

STATE HYGIENIC LABORATORY, DES MOINES BRANCH
WATER LABORATORY DIVISION
MINERAL ANALYSIS

LAB. NO. 1505
MINERAL NO. 4763
9 Feb 1965

TOWN Tiffin COUNTY Johnson
OWNER OF SUPPLY Town of Tiffin
COLLECTOR'S NAME R Hansen - L Steele
DATE COLLECTED 11 Dec 1964 DATE RECEIVED 15 Dec 1964
REPORT TO: NAME Iowa Geological Survey
ADDRESS Iowa City, Iowa

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
Tiffin #1 end discharge pipe 100 ft from well; TD 68 ft
Nov 1964

WELL PUMPED 5 1/3 HRS. AT 30 GPM. DATE OF PREVIOUS SAMPLE None
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Yes
TEMPERATURE °C 53 F ALKALINITY (ppm CaCO₃) P T pH
IS A POLYPHOSPHATE BEING USED? No

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 88.0 x 10⁵ TURBIDITY
DISSOLVED SOLIDS 523 SOLUBLE IRON (Fe) 3.5
TOTAL SOLIDS 523 SILICA (SiO₂) 16.0 TOTAL IRON (Fe) 3.5
ALKALINITY (ppm CaCO₃) P None T 330 pH 7.5 DATE 15 Dec 1964

POSITIVE IONS

K+	1.3
Na+	11.6
Ca++	112
Mg++	38.9
Mn++	0.10
Al+++	

NEGATIVE IONS

NO ₃ -	3.9
F-	0.35
Cl-	46
SO ₄ --	72.4
HCO ₃ -	403
CO ₃ --	None

HARDNESS AS CaCO₃ 440 ppm 25.7 gpg
Turbid with yellow color on receipt in lab.

ANALYST Ryan, Schwabbauer

R. L. MORRIS
PRINCIPAL CHEMIST

bw

N ↑
 shed
 fire hall
 park
 Well loc. in town park, just south and
 between town shed and town fire hall

PUMPING TEST DATA

Project TIFFIN EXPLORATION
11 Dec 64
 Sheet No. 1 of 2 sheets

Theis nonequilibrium $u = \frac{1.87 Q}{T s}$ $u = \frac{1.87 r^2 S}{T t}$	Modified Theis $T = \frac{264 Q}{\Delta s}$ $S = \frac{0.3 T_0}{r^2}$	Theim $T = \frac{527.7 Q}{\Delta s}$ $S = \frac{0.3 T_0}{r^2}$	$r = 239$ ft. $m =$ ft. $Q = 220$ gpm	Well No. <u>Obs #1</u> Well owner <u>TOWN TIFFIN</u>
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M.P. = 2.1'

Measured by	Date	Hour	Tape reading		Depth to Water (ft. below M.P.)	t (min.)	t' (min.)	1/t'	1/t or 1/t'	s or n'	Remarks		
			Measuring Point	Water Level									
WS		8:30	30.00	3.73	26.27								SWL
		9:10							$\frac{8.125 \times 10^{-7}}{t}$				Start pump
			30.00	3.67	26.33	2			4.112×10^{-7}	0.06			
			28.00	1.66	26.34	4			2.056	0.07			
				1.66	26.34	6			1.37	0.07			
				1.65	26.35	8			1.03	0.08			
				1.65	26.35	10			8.22×10^{-6}	0.08			
				1.63	26.37	12			6.85	0.10			
				1.70	26.30	16			6.15	0.03			
				1.61	26.39	18			4.57	0.12			
		9:30		1.61	26.39	20			4.11	0.12			
				1.60	26.40	22			3.74	0.13			
				1.59	26.41	24			3.43	0.14			
				1.58	26.42	26			3.16	0.15			
		9:40		1.56	26.44	30			2.74	0.17			
				1.55	26.45	35			2.35	0.18			
		9:50		1.53	26.47	40			2.06	0.20			
				1.50	26.50	45			1.83	0.23			
		10:00		1.48	26.52	50			1.64	0.25			
				1.44	26.56	60			1.37	0.29			
				1.39	26.61	70			1.17	0.34			
		10:30		1.35	26.65	80			1.03	0.38			
				1.30	26.70	90			9.15×10^{-5}	0.43			
				1.25	26.75	100			8.22	0.48			
		11:00		1.20	26.80	110			7.47	0.53			

