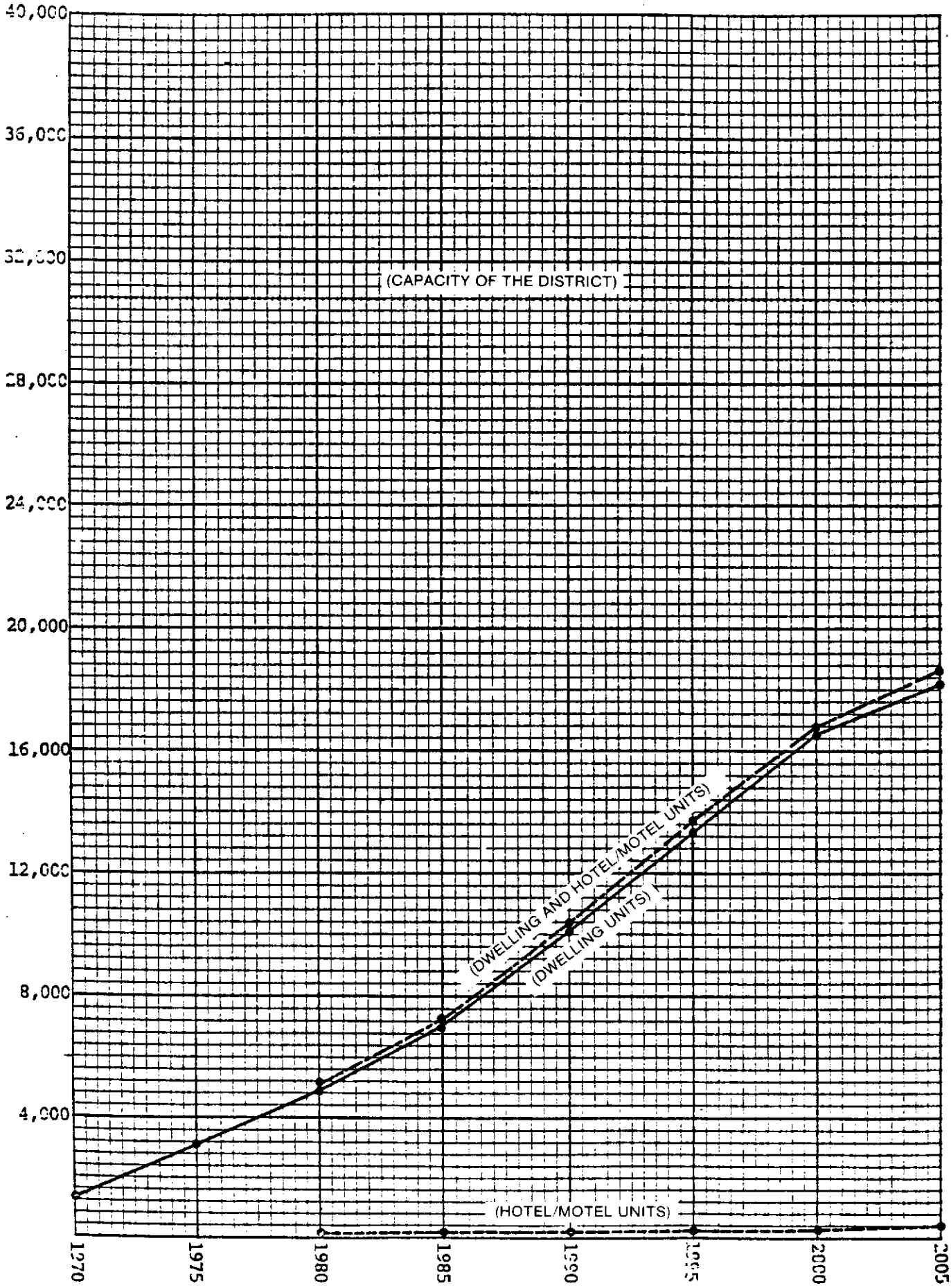


Figure B PLANNING AREA 12; IONA McGREGOR
(From Lee County Division of Community Development, 1983)

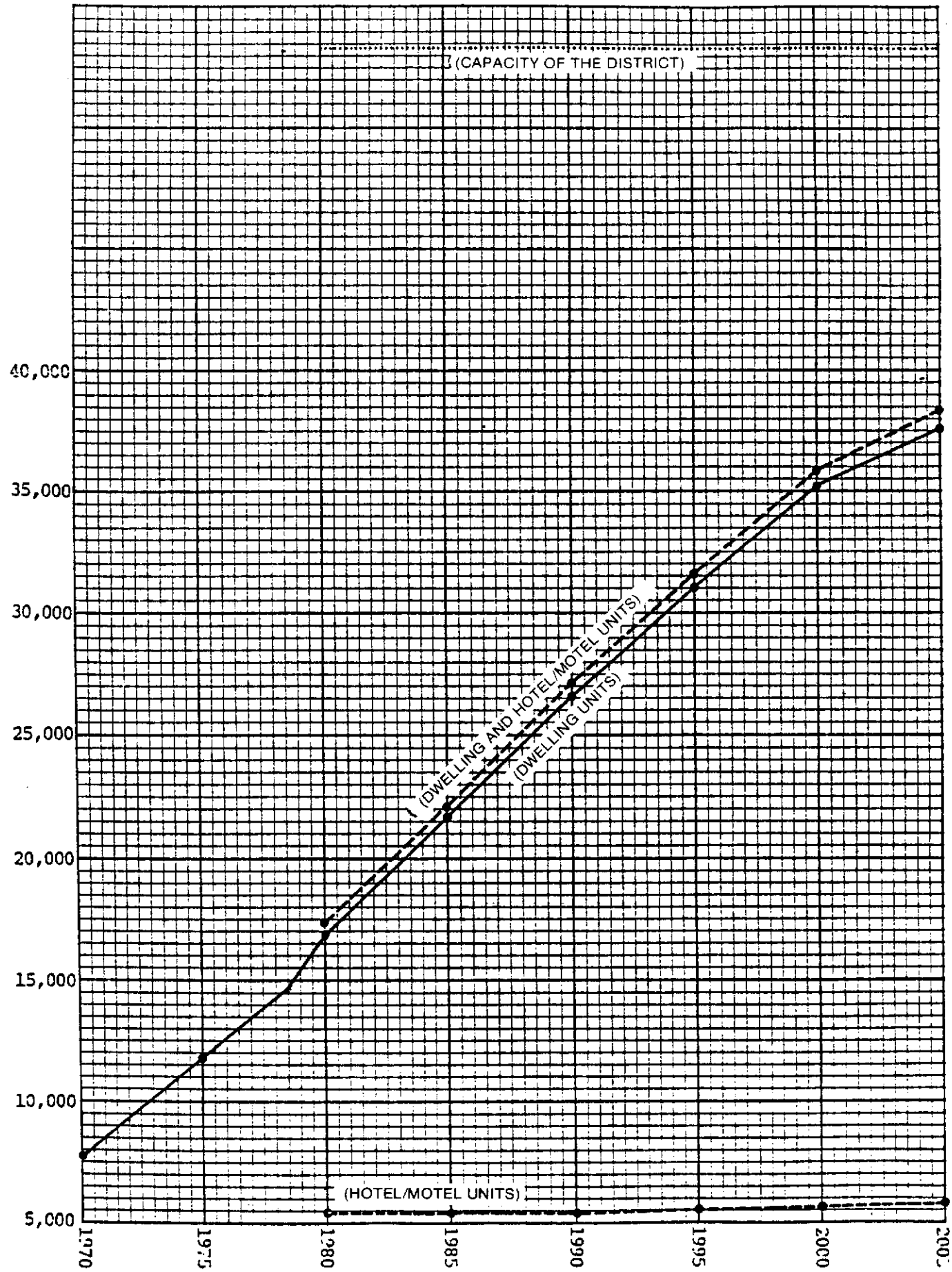


Figure C PLANNING AREA 13; SOUTH FORT MYERS
(From Lee County Division of Community Development, 1983)

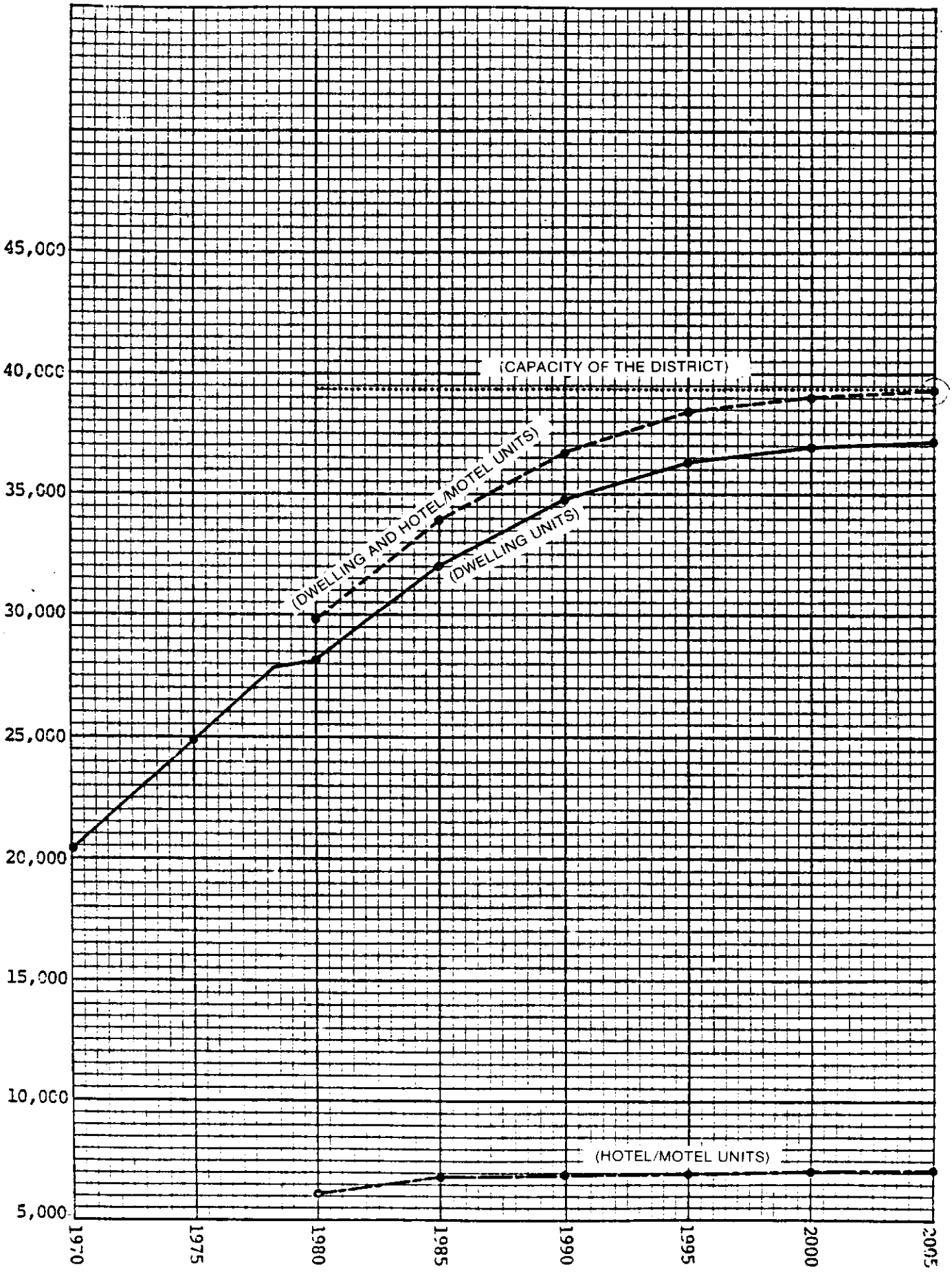


Figure D PLANNING AREA 14; FORT MYERS
(From Lee County Division of Community Development, 1983)

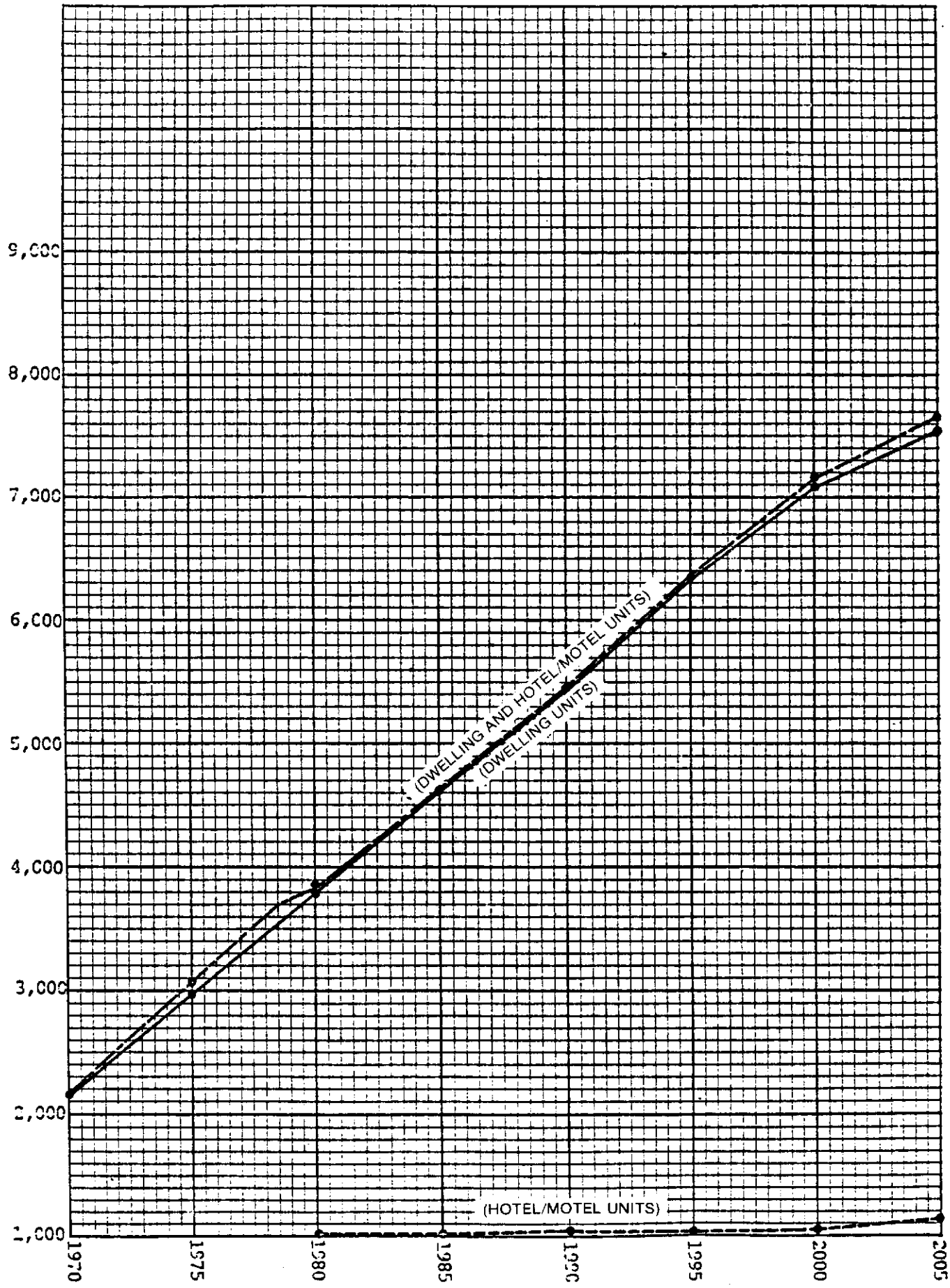


Figure E PLANNING AREA 15; PINE ISLAND
(From Lee County Division of Community Development, 1983)

