# APT ANALYSIS

796200 955900

SITE: Tequesta Wellfield #3

Section 30 Township 40 S Range 43 E

REPORT: Evaluation of the Potential for Raw Water Supply Development for Village of Tequesta May 1981 Gee & Jenson

GEOLOGIC DATA: pg. ____, Appendix A

WELL NUMBER OF WELL DESCRIBED: D1-3

| DEPTH (LSD) | LITHOLOGY |
|---|---|
| 0-5 | sand, white, fine to v. fine, unconsol. |
| 5-20 | sand, white & brown, fine to v. fine |
| 20-25 | sand, white fine to v. fine w/ yellow silt clay |
| 25-35 | sand, white to lt. tan, fine to v. fine |
| 35-40 | limestone, tan, consol., biosparite, trace shell fragm. |
| 40-60 | limestone, lt gray, intramicrite, silt, v. fine grained, trace shell |
| 60-100 | shell, broken 70% silicasilt, lt gray |
| 100-115 | sand, white to dk gray fine to silty, shell fragm. |
| 115-150 | shell 70%, broken, sand 30% fine to silt size |

Producing zone interval: _____ (lsd) _____ (msl)

Aquifer name: _____

Static Water Level at the site is approximately _____ ft. msl.

WELL DESCRIPTIONS:

| Well | Diam. (in) | Total Depth | Cased Depth | Scr/Open Intervl | Slot Size | Radius |
|---|---|---|---|---|---|---|
| 8R | 10 | 70 | 50 | 50-70 | | 0 |
| S1-3 | 2 | 60 | 15 | 15-60 | | 100 |
| S2-3 | 2 | 70 | 20 | 20-70 | | 49.5 |
| S3-3 | 2 | 70 | 20 | 20-70 | | 177.4 |
| D1-3 | 2 | 97 | 80 | 80-97 | | 37.8 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

INFLUENCING FACTORS:

APT: pg. 26

Started: 8/15/80

Duration: 74 hours

Discharge: 950 gpm

Recovery: _____

Comments:

1) _____

_____

2) _____

_____

3) _____

_____

CONSULTANT'S ANALYSIS: pg. Table 6.2

Method: Boulton

Results:

| Well | Transmissivity (GPD/FT) | S or Sy | Leakance ( ) |
|---|---|---|---|
| S2-3 | 362,900 | — | |
| S1-3 | 766,090 | — | |
| S3-3 | 756,042 | $9.9 \times 10^{-4}$ | |

Comments: Partial penetration effects not accounted for

Method: _____

Results:

| Well | Transmissivity (GPD/FT) | S or Sy | Leakance ( ) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

Comments: _____

Method: _____

Results:

| Well | Transmissivity (GPD/FT) | S or Sy | Leakance ( ) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

Comments: _____

Tequesta Wellfield 2 | APT | Well D1-2

## Neuman Analysis

$Q = 460$ gpm
$r = 25'$ ✓
$b = 120'$
$\beta = .004$

✓ $t = 1$ min  $t_s = 410$ ✓
✓ $s = 1$ ft  $s_d = 25$ ✓

$$T = \frac{114.6\, Q\, s_d}{s}$$

$$= \frac{(114.6)(460)(25)}{1}$$

$$= 1,317,900 \text{ GPD/FT} \checkmark$$

$$S = \frac{T t}{2693 r^2 t_s}$$

$$= \frac{(1317900)(1)}{(2693)(25^2)(410)}$$

$$= 1.91 \times 10^{-3} \checkmark$$

$$K_h = T/b$$

$$= 1317900/120$$

$$= 10,982 \text{ GPD/FT}^2 \checkmark$$

$$K_d = \beta b^2/r^2$$

$$= \frac{(.004)(120^2)}{(25^2)}$$

$$= .092 \checkmark$$

$$K_v = K_h K_d$$

$$= (10982)(.092)$$

$$= 1012.1 \text{ GPD/FT}^2 \checkmark$$

Tequesta Wellfield #2 APT Well DI-2

Streltsova Analysis

$t = 375$ $\quad W = 1$

$s = 3.6$ $\quad \theta = 104$

$Q = 460$

$r = 25$

$b = 120$

$l' = .6$

$y' = .6$

$\rho' = .5$

$$T = \frac{WQ}{4\pi l' s} \times 1440$$

small r

$$= \frac{(1)(460)}{(4)(\pi)(.6)(36)} \times 1440$$

$$= 16.94 \times 1440 = 24,403$$

$$S = \frac{4Tt}{\theta r^2}$$

$$= \frac{(4)(16.94)(375)}{(10^4)(25^2)}$$

$$= 4.06 \times 10^{-3}$$

$K_h = 24403/120$

$= 203.36$

$\rho = \rho' b$

$= (.5)(120)$

$= 60$

$\rho = \sqrt{K_v/K_h}$ r

$\frac{60}{25} = \sqrt{K_v/K_h}$

$K_v/K_h = 5.76$

$K_v = (K_h)(K_v/K_h)$

$= (203.36)(5.76)$

$= 1171.35$

WMD TAPENO 6153 PLOT NO 0050
USER NO NELMS DATE 86/04/24 TIME 16:23

OBSERVATION WELL: D1-2, WELLFIELD #2
R= 25 Q= 460

p=.5

rule OK

DRAWDOWN IN FEET

1 TENTHS 1 1 TENS 1 HUNDREDS 1 THOUSANDS 1 TEN THOUSANDS 1

TIME IN MINUTES

VILLAGE OF TEQUESTA

Tequesta APT | Well OI-5

## Neuman Analysis

$Q = 217$ gpm
$r = 24'$
$b = 120'$
$\beta = .2$

$t = 1$ $\quad t_s = 24$ ✓
$s = 1$ $\quad s_d = 5.6$

$$T = \frac{114.6 Q s_d}{s}$$

$$= \frac{(114.6)(217)(5.6)}{1}$$

$$= 139{,}262 \text{ gpd/ft}$$

match questionable ?.?

$$S = \frac{Tt}{2693 r^2 t_s}$$

$$= \frac{(139{,}262)(1)}{(2693)(24^2)(24)}$$

$$= 3.7 \times 10^{-3}$$

$$S_y = \frac{C_2 T t}{r^2 t_y}$$

$$= \frac{.1337(139{,}262)(1)}{(24)^2 (.024)}$$

$$= \frac{18619}{13824}$$

$$= 1347.$$

$$K_h = T/b$$

$$= 139262/120$$

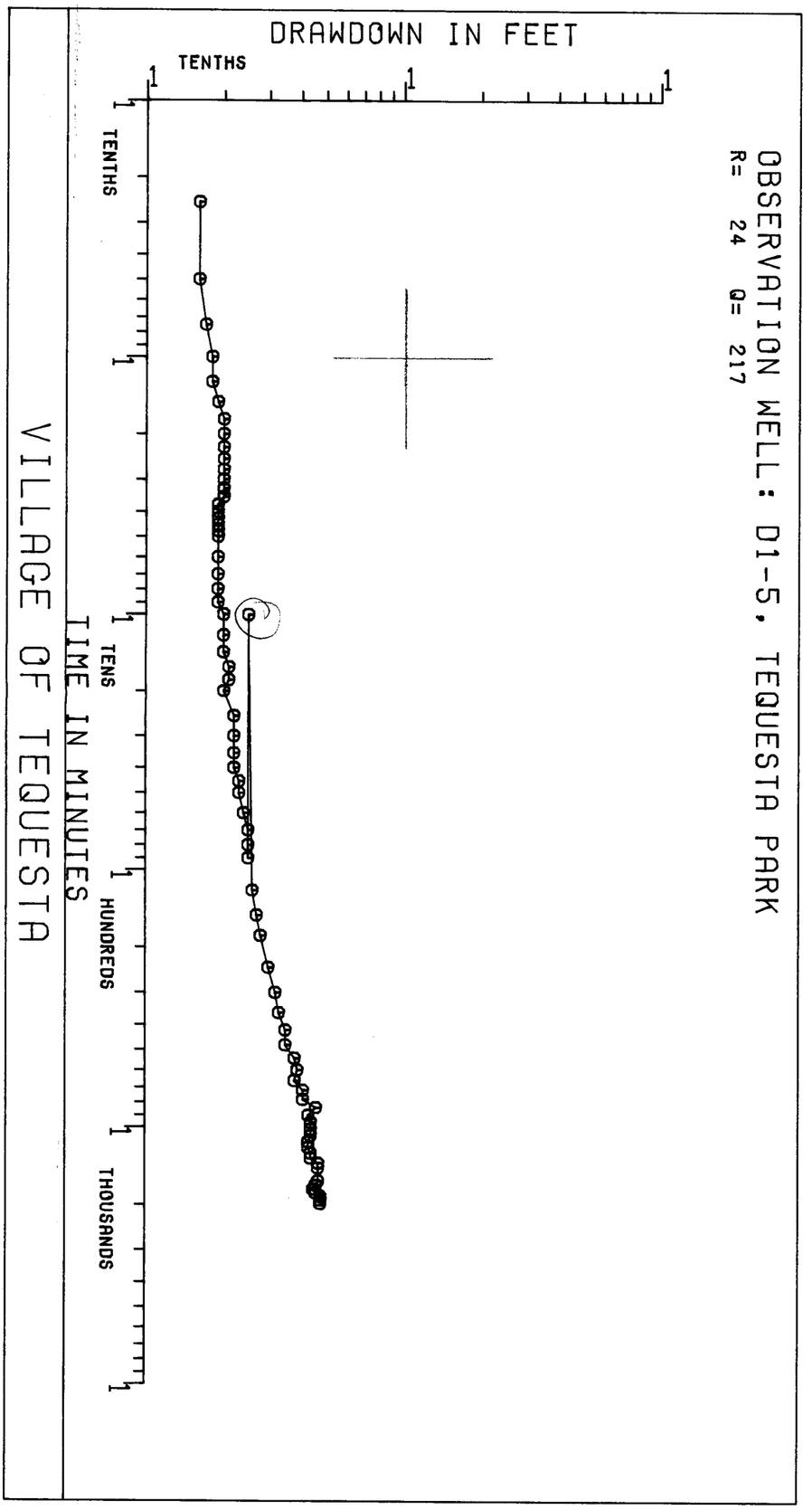
$$= 1161$$

$$K_d = \beta b^2 / r^2$$

$$= \frac{(.2)(120^2)}{(24^2)}$$

$= 5??$

WMD TAPENO 6265 PLOT NO 0349
USER NO NELMS DATE 86/05/05 TIME 12:52



Tequesta Wellfield #2 APT Well S2-2

Streltsova Analysis

$Q = 460$ gpm
$r = 103'$
$b = 120'$
$l' = .6$
$v' = .6$
$\beta' = .3$

$t = 1050$ $W = 1$
$S = .28$ $\theta = 10^4$

$$T = \frac{WQ}{4\pi l's} \times 1440$$

$$= \frac{(1)(460)}{(4)(\pi)(.6)(.28)} \times 1440$$

$$= 217.89 \times 1440 = 313,763$$

$$S = \frac{4Tt}{\theta r^2}$$

$$= \frac{(4)(217.89)(1050)}{(10^4)(103^2)}$$

$$= 8.6 \times 10^{-3}$$

$K_h = T/b$
$= 313763/120$
$= 2614.7$

$\rho = \rho' b$
$= (.3)(120)$
$= 36$

$\rho = \sqrt{K_v/K_h}\, r$

$K_v = (K_h)(K_v/K_h)$
$= (2614.7)(.9)$
$= 235.3$

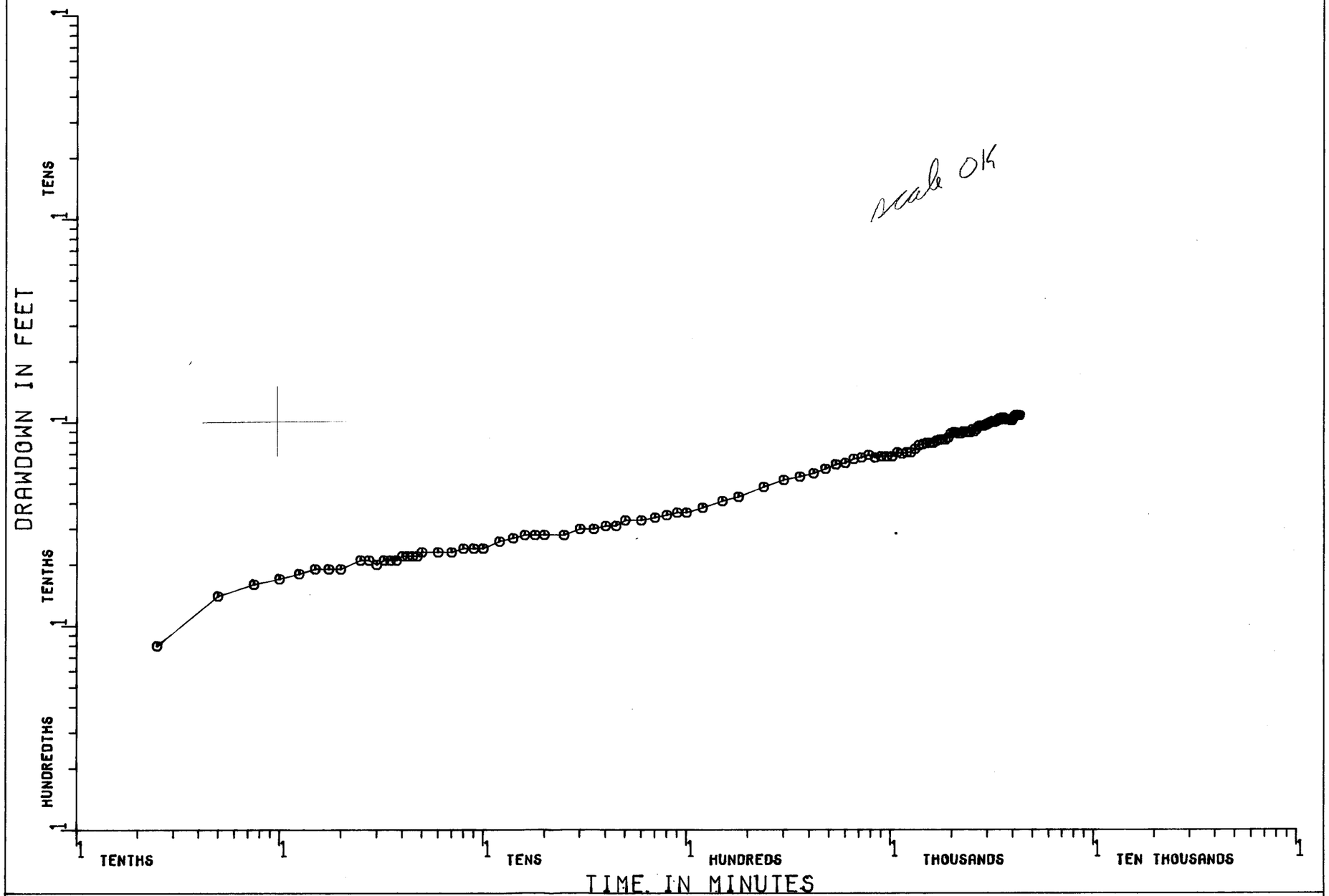
$\frac{36}{120} = \sqrt{K_v/K_h}$

$K_v/K_h = .09$

$p' = .3$

OBSERVATION WELL: S2-2, WELLFIELD #2
R= 103 Q= 460

scale OK




VILLAGE OF TEQUESTA

WMD TAPENO 6153 PLOT NO 0021
USER NO NELMS DATE 86/04/24 TIME 16:22

Tequesta Wellfield #2 Well S3-2

## Neuman Analysis

✓ $t$ = 1 min ✓ $S_d$ = 1.1
✓ $s$ = 1 ft ✓ $t_s$ = 3.3

$Q$ = 460 gpm ✓
$r$ = 194' ✓
$b$ = 120'
$\beta$ = .4

$$T = \frac{114.6\, Q S_d}{s}$$

$$= \frac{(114.6)(460)(1.1)}{1}$$

$$= 57{,}988 \text{ GPD/FT} \checkmark$$

match very questionable

$$S = \frac{Tt}{2693\, r^2 t_s}$$

$$= \frac{(57988)(1)}{(2693)(194^2)(3.3)}$$

$$1.7 \times 10^{-4} \checkmark$$

$$S_y = \frac{C_2 T t}{r^2 t_y}$$

$$= \frac{.1337(57988)(1)}{(194^2)(.033)}$$

$$= \frac{7753}{1242}$$

$$= 6.2$$

$$K_h = T/b$$

$$= 57988/120$$

$$= 483.2 \text{ GPD/FT}^2 \checkmark$$

$$K_d = \beta b^2/r^2$$

$$= \frac{(.4)(120^2)}{194^2}$$

$$= .15 \checkmark$$

$$K_z = K_h K_d$$
$$= (483.2)(.15)$$
$$= 73.9 \text{ GPD/FT}^2 \checkmark$$

Poor Match (1)