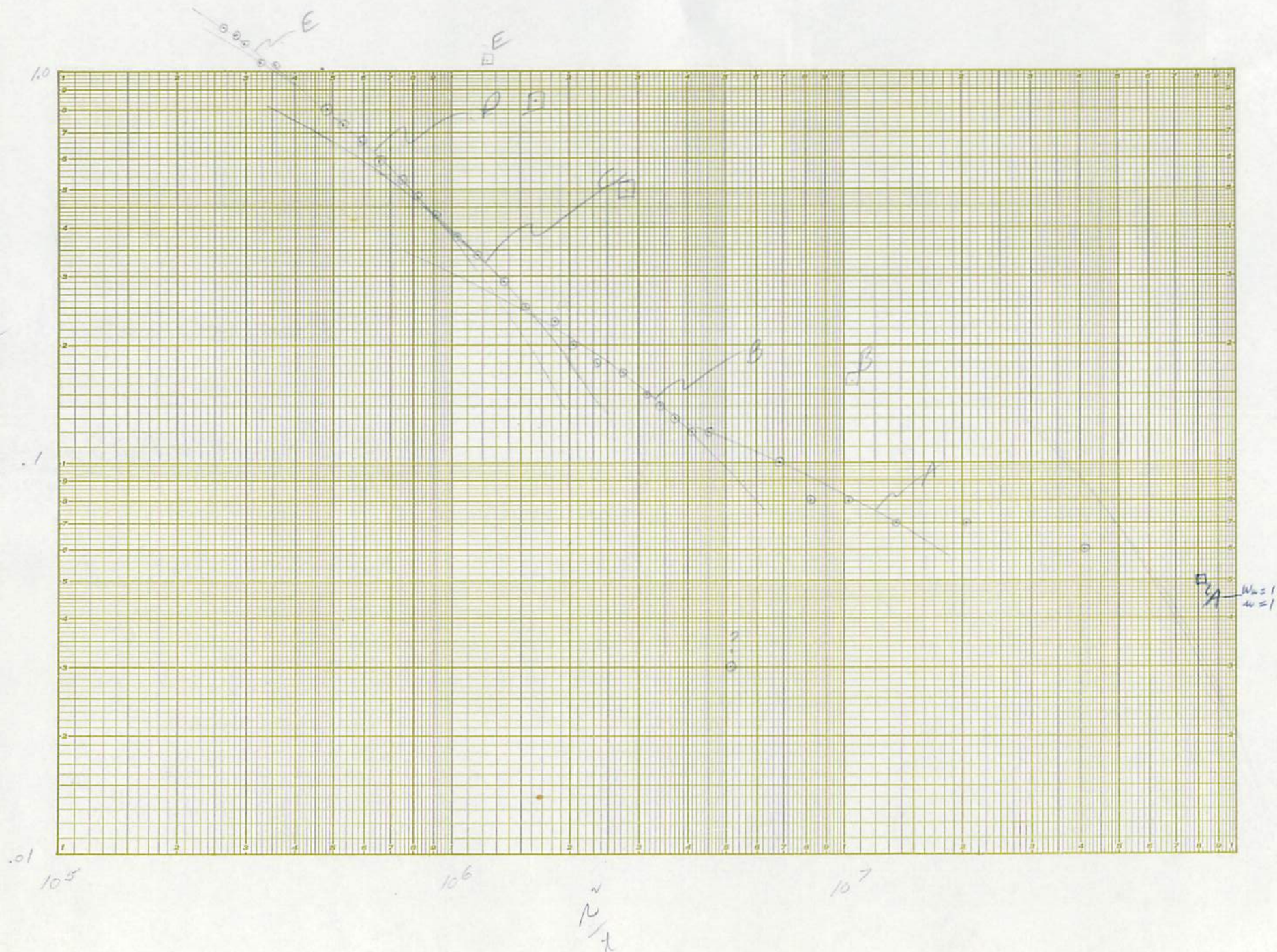
PUMPING TEST DATA

Project TIFFIN Exploration
11 Dec 64

Sheet No. 2 of 2 sheets

Theis nonequilibrium $\Delta = \frac{114.6 Q}{T}$ $u = \frac{1.87 r^2 S}{T t}$	Modified Theis $T = \frac{264 Q}{\Delta s}$ $S = \frac{0.3 T_1}{r^2}$	Theim $T = \frac{527.7 Q}{\Delta s}$ $S = \frac{0.3 T_1}{r^2}$	$r = 239$ ft. $m =$ ft. $Q = 220$ gpm	Well No. <u>obs #1</u> Well owner _____
--	---	--	---	--

Measured by	Date	Hour	Type reading		Depth to Water (ft. below M.P.)	t (min.)	t' (min.)	1/t'	s/t or r ² /t'	s or e'	Remarks		
			Measuring Point	Water Level									
		11:15	28.00	1.14	26.86	125			1.58 x 10 ⁻⁵	0.59			
		11:30		1.07	26.93	140			.587	0.66			
				1.00	27.00	155			.530	0.73			
		12 Noon		0.93	27.07	170			.484	0.80			
		1.00		0.68	27.32	230			.358	1.05			
		1.20		0.67	27.33	250			.329	1.06			
		1.40		0.55	27.45	270			.305	1.18			
		2.00		0.51	27.49	290			.284	1.22			
		2.20		0.41	27.59	310			.266	1.32			
		2.30		0.65	27.35	320			.257	1.08	corrected recovery		Pump off
				0.86	27.14		2			0.87	01	88	
				0.37	27.63		6			1.36	02	138	
				0.39	27.61		8			1.34	03	137	
				0.66	27.64		10			1.37	+ .05	142	
				0.35	27.65		14			1.38	07	145	
				0.35	27.65		20			1.38	+ .10	148	
				0.34	27.66		25			1.39	- .13	152	
		3.00		0.34	27.66		30			1.39	+ .15	154	
				0.36	27.64		55			1.37			
		3.30		0.37	27.63		60			1.36	+ .28	164	
				0.38	27.62		70			1.35	32	167	
				0.40	27.60		80			1.33	36	169	
		4.00		0.42	27.58		90			1.31	+ .40	171	
				0.45	27.55		105			1.28	45	173	
		4.30		0.48	27.52		120			1.25	+ .50	175	