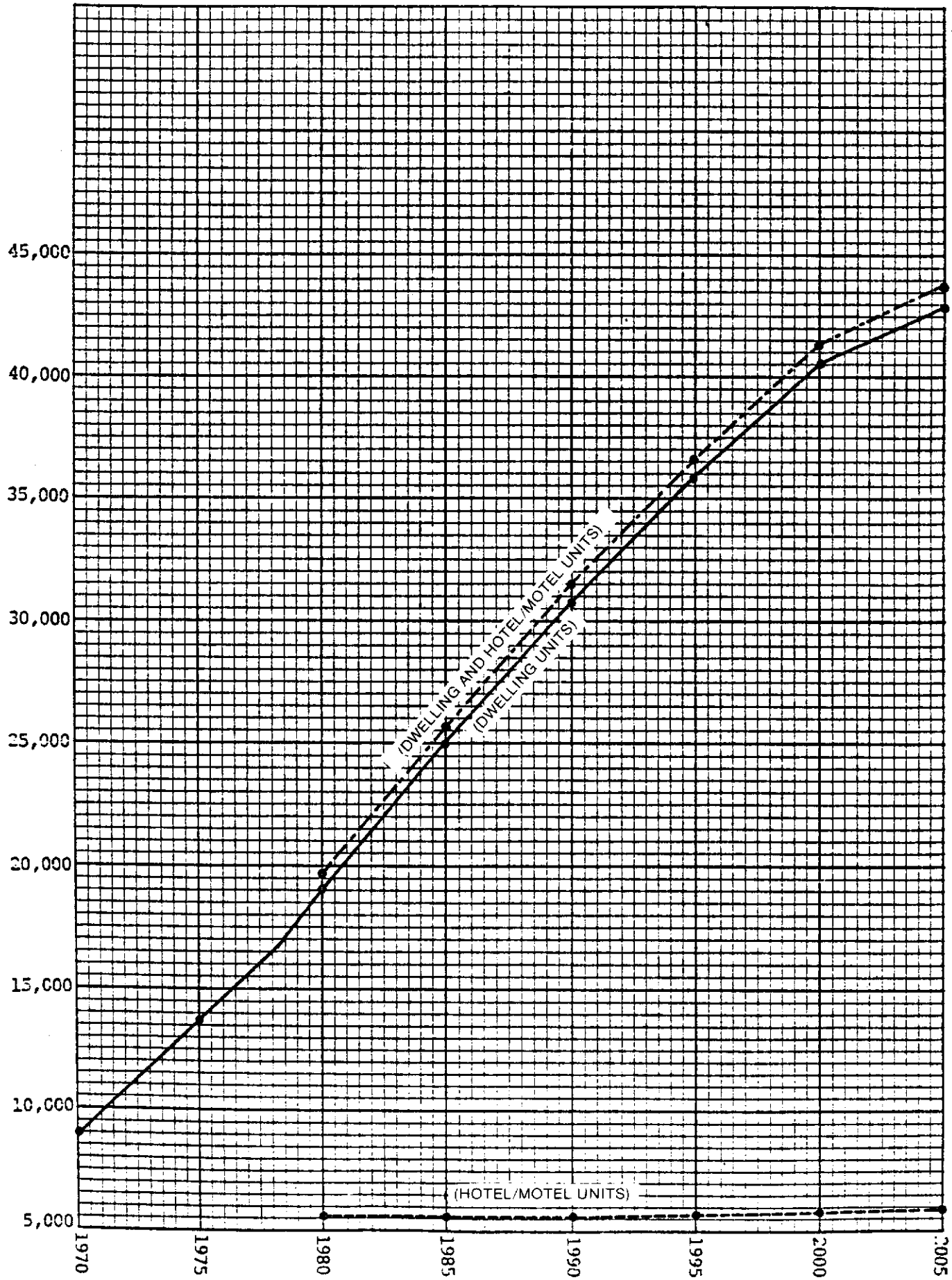


Figure F PLANNING AREA 16; N. FORT MYERS
(From Lee County Division of Community Development, 1983)

APPENDIX IV

Examples of Water Use Computations

APPENDIX IV

Further explanation of the procedures used in the water use forecasting section is described in the following section. Some of the procedures described are population densities, homes to well ratios, mid-Hawthorn irrigation well forecasts for ranges of both high and low populations, projected wellfield service area uses, and percent buildout estimations for each of the sixteen population planning areas.

Table 7 cites each planning area along with the estimated projected populations of the same. The population ranges of areas 1-11 were taken from the Cape Coral Population Forecast Report, Cape Coral Planning Department, 1983. In the aforementioned report, population forecasts were cited with both low and high values. These are derived from a ratio methodology and based upon statistics from the U. S. Bureau of the Census, 1960, 1970, and 1980, and the University of Florida Population Forecasts for Lee County. The high value is taken from the Cape Coral Comprehensive Plan. Methodology of both methods is detailed and available for inspection in the Cape Coral Planning Department office.

The population values in area 12-16 were cited from the Lee County Division of Community Development, Department of Long Range Planning report on population forecasts, 1982. The methodology in computing these values is also available. In this case, it can be found within the aforementioned report and/or at the Lee County Department of Long Range Planning Office.

Also cited in Table 7 are the population densities (persons per acre), the number of dwelling units (homes), the estimated number of wells and the ratio of homes to wells within each of the sixteen planning areas. The methods used to derive these values are described below, as numbered on the table.

TABLE 7

POPULATION DENSITIES, HOMES/WELL RATIOS

AND TOTAL IRRIGATION WITHDRAWAL FOR EACH PLANNING AREA

AREA	ACRES	POPULATION[1]	DENSITY PERSONS/ACRE[2]	NO. HOMES[3]	NO. WELLS[4]	RATIO HOMES/WELL[5]	TOTAL WITHDRAWAL (MGD)
1	1,543	5292-6608	3.40-4.30	1960-2447	384	5.1-6.4	0.12
2	3,012	2394-2955	0.79-0.98	867-1094	216	4.0-5.1	0.06
3	2,565	8165-10000	3.18-3.94	3024-3741	268	11.2-14.0	0.08
4	3,648	3431-4257	0.94-1.17	1271-1577	210	6.0-7.5	0.06
5	3,056	6898-8382	2.26-2.74	2555-3104	475	5.4-6.5	0.14
6	3,831	1791-2236	0.46-0.58	663-828	181	3.7-4.6	0.05
7	2,212	4906-5969	2.22-2.70	1817-2211	252	7.2-8.8	0.08
8	2,071	1158-1445	0.56-0.70	429-535	69	6.2-7.7	0.02
9	5,402	4734-5903	0.88-1.09	1753-2186	932	1.9-2.3	0.28
10	2,191	1364-1699	0.62-0.78	505-629	153	3.3-4.1	0.05
11	27,237	3969-4946	0.14-0.18	1470-1832	279	5.3-6.6	0.08
11	22,907	10,795	0.47	4,756	1,134	4.2	0.34
13	18,631	31,020	1.66	13,665	1,872	7.3	0.56
14	13,631	58,923	4.30	25,957	4,056	6.4	1.22
15	25,881	4,532	0.18	1,996	333	6.0	0.10
16	20,215	35,735	1.81	15,742	2,127	7.4	0.64
						TOTAL	3.88

METHODS

1. Population of areas 1-11 are cited from the Cape Coral Forecasts Report, and areas 12-16 are cited from the Lee County Divison of Community Development.

2. Population ÷ Acres - becomes a range within areas 1-11 due to the high and low population values given in the Cape Coral Planning Report.

3. No. Homes = Population ÷ No. Persons/Dwelling Unit (taken from Lee County Report) (eg. 2.27 for 1985, 2.04 for 2010).

4. No. Wells from information provided by Cape Coral Utilities (for areas 1-11).

For areas 12-16:

   a. Compare density of population to one of the other areas (1-11).

   b. Once matched, find Homes/Well ratio (5) of the match (areas 1-11).

   c. Determine where population density from areas 12-16 falls within range of the match from areas 1-11.

      eg. Density Range from areas 1-11 = 1.02 - 2.46

      Density from areas 12-16 = 1.48

      2.46 - 1.02 = 1.44 range difference

      2.46 - 1.48 = 0.98 1.48 - 1.02 = 0.46

      0.98 = X% 1.44 0.46 = X% 1.44

      X = 68% below top of range X = 32% above bottom of range

   d. Take value(s) from c. and apply to Homes/Well ratio range

      eg. matching Homes/Wells range = 4.2 - 6.4

      From c. get 68% below top range or 32% above bottom of range

      6.4 - 4.2 = 2.2 range difference

      X = 6.4 - 0.68 (2.20) = 4.9 or

      X = 4.2 + 0.32 (2.2) = 4.9

      This is the value of homes to wells for that area.

   e. Divide the No. of Homes by Homes/Wells ratio found in part d. This is the estimated no. wells for areas 12-16.

5. Homes/Well Ratio = No Homes ÷ No. of Wells (areas 1-11)
For areas 12-16 the Homes/Wells ratio was found before the No. of Wells as shown in (4)d-e.

Table A reveals the percent buildout ranges of each of the sixteen planning areas. The methodology used to determine the above was divided into two sets of procedures due to the two different sources of population information (ie. City of Cape Coral and Lee County).

AREAS 1-11

Used maps from Cape Coral Report with percent buildout and related each forecasted year with the following and previous years. Only maps from 1985 forecasts and 2000 forecasts were cited in the report. Percent was given in ranges (ie. 61-100%, 31-60%, etc.) so buildout for each area (zone) was estimated. These were also ranges of percentages. The procedures used are described below.

PERCENT BUILDOUT ESTIMATIONS
(AREAS 1-11)

AREA	1985 LOW	1985 HIGH	2000 LOW	2000 HIGH	DIFFERENCE LOW	DIFFERENCE HIGH	PERCENT RANGES 1900	1995	2005
1	80	100	90	100	10	0	83-100	87-100	93-100
2	50	70	70	100	20	30	57-80	64-90	77-100
3	60	90	80	100	20	10	67-83	74-86	87-100
4	20	40	75	90	55	50	38-57	56-74	93-100
5	60	90	80	100	20	10	67-93	74-96	87-100
6	15	25	45	75	30	50	25-42	35-59	55-92
7	50	75	75	95	25	20	57-83	64-91	82-100
8	10	20	40	70	30	50	20-37	30-54	50-87
9	15	45	60	85	40	45	30-58	45-71	75-98
10	5	15	35	65	30	50	15-32	25-49	45-82
11	0	5	25	45	20	40	7-18	14-31	32-58

TABLE A

PERCENT BUILDOUT

AREA	RATIO (HOMES/WELL)	1985	1990	1995	2000	2005
1	5.1-6.4	80-100	83-100	87-100	90-100	93-100
2	4-5	50-70	57-80	64-90	70-100	77-100
3	11-14	60-90	67-83	74-86	80-100	87-100
4	6-7.5	20-40	38-57	56-74	75-90	93-100
5	5.5-6.5	60-90	67-93	74-96	80-100	87-100
6	3.5-4.5	15-25	25-42	35-59	45-75	55-92
7	7-9	50-75	57-83	64-91	75-95	82-100
8	6.2-7.7	10-20	20-37	30-54	40-70	50-87
9	2-2.5	15-45	30-58	45-71	60-85	75-98
10	3.5-4	5-15	15-32	25-49	35-65	45-82
11	5.5-6.5	0-5	5-20	10-35	20-45	25-60
12	4.2	30-40	40-50	55-65	65-75	75-85
13	7.3	35-45	45-55	55-65	60-70	65-75
14	6.4	75-85	85-95	85-95	90-100	90-100
15	6.0	5-15	10-20	10-20	15-25	15-25
16	7.4	15-25	20-30	30-40	35-45	40-50

The previous estimates were calculated as such:

1. The known estimated ranges of buildout (from maps) for 1985 and 2000 were determined.

2. The high ranges were subtracted from each other and the low ranges the same.

3. These values were divided by three (the number of five year increments between the known years, 2000 and 1985).
4. Values from (3) were added to ranges from 1985 in succession.

   eg. 1985 = 1985 (known)
   1990 = 1985 + (3)
   1995 = 1990 + (3)
   2000 = 2000 (known)
   2005 = 2000 + (3)
   for both the low and high ranges

AREAS 12-16

Used information and charts drawn from Lee County Report to determine percent buildout from the capacity of each area. Results are shown below along with the average rate per year increase.

AREA	CAPACITY	1985	1990	1995	2000	2005	AVERAGE* RATE/YR. INCREASE
12	31,800	34%	46%	59%	71%	78%	2.20
13	53,300	40%	51%	58%	66%	70%	1.50
14	39,400	81%	88%	92%	94%	94%	0.65
15	36,509	12%	14%	17%	19%	20%	0.40
16	54,494	20%	27%	34%	41%	45%	1.25
(1-11)	238,979	20%	24%	27%	31%	33%	0.65

*Indicates at what rate each area is reaching capacity.

After the percent buildout was determined and found not be an undermining factor, the projected number of four inch irrigation wells was determined. This was completed by finding the percent increase of the number of dwelling units (homes) for each area and for every five year population projection (eg. 1985-1990, 1995-2000). This percent increase was applied directly to the

number of wells in each of the areas. The projected numbers in areas fourteen and sixteen were altered in the modeling section due to additional use of the Sandstone Aquifer and Surficial Aquifer System as irrigation sources. This was done to compensate for an offset in the calibration process of the modeling of the mid-Hawthorn aquifer. In addition, the same procedure was used in determining the number of wells in area 1-11 for the projected high populations within Cape Coral. All these results are tabulated below in the following tables (Tables B-E).