Tequesta Wellfield | #2 | Well S3-2

## Streltsova Analysis

$Q = 460$ gpm
$r = 194'$
$b = 120'$
$l' = .6$
$y' = .6$
$\rho' = 1.5$ ?

match extremely questionable

$t = 4900$ $\quad W = 1$
$s = 1.1$ $\quad \theta = 10^{-4}$

$$T = \frac{WQ}{4\pi l' s} \times 1440$$

$$= \frac{(1)(460)}{(4)(\pi)(.6)(1.1)} 1440$$

$$= 55.46 \times 1440 = 79,867$$

$$S = \frac{4Tt}{\theta r^2}$$

$$= \frac{(4)(55.46)(4900)}{(10^{-4})(194^2)}$$

$$= 2.9 \times 10^{-3}$$

$$K_h = T/b$$
$$= 79867/120$$
$$= 665.6$$

$$\rho = \rho' h$$
$$= (1.5)(120)$$
$$= 180$$

$$\rho = \sqrt{K_v/K_h}\, r$$

$$\frac{180}{194} = \sqrt{K_v/K_h}$$

$$K_v/K_h = .86$$

$$K_v = (K_h)(K_v/K_h)$$
$$= (665.6)(.86)$$
$$= 573.0$$

$\rho = 1.5$

scale OK

WMD TAPENO 6153 PLOT NO 0047
USER NO NELMS DATE 86/04/24 TIME 16:23

OBSERVATION WELL: S3-2, WELLFIELD #2
R= 194 Q= 460

DRAWDOWN IN FEET

HUNDREDTHS TENTHS 1 TENS 1

TENTHS 1 TENS 1 HUNDREDS 1 THOUSANDS 1 TEN THOUSANDS 1

TIME IN MINUTES

VILLAGE OF TEQUESTA

Tequesta Wellfield 2 APT Well S2-2

## Neuman Analysis

$Q = 460$ gpm
$r = 103'$ ✓
$b = 120'$
$\beta = .001$

✓ $t = 1$ min ✓ $Sd = 22$
✓ $S = 1$ ft ✓ $t_s = 100$

$$T = \frac{114.6\,Q\,Sd}{S}$$

$$= \frac{(114.6)(460)(22)}{1}$$

$= 1,159,752$ GPD/FT ✓ (155,047 FT²/DAY)

$$S = \frac{T t}{2693 r^2 t_s}$$

$$= \frac{(1159752)(1)}{(2693)(103^2)(100)}$$

$= 4.06 \times 10^{-4}$ ✓

$K_h = T/b$
$= 1157952/120$
$= 9649.6$ GPD/FT² ✓ (1290 FT/DAY)

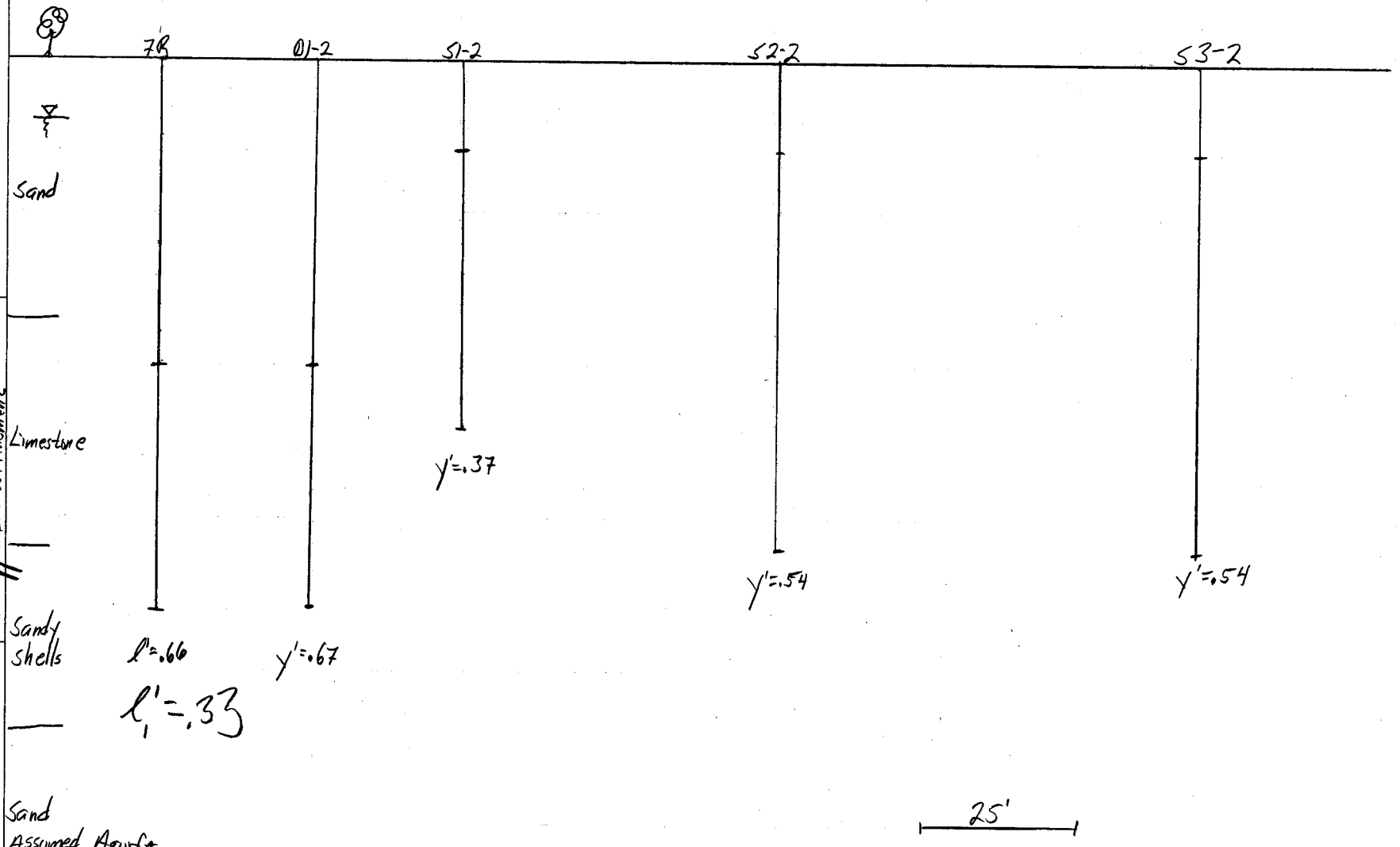
$K_d = \beta b^2/r^2$
$= \frac{(.001)(120^2)}{(103^2)}$
$= .001$ ✓

$K_z = K_h K_d$
$= (9649.6)(.0013)$
$= 13.09$ GPD/FT² ✓ (1.75 FT/DAY)

Poor Match (1) Points after 10 min. didn't fit, curve never leveled

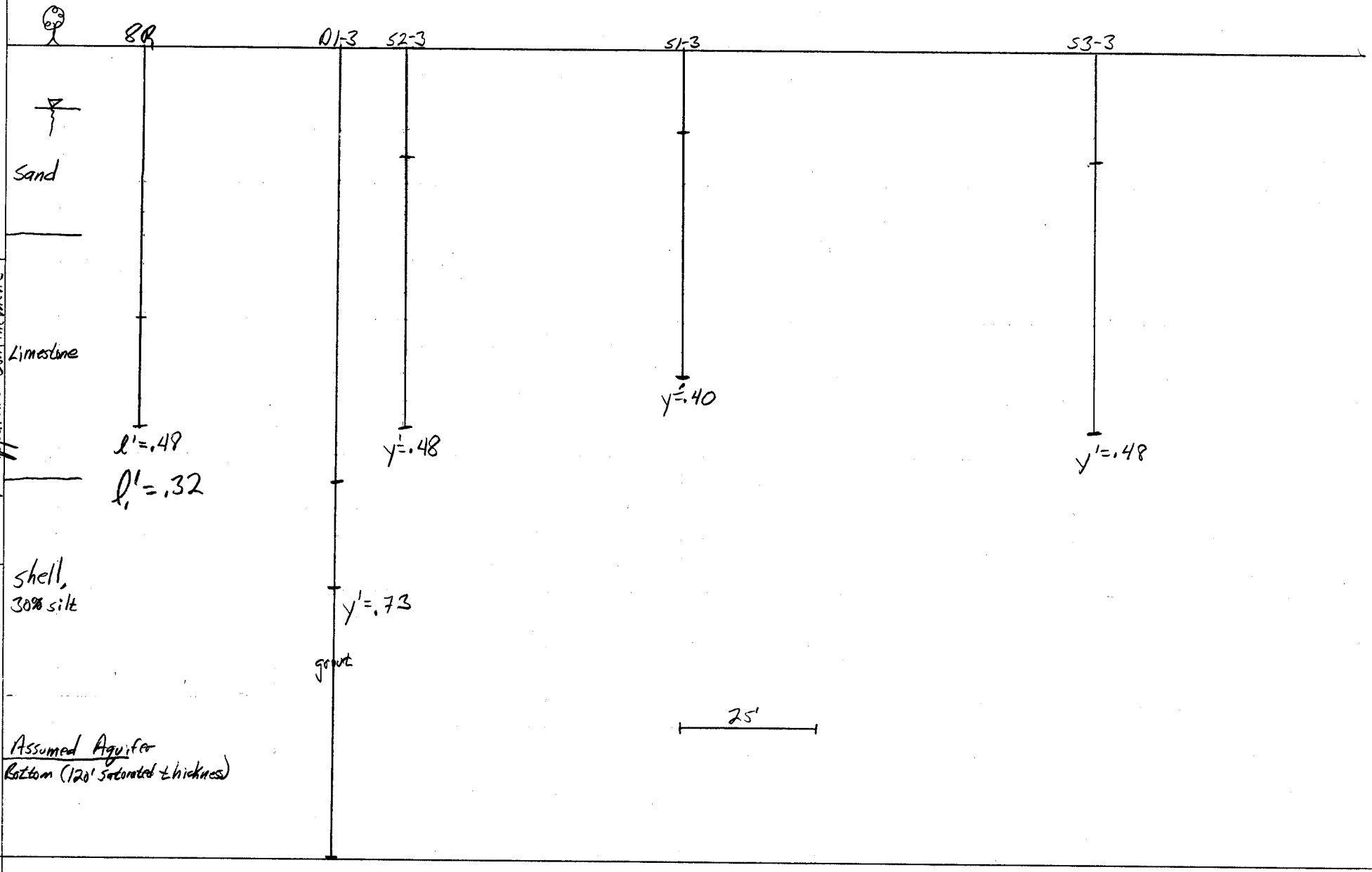
# Tequesta APT - Wellfield #2

Q = 450 gpm  t = 72 hours



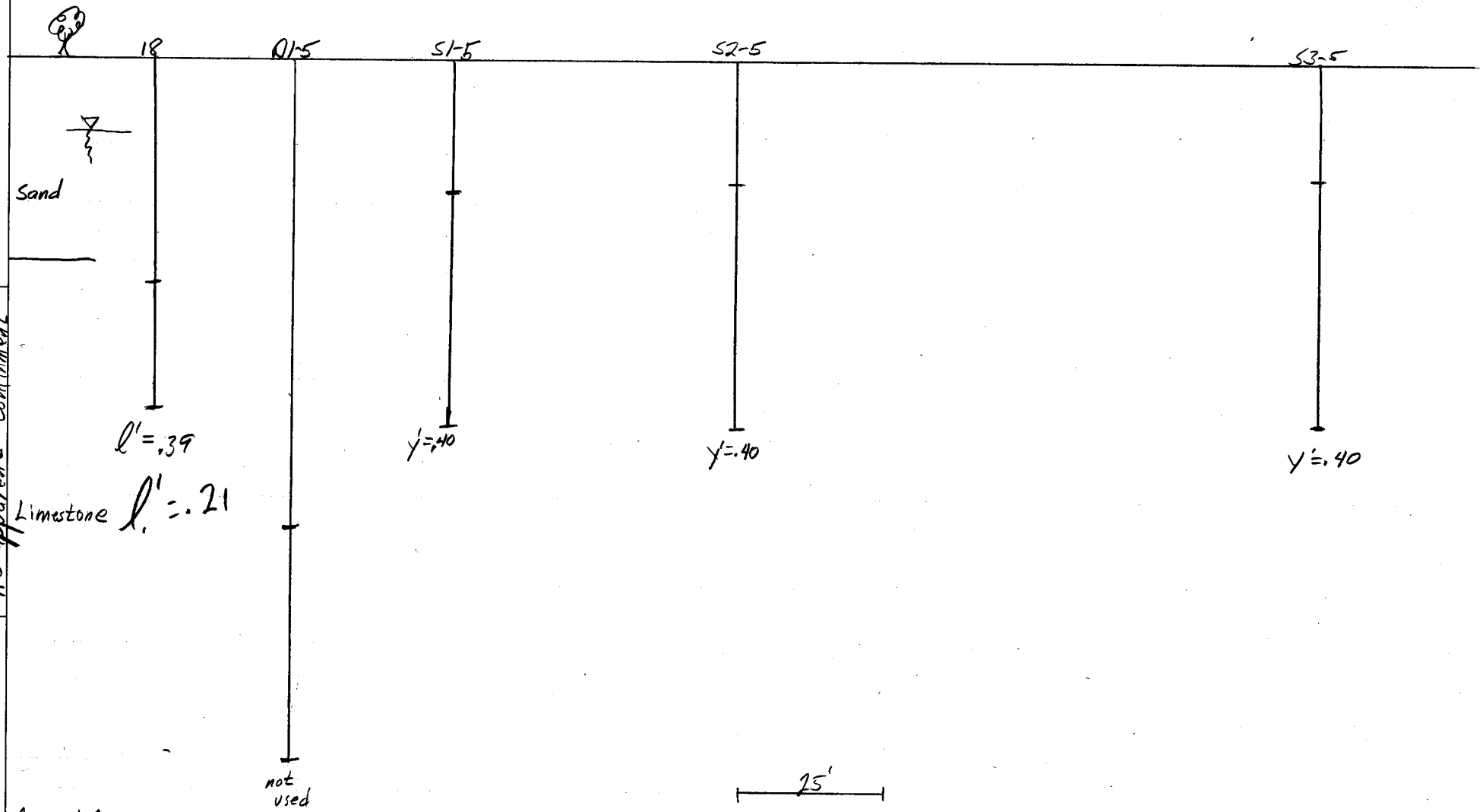
# Tequesta APT. Wellfield #3

$Q = 460$ gpm  $t = 72$ hours



Tequesta APT - Wellfield #5

Q = 218 GPM, t = 36 hours



Tequesta

BOULTON TO NEUMAN
Wellfield 2 Obs. Well S1-2
INPUT DATA:

AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 48.5 FT
TRANSMISSIVITY = 290957 GPD/FT
SPECIFIC YIELD = .02
ALPHA = 0
r/B = .2

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 1454.785 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 235.069 (GPD/FT2)
ANISOTROPY RATIO = .1615833 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 2 Obs. Well S2-2
INPUT DATA:

AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 103 FT
TRANSMISSIVITY = 361187 GPD/FT
SPECIFIC YIELD = .06
ALPHA = 0
r/B = .6

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 1805.935 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 674.8705 (GPD/FT2)
ANISOTROPY RATIO = .3736959 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 2 Obs. Well S3-2
INPUT DATA:

AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 194.5 FT
TRANSMISSIVITY = 402863 GPD/FT
SPECIFIC YIELD = .07
ALPHA = 0
r/B = 1.5

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 2014.315 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 1523.493 (GPD/FT2)
ANISOTROPY RATIO = .756333 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 2 Obs. Well D1-2
INPUT DATA:

AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 25 FT
TRANSMISSIVITY = 133263 GPD/FT
SPECIFIC YIELD = .3
ALPHA = 0
r/B = .1

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 666.315 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 93.28747 (GPD/FT2)
ANISOTROPY RATIO = .1400051 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 3 Obs. Well S1-3
INPUT DATA:

AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 100.4 FT
TRANSMISSIVITY = 766090 GPD/FT
SPECIFIC YIELD = .011
ALPHA = 0
r/B = .4

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 3830.45 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 632.348 (GPD/FT2)
ANISOTROPY RATIO = .1650845 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 3 Obs. Well S2-3
INPUT DATA:

AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 49.5 FT
TRANSMISSIVITY = 362900 GPD/FT
SPECIFIC YIELD = .03
ALPHA = 0
r/B = .1

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 1814.5 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 64.7993 (GPD/FT2)
ANISOTROPY RATIO = 3.571193E-02 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 3 Obs Well S3-3
INPUT DATA:

AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 177.45 FT
TRANSMISSIVITY = 756042 GPD/FT
SPECIFIC YIELD = .31
ALPHA = 0
r/B = 1

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 3780.21 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 1428.513 (GPD/FT2)
ANISOTROPY RATIO = .3778924 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 3 Obs. Well D1-3
INPUT DATA:

AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 37.8 FT
TRANSMISSIVITY = 435480 GPD/FT
SPECIFIC YIELD = .41
ALPHA = 0
r/B = .1

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 2177.4 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 133.3455 (GPD/FT2)
ANISOTROPY RATIO = .0612407 (GPD/FT2)

BOULTON TO NEUMAN

/NPUT DATA:
AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 51.5 FT
TRANSMISSIVITY = 227116 GPD/FT
SPECIFIC YIELD = .17
ALPHA = 0
r/B = .4

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 1135.58 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 712.4871 (GPD/FT2)
ANISOTROPY RATIO = .6274213 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 5 Obs. Well S2-5
INPUT DATA:
AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 99.8 FT
TRANSMISSIVITY = 185058 GPD/FT
SPECIFIC YIELD = .17
ALPHA = 0
r/B = 1

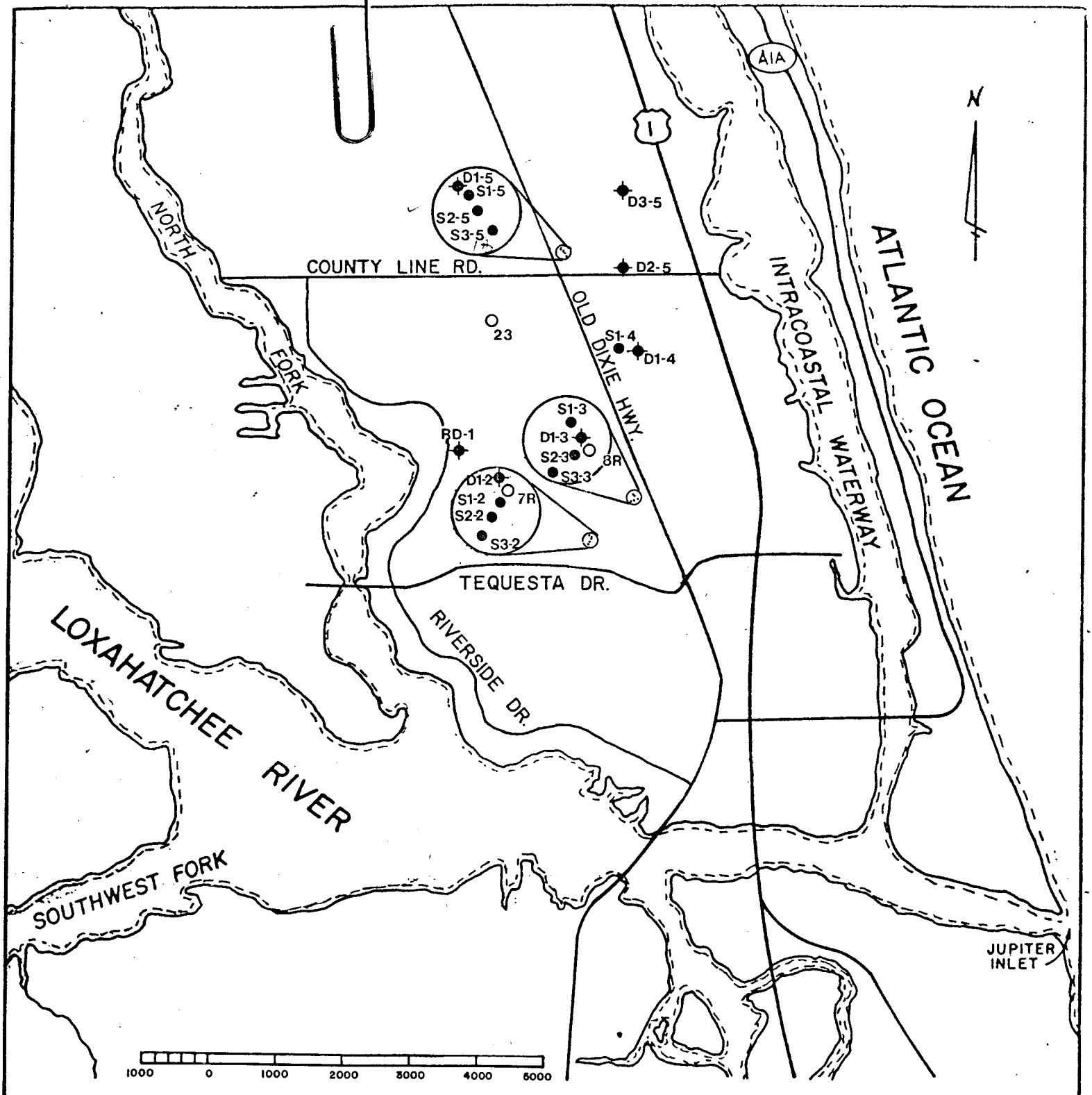
RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 925.29 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 1105.445 (GPD/FT2)
ANISOTROPY RATIO = 1.194701 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 5 Obs. Well S3-5
INPUT DATA:
AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 194.7 FT
TRANSMISSIVITY = 297414 GPD/FT
SPECIFIC YIELD = .2
ALPHA = 0
r/B = 1.5

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 1487.07 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 1122.411 (GPD/FT2)
ANISOTROPY RATIO = .75478 (GPD/FT2)

BOULTON TO NEUMAN
Wellfield 5 Obs. Well D1-5
INPUT DATA:
AQUIFER THICKNESS = 200 FT
DISTANCE PUMP WELL TO OBS WELL = 23.8 FT
TRANSMISSIVITY = 390356 GPD/FT
SPECIFIC YIELD = .25
ALPHA = 0
r/B = .3

RESULTS:
HORIZONTAL HYDRAULIC CONDUCTIVITY = 1951.78 (GPD/FT2)
VERTICAL HYDRAULIC CONDUCTIVITY = 3103.338 (GPD/FT2)
ANISOTROPY RATIO = 1.590004 (GPD/FT2)




## LEGEND

- O TEST SUPPLY WELL
- ✦ DEEP OBSERVATION WELL
- ● SHALLOW OBSERVATION WELL

# OBSERVATION AND TEST SUPPLY WELL LOCATIONS

GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.
WEST PALM BEACH, FLORIDA

78-224

FIGURE 4.1

TABLE 4.2

TEST SUPPLY WELL CONSTRUCTION DATA
VILLAGE OF TEQUESTA

| Location | Well No. | Casing Diameter (in.) | Cased Interval (ft.) | Screen Diameter (in.) | Screened Interval (ft.) | Total Depth (ft.) | Date Constructed |
|---|---|---|---|---|---|---|---|
| Wellfield No. 2 | 7R | 16(Outer) [1]<br>10(Inner) [2] | 0-50 | 8 | 50-90 [3] | 90 | 6/17/80 to 6/28/80 |
| Wellfield No. 3 | 8R | 16(Outer) [1]<br>10(Inner) [2] | 0-50 | 8 | 50-70 [3] | 70 | 7/22/80 to 7/30/80 |
| West End of Wingo Street | 23 | 16(Outer) [1]<br>10(Inner) [2] | 0-45 | 8 | 45-70 [3] | 70 | 3/2/81 to 3/16/81 |

1 Steel

2 Schedule 40 PVC

3 #100 Slot Schedule 40 PVC

Wellfield 2, Well 7R
T = 352,000 gpd/ft
S = 0.05

Wellfield 3, Well 8R and Well 23
T = 762,000 gpd/ft
S = 0.02

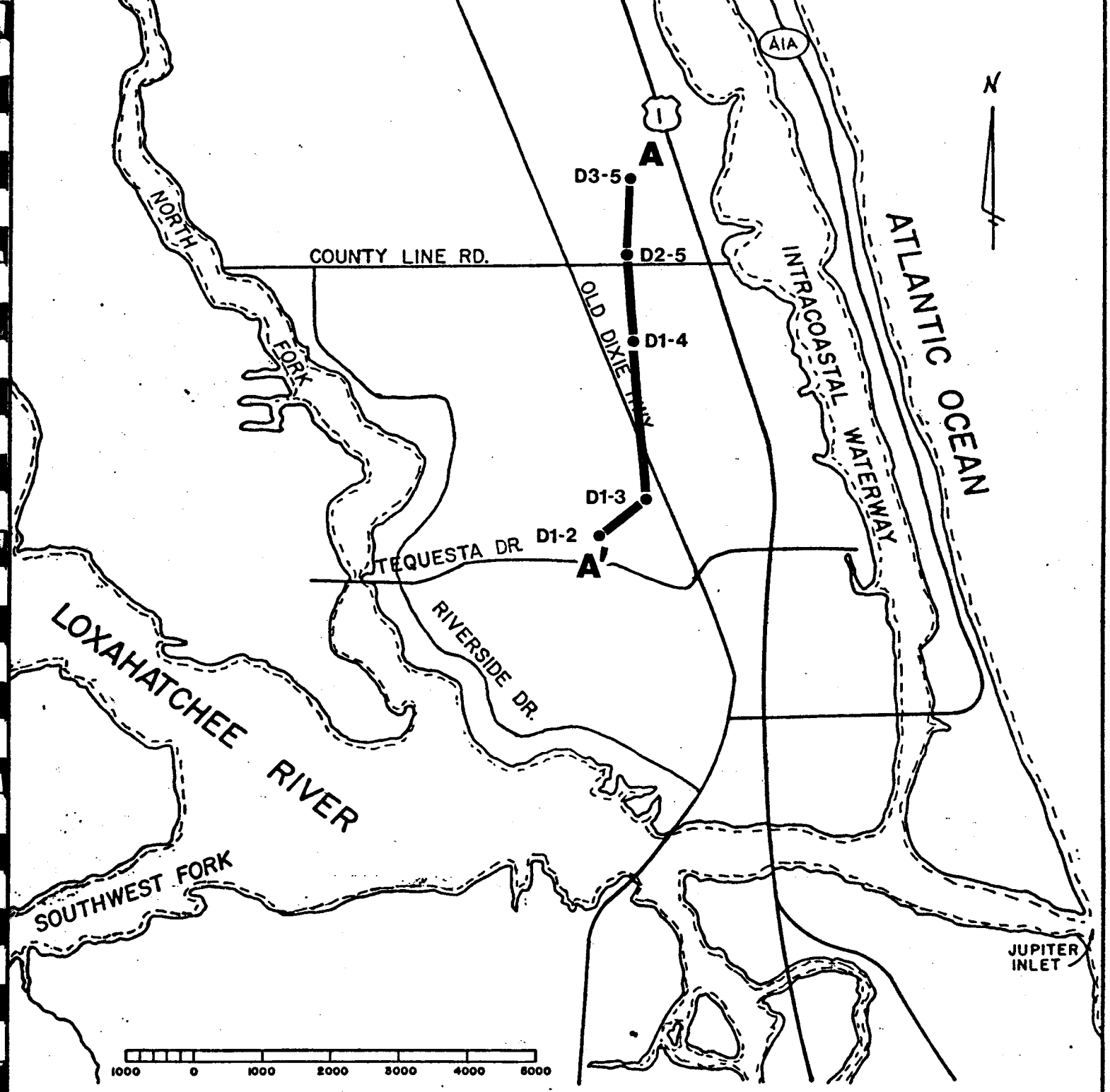
Wellfield 5, Well 18
T = 237,000 gpd/ft
S = 0.18

Transmissivity values appear to increase northward in response to a higher average water table and greater aquifer thickness. The significantly lower transmissivity observed in Wellfield 5 is primarily a result of the shallow penetration (35 feet) into the aquifer of the pumped well. Transmissivity is a function of aquifer thickness. Presuming an available aquifer thickness of 120 feet for this area, as indicated by test data, a fully penetrating well would produce transmissivity values nearly triple (700,000 gpd/ft) those calculated for Well 18 (237,000 gpd/ft).