TIFFIN PUMP TEST



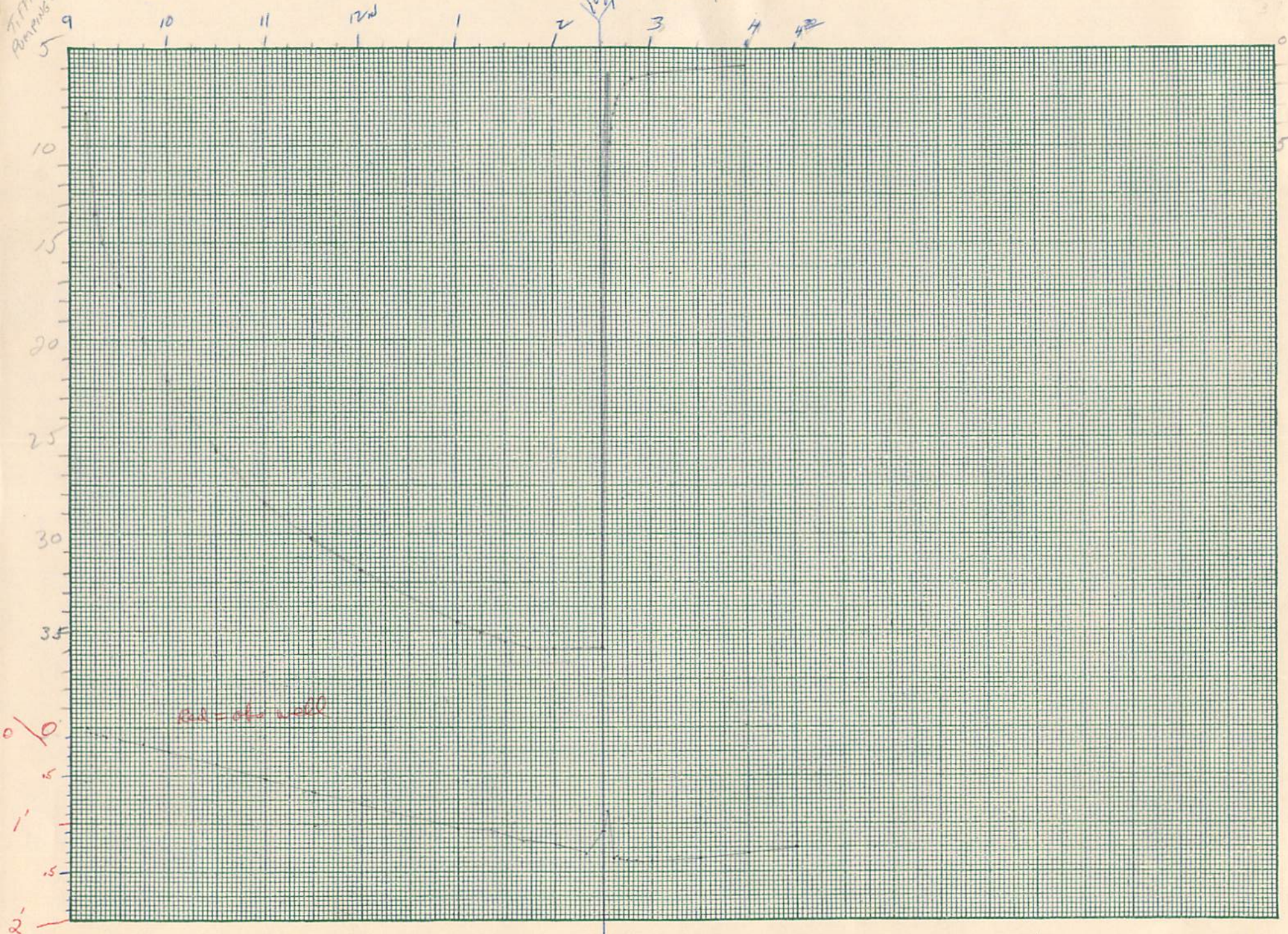
5' Final
Pumping Well

Dd curve

Form No. 641 - 10 Millimeters to Centimeter
AMERICAN PAD & PAPER CO., HOLYOKE, MASS.