The number of grid blocks within each planning area was determined from an overlain thirty second grid. This grid was one of the ones used in the mid-Hawthorn modeling process (Figure 19).

Next, the number of wells per grid block was determined for each of the planning areas for every forecasted year. This was also done for both the projected low and high population forecasts within the eleven Cape Coral planning areas.

TABLE B
MID HAWTHORN IRRIGATION WELL FORECAST
(Data From High Population Forecasts of Cape Coral)

YEAR	AREA	PROJECTED POPULATION	NO HOMES	%INCREASE	PROJECTED NO WELLS
1985	1	6608	2447		384
1985	2	2955	1094		216
1985	3	10100	3741		268
1985	4	4257	1577		210
1985	5	8382	3104		475
1985	6	2236	828		179
1985	7	5969	2211		252
1985	8	1445	535		69
1985	9	5903	2186		932
1985	10	1699	629		153
1985	11	4946	1832		279
1990	1	6812	3168	29	495
1990	2	4580	2130	95	421
1990	3	11280	5247	40	375
1990	4	6862	3192	102	424
1990	5	10722	4987	61	765
1990	6	4179	1944	35	242
1990	7	7916	3681	66	418
1990	8	2991	1391	60	110
1990	9	10142	4717	116	2013
1990	10	3502	1629	159	396
1990	11	8726	4059	122	619
1995	1	6966	3349	06	525
1995	2	6271	3015	42	598
1995	3	12289	5906	13	424
1995	4	9632	4631	45	615
1995	5	12774	6141	23	941
1995	6	6286	3022	55	375
1995	7	9689	4658	27	531
1995	8	4667	2244	61	178
1995	9	14748	7090	50	3020
1995	10	5449	2620	61	638
1995	11	12527	6023	48	916
2000	1	7102	3464	03	541
2000	2	7867	3836	27	759
2000	3	13229	6453	09	462
2000	4	12244	5973	29	793
2000	5	14701	7171	17	1101
2000	6	8275	4037	34	502
2000	7	11358	5540	19	632
2000	8	6248	3048	36	242
2000	9	19095	9315	31	4009
2000	10	7287	3555	36	868
2000	11	16117	7862	31	1200
2005	1	7730	3769	09	490
2005	2	10352	5075	32	1002
2005	3	14713	7212	12	517
2005	4	16427	8052	35	1071
2005	5	16757	8214	15	1266
2005	6	11674	5723	42	713
2005	7	13401	6559	18	746
2005	8	9027	4425	45	351
2005	9	26559	13019	40	5613
2005	10	10513	5153	45	1259

TABLE C

PROJECTED NUMBER OF WELLS AND WELLS PER GRID BLOCK
(CAPE CORAL HIGH POPULATION FORECASTS)

AREA	GRID BLOCKS	NO. WELLS					NO. WELLS/GRID BLOCK				
		1985	1990	1995	2000	2005	1985	1990	1995	2000	2005
1	9	384	495	525	541	590	42.7	55.0	58.3	60.1	65.5
2	16	216	421	598	759	1002	13.5	26.3	37.4	47.4	62.6
3	12	268	375	424	462	517	22.3	31.3	35.3	38.5	43.1
4	19	210	424	615	793	1071	11.1	22.3	32.4	41.7	56.4
5	19	475	765	941	1101	1266	25.0	40.3	49.5	57.9	66.6
6	22	179	242	375	502	713	8.1	11.0	17.0	22.8	32.4
7	12	252	418	531	632	746	21.0	34.8	44.3	52.7	62.2
8	12	69	110	178	242	351	5.8	9.2	14.8	20.2	29.3
9	27	932	1081	1621	2123	2972	34.5	40.0	60.0	78.6	110.1
10	12	153	396	638	868	1259	12.8	33.0	53.2	72.3	104.9
11	138	279	619	916	1200	1668	2.0	4.5	6.6	8.7	12.1

TABLE D
MID HAWTHORN IRRIGATION WELL FORECAST
(Data From Low Population Forecasts of Cape Coral and Lee County)

YEAR	AREA	PROJECTED POPULATION	NO HOMES	% INCREASE	PROJECTED NO WELLS
1985	1	5292	1960		384
1985	2	2394	867		216
1985	3	6165	3024		268
1985	4	3431	1271		210
1985	5	6898	2555		475
1985	6	1791	663		179
1985	7	4906	1817		252
1985	8	1158	429		69
1985	9	4734	1753		932
1985	10	1364	505		153
1985	11	3969	1470		279
1985	12	10795	4756		1132
1985	13	31020	13665		1872
1985	14	58923	25961		4056
1985	15	4532	1996		333
1985	16	35735	15742		2127
1990	1	4979	2316	18	453
1990	2	3347	1557	80	389
1990	3	8244	3834	27	340
1990	4	5016	2333	04	386
1990	5	7637	3645	43	679
1990	6	3054	1420	14	383
1990	7	5785	2691	48	373
1990	8	2187	1017	37	95
1990	9	7413	3448	97	1836
1990	10	2560	1191	36	361
1990	11	6378	2967	1.02	564
1990	12	14582	6782	43	1619
1990	13	38092	17717	30	2433
1990	14	61323	28522	10	4462
1990	15	5292	2461	23	410
1990	16	43387	20180	28	2722
1995	1	4834	2324	00	453
1995	2	4352	2092	34	521
1995	3	8528	4100	07	364
1995	4	6684	3213	38	533
1995	5	8865	4262	17	794
1995	6	4364	2098	48	567
1995	7	6724	3233	20	448
1995	8	3239	1557	53	145
1995	9	10235	4921	43	2625
1995	10	3781	1818	53	552
1995	11	8694	4180	41	795
1995	12	18621	9048	33	2153
1995	13	44252	21275	20	2920
1995	14	61600	29712	04	4640
1995	15	6118	2941	20	492
1995	16	50071	24072	19	3239
2000	1	4878	2380	02	462
2000	2	5400	2634	26	656
2000	3	9081	4430	08	393
2000	4	8404	4100	28	682
2000	5	10093	4923	16	921
2000	6	5682	2772	32	748

TABLE D (CONT.)

2000	7	7797	3803	18	529
2000	8	4290	2093	34	194
2000	9	13109	6395	30	3413
2000	10	5003	2440	34	740
2000	11	11065	5398	29	1026
2000	12	22566	11008	22	2627
2000	13	49986	24383	15	3358
2000	14	61798	30145	01	4686
2000	15	6800	3317	13	556
2000	16	56203	27416	14	3692
2005	1	4879	2392	01	467
2005	2	6535	3203	22	800
2005	3	9285	4551	03	405
2005	4	10367	5082	24	846
2005	5	10575	5184	05	967
2005	6	7369	3612	30	972
2005	7	8457	4146	09	576
2005	8	5696	2792	33	258
2005	9	16762	8217	28	4369
2005	10	6634	3252	33	984
2005	11	14041	6883	28	1313
2005	12	24787	12150	10	2890
2005	13	53370	26162	07	3593
2005	14	61550	30172	00	24686
2005	15	7244	3551	07	595
2005	16	59308	29072	06	3914

TABLE E

TABLE 12 PROJECTED NUMBER OF WELLS AND WELLS PER GRID BLOCK
(CAPE CORAL LOW POPULATION FORECASTS AND LEE COUNTY'S FORECASTS OUTSIDE OF CAPE CORAL)

		NO. WELLS					NO. WELLS/GRID BLOCK				
AREA	GRID BLOCKS	1985	1990	1995	2000	2005	1985	1990	1995	2000	2005
1	9	384	453	453	462	467	42.7	50.3	50.3	51.3	51.9
2	16	216	389	521	656	800	13.5	24.3	32.6	41.0	50.0
3	12	268	340	364	393	405	22.3	28.3	30.3	32.8	33.8
4	19	210	386	533	682	846	11.0	20.3	28.1	35.9	44.5
5	19	475	679	794	921	967	25.0	35.7	41.8	48.5	50.9
6	22	179	383	567	748	972	8.1	17.4	25.8	34.0	44.2
7	12	252	373	448	529	576	21.0	31.1	37.3	44.1	48.0
8	12	69	95	145	19.4	258	5.8	9.9	12.1	16.2	21.5
9	27	932	1836	2625	3413	4369	34.5	68.0	97.2	126.4	161.8
10	12	153	361	552	740	984	12.8	30.1	46.0	61.4	82.0
11	138	279	564	795	1026	1313	2.0	4.1	5.8	7.4	9.5
12	119	1132	1619	2153	2627	2890	15.5	22.2	29.5	36.1	39.6
13	98	1872	2433	2920	3358	3593	19.1	24.8	29.8	34.3	36.7
14	73	4056	4462	4640	4686	4686	55.6	61.1	63.6	64.2	64.2
15	129	333	410	492	556	595	2.6	3.2	3.8	4.3	4.6
16	167	2127	2722	3239	3692	3914	12.7	16.3	19.4	22.1	23.4

TABLE F

-ESTIMATED PUMPAGE-
MID HAWTHORN IRRIGATION WELLS FOR WET AND DRY SEASONS
(FOR EACH GRID BLOCK)

POP PLANNING AREA	1985		1990		1995		2000		2005		GRID BLOCK X	GRID BLOCK Y
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	33	37
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	33	39
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	34	37
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	34	38
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	34	39
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	34	40
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	35	37
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	35	38
01	0.050	0.099	0.058	0.117	0.058	0.117	0.059	0.119	0.060	0.121	35	39
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	33	31
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	33	33
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	33	35
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	34	30
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	34	31
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	34	32
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	34	33
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	34	34
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	34	35
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	34	36
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	35	31
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	35	32
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	35	33
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	35	34
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	35	35
02	0.018	0.033	0.028	0.056	0.038	0.076	0.048	0.095	0.058	0.116	35	36
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	31	37
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	31	38
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	31	39
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	31	40
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	31	41
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	32	37
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	32	38
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	32	39
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	32	40
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	32	41
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	33	38
03	0.025	0.048	0.033	0.066	0.035	0.070	0.038	0.076	0.039	0.078	33	40
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	31	29
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	31	30
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	31	31
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	31	32
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	31	33
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	31	34
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	31	35
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	31	36
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	32	30
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	32	31
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	32	32
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	32	33
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	32	34
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	32	35
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	32	36

04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	33	30
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	33	32
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	33	34
04	0.011	0.021	0.024	0.047	0.033	0.065	0.042	0.083	0.052	0.103	33	36
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	28	37
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	28	38
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	28	39
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	28	40
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	28	41
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	28	42
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	28	43
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	29	37
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	29	38
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	29	39
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	29	40
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	29	41
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	29	42
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	30	37
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	30	38
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	30	39
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	30	40
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	30	41
05	0.039	0.074	0.041	0.083	0.049	0.097	0.056	0.113	0.059	0.118	30	42
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	28	30
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	28	31
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	28	32
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	28	33
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	28	34
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	28	35
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	28	36
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	29	29
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	29	30
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	29	31
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	29	32
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	29	33
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	29	34
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	29	35
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	29	36
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	30	30
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	30	31
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	30	32
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	30	33
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	30	34
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	30	35
06	0.012	0.023	0.020	0.040	0.030	0.060	0.039	0.079	0.051	0.103	30	36
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	26	37
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	26	38
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	26	39
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	26	40
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	26	41
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	26	42
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	27	37
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	27	38
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	27	39
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	27	40
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	27	41
07	0.024	0.045	0.036	0.072	0.043	0.087	0.051	0.102	0.056	0.111	27	42
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	26	31
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	26	32
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	26	33
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	26	34
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	26	35
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	26	36
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	27	31

08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	27	32
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	27	33
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	27	34
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	27	35
08	0.007	0.014	0.011	0.023	0.014	0.028	0.019	0.038	0.025	0.050	27	36
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	21	40
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	21	41
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	21	42
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	22	38
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	22	39
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	22	40
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	22	41
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	22	42
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	23	36
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	23	37
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	23	38
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	23	39
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	23	40
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	23	41
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	23	42
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	24	37
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	24	38
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	24	39
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	24	40
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	24	41
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	24	42
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	25	37
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	25	38
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	25	39
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	25	40
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	25	41
09	0.035	0.065	0.079	0.158	0.113	0.226	0.147	0.294	0.188	0.376	25	42
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	23	36
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	24	34
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	24	34
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	24	36
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	25	32
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	25	33
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	25	34
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	25	35
10	0.018	0.030	0.035	0.070	0.053	0.107	0.072	0.143	0.095	0.190	25	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	11	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	11	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	11	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	12	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	12	39
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	12	41
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	13	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	13	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	13	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	13	39
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	13	40
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	13	41
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	13	42
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	14	26
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	14	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	14	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	14	39
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	14	40
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	14	41
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	14	42
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	14	43
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	15	26
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	15	27

11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	15	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	15	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	15	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	15	39
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	15	40
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	15	43
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	26
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	30
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	32
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	34
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	35
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	37
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	38
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	16	42
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	30
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	32
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	33
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	34
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	35
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	37
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	38
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	39
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	41
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	42
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	17	26
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	26
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	30
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	32
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	33
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	34
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	35
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	37
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	38
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	39
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	40
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	41
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	18	42
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	30
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	32
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	33
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	34
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	35
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	37
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	38
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	39

11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	40
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	41
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	19	42
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	26
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	30
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	32
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	33
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	34
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	35
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	37
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	38
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	39
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	20	40
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	30
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	32
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	33
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	34
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	35
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	37
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	38
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	21	39
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	30
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	32
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	33
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	34
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	35
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	36
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	22	37
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	23	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	24	28
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	23	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	23	30
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	23	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	23	32
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	23	33
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	23	34
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	23	35
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	24	27
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	24	29
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	24	31
11	0.002	0.004	0.005	0.010	0.007	0.013	0.009	0.017	0.011	0.022	24	33
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	34	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	35	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	35	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	36	41
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	36	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	36	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	36	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	37	40
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	37	41

12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	37	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	37	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	37	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	38
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	39
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	40
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	41
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	48
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	49
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	38	33
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	33
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	34
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	35
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	36
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	37
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	38
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	39
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	40
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	41
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	39	48
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	33
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	34
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	35
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	36
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	37
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	38
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	39
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	40
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	41
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	40	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	35
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	36
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	37
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	38
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	39
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	40
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	41
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	41	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	33
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	34
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	35
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	36

12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	37
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	38
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	39
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	40
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	41
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	42	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	37
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	38
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	39
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	40
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	41
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	43	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	44	39
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	44	41
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	44	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	44	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	44	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	44	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	44	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	44	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	45	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	45	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	45	44
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	45	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	45	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	45	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	45	48
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	46	42
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	46	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	46	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	46	47
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	46	48
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	47	43
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	47	45
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	47	46
12	0.015	0.030	0.026	0.052	0.034	0.068	0.042	0.084	0.046	0.092	47	47
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	26	53
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	26	54
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	26	55
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	26	56
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	26	57
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	26	58
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	26	59
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	27	53
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	27	54
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	27	55
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	27	56
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	27	57
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	27	58
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	27	59
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	28	53
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	28	54
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	28	55
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	28	56