Raw Data Available



(Card 16,17,18) PB 103




## LEGEND

- DEEP OBSERVATION WELL

# LOCATION OF LITHOLOGIC CROSS-SECTION

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WEST PALM BEACH, FLORIDA

78-224

FIGURE 5.1

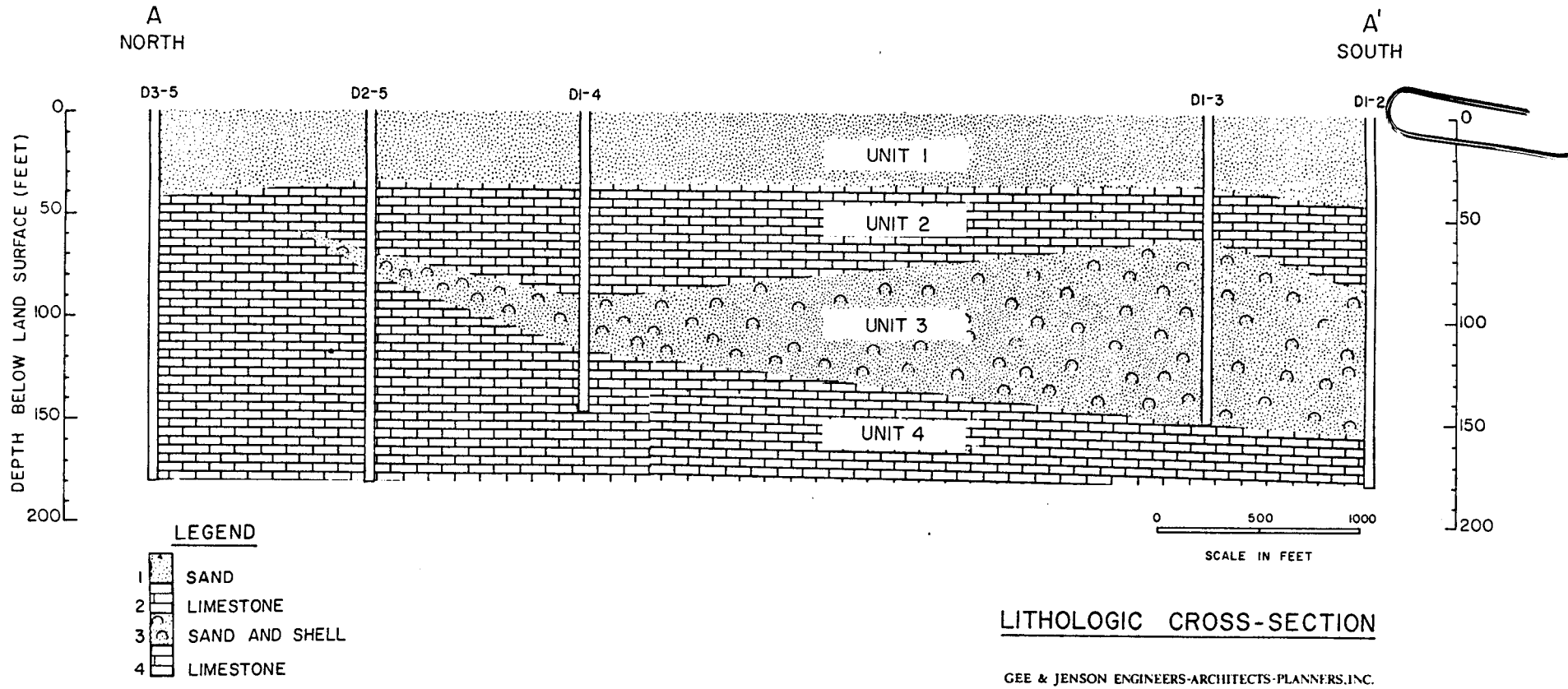



FIGURE 5.2

LITHOLOGIC CROSS-SECTION

GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.
WEST PALM BEACH, FLORIDA

78-224

PB103

TABLE 6.1

WELL CONSTRUCTION DATA FOR AQUIFER TEST GROUPS
VILLAGE OF TEQUESTA

| Location | Well No. | Casing Diameter (in.) | Cased Interval (ft.) | Screen Diameter (in.) | Screened Interval (ft.) | Total Depth (ft.) | Distance from Pumped Well (ft.) |
|---|---|---|---|---|---|---|---|
| Wellfield No. 2 | 7R | 16(Outer) 10(Inner) | 0-50(Outer) 0-50(Inner) | 8 | 50-90 | 90 | 0.0 |
| | S1-2 | 2 | 0-15 | 2 | 15-58 | 58 | 48.5 |
| | S2-2 | 2 | 0-15 | 2 | 15-79 | 79 | 103.0 |
| | S3-2 | 2 | 0-15 | 2 | 15-80 | 80 | 194.4 |
| | D1-2 | 2 | 0-50 | 2 | 50-180 | 89[1] | 25.0 |
| Wellfield No. 3 | 8R | 16(Outer) 10(Inner) | 0-50(Outer) 0-50(Outer) | 8 | 50-70 | 70 | 0.0 |
| | S1-3 | 2 | 0-15 | 2 | 15-60 | 60 | 100.3 |
| | S2-3 | 2 | 0-20 | 2 | 20-70 | 70 | 49.5 |
| | S3-3 | 2 | 0-20 | 2 | 20-70 | 70 | 177.4 |
| | D1-3 | 2 | 0-80 | 2 | 80-151 | 97[2] | 37.8 |
| Wellfield No. 5 | 18 | 6 | 0-38 | 6 | 38-60 | 60 | 0.0 |
| | S1-5 | 2 | 0-23 | 2 | 23-63 | 63 | 51.5 |
| | S2-5 | 2 | 0-22 | 2 | 22-62 | 62 | 99.8 |
| | S3-5 | 2 | 0-20 | 2 | 20-60 | 60 | 194.7 |
| | D1-5 | 2 | 0-80 | 2 | 80-120 | 120 | 23.8 |

[1] Grouted to 89 feet on July 7, 1980

[2] Grouted to 97 feet on August 20, 1980

TABLE 6.2

SUMMARY OF AQUIFER PARAMETERS [1]
VILLAGE OF TEQUESTA

| | TRANSMISSIVITY (gpd/ft.) | | STORAGE COEFFICIENT | |
|---|---|---|---|---|
| Well 7R<br>Wellfield 2 Q=457 gpm | Early Time | Late Time | Early Time | Late Time |
| D1-2 (r=25 ft.) | [2] | 133,263 [3] | [2] | 0.30 |
| S1-2 (r=48.5 ft.) | 308,072 | 290,957 | $1.4 \times 10^{-3}$ | 0.02 |
| S2-2 (r=103 ft.) | 402,863 | 361,187 | $1.4 \times 10^{-3}$ | 0.06 |
| S3-2 (r=194.5 ft.) | 374,087 | 402,863 | $1.4 \times 10^{-3}$ | 0.07 |
| | | 351,669 | | 0.05 |
| Well 8R<br>Wellfield 3 Q=950 gpm | | | | |
| S2-3 (r=49.5 ft.) | [2] | 362,900 [3] | [2] | 0.03 |
| S1-3 (r=100.35 ft.) | [2] | 766,090 | [2] | 0.01 |
| S3-3 (r=177.45 ft.) | 745,685 | 756,042 | $9.9 \times 10^{-4}$ | 0.03 |
| | | 761,066 | | 0.02 |
| Well 18<br>Wellfield 5 Q=218 gpm | | | | |
| S1-5 (r=51.5 ft.) | 227,116 | 227,116 | $9.8 \times 10^{-3}$ | 0.17 |
| S2-5 (r=99.8 ft.) | [2] | 185,058 | [2] | 0.17 |
| S3-5 (r=194.7 ft.) | [2] | 297,414 | [2] | 0.20 |
| | | 237,196 | | 0.18 |

[1] Results obtained using Boulton Method of Analysis

[2] Field data could not be curve-matched.

[3] Not used in computing average values.

TABLE 6.6

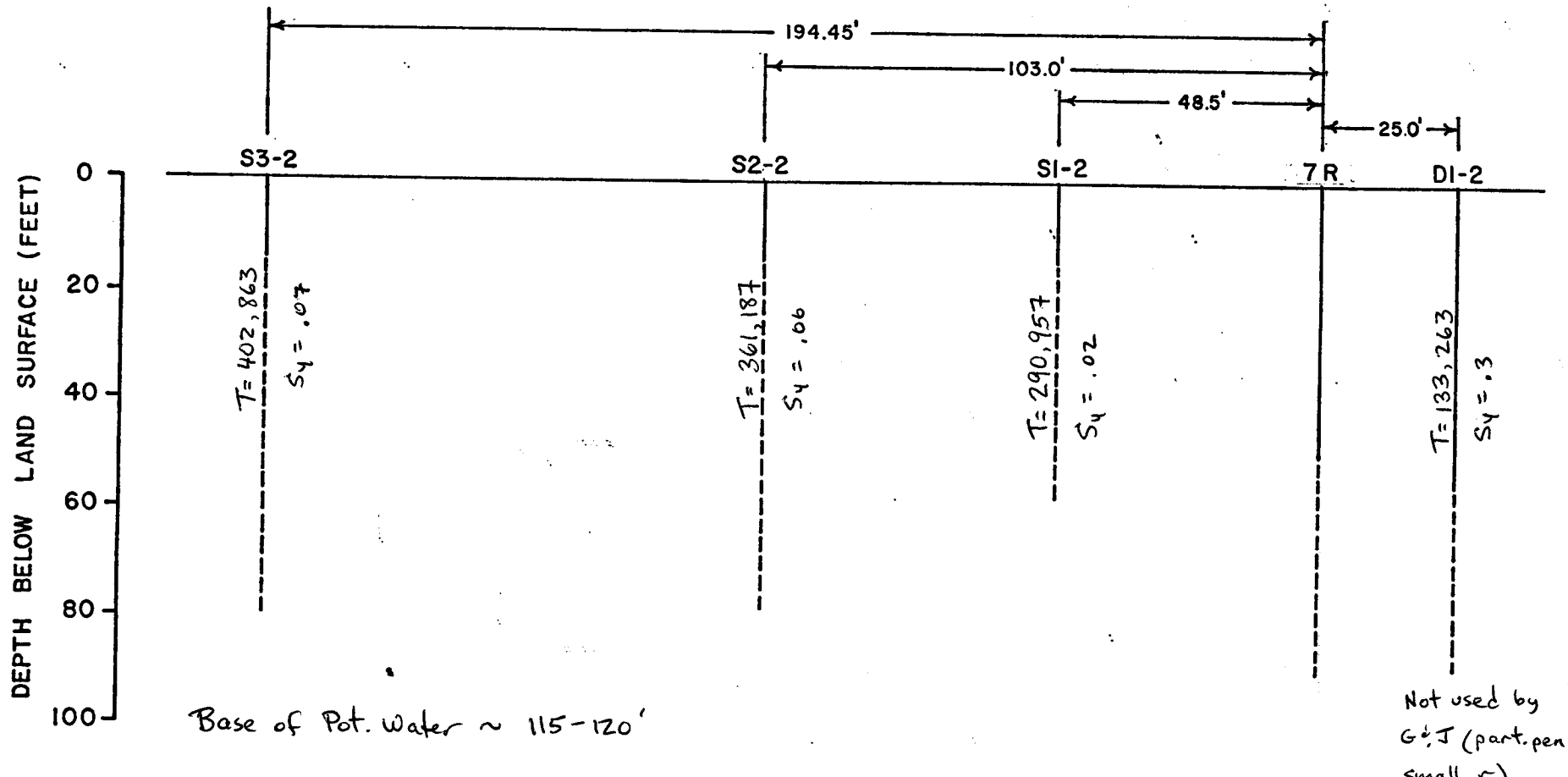
SUMMARY OF SPECIFIC CAPACTIY TEST DATA

VILLAGE OF TEQUESTA

| Well No. | Discharge gpm | Drawdown (ft.) | Specific Capacity (gpm/ft) | Duration of Test (min.) | Screened Interval (ft.) | Slot Size | Transmissivity (gpd/ft) |
|---|---|---|---|---|---|---|---|
| 7R | 457 | 9.02 | 50 | 4,320 | 40 | 100 | 352,000 |
| 8R | 950 | 20.77 | 46 | 4,380 | 20 | 100 | 762,000 |
| 18 | 218 | 10.16 | 21 [1] | 2,160 | 25 | 20 | 237,000 |
| 23 | 855 | 14.40 | 59 | 300 | 25 | 100 | [2] |

[1] Specific capacity of Well 18 is anomalously low due to method of well construction. (Slot size and diameter of screen)

[2] Comparing pumping rate, screened interval and specific capacity indicates the transmissivity of Well 23 is in the same range or greater than Well 8R (762,000 gpd/ft).




Boulton Analysis

$\bar{T}$ = 352,000 GPD/FT

$\bar{S}$ = .05

LEGEND

S2-2 WELL NO.