Recovery

14
27
30



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington _____
District _____

TIFFIN PUMPING WELL

11 DEC 64

	TIME	Hold	± Ft WL	Dd							
	8.35	30.00	-0.98	29.02							
	9.08	30.00	-2.55	27.45							
	9.10	~~30.00~~	~~-2.55~~								
1		35	+1.75	36.75	9.30						
2		40	-1.45	38.55	11.10						
3			-0.3	39.70	12.25						
4			+0.32	40.32	12.87						
5			+0.97	40.97	13.52						
6			+1.21	41.21	13.76						
7			+1.65	41.65	14.20						
8			+1.93	41.93	14.48						
9			+2.18	42.18	14.73						
10	9.20		+2.45	42.45	15.00						
12		45-	2.21	42.79	15.34						
14			-1.70	43.30	15.85						
16			-1.20	43.80	16.35						
18			-0.81	44.19	16.74						
20	9.30		-0.33	44.67	17.22	19GPM	53				
25	9.35	45+	0.75	45.75	18.30						
30	9.40	+	1.92	46.92	19.47						
35	9.45	50-	2.59	47.41	19.96						
40	9.50		-1.79	48.21	20.76						
45	9.55		-1.11	48.89	21.44						
50	10.00		-0.43	49.57	22.12						
55	10.05		+0.24	50.24	22.79						
60	10.10		+0.92	50.92	23.47	19.1					
70	10.20		+1.16	51.16	23.71						
80	10.30	55	-1.82	53.18	25.73						
90	10.40		-0.76	54.24	26.79						
100	10.50		+0.06	55.06	27.61						
110	11.00		+0.93	55.93	28.48						
120	11.10		+1.73	56.73	29.28						

File No. { Washington -----
District -----

TIFFIN PUMPING WELL

14

 $MP = 1.9$

}	Bowls - taking air	
}		
	shut off	

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY

 File No. { Washington _____
 District _____

TIFFIN OBS WELL T.D-6100 MP-2.1

DEC DATE 64	TIME	MIN	HELD	WGT	W/V	D/D						
10	1045		15.00	5.35	9.65							
11	830		30.00	3.73	26.27							
	9:10		START									
		2	28.00	2.67	26.33	0.06						
		4	28.00	1.66	26.34	0.07						
		6	28.00	1.66	26.34	0.07						
		8	28.00	1.65	26.35	0.08						
		10	28.00	1.65	26.35	0.08						
		12	28.00	1.63	26.37	0.10						
		16	28.00	1.70	26.30	0.03						
		18	28.00	1.61	26.39	0.12						
		20	28.00	1.61	26.39	0.12						
		22	28.00	1.60	26.40	0.13						
		24	28.00	1.59	26.41	0.14						
		26	28.00	1.58	26.42	0.15						
		30	28.00	1.56	26.44	0.17						
945	35	28.00	1.55	26.45	0.18							
50	40	28.00	1.53	26.47	0.20							
55	45	28.00	1.50	26.50	0.23							
10:00	50	28.00	1.48	26.52	0.25							
10:10	60	28.00	1.44	26.56	0.29							
10:20	70	28.00	1.39	26.61	0.34							
10:30	80	28.00	1.35	26.65	0.38							
1040	90	28.00	1.30	26.70	0.43							
1050	100	28.00	1.25	26.75	0.48							
11:00	110	28.00	1.20	26.80	0.53							
11:15	125	28.00	1.14	26.86	0.59							
11:30	140	28.00	1.07	26.93	0.66							
1145	155	28.00	1.00	27.00	0.73							
Noon	170	28.00	0.93	27.07	0.80							