13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	28	57
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	28	58
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	49
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	50
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	51
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	52
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	53
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	54
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	55
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	56
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	29	57
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	49
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	50
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	51
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	52
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	53
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	54
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	55
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	56
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	30	57
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	46
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	47
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	48
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	49
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	50
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	51
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	52
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	53
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	54
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	55
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	31	56
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	45
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	46
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	47
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	48
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	49
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	50
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	51
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	52
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	53
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	54
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	32	55
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	44
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	45
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	46
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	47
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	48
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	49
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	50
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	51
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	52
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	53
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	33	54
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	44
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	45
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	46
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	47
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	48
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	49
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	50
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	51
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	34	52
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	35	45
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	35	46

13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	35	47
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	35	48
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	35	49
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	35	50
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	35	51
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	36	45
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	36	46
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	36	47
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	36	48
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	36	49
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	36	50
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	37	45
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	37	46
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	37	47
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	37	48
13	0.030	0.059	0.029	0.058	0.035	0.069	0.040	0.080	0.043	0.085	37	49
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	18	57
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	18	58
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	19	55
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	19	56
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	19	57
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	19	58
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	19	59
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	20	54
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	20	55
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	20	56
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	20	57
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	20	58
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	21	52
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	21	53
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	21	54
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	21	55
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	21	56
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	21	57
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	22	51
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	22	52
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	22	53
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	22	54
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	22	55
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	22	56
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	23	49
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	23	50
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	23	51
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	23	52
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	23	53
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	23	54
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	23	55
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	23	56
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	48
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	49
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	50
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	51
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	52
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	53
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	54
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	55
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	24	56
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	25	48
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	25	49
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	25	50
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	25	51
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	25	52
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	25	53
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	25	54

14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	25	55
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	26	47
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	26	48
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	26	49
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	26	50
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	26	51
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	26	52
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	27	47
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	27	48
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	27	49
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	27	50
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	27	51
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	27	52
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	28	47
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	28	48
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	28	49
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	28	50
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	28	51
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	28	52
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	29	46
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	29	47
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	29	48
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	30	46
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	30	47
14	0.064	0.129	0.071	0.014	0.074	0.150	0.075	0.150	0.046	0.092	30	48
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	16	13
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	16	15
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	16	17
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	17	15
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	17	16
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	17	17
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	17	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	18	13
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	18	14
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	18	15
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	18	16
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	18	17
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	18	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	18	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	19	13
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	19	14
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	19	15
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	19	16
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	19	17
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	19	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	19	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	20	14
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	20	15
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	20	16
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	20	17
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	20	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	20	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	21	15
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	21	16
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	21	17
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	21	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	21	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	21	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	22	16
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	22	17
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	22	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	22	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	22	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	23	17

15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	23	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	23	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	23	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	24	17
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	24	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	24	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	24	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	25	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	25	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	25	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	25	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	25	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	25	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	26	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	26	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	26	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	26	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	26	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	26	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	27	18
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	27	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	27	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	27	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	27	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	27	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	27	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	27	25
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	28	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	28	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	28	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	28	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	28	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	28	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	28	25
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	29	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	29	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	29	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	29	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	29	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	29	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	29	25
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	30	19
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	30	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	30	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	30	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	30	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	30	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	31	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	31	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	31	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	31	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	32	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	32	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	32	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	32	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	33	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	33	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	33	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	33	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	34	20
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	34	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	34	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	34	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	35	21

15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	35	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	35	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	35	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	36	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	36	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	36	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	36	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	37	21
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	37	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	37	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	37	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	38	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	38	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	38	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	39	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	39	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	39	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	39	25
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	40	22
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	40	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	40	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	40	25
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	41	23
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	41	24
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	41	25
15	0.003	0.006	0.004	0.007	0.004	0.009	0.005	0.010	0.005	0.011	41	26
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	42
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	43
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	44
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	8	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	43
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	44
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	9	57
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	43
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	44
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	50

16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	10	57
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	44
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	11	57
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	44
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	12	57
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	13	57
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	57
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	14	58
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	47

16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	15	57
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	56
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	57
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	16	58
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	53
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	54
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	17	55
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	18	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	18	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	18	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	18	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	18	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	18	51
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	18	52
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	19	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	19	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	19	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	19	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	19	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	19	50
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	20	42
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	20	43
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	20	44
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	20	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	20	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	20	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	20	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	20	49
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	21	43
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	21	44
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	21	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	21	46
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	21	47
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	21	48
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	22	43
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	22	44
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	22	45
16	0.015	0.030	0.019	0.038	0.023	0.045	0.026	0.051	0.027	0.054	22	46

APPENDIX V

Data Set of Mid and Lower Hawthorn Aquifer Parameters

TRANSMISSIVITIES
FOR THE MID-HAWTHORN AQUIFER

NO	LAT.	LONG.	X	Y	T	VAR. T
01	263440	815743	37.33	51.43	14.02	4.71
02	263440	815755	37.33	51.83	2.72	1.61
03	263459	815755	37.97	51.83	4.75	2.05
04	2635 2	815740	38.07	51.33	6.00	2.34
05	263440	815731	37.33	51.03	3.20	1.71
06	2637 4	815929	42.13	54.97	21.20	7.52
07	263656	815938	41.93	55.27	16.50	5.61
08	263615	815827	40.50	52.90	15.51	5.24
09	263640	815930	41.33	55.00	10.76	3.65
10	263626	815827	40.87	52.90	19.09	6.62
11	263646	815827	41.53	52.90	9.68	3.39
12	2637 8	815827	42.27	52.90	20.28	7.12
13	263724	815827	42.80	52.90	25.06	9.29
14	263719	815853	42.63	53.77	22.89	8.27
15	263747	815826	43.57	52.87	9.66	3.32
16	263754	8158 7	43.80	52.23	3.66	1.81
17	2639 7	815520	46.23	46.67	4.91	2.09
18	2639 5	815457	46.17	45.90	2.72	1.61
19	264050	815637	49.67	49.23	5.91	2.32
20	264037	815633	49.23	49.10	4.31	1.95
21	264045	815633	49.50	49.10	8.69	3.05
22	263816	82 053	44.53	57.77	8.29	2.94
23	2638 3	82 047	44.10	57.57	7.69	2.78
24	2638 3	82 059	44.10	57.97	6.50	2.47
25	263812	82 042	44.40	57.40	4.71	2.04
26	2638 3	82 047	44.10	57.57	7.69	2.76
27	264054	815926	49.80	54.87	8.60	1.66
28	264146	815923	51.53	54.77	17.50	6.89

29	264144	815826	51.47	52.67	17.00	6.50
30	264055	815831	49.83	53.03	16.70	6.28
31	264241	815824	53.37	52.60	19.60	8.64
32	264147	815827	51.57	48.90	13.40	4.04
33	2639 7	815927	46.23	54.90	15.70	5.55
34	264120	82 221	50.67	60.70	10.00	2.25
35	2639 5	815728	46.17	50.93	13.00	3.80
36	263653	82 027	41.77	56.90	9.00	1.82
37	263436	815632	37.27	49.07	15.70	5.55
38	2634 4	815758	36.13	51.93	11.50	2.98
39	263347	82 026	35.57	56.67	16.00	5.76
40	264055	815727	49.83	50.90	15.00	5.06
41	264053	815630	49.77	49.00	8.75	1.72
42	264053	815632	49.77	49.07	9.30	1.95
43	263246	815244	33.60	41.47	10.00	2.25
44	2633 9	815237	34.30	41.23	17.00	6.50
45	263325	815246	34.83	41.60	21.00	9.92
46	263336	815248	35.20	41.60	25.60	14.75
47	2634 3	815238	36.10	41.27	18.00	7.29
48	263326	815121	34.87	38.70	7.60	1.30
49	263126	815245	30.93	41.50	10.80	2.62
50	263220	815216	32.67	40.53	14.30	4.60
51	263323	815327	34.77	42.90	15.90	5.69
52	263321	815511	34.70	46.37	15.60	5.48
53	263314	815227	34.47	40.90	10.20	2.34
54	264516	815015	56.60	36.50	2.00	.04
55	264435	8156 0	57.17	48.00	10.00	1.00
56	263140	8150 0	31.33	36.00	11.00	2.72
57	2617 9	813535	2.30	7.17	17.40	3.03
58	263815	82 1 5	44.50	58.17	5.20	.27
59	262839	815031	25.30	37.03	6.48	.42
60	263117	82 510	30.57	66.33	5.83	.34

T: GPD/FT/1000

TRANSMISSIVITIES AND STORAGE COEFFICIENTS
FOR THE LOWER HAWTHORN AQUIFER

WELL	LAT.	LONG.	X	Y	T	VAR. T	S	VAR. S
19	263950	82 245	47.93	59.50	8.00	1.44	-2.52	2.00
20	263536	82 2 1	39.27	50.03	3.10	.22	-3.00	2.00
21	2628 5	82 920	24.17	74.67	1.50	.05	-4.05	2.00
18	264047	82 9 0	49.57	74.00	6.00	.81	-4.00	2.00
23	262634	82 616	21.13	66.53	7.40	1.23	-3.70	2.00
24	262623	82 610	20.83	66.33	8.00	1.44	-4.00	2.00
25	262622	82 5 4	20.73	66.13	1.37	.04	-4.52	2.00
L2017	262245	814945	13.50	35.50	5.60	1.30	-3.00	2.00
RU9B	263433	82 024	37.10	56.60	12.00	2.72	-2.66	2.00
RU30	263445	82 024	37.50	56.60	17.50	6.64	-3.52	2.00
LM2221	263741	82 142	43.37	59.40	10.40	2.45	-3.48	2.00
LM988	262638	82 047	21.27	69.57	8.80	1.74	-4.36	2.00

T: GPD/FT/100.00; S: LOG10 OF STORAGE COEFFICIENT.

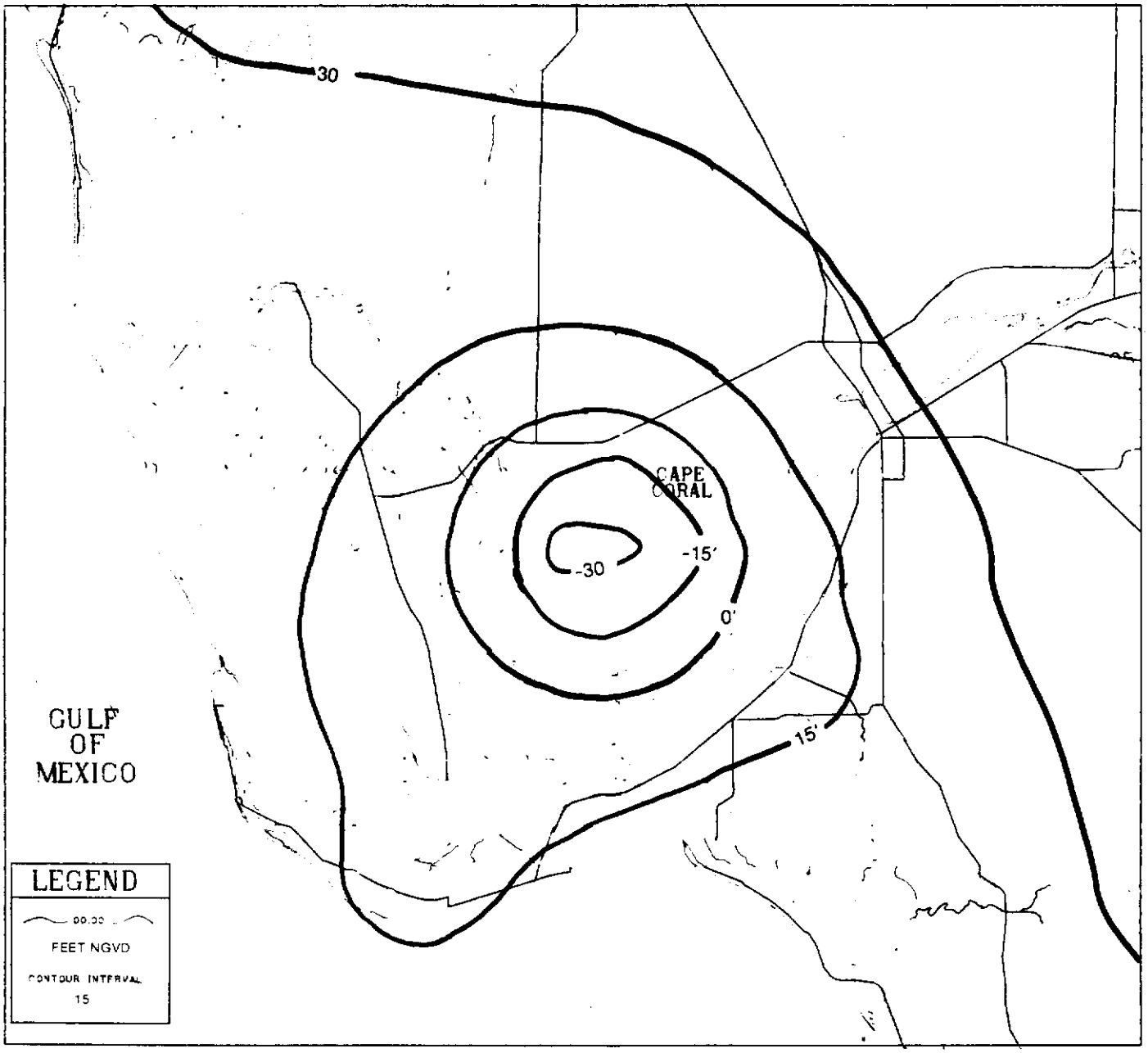
APPENDIX VI

Projected Potentiometric Surface of the Lower Hawthorn Aquifer for Wet and Dry Seasons (1985-1990)