CASED INTERVAL

SCREENED INTERVAL

T= GPD/FT

TEQUESTA
WELL FIELD 2
AQUIFER TEST WELL CONFIGURATION
Q = 457 g.p.m.
72 hour test

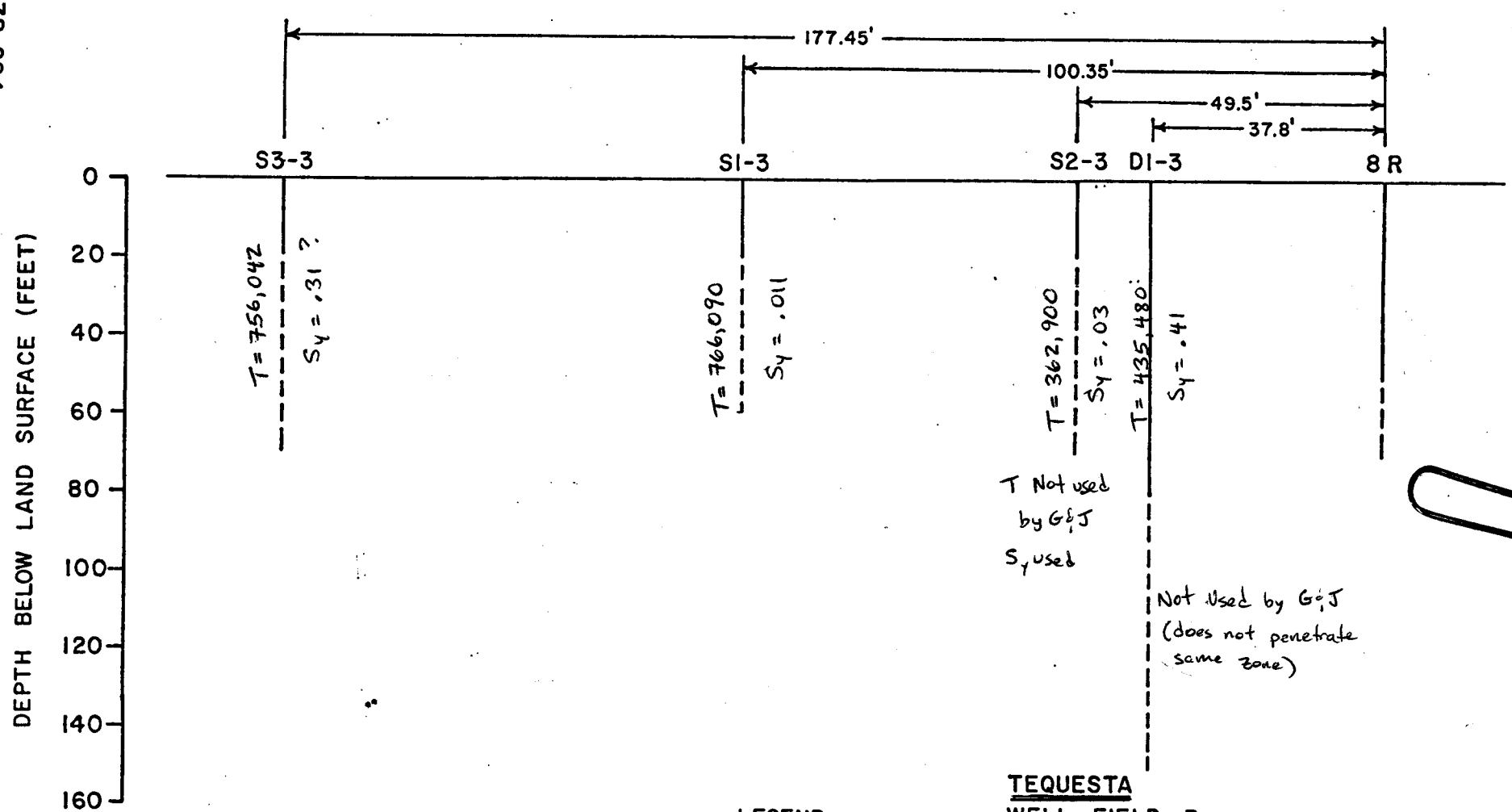
FEET
0 20 40
SCALE

FIGURE 6.1

JOB NO. 78-224

GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.
WEST PALM BEACH, FLORIDA

78-224




Boulton Analysis

$\bar{T}$ = 760,000 GPD/FT

$S_y$ = .026

LEGEND

S2-3 WELL NO.

CASED INTERVAL

SCREENED INTERVAL

T = GPD/FT

**TEQUESTA**

**WELL FIELD 3**

**AQUIFER TEST WELL CONFIGURATION**

**Q = 950 g.p.m.**

74 hour test

FEET

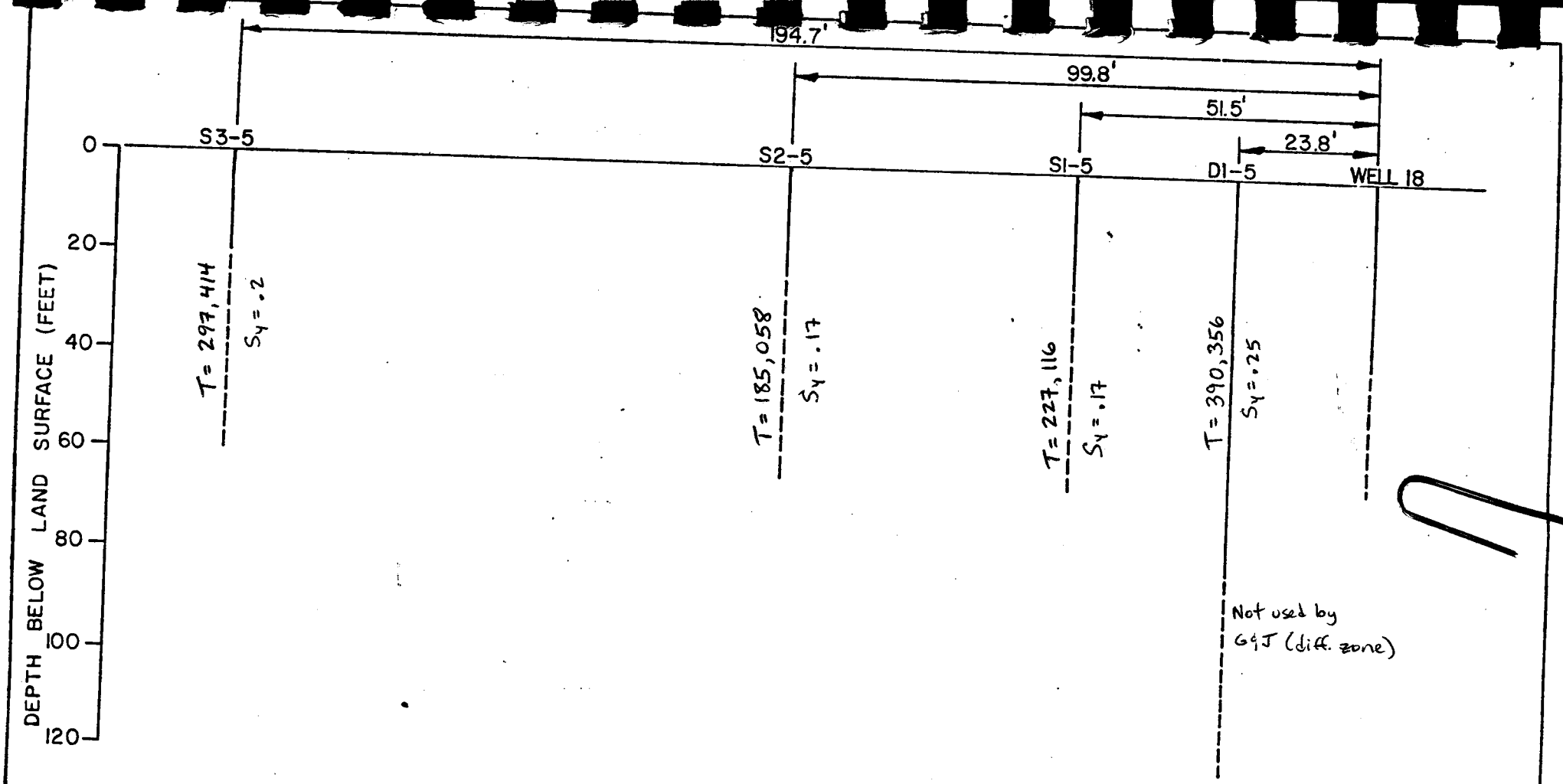
0 20 40

SCALE

78-224

GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.
WEST PALM BEACH, FLORIDA

FIGURE 6.8




Boulton Analysis

$\bar{T}$ = 237,000 GPD/FT

$\bar{S_y}$ = .18

LEGEND

S2-5 WELL NO.

CASED INTERVAL

SCREENED INTERVAL

T=GPD/FT

WELLFIELD 5

AQUIFER TEST WELL CONFIGURATION

Q = 218 g.p.m.

36 hour test

FEET

0 20 40

SCALE

FIGURE 6.15

JOB NO. 78-224

GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.
WEST PALM BEACH, FLORIDA

GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.

## WELL CONSTRUCTION

Well No. 7R

Driller: Drilling Services Inc.

Samples: Cuttings X, Core

Casing: Depth 0-50 feet
Diameter Inner: 10 inch, Outer: 16 inch
Material Inner: PVC Schedule 40, Outer: Steel Casing

Location: Wellfield No. 2

Recorded by: RW

Date Drilled: 7/22/80 to 7/30/80

Screen: Depth 50-90 feet
Diameter 8 inch
Material 100 slot telescopic PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-5 | Sand: silica, white, medium to fine grained subrounded to subangular, unconsolidated. |
| 5-25 | Sand: silica, white and orange-brown, medium to fine grained, subrounded to subangular, with shell fragments, color getting lighter with depth, unconsolidated. |
| 25-35 | Sand: silica, white to light tan, fine to very fine grained, subrounded to subangular, unconsolidated. |
| 35-41 | Sand: silica, white to light tan, fine grained, subrounded to subangular, with shell fragments, unconsolidated. |
| 41-83 | Limestone: biosparite, white, gray and tan, coarse to fine grained, with shell fragments. |
| 83-90 | Shell: fragmental, light to dark gray, 50 percent.<br>Sand: silica, fine to medium grained, subrounded to subangular, unconsolidated, 50 percent. |

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GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.

# WELL CONSTRUCTION

Well No. 8R

Driller: Drilling Services, Inc.

Samples: Cuttings X, Core

Casing: Depth 0-50 feet

Diameter Outer: 16 inch
Inner: 10 inch

Material Outer: Steel Casing
Inner: PVC Schedule 40

Location: Wellfield No. 3

Recorded by: RW

Date Drilled: 6/17/80 to 6/28/80

Screen: Depth 50-70 feet

Diameter 8 inch

Material 100 slot telescopic PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-8 | Sand: silica, white and gray, medium to fine grained subangular to subrounded, unconsolidated. |
| 8-39 | Sand: silica, white and tan, medium to fine grained, subrounded to subangular, unconsolidated. |
| 39-70 | Limestone: biosparite, trace of sand, coarse to fine grained with shell fragment, hard and soft layers. |

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GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.

# WELL CONSTRUCTION

Well No. D1-4
Driller: Drilling Services Inc.
Samples: Cuttings X, Core
Casing: Depth 0-80 feet
Diameter 2 inch
Material Schedule 40 PVC

Location: Wellfield No. 4
Recorded by: JE
Date Drilled: 5/16/80
Screen: Depth 80-145 feet
Diameter 2 inch
Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-7 | Sand: silica, white, very fine to medium grained, rounded to subrounded, trace very fine heavy minerals, unconsolidated. |
| 7-36 | Sand: silica, light orange-brown (iron stain), very fine to coarse grained, predominantly fine to medium grained, rounded to subrounded, trace of very fine heavy minerals, in upper 10 feet thin beds of orange silty sand, slightly cemented, unconsolidated. |
| 36-42 | Limestone: biosparite, very light brown to tan, abundant silica sand, trace shell fragments and ȯȯlites, weathered zone, consolidated, poorly lithified. |
| 42-57 | Limestone: biointrasparite, very light brown-gray, abundant shell and ȯȯlites, well lithified to poorly lithified in 0.5 to 1 foot seams. |
| 57-73 | Limestone: biosparite, dolomitic, dark brown, large shell fragments, trace silica, well lithified. |
| 73-80 | Limestone: biosparite, very light brownish gray, shells and ȯȯlites, sandy, well lithified to poorly lithified in 0.5 to 1.0 foot seams. |
| 80-90 | Limestone: biosparite, light grayish brown to light brownish gray, cemented shell and fragments, well lithified to friable, 80 percent.<br><br>Shell: unconsolidated, fine to medium grained whole and fragmental pelecypods, 20 percent. |

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## WELL CONSTRUCTION

Well No. D1-4 (Cont'd)
Driller: Drilling Services, Inc.
Samples: Cuttings X, Core
Casing: Depth 0-80 feet
Diameter 2 inch
Material Schedule 40 PVC

Location: Wellfield No. 4
Recorded by: JE
Date Drilled: 5/16/80
Screen: Depth 80-145 feet
Diameter 2 inch
Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 90-110 | Shell: fragmental and whole shell (pelecypod, Turitella sp. and Oliva sp. gastropod, 50 percent.<br><br>Sand: silica, light gray, very fine to medium grained, rounded to subrounded, trace of heavy minerals, trace of calcareous silty clay, 50 percent. |
| 110-115 | Shell and Sand: same as 90-110, but with a trace of poorly lithified biosparite and minor gray-green soft silty clay. |
| 115-125 | Limestone: biomicrite, light brownish gray to light brown, trace of heavy minerals present, unconsolidated shells and shell fragments, trace of very fine to medium grained silica sand, well lithified to poorly lithified thin seams. |
| 125-130 | Limestone: same as 115-125, but with an increase in silica sand. |
| 130-135 | Shell and Sand: same as 90-110. |
| 135-137 | Silty Clay: dark green, soft, trace of sand to pebble sized phosphatic shell and particles, unconsolidated. |
| 137-146 | Limestone: light gray brown, possibly dolomitic, honeycombed, trace of dark green clay, lithified to poorly lithified. |

## WELL CONSTRUCTION

Well No. D1-5
Driller: Drilling Services Inc.
Samples: Cuttings X, Core
Casing: Depth 0-80 feet
Diameter 2 inch
Material Schedule 40 PVC

Location: Wellfield No. 5
Recorded by: JE
Date Drilled: 5/13/80
Screen: Depth 80-120 feet
Diameter 2 inch
Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-7 | Sand: silica, white, very fine to coarse grained, rounded to subrounded, trace heavy minerals, unconsolidated. |
| 7-35 | Sand: silica, light brown-orange (iron-stain), very fine to coarse, rounded to subrounded, trace heavy minerals, thin layers dark orange silty sand, slightly cemented in upper part, medium to coarse grained near bottom, unconsolidated. |
| 35-57 | Limestone: biosparite, very light brown cream, uniform cuttings, abundant silica sand and shell fragments, lithified. |
| 57-65 | Limestone: biosparite, very light brown cream, very fine to 10 mm pelecypod fragments, well lithified. |
| 65-85 | Limestone: biointrasparite, very light tan, abundant interbedded silica, inclusions of gray-green silty clay, abundant shell fragments, lithified. |
| 85-90 | Limestone: as 65-85 feet, but with 20-30 percent biomicrite, gray, dense, fine grained. |
| 90-115 | Limestone: biointrasparite, very light tan, interbedded silica, partial dolomite replacement, poorly lithified, 50 percent.<br>Limestone: biointramicrite, gray, very fine grained, poorly lithified, 50 percent. |
| 115-120 | Limestone: micrite, brown, fossiliferous, porous, dolomitic, abundant pelecypod fragments, trace of silica, lithified. |