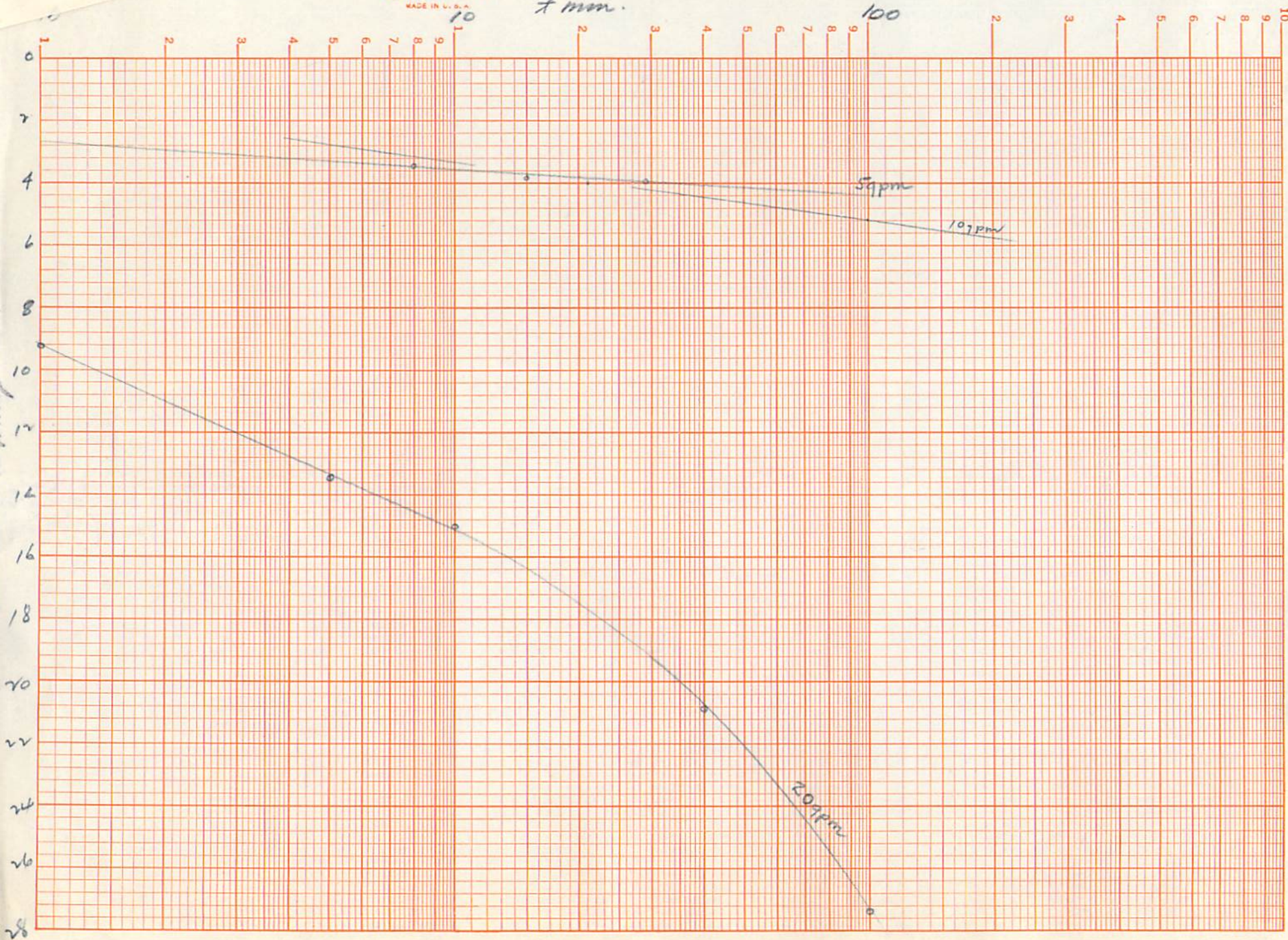
TIFFIN OBS WELL

DEC 64	TIME	MIN	HELD	WET	W/L	P/D				R= 239
11	1300		28.00	0.68	27.32	1.05				
	1320		28.00	0.67	27.33	1.06				
	1340		28.00	0.55	27.45	1.18				
	1400		28.00	0.51	27.49	1.22				
	1420		28.00	0.41	27.59	1.32				
	1430		28.00	0.65	27.35	1.08		OFF		
		2		0.86	27.14	0.87				
		4								
		6		0.37	27.63	1.36				
		8		0.39	27.61	1.34				
		10		0.66	27.64	1.37				
		12								
		14		0.35	27.65	1.38				
		16								
		18								
		20		0.35	27.65	1.38				
		25		0.34	27.66	1.39				
	1500	30		0.34	27.66	1.39				
	1525	55		0.36	27.64	1.37				
	1530	60		0.37	27.63	1.36				
	1540	70		0.38	27.62	1.35				
	1550	80		0.40	27.60	1.33				
	1600	90		0.42	27.58	1.31				
	1615	105		0.45	27.55	1.28				
	1630	120		0.48	27.52	1.25				

$\pm$ min.

100

drawdown in ftmpwell



Dec 22, 1964

Hanson + Kunkle

(6)

Step Drawdown Data.

Q	ΔQ	$dd@$ 10 min.	Δdd
	.011 cfs		3.57
5 gpm = .011 cfs		3.57'	
	.033 cfs		11.43
20 gpm = .044 cfs		15.00'	

$$\text{well loss constant } C = \frac{(\Delta s_2 / \Delta Q_2) - (\Delta s_1 / \Delta Q_1)}{\Delta Q_2 + \Delta Q_1}$$

$$= \frac{(11.43 / .033) - (3.57 / .011)}{.044}$$

$$= \frac{347 - 325}{.044} = \frac{22}{.044}$$

$$= 500 \leftarrow \text{extremely high}$$

Question:

Are the screen openings sufficient to permit the Q pumped?

According to Walton optimum Q is $= L \times 7.48 \times A_o \times V_c$.

V_c for sand with permeability $< 500 \text{ gpd/ft}^2$ is 2 ft/min.
 $L = 5 \text{ ft}$ and A_o for #12 slit screen 6" diameter is 24 inches²/ft or 0.166 ft²/ft.

$$Q = 5 \times 7.48 \times 0.166 \times 2 = 12.5 \text{ gpm optimum}$$

discharge for screen without well loss.

∴ at 20 gpm the optimum screen entrance velocity was exceeded resulting in excessive drawdown.

at 5 gpm the well should perform ok.

Calculate specific capacity @ 5 gpm and 10 min., $= 5.00 / 3.60, = 1.4 \text{ gpm/ft.}$ According to Walton p. 12, fig. 3, for a specific capacity of 1.4 gpm/ft. ~~and~~ and $S = 1 \times 10^{-3}$, T should be 3×10^3 . From obs. well $T = 2.5 \times 10^3$.