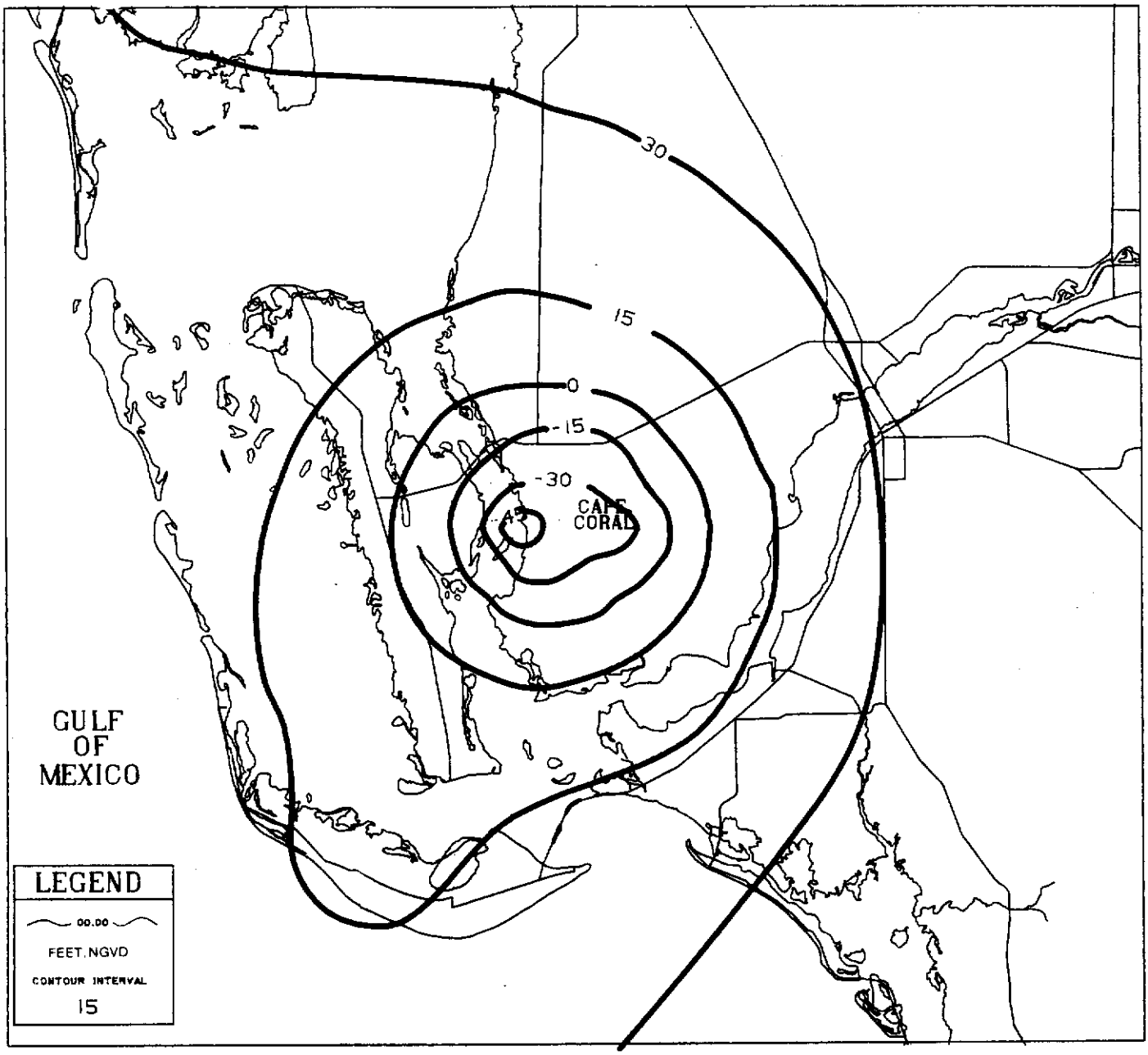
WITHDRAWALS USED IN WET/DRY SEASON SIMULATIONS (MGD)

(LEE COUNTY, DIVISION OF COMMUNITY DEVELOPMENT, 1982)

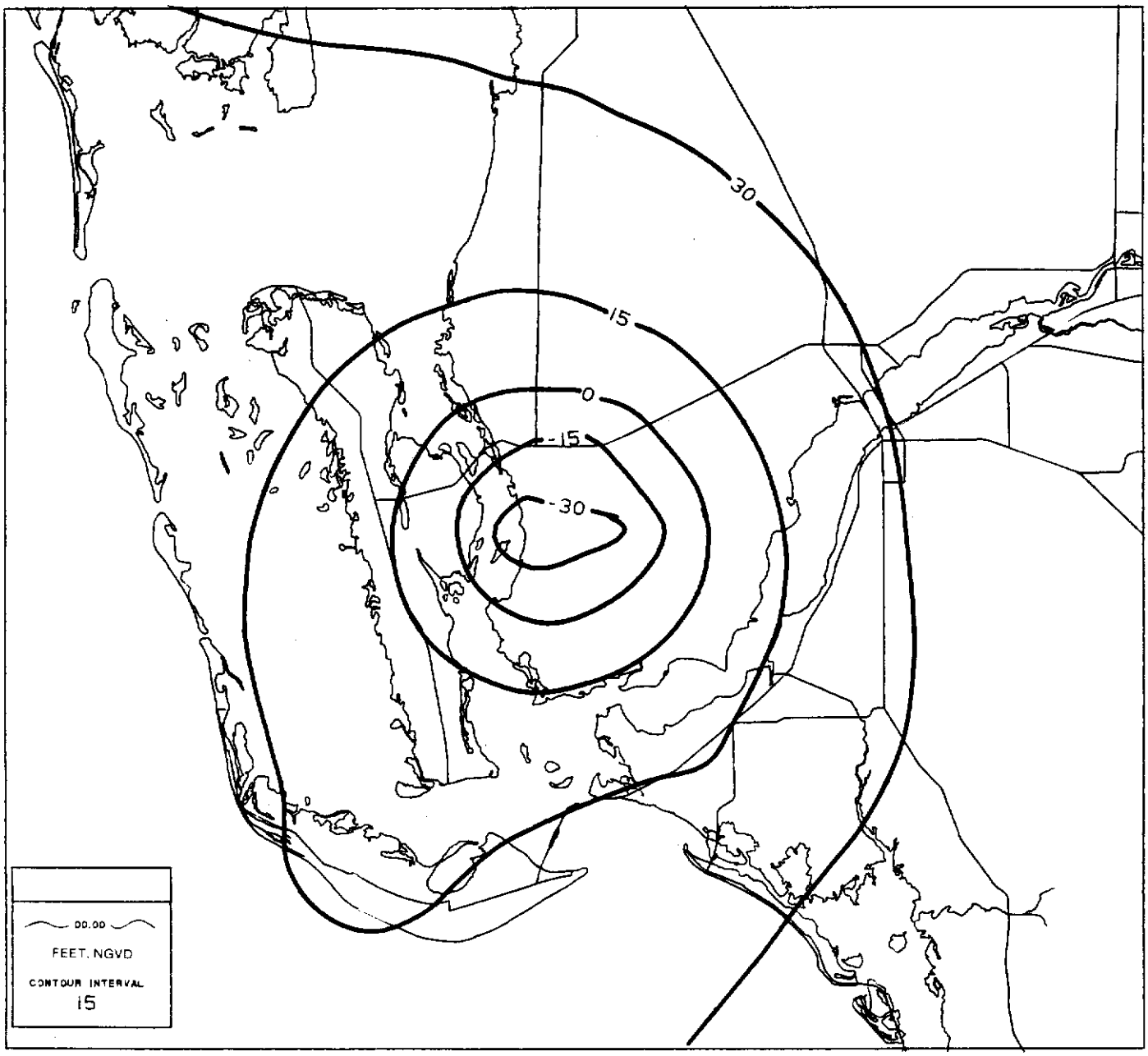
Year	Dry Season	Wet Season
1985	9.03	8.14
1986	9.92	8.45
1987	10.28	8.76
1988	10.64	9.07
1989	11.01	9.37
1990	11.37	9.68



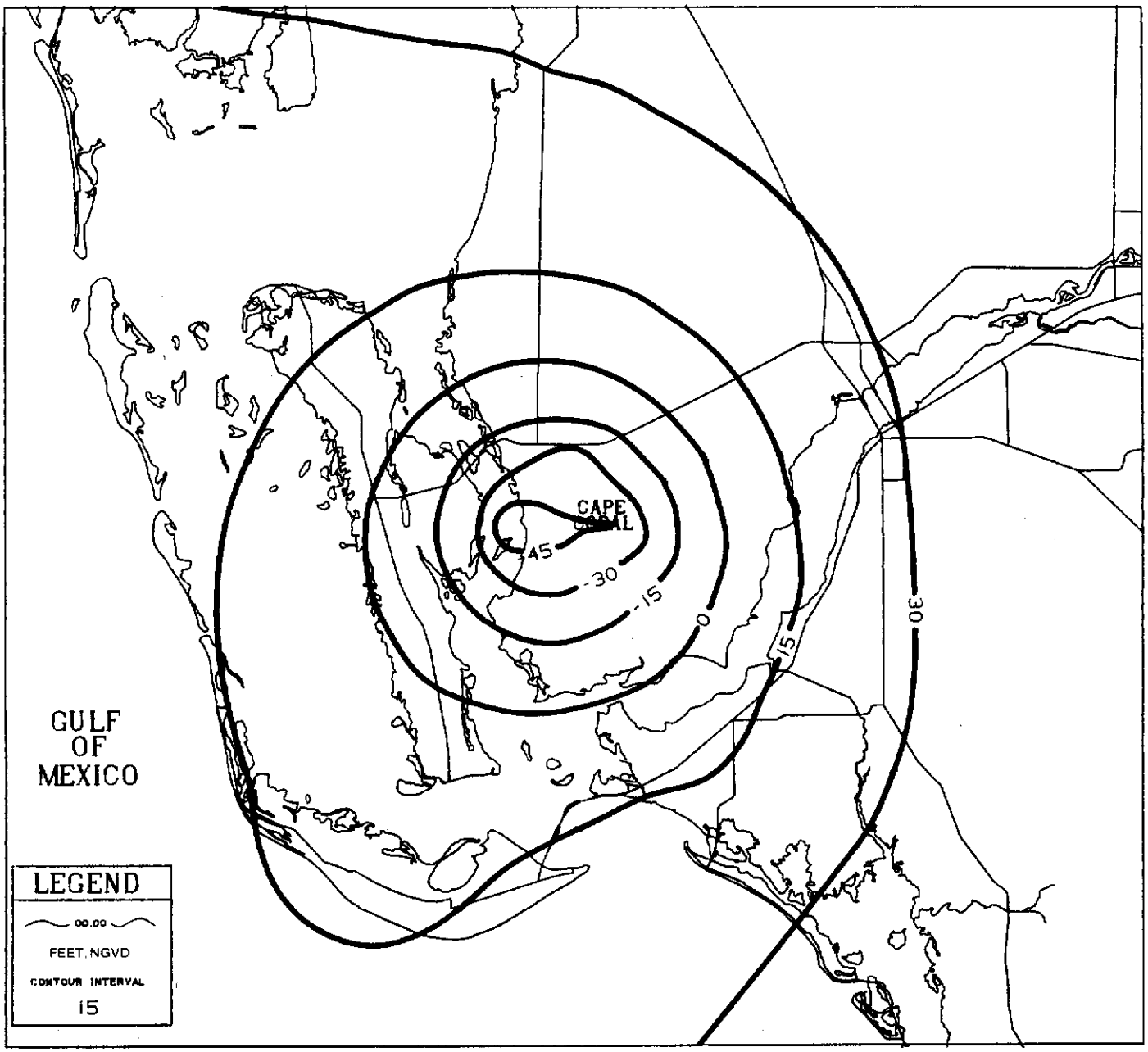
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1985 WET SEASON (DATA FROM LEE COUNTY DIVISION OF COMMUNITY DEVELOPMENT)



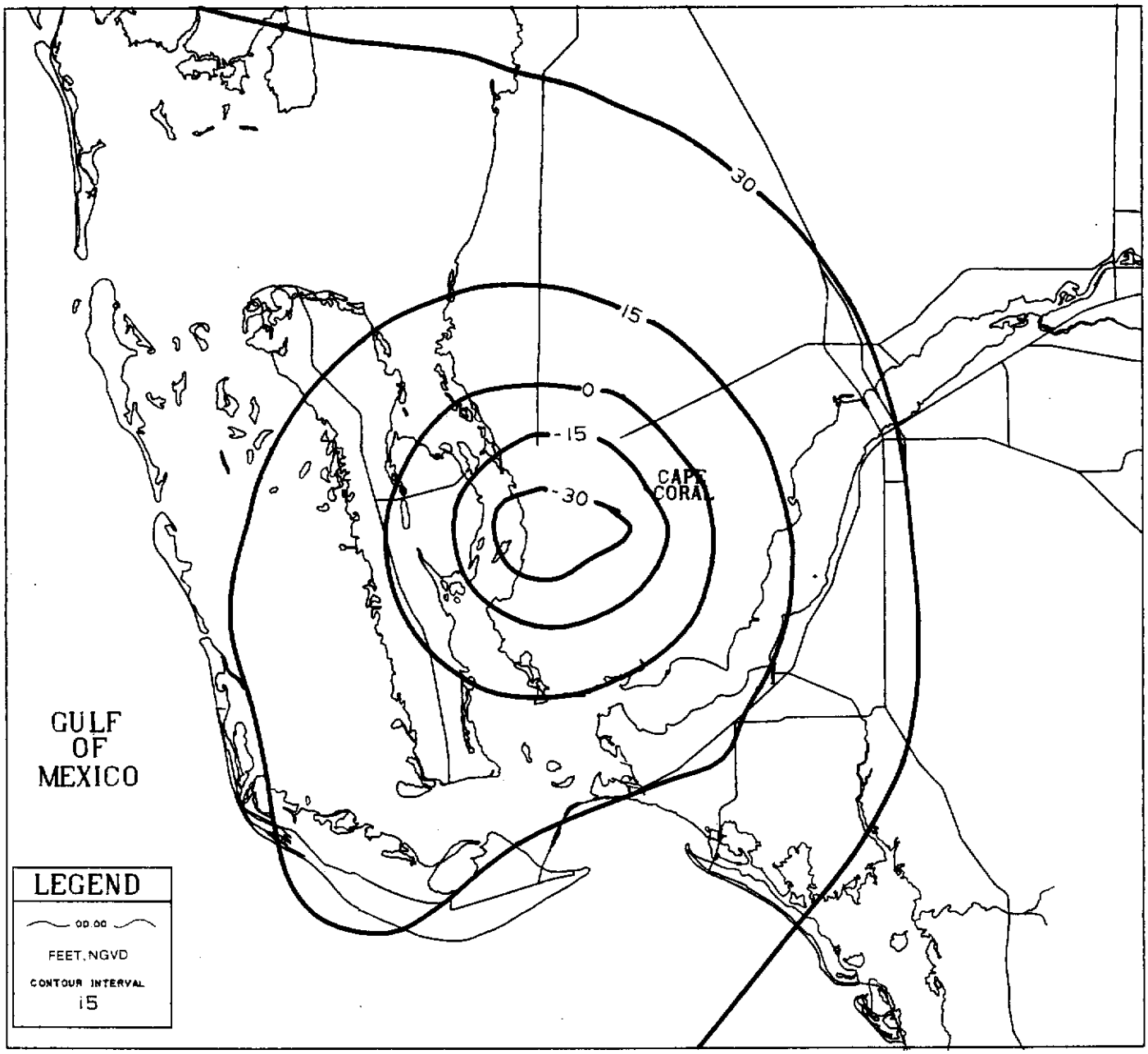
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1985 DRY SEASON (DATA FROM LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT 1982)