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# WELL CONSTRUCTION

Well No. D2-5
Driller: Drilling Services Inc.
Samples: Cuttings X, Core
Casing: Depth 0-40 feet
Diameter 2 inch
Material Schedule 40 PVC

Location: Wellfield No. 5
Recorded by: RW
Date Drilled: 7/17/80
Screen: Depth 40-180 feet
Diameter 2 inch
Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-15 | Sand: silica, yellow, medium to fine grained, subangular to subrounded, unconsolidated. |
| 15-33 | Sand: silica, white and brown, medium to fine grained, subangular to subrounded, unconsolidated. |
| 33-70 | Limestone: biosparite, tan and white, sand coarse to fine grained, subangular to subrounded, trace of shell fragments, lithified. |
| 70-79 | Sand: silica, white and brown, medium to silt grained, subangular to subrounded, abundant shell fragments, unconsolidated. |
| 79-100 | Limestone: biointrasparite, gray-brown and white, with silica sand layers, medium to silt grained, with abundant shell fragments, lithified. |
| 100-110 | Limestone: biointrasparite, dark brown to gray and white, with shell and shell fragments, abundant silica sand, with medium to silt sized grains, hard and soft layers, lithified to consolidated. |
| 110-115 | Limestone: biointrasparite, tan, soft, abundant fine grained unconsolidated silica sand, poorly lithified. |
| 115-138 | Limestone: biointrasparite, brown to tan, trace of silica sand and shell fragments, lithified. |
| 138-145 | Limestone: biointrasparite, dark gray to tan, trace of silica sand and tan silty clay, lithified. |

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# WELL CONSTRUCTION

Well No. D2-5 (Cont'd)
Driller: Drilling Services Inc.
Samples: Cuttings X, Core
Casing: Depth 0-40 feet
Diameter 2 inch
Material Schedule 40 PVC

Location: Wellfied No. 5
Recorded by: RW
Date Drilled: 7/17/80
Screen: Depth 40-180 feet
Diameter 2 inch
Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 145-170 | Limestone: biointrasparite, tan to gray, lithified, 50 percent. |
| | Sand: silica, coarse to silt sized grains, sub-angular to subrounded, 20 percent. |
| 145-170 | Shell: fragmental and whole, 30 percent. |
| 170-180 | Limestone: biointrasparite, tan, lithified, 50 percent. |
| | Shell: fragmental and whole, with abundant silica sand, 50 percent. |

# WELL CONSTRUCTION

Well No. D3-5
Driller: Drilling Services Inc.
Samples: Cuttings X, Core
Casing: Depth 0-100 feet
Diameter 2 inch
Material Schedule 40 PVC

Location: Wellfield No. 5
Recorded by: RW
Date Drilled: 8/25/80
Screen: Depth 100-178 feet
Diameter 2 inch
Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-25 | Sand: silica, light brownish orange, fine to very fine grained, subangular to angular, unconsolidated. |
| 25-42 | Sand: silica, light brownish orange, medium to fine grained, subrounded to rounded, trace of white and brown shell fragments, unconsolidated. |
| 42-70 | Limestone: biosparite, tan, trace of white shell fragments, well lithified. |
| 70-105 | Limestone: biointrasparite, light brown abundant very fine grained shell fragments, trace of fine grained silica, possible dolomitization, well lithified. |
| 105-120 | Limestone: biointrasparite, very light tan, abundant white fine grained shell fragments, trace of fine grained silica sand, well lithified. |
| 120-130 | Limestone: biointrasparite, light gray, with abundant fragmented white and tan pelecypods, trace of fine grained phosphate, lithified. |
| 130-140 | Sand: carbonate, very light gray, very fine to silt sized grains, unconsolidated. |
| 140-170 | Limestone: biointrasparite, gray, friable and very sandy, with white pelecypod fragments, abundant fine grained silica, abundant phosphate particles, consolidated. |
| 170-180 | Limestone: Same as 140-170, but with abundant gray silty clay, consolidated. |

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## WELL CONSTRUCTION

Well No. RD-1
Driller: Drilling Services, Inc.
Samples: Cuttings X, Core
Casing: Depth 0-20 feet
Diameter 2 inch
Material Schedule 40 PVC

Location: Tequesta (Riverside Drive)
Recorded by: RW
Date Drilled: 8/27/80
Screen: Depth 20-178.5 feet
Diameter 2 inch
Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-30 | Sand: silica, light brown, fine to very fine grained, angular to subrounded, unconsolidated. |
| 30-35 | Limestone: sorted biosparite, very light brown, abundant pelecypods, well lithified. |
| 35-65 | Shell: white, whole and fragmental pelecypods, abundant large well-rounded pelecypod fragments, unconsolidated, 70 percent. |
| | Sand: silica, very light brown, fine to very fine grained, unconsolidated, 30 percent. |
| 65-70 | Limestone: unsorted biosparite, light gray, lithified. |
| 70-95 | Shell and Sand: same as 35-65 feet, but with thin biosparite limestone stringers, lithified. |
| 95-110 | Shell and Sand: same as 35-65 feet, but with shell fragments ranging in color from light brown to dark gray. |
| 110-120 | Sand: silica, very light gray, very fine to silt sized grains, abundant fine grained carbonates, unconsolidated. |
| 120-130 | Shell and Sand: same as 95-110 feet. |
| 130-140 | Sand: same as 110-120 feet, but with fine grained carbonates increasing to 25 percent. |
| 140-175 | Limestone: micrite, light gray to very light gray, trace of pelecypod fragments from 140-145 feet, poorly consolidated. |
| 175-180 | Silty Clay: light gray, poorly consolidated. |

# WELL CONSTRUCTION

Well No. S1-4
Driller: Drilling Services Inc.
Samples: Cuttings X, Core
Casing: Depth 0-15 feet
Diameter 2 inch
Material Schedule 40 PVC

Location: Wellfield No. 4
Recorded by: RW
Date Drilled: 6/17/80
Screen: Depth 15-65 feet
Diameter 2 inch
Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-10 | Sand: silica, white, medium to fine grained, subangular to subrounded, unconsolidated. |
| 10-32 | Sand: silica, white, tan and orange, medium to fine grained, subangular to subrounded, unconsolidated. |
| 32-50 | Limestone: biosparite, white to tan, coarse to fine grained, subangular to subrounded, with white unconsolidated shell fragments, lithified. |
| 50-60 | Limestone: biosparite, gray to tan, medium to very fine grained, with shell fragments, lithfied. |
| 60-65 | Limestone: biosparite, dark brown, trace tan silty clay, trace shell fragments, trace fine to medium grained silica sand, lithified. |

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GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.

# WELL CONSTRUCTION

Well No. S3-3

Driller: Drilling Services Inc.

Samples: Cuttings X, Core

Casing: Depth 0-20 feet

Diameter 2 inch

Material PVC Schedule 40

Location: Wellfield No. 3

Recorded by: RW

Date Drilled: 7/31/80

Screen: Depth 20-70

Diameter 2 inch

Material 40 slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-10 | Sand: silica, white to light tan, medium to fine grained, subangular to subrounded with shell fragments, unconsolidated. |
| 10-37 | Sand: silica, white to brown, medium to fine grained, subangular to subrounded with shell fragments, unconsolidated. |
| 37-70 | Limestone: biospartie, sand coarse to fine grained, subangular to subrounded with shell fragments, hard and soft layers, very loosely cemented. |

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GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.

## WELL CONSTRUCTION

Well No. S3-5

Driller: Drilling Services Inc.

Samples: Cuttings X, Core

Casing: Depth 0-20 feet

Diameter 2 inch

Material Schedule 40 PVC

Location: Wellfield No. 5

Recorded by: JE

Date Drilled: 5/7/80

Screen: Depth 20-60 feet

Diameter 2 inch

Material 40 Slot PVC

| DEPTH BELOW LAND SURFACE (FEET) | LITHOLOGY DESCRIPTION |
|---|---|
| 0-8 | Sand: silica, white, very fine to coarse grained, rounded to subrounded, trace heavy minerals, unconsolidated. |
| 8-32 | Sand: silica, light brownish orange (iron-stain) very fine to coarse grained, rounded to subrounded, trace heavy minerals, thin layers dark orange silty sand, slightly cemented in upper part, unconsolidated. |
| 32-60 | Limestone: biosparite, very light brown cream, uniform cuttings, trace of silica sand and shell fragments, well lithified. |

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WMD TAPENO 6265 PLOT NO 0337
USER NO NELMS DATE 86/05/05 TIME 12:47