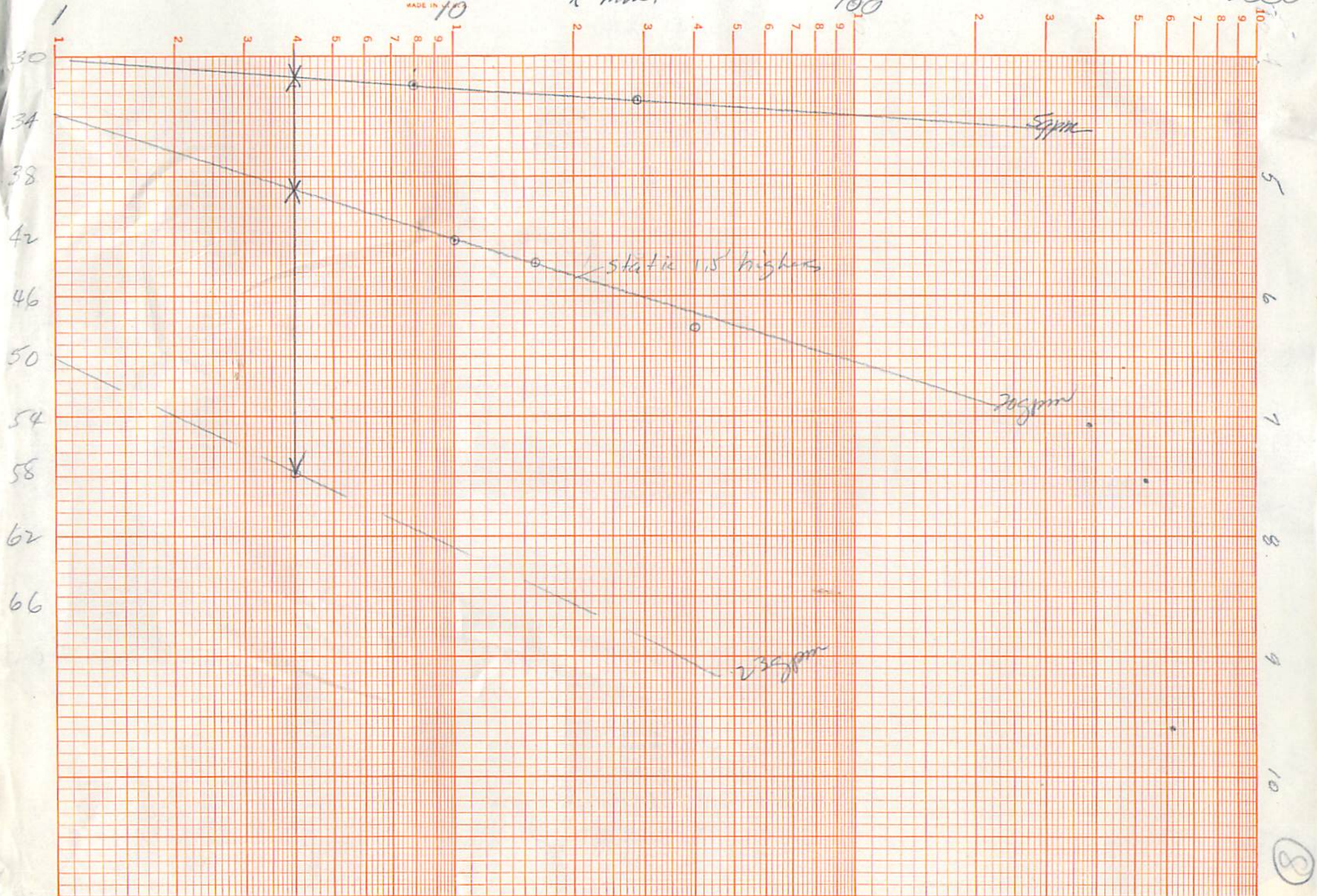
Therefore, well did perform satisfactorily at 5 gpm, and excess dd. at 20 gpm is due to high entrance velocity.

For higher rates of Q than 12.5 gpm need a different screen.

$\pm$ min.

100

1000



(9)

TIFFEN Well

Assumptions

1. Transmissibility, $T = 2500 \text{ gpd/ft.}$ 2. Storage Coeff, $S = 1.0 \times 10^{-2}$ 3. Time = 30 minutes = $30/1440$ days4. $r = 3'' = (3/12)$ $r^2 = (1/4)^2 = .0625$ 5. Q/s @ $t = 30 \text{ mins.}$ & $Q = 19 \text{ gpm} = 0.975 \text{ gpm/ft. of drawdown}$ Q/s @ $t = 30 \text{ mins.}$ & $Q = 5 \text{ gpm} = 1.26 \text{ gpm/ft. " "$ MAX. THEORETICAL Q/s @ 100% efficiency = $\frac{T}{114.6 \times W(u)}$ Where $W(u)$ is from standard table when

$$u = \frac{1.87 \sqrt{r^2 S}}{T \times t} = \frac{1.87 \times (.0625) \times 1 \times 10^{-2}}{2.5 \times 10^3 \times 30/1440}$$

$$= \frac{1.17 \times 10^{-5}}{2.5 \times 10^3 \times 2.08 \times 10^{-2}} = \frac{11.7 \times 10^{-5}}{5.2 \times 10^1} = \underline{\underline{2.25 \times 10^{-6}}}$$

$$W(u) = \underline{\underline{17.43}}$$

$$Q/s = \frac{T}{114.6 \times W(u)} = \frac{2.5 \times 10^3}{1.146 \times 10 \times 17.43} = \frac{2.5 \times 10^3}{14.25 \times 10^2} = 0.175 \times 10^1$$