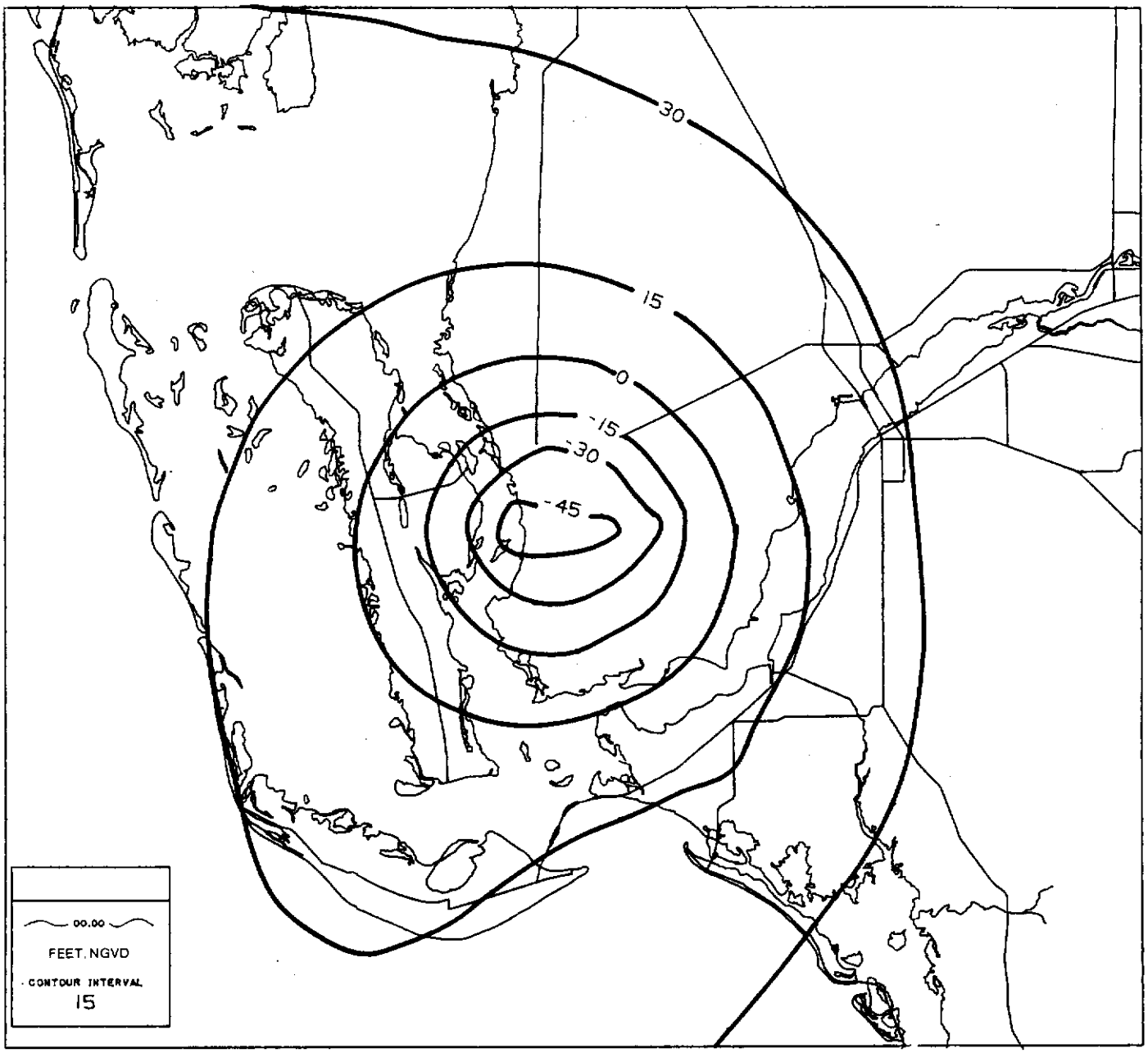
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1986 WET SEASON (DATA FROM LEE COUNTY DIVISION OF COMMUNITY DEVELOPMENT, 1982)



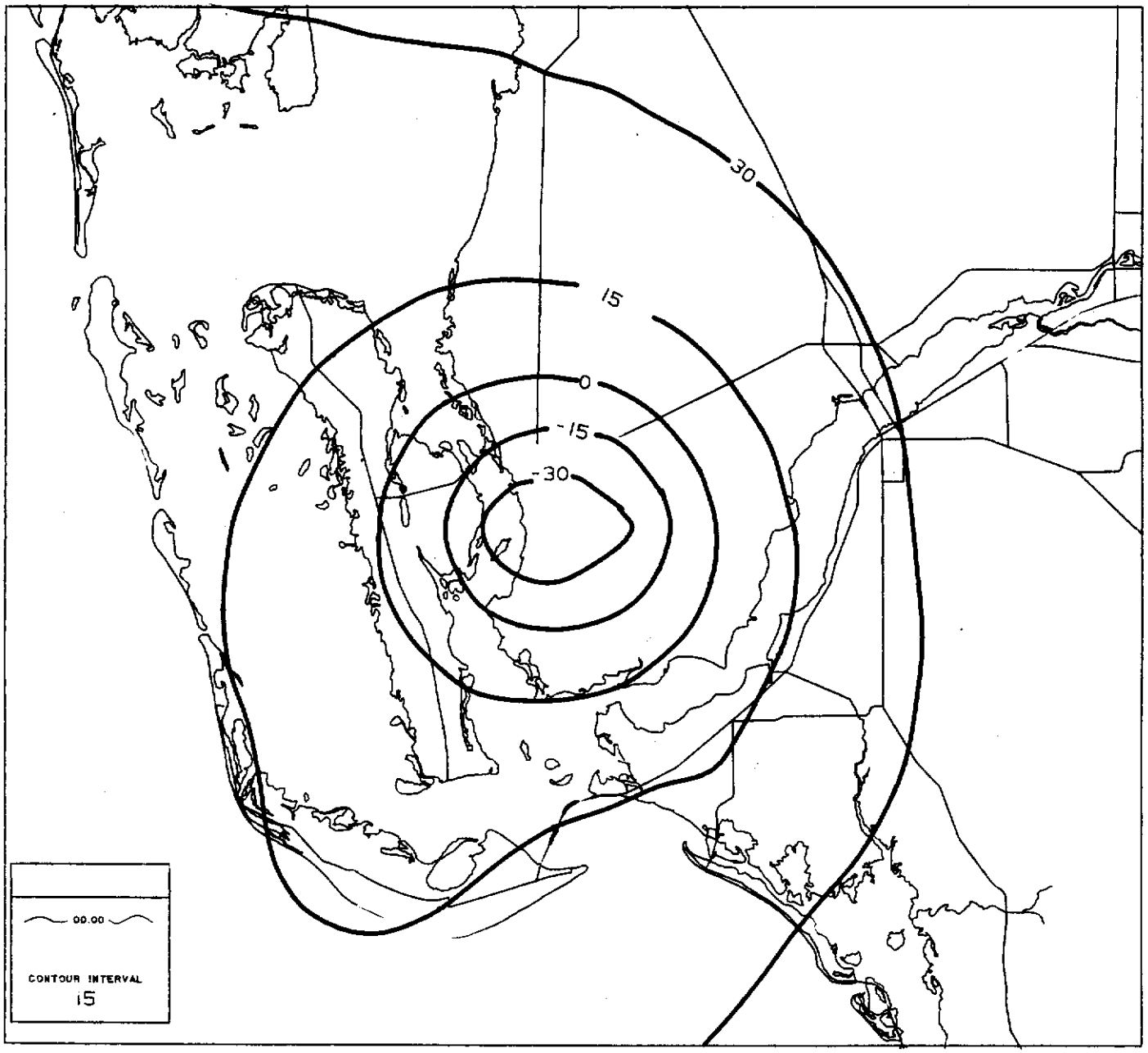
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1986 DRY SEASON (DATA FROM THE LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT 1982)



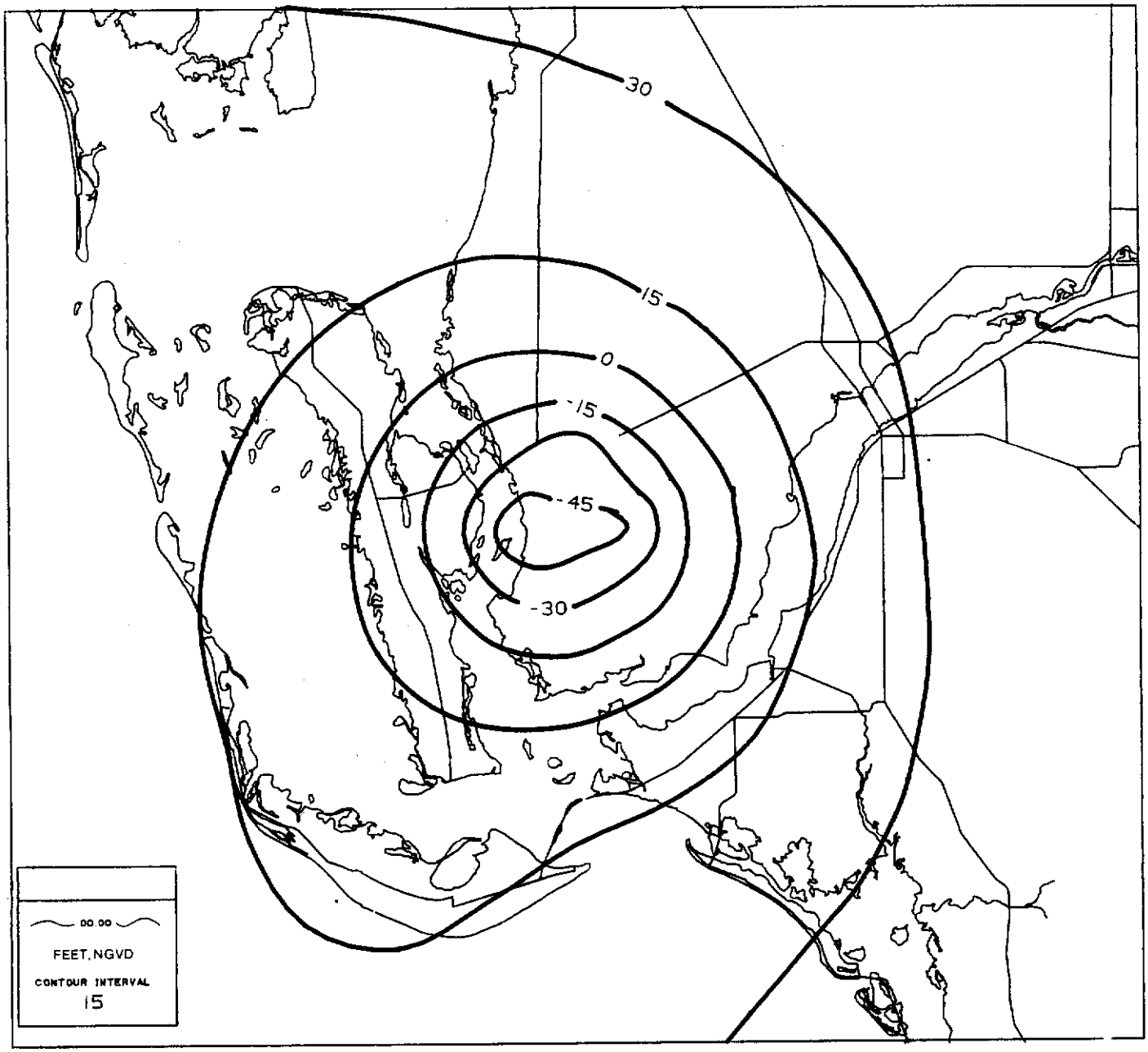
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1987 WET SEASON. (DATA FROM LEE COUNTY DIVISION OF COMMUNITY DEVELOPMENT, 1982)



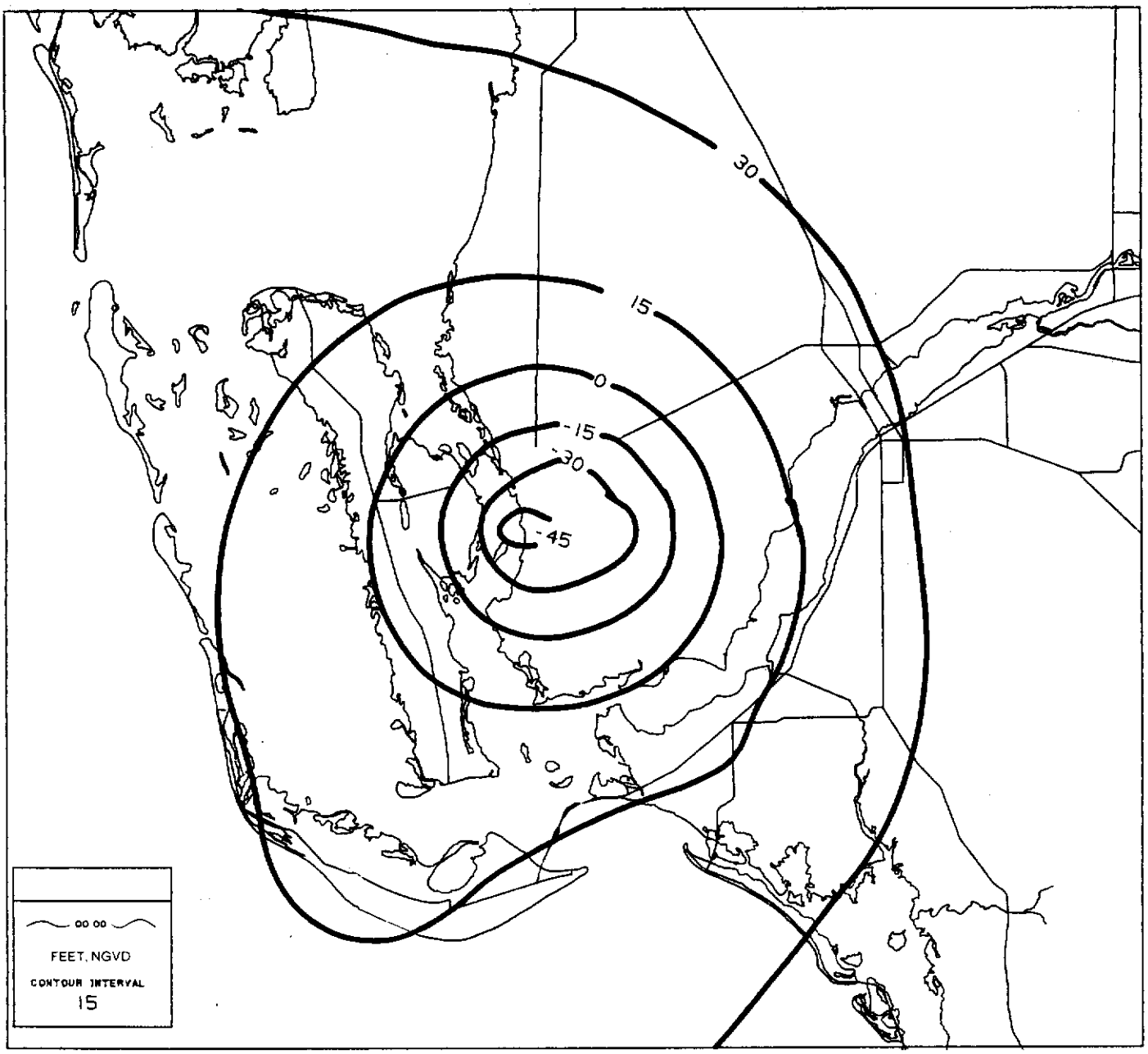
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1987 DRY SEASON (DATA FROM LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT, 1982)