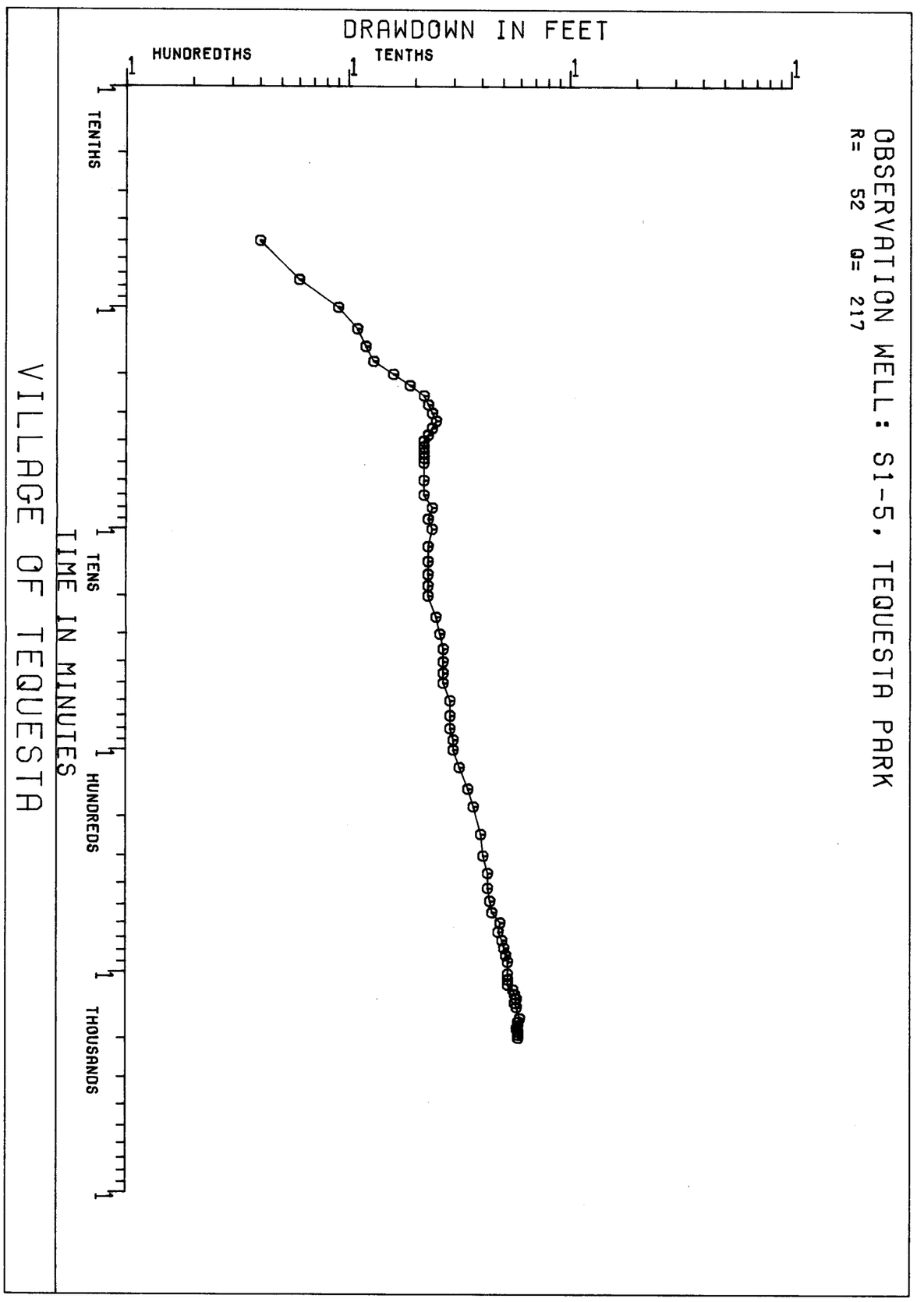
no match

OBSERVATION WELL: D1-3, WELLFIELD #3
R= 38 Q= 950

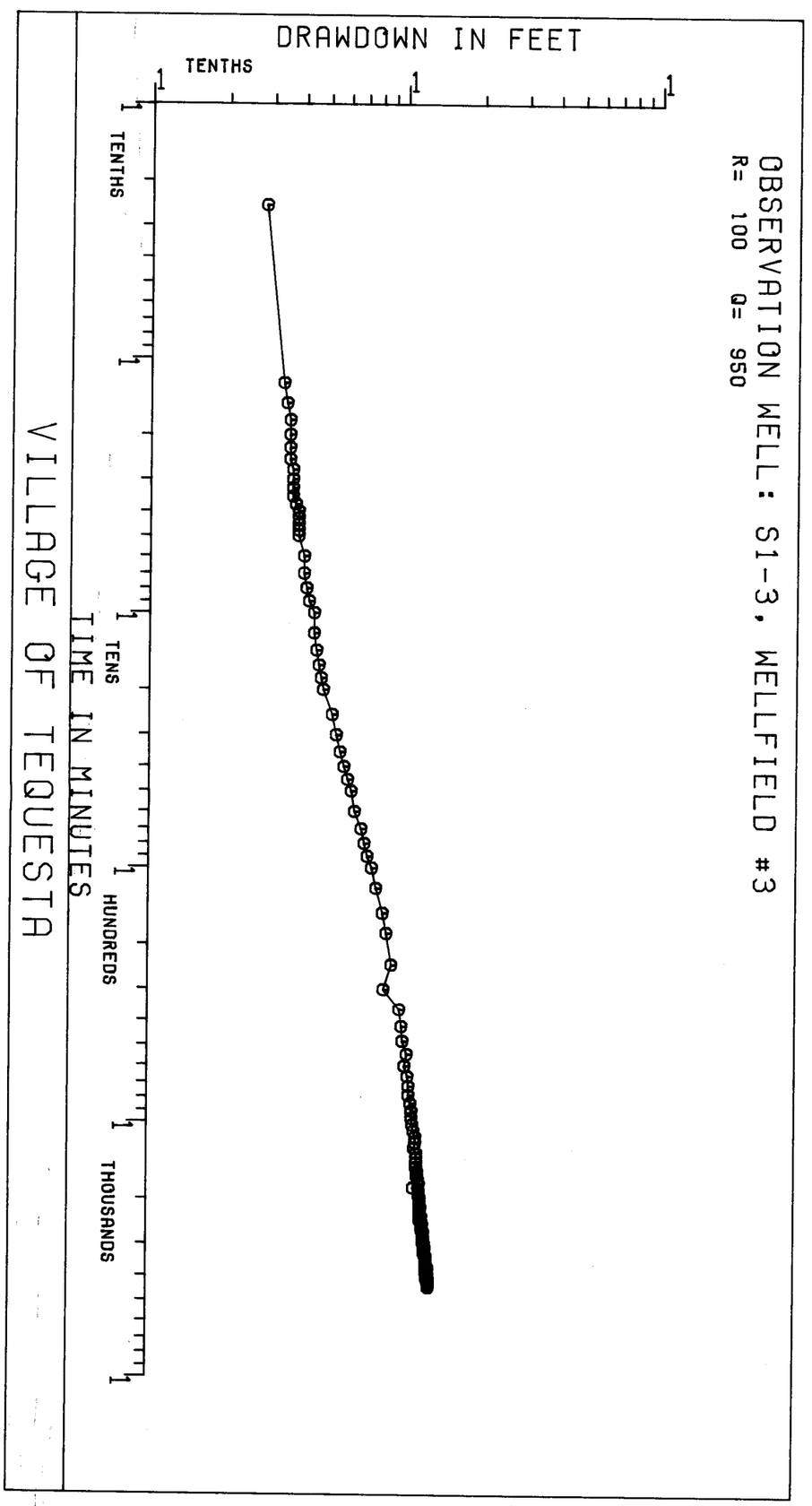



VILLAGE OF TEQUESTA

WMD TAPENO 6265 PLOT NO 0352
USER NO NELMS DATE 86/05/05 TIME 12:52



WMD TAPENO 6265 PLOT NO 0343
USER NO NELMS DATE 86/05/05 TIME 12:49



WMD TAPENO 6153 PLOT NO 0040
USER NO NELMS DATE 86/04/24 TIME 16:20

OBSERVATION WELL: S1-2
R= 48 Q= 457

scale OK

no match possible

DRAWDOWN IN FEET

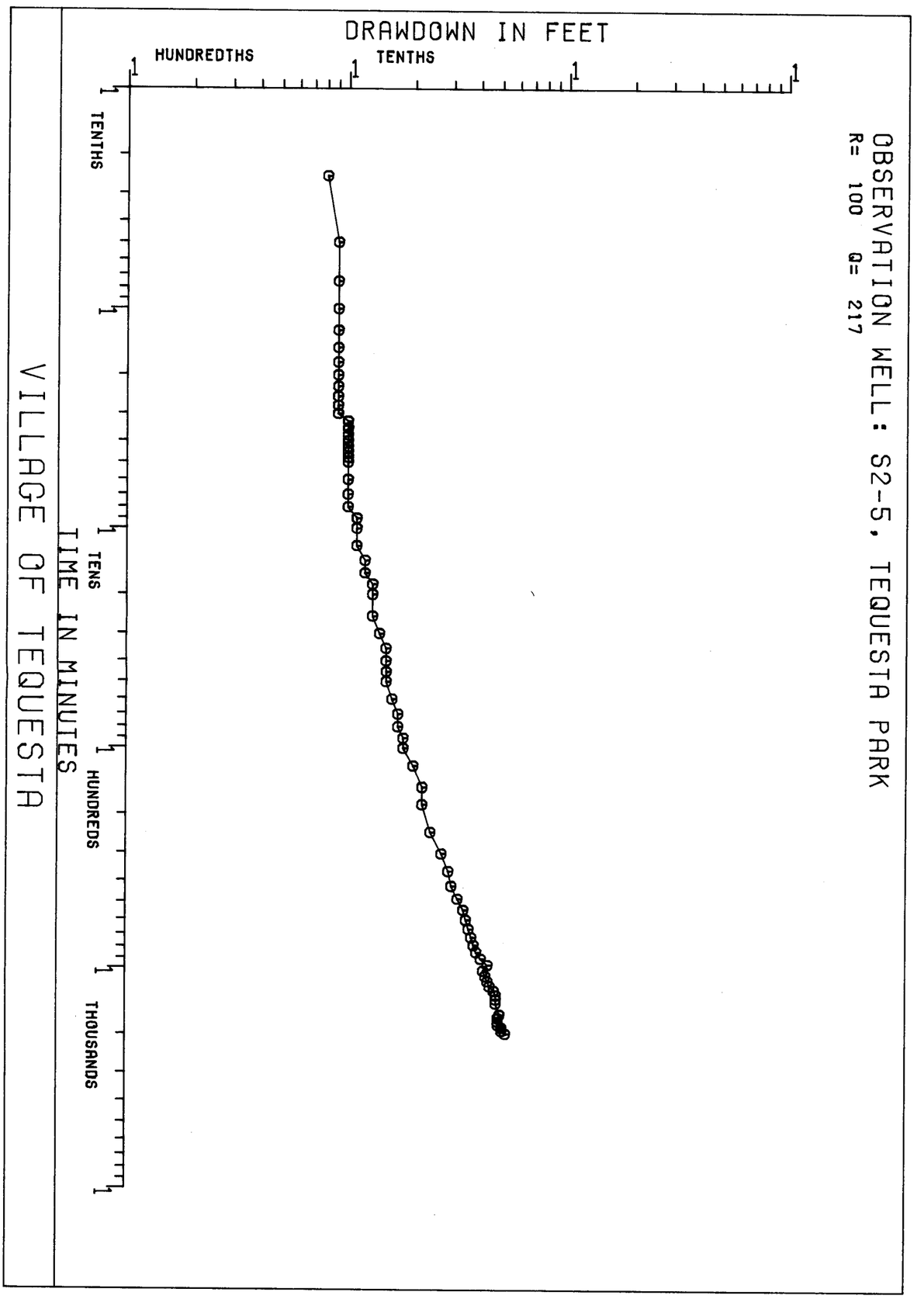
TENTHS 1 TENS 1 HUNDREDS 1

1 TENTHS 1 TENS 1 HUNDREDS 1 THOUSANDS 1 TEN THOUSANDS 1

TIME IN MINUTES

VILLAGE OF TEQUESTA

WMD TAPENO 6265 PLOT NO 0355
USER NO NELMS DATE 86/05/05 TIME 12:52



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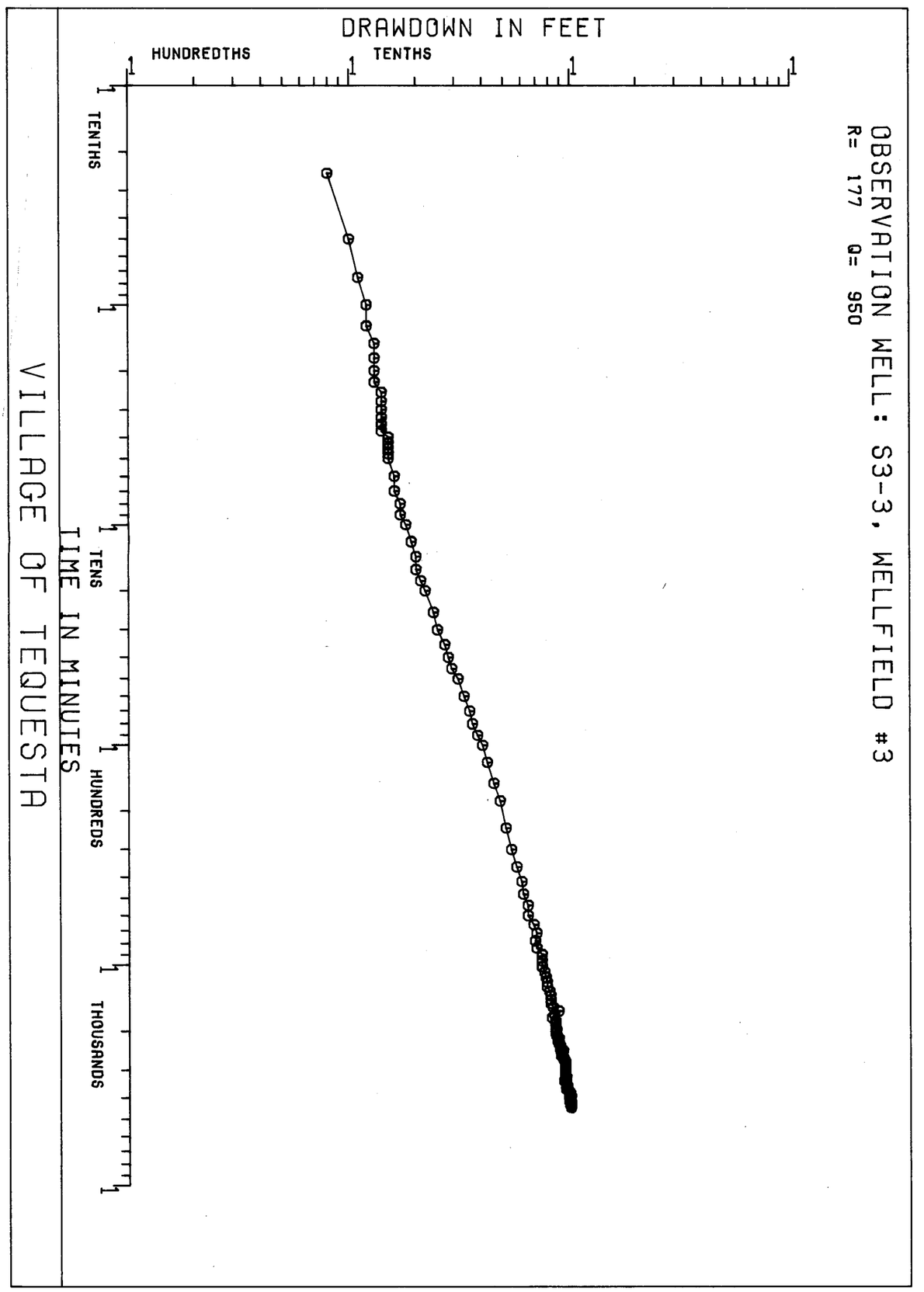
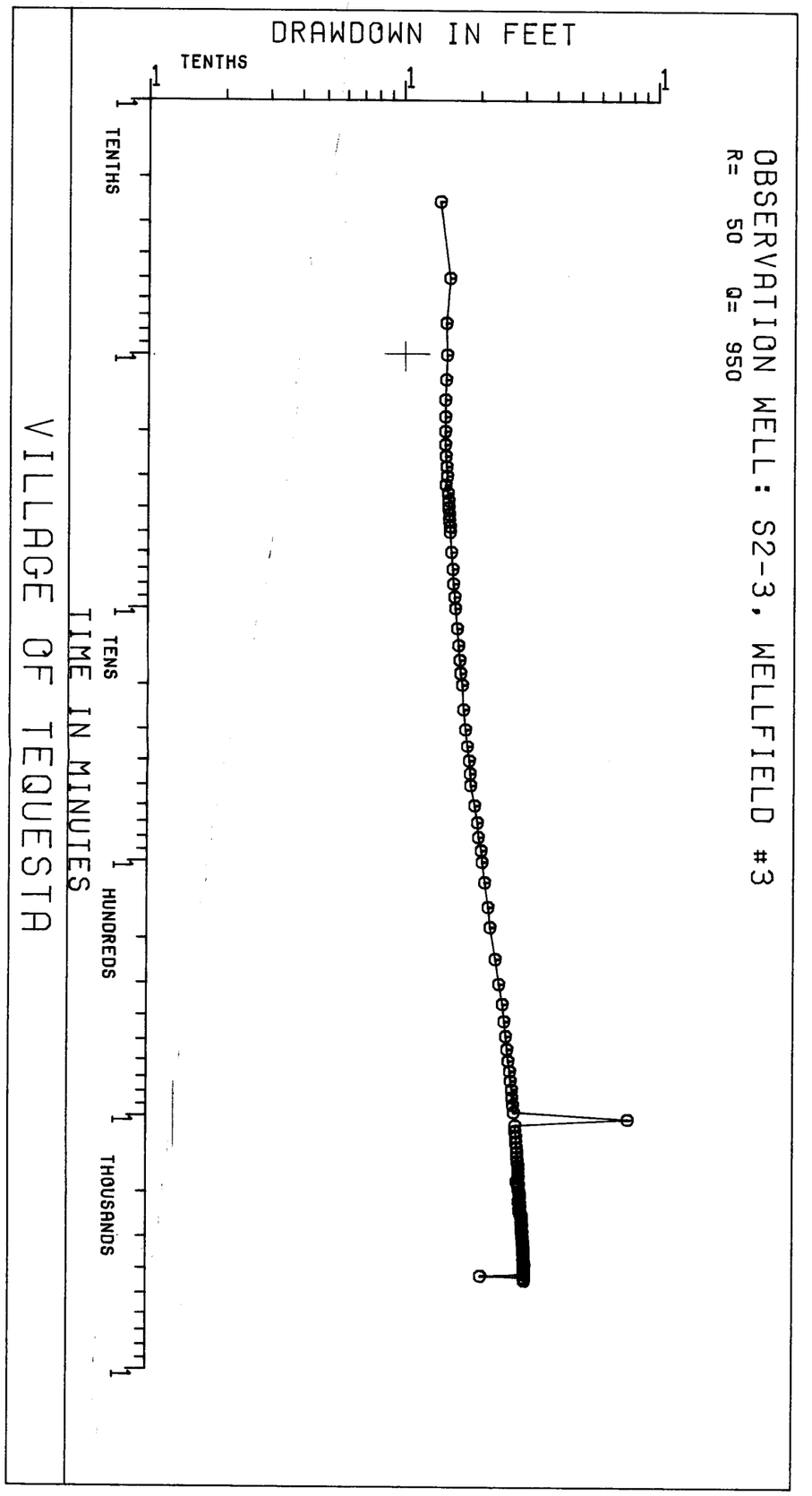
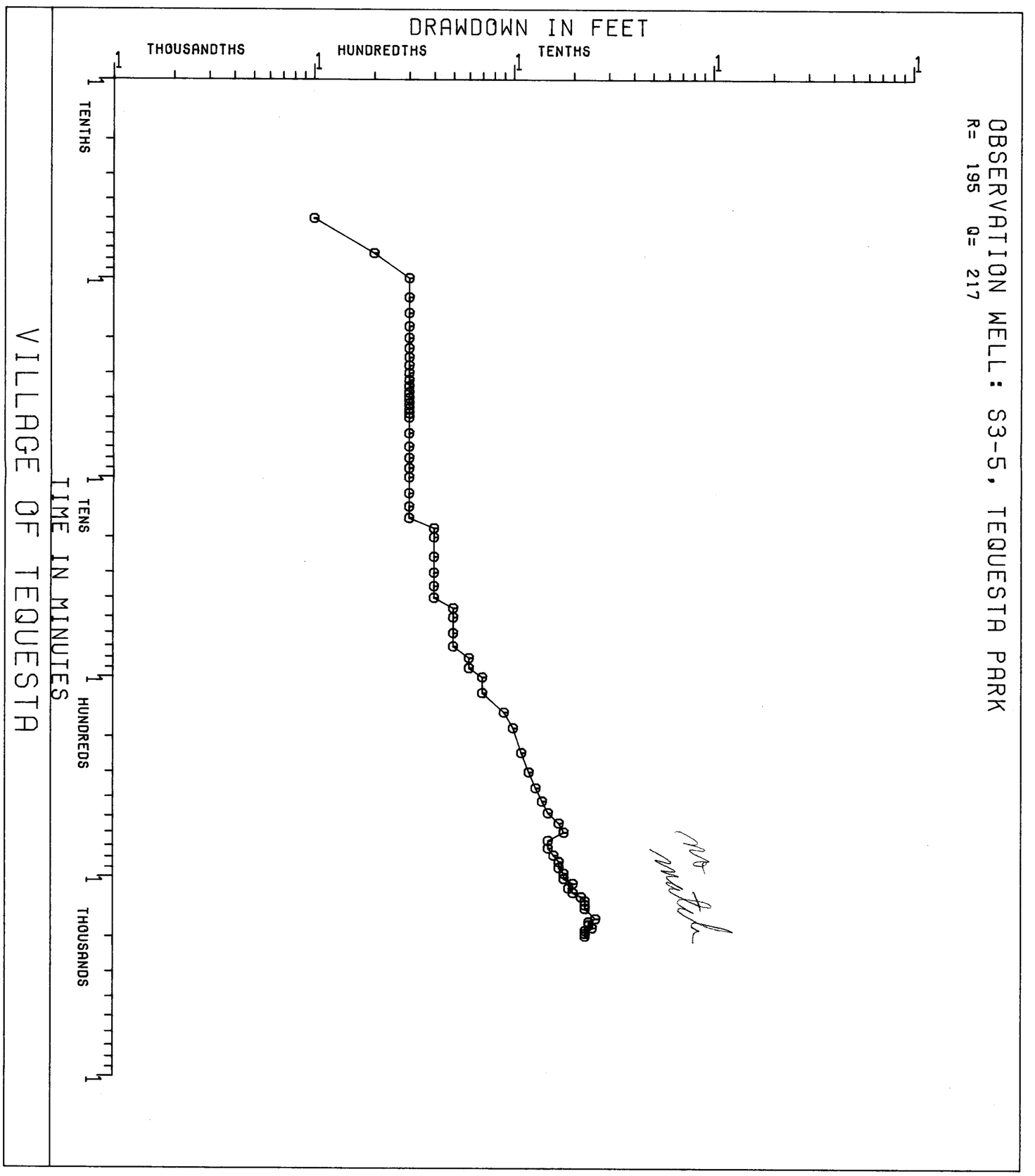