MAX.
THEOR.

$$Q/s = \underline{\underline{1.75 \text{ gpm/ft. of drawdown}}}$$

ACTUAL % Q/s OBTAINABLE USING KOZENY FORMULA
FOR CORRECTION FOR SCREEN PENETRATION.

$$m = 6 \text{ ft. amount of screen open to sand} = 4.5'; \frac{4.5}{6.0} = 75\% \text{ penetration}$$

$$m/r = 6/2.5 = 2.4; \% Q/s \text{ obtainable} = 100\%$$

$$\text{EFFICIENCY OF WELL @ } 5 \text{ gpm} = 1.26/1.75 = 72\%$$

$$\text{" " " " @ } 20 \text{ gpm} = 0.975/1.75 = 56\%$$

$$\text{LOWEST EFFICIENCY of WELL @ } 20 \text{ gpm and } 30 \text{ min} = 0.555/1.48 = 37\%$$

6" well

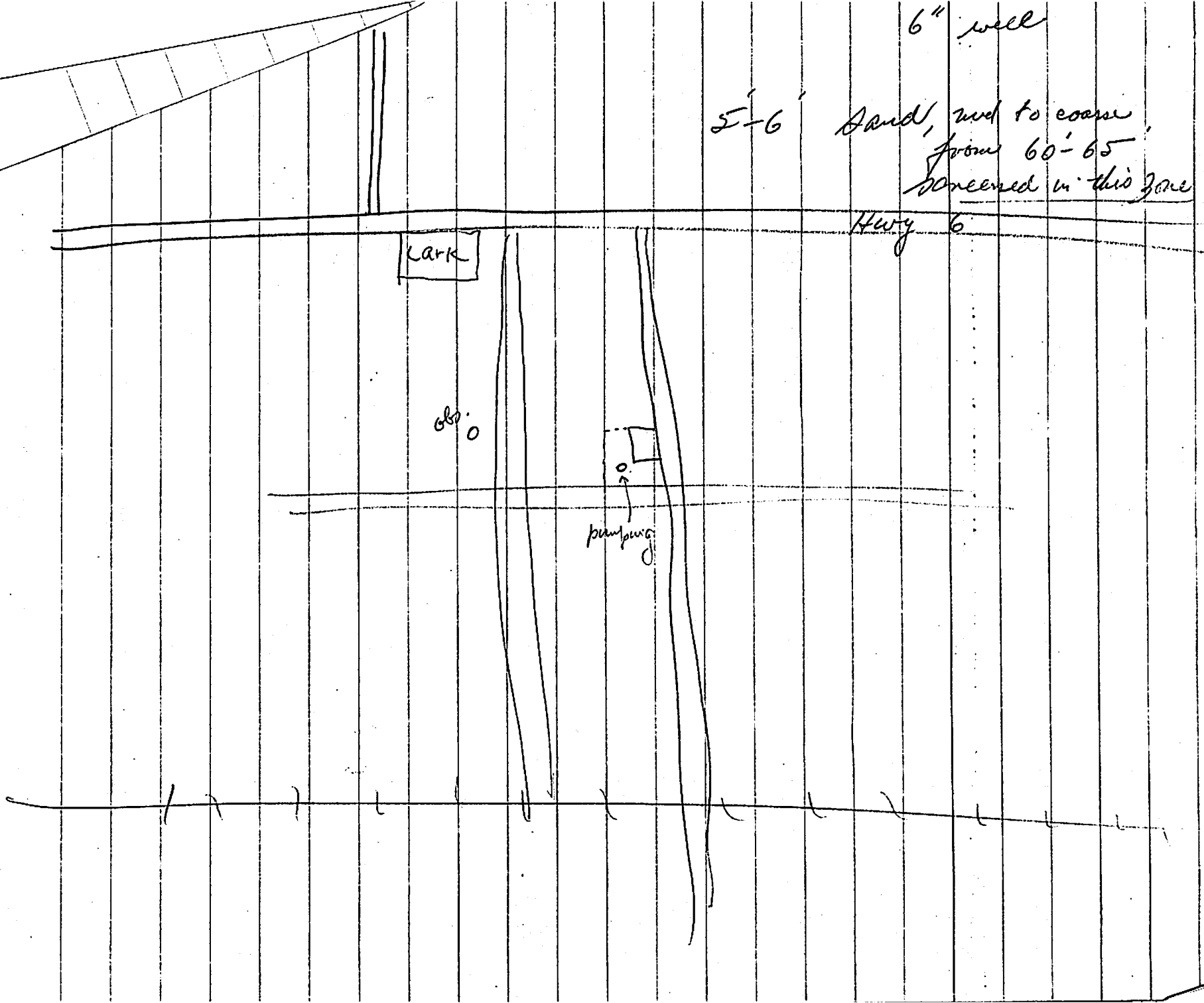
5'-6' sand, mud to coarse
from 60'-65'
screened in this zone

Hwy 6

Lark

60'

pump



Tiffen Report.