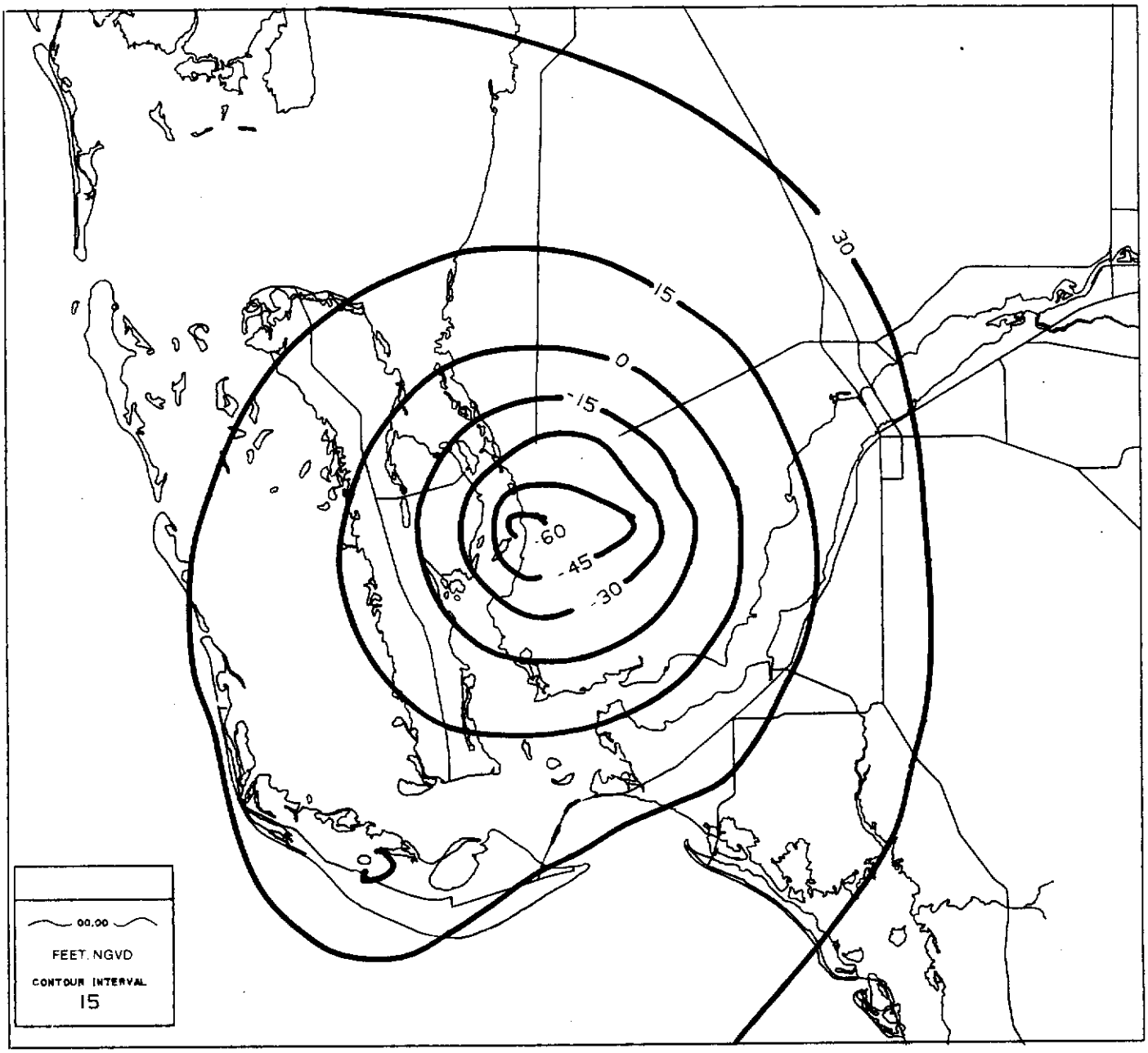
PROJECTED POTENTIOMETRIC SURFACE OF THE SURFACE OF THE LOWER HAWTHORN AQUIFER, 1988 WET SEASON (DATA FROM LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT, 1982)



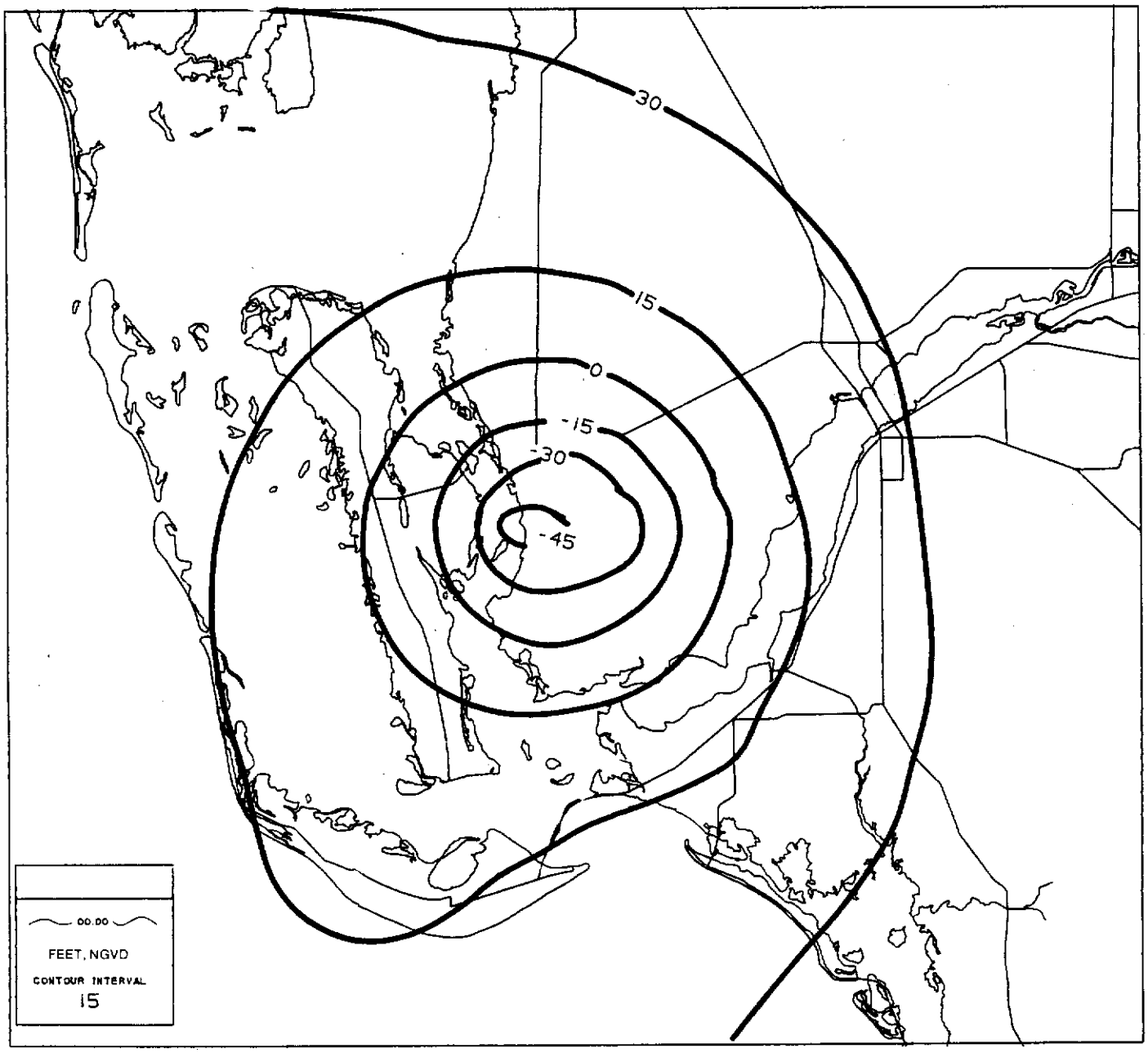
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1988 DRY SEASON (DATA FROM LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT, 1982)



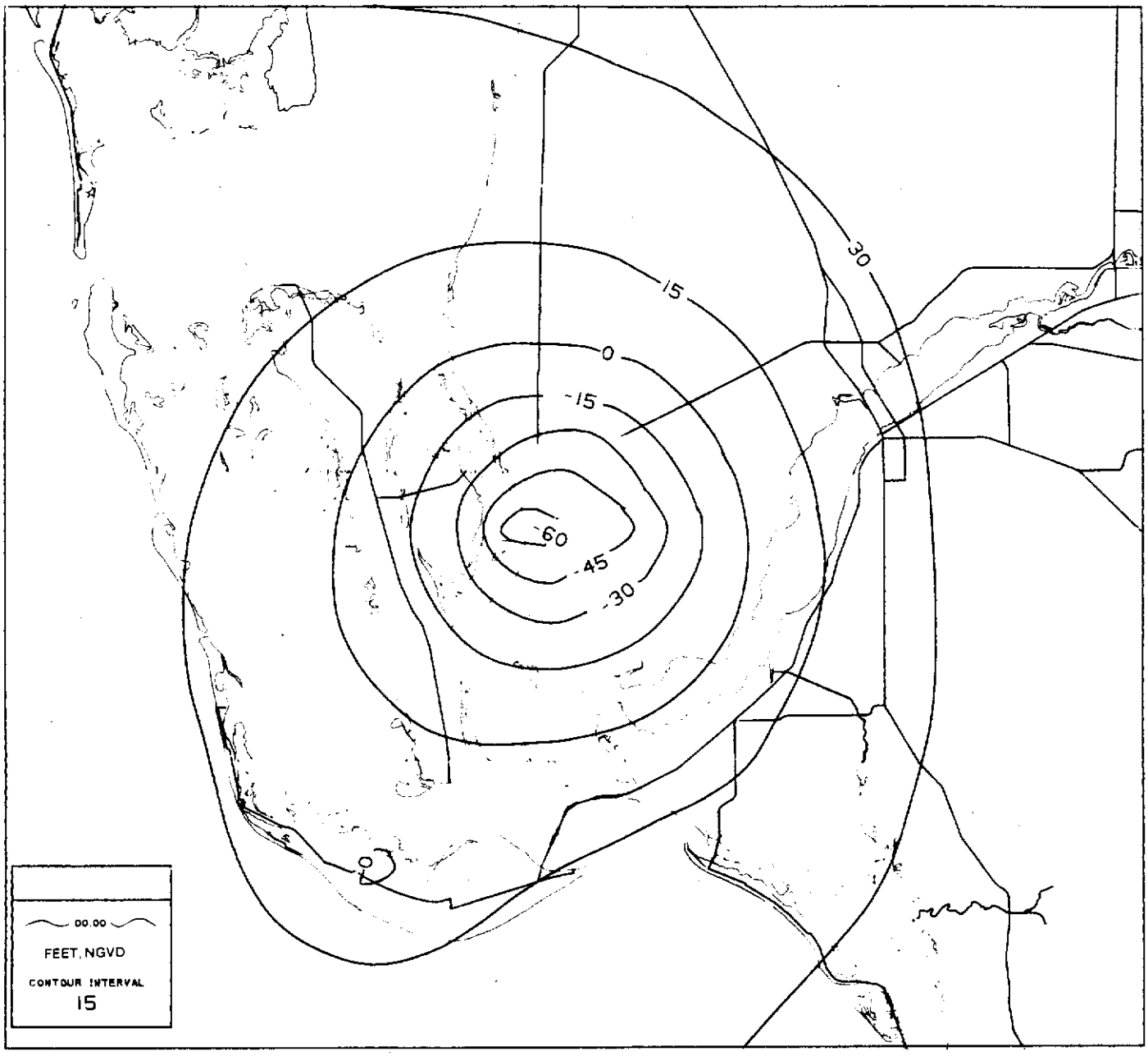
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1989 WET SEASON (DATA FROM LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT, 1982)