WMD TAPENO 6265 PLOT NO 0340
USER NO NELMS DATE 86/05/05 TIME 12:48



WMD TAPENO 6265 PLOT NO 0316
USER NO NELMS DATE 86/05/05 TIME 12:53



WMD TAPENO 6265 PLOT NO 5000
USER NO RICK-BO DATE 86/06/12 TIME 15:37

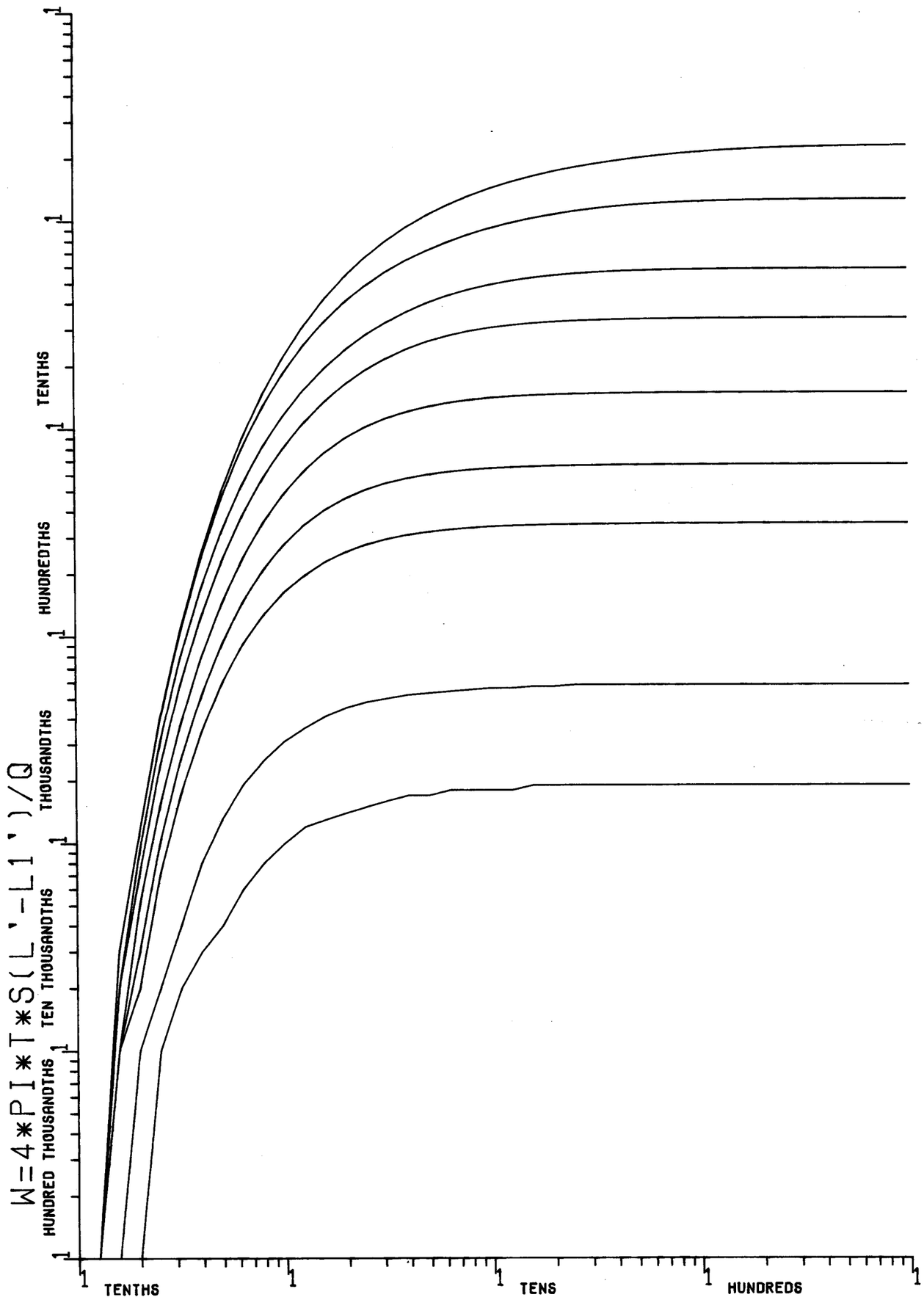
WMD TAPENO 6265 PLOT NO 5006
USER NO RICK-BO DATE 86/06/12 TIME 15:40

WMD TAPENO 6265 PLOT NO 5003
USER NO RICK-BO DATE 86/06/12 TIME 15:39

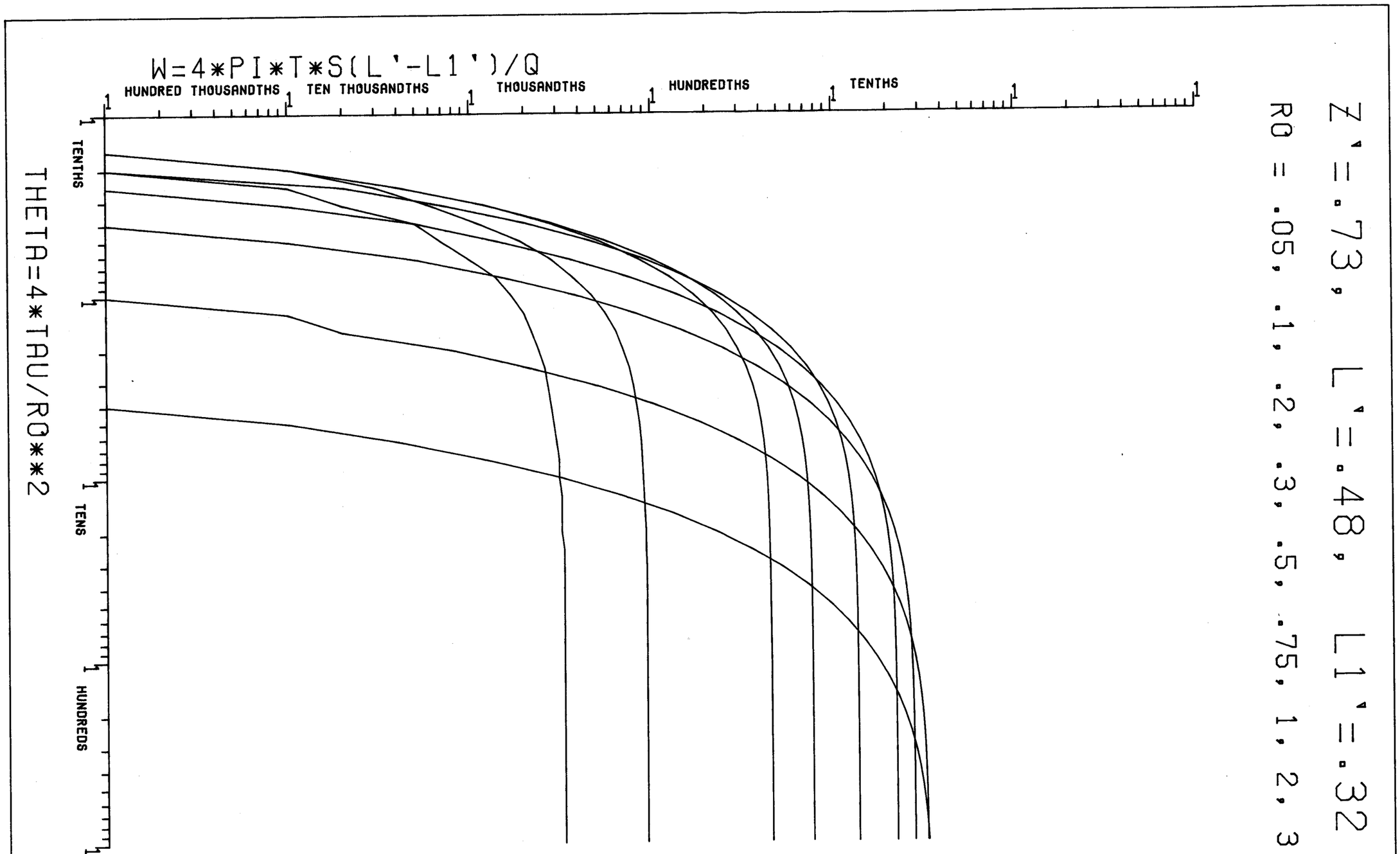
WMD TAPENO 6404 PLOT NO 5051
USER NO RICK-BO DATE 86/06/12 TIME 15:35

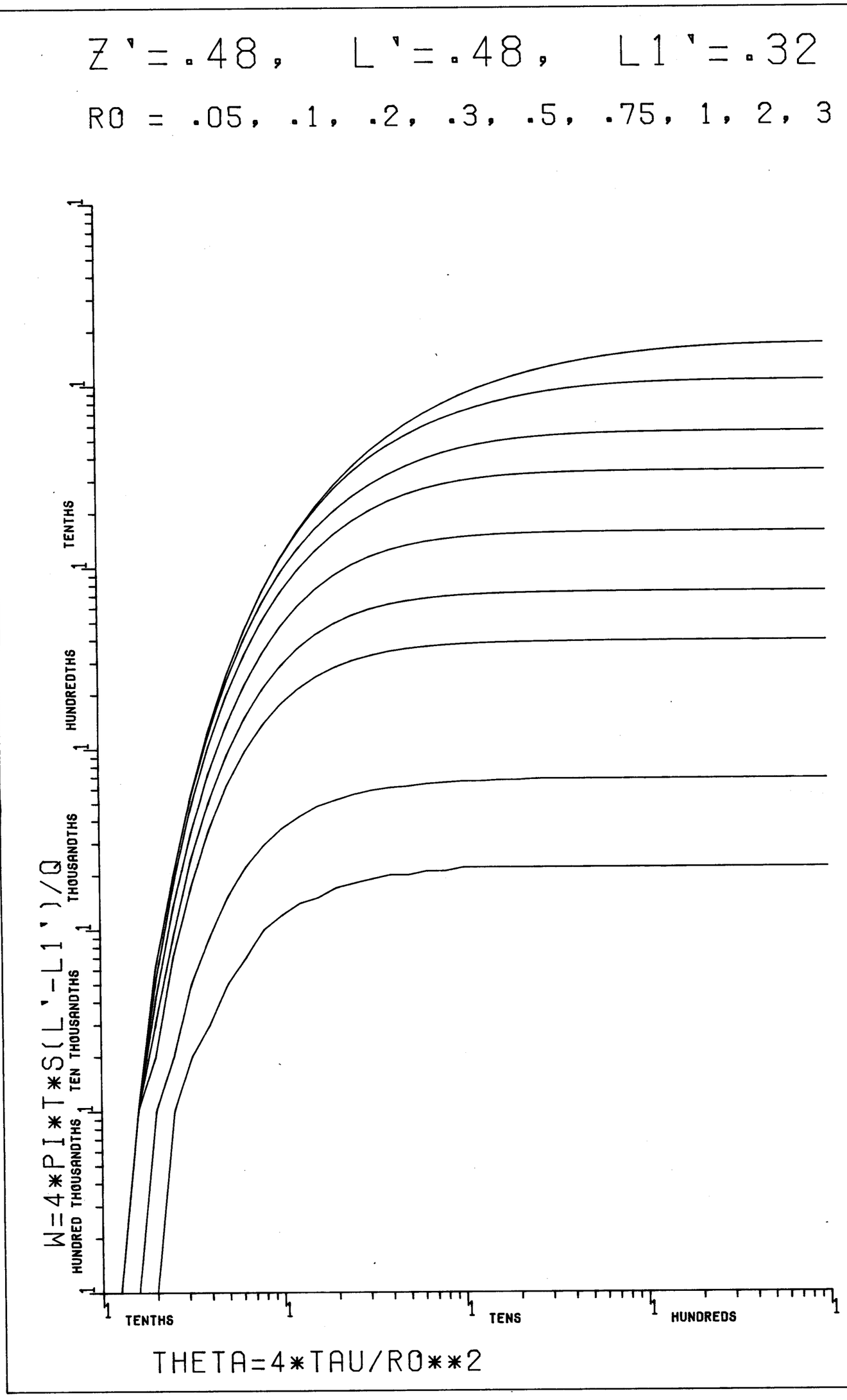
Z' = .4, L' = .48, L1' = .32

R0 = .05, .1, .2, .3, .5, .75, 1, 2, 3



WMD TAPENO 6404 PLOT NO 5045
USER NO RICK-BO DATE 86/06/12 TIME 15:24






WMD TAPENO 6404 PLOT NO 5048
USER NO RICK-BO DATE 86/06/12 TIME 15:26