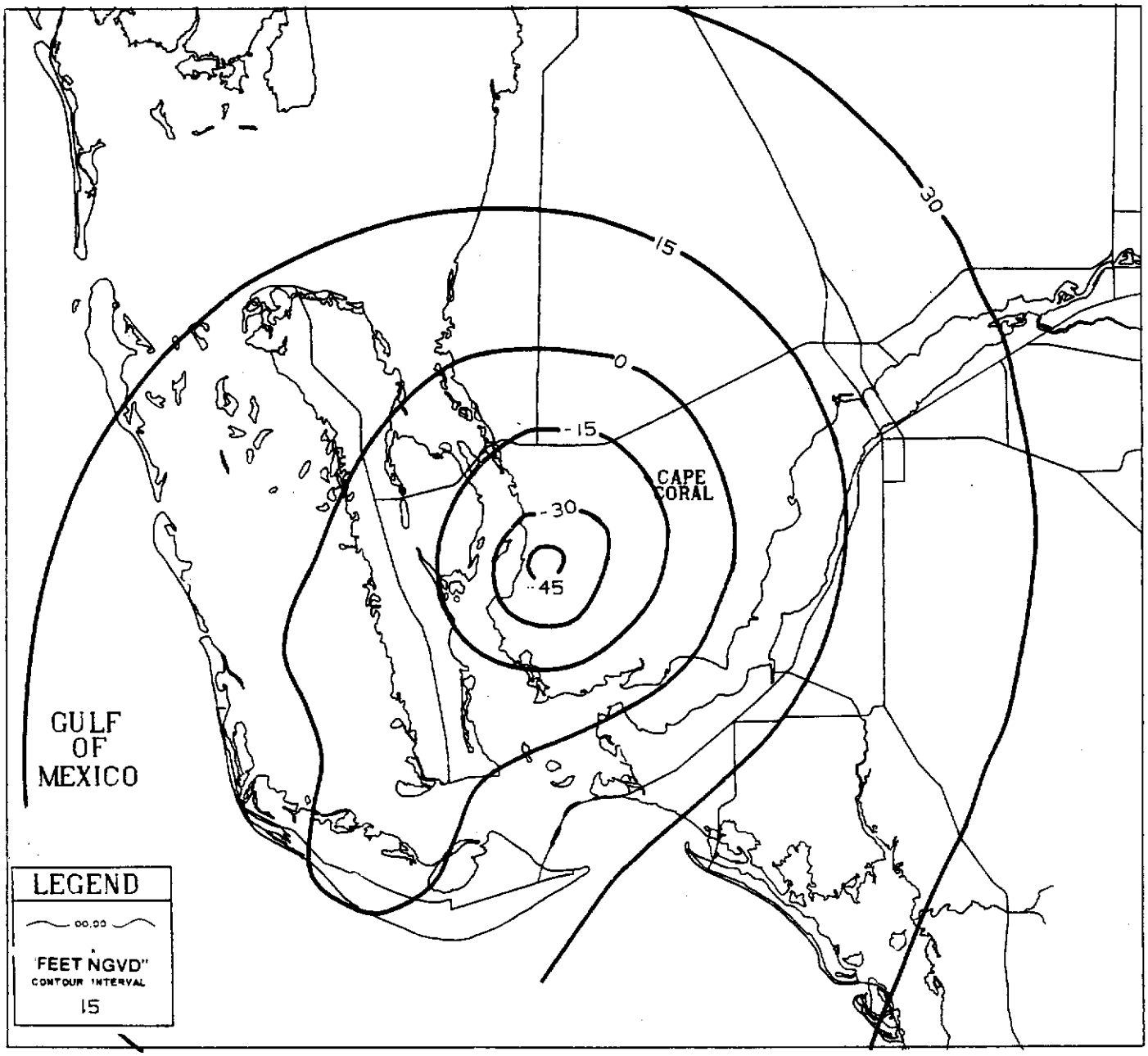
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1989 DRY SEASON (DATA FROM LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT, 1982)



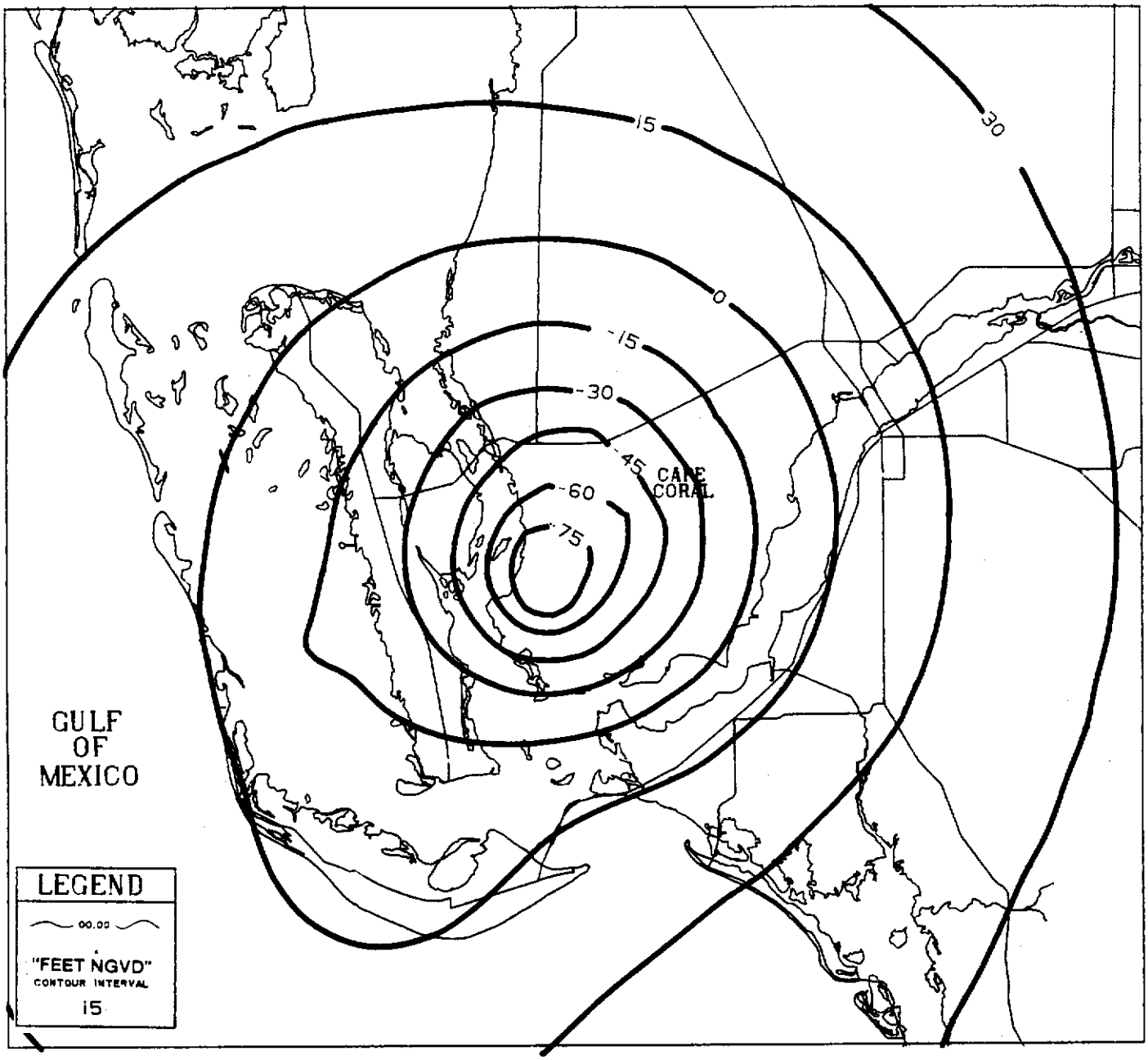
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1990 WET SEASON (DATA FROM LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT, 1982)



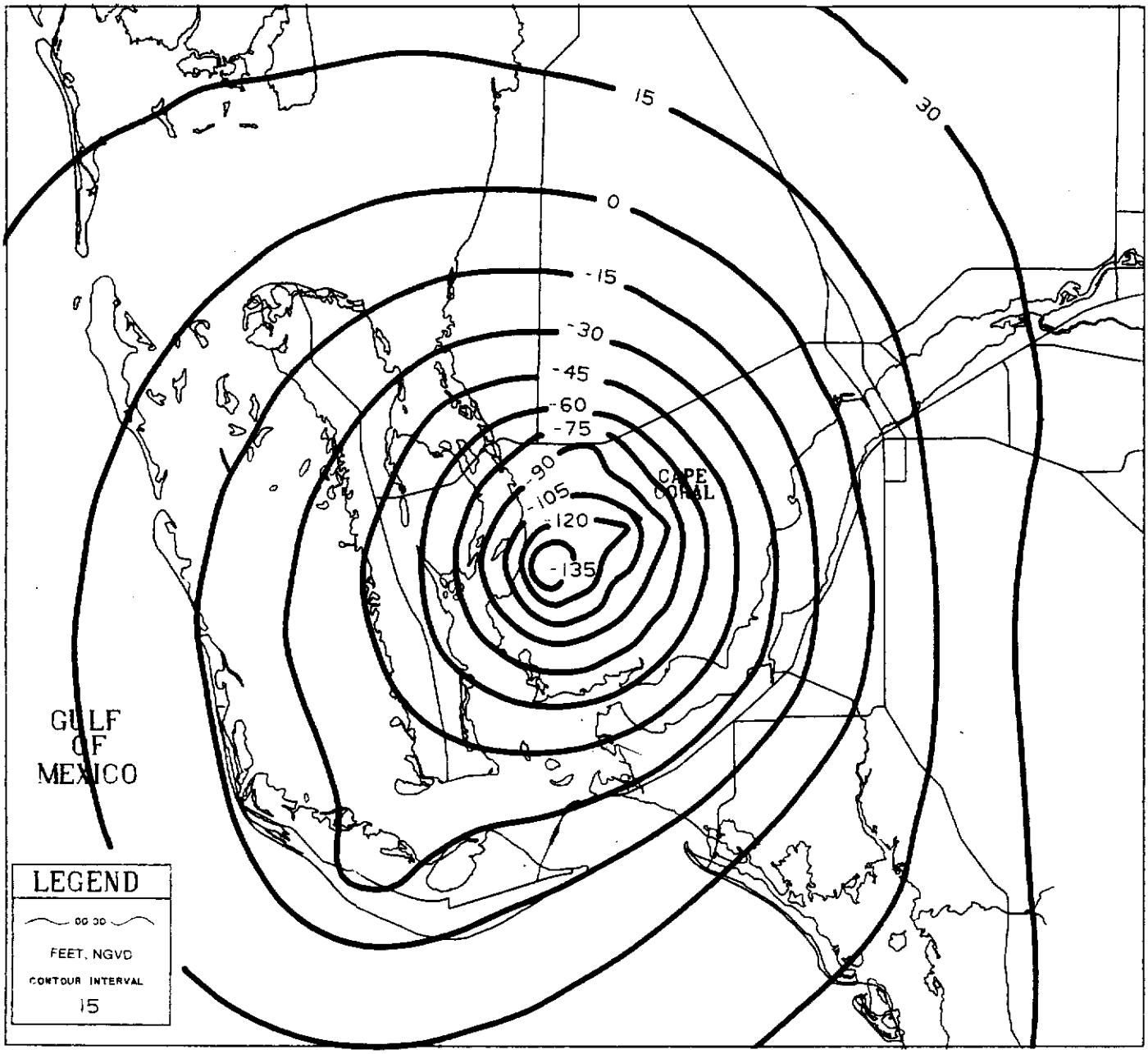
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1990 DRY SEASON (DATA FROM LEE COUNTY DIV. OF COMMUNITY DEVELOPMENT, 1982)



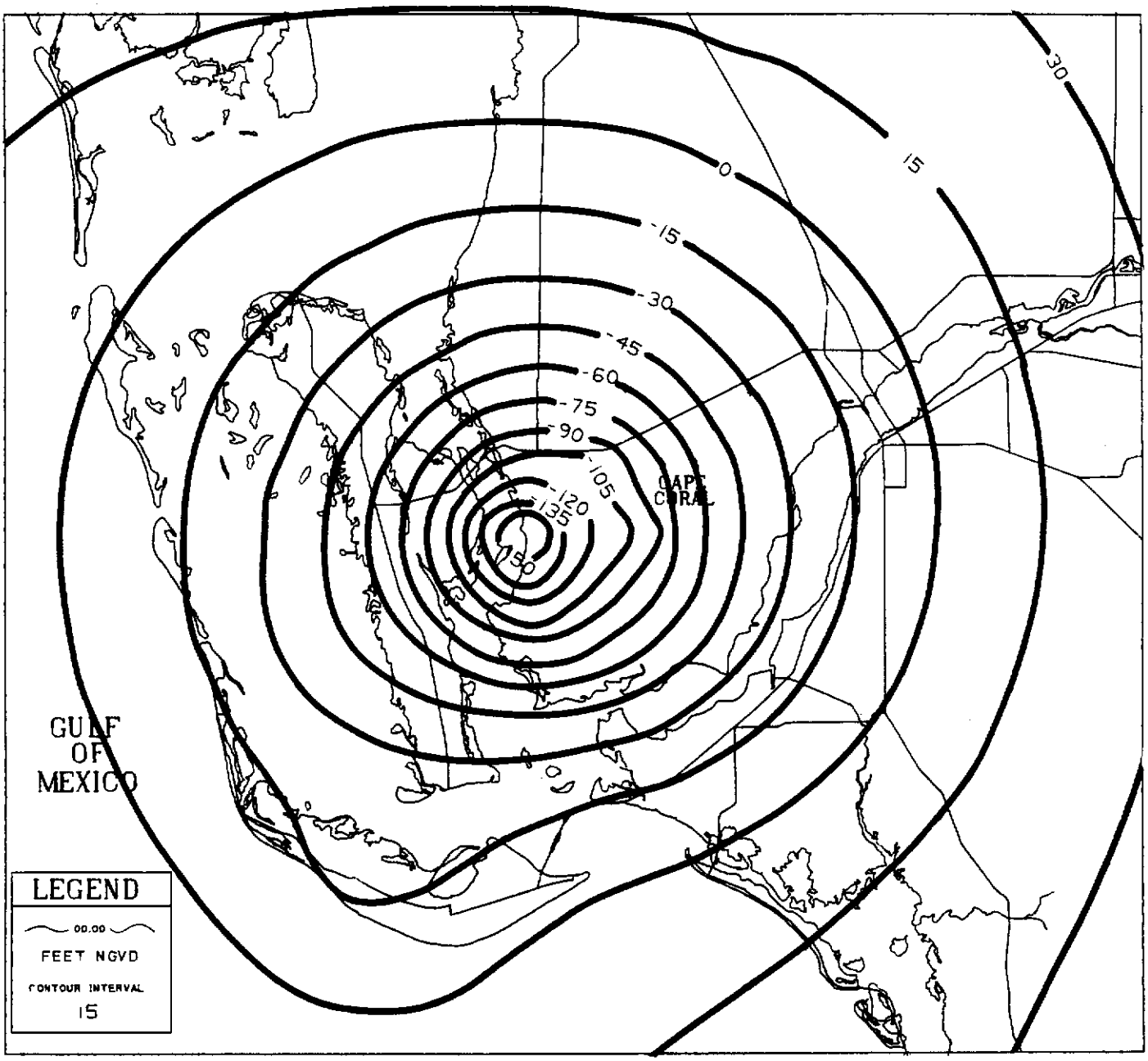
PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1995 (LCDCD, HIGH TRANSMISSIVITY AND REDUCED LEAKANCE)



PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 1995 (CCPD, HIGH TRANSMISSIVITY AND LOW LEAKANCE)



PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 2005
(LCDCD, HIGH TRANSMISSIVITY AND LOW LEAKANCE)



PROJECTED POTENTIOMETRIC SURFACE OF THE LOWER HAWTHORN AQUIFER, 2005
(CCPD, HIGH TRANSMISSIVITY AND LOW LEAKANCE)