Dec. 23, 1964

The well efficiency is acceptable at 5gpm, but at higher discharges the well efficiency deteriorates to about 30% and if discharge of 20gpm is maintained for a period of 5 hours the efficiency reduces to 37%. Thus, the formation at the screen is unstable.

The pump test at 20gpm for 300 minutes extended the drawdown cone to 900 feet.

If tested at 10gpm for 5 days the cone could be extended to 4200 ft. Because of possible negative boundaries it would be desirable to conduct such a test.

The pump well, despite some inefficiency, could maintain a discharge of 10 gpm for 5 days.

If after the 5 day test no negative boundaries are encountered, it should be recommended that a new production well be installed. This should probably be a gravel-packed well.

If possible additional obs. wells should be installed prior to the five day test. If not then, prior to production of permanent well.

SRB

OBSERVATION WELL

①

DRAWDOWN (LATE DATA)

$$T = \frac{114.6 \times 20 \times W(u)}{r}$$

$$= \frac{1.146 \times 10^2 \times 20 \times 1}{1.0}$$

$$= \underline{2300}$$

$$\frac{2300}{6} = \boxed{400 \text{ gpd/ft}^2}$$

not bad for this aquifer

$$\mu = \frac{2.7 \times 10^3 r^2 \times S}{T \Delta t}$$

$$10^{-1} = \frac{2.7 \times 10^3 \times 5.7 \times 10^4 S}{2.3 \times 10^3 \times 6 \times 10^2}$$

$$14 \times 10^4 = 15.5 \times 10^7 S$$

$$S = 0.9 \times 10^{-3} = \underline{9 \times 10^{-4}}$$

↑ best fit to the geological situation

RECOVERY

CURVE #1 (ignores 2min point as observer error)

$$T = \frac{1.146 \times 10^2 \times 20 \times 1}{0.6}$$

$$= \underline{3800}$$

$$\frac{3800}{6} = \boxed{630 \text{ gpd/ft}^2}$$

not bad for this aquifer

$$\mu = \frac{2.7 \times 10^3 \times r^2 \times S}{4 \times 10^3 \times 20}$$

$$S = \underline{5 \times 10^{-5}}$$

↑ low

RECOVERY

CURVE #2 (uses 2min. point)

$$T = \frac{1.146 \times 10^2 \times 20 \times 1}{0.3}$$

$$= \underline{7700}$$

↑ high for coarse sand

$$\frac{7700}{6} = \underline{1300 \text{ gpd/ft}^2}$$

$$10^{-2} = \frac{15.5 \times 10^7 S}{7.7 \times 10^3 \times 4}$$

$$\frac{31 \times 10^1}{15.5 \times 10^7} = S = \underline{2 \times 10^{-6}}$$

↑ improbably low

(2)

Using:

$$T = 2500 \quad \text{and } Q = 20 \text{ gpm}$$

$$S = 1 \times 10^{-3}$$

$$r = 0.5/2 = 0.25'; \quad r^2 = .0625$$

Calculate dcl in pumping well after 300 min. of pumping. (check test results.)

$$u = \frac{2.7 \times 10^3 \times 6.25 \times 10^{-2} \times 1 \times 10^{-3}}{2.5 \times 10^3 \times 3 \times 10^2} = \frac{17 \times 10^{-2}}{7.5 \times 10^5} = 2.3 \times 10^{-7}$$

$$W(u) = 14.7$$

$$s = \frac{1.146 \times 10^2 \times 20 \times 14.7}{2.5 \times 10^3} = \frac{33.8 \times 10^2}{2.5 \times 10^3} = \underline{\underline{13.5'}} = 13.5'$$

actual dd = 36'

Either aquifer constants are wrong or the pump well has a hell of a big well loss!

efficiency of pump well = 56% at 20 gpm. and 30 min

← see page 9

$$\frac{\text{actual } Q/s}{\text{theoretical } Q/s} = .56$$

$$\text{theoretical } Q/s = 1.48$$

$$\text{actual } \frac{Q}{s} = 1.48(.56) = 0.83$$

$$s = \frac{Q}{0.83} = 24' \text{ drawdown.}$$

not correct

i.e. the efficiency drops to $\frac{.555}{1.48} = \underline{\underline{37\%}}$

unstable condition at screen deteriorates with time and high Q

(3)

TIEFFEN WELL

Nov. 1964

#12 slot or gauss

no gravel pack

PUMP WELL

$$T = \frac{1.146 \times 10^2 \times 20 \times 1}{9}$$

$$= 250 \text{ gpd/ft. } \leftarrow \text{too low}$$

$$\frac{10^{-1}}{2.5 \times 10^2 \times 23} = \frac{2.7 \times 10^3 \times 6.25 \times 10^{-2} \times S}{2.5 \times 10^2 \times 23}$$

$$57.5 \times 10^2 = 17 \times 10^1 S$$

$$S = \frac{57.5 \times 10^1}{17 \times 10^1} = 3.4 \leftarrow \text{too high}$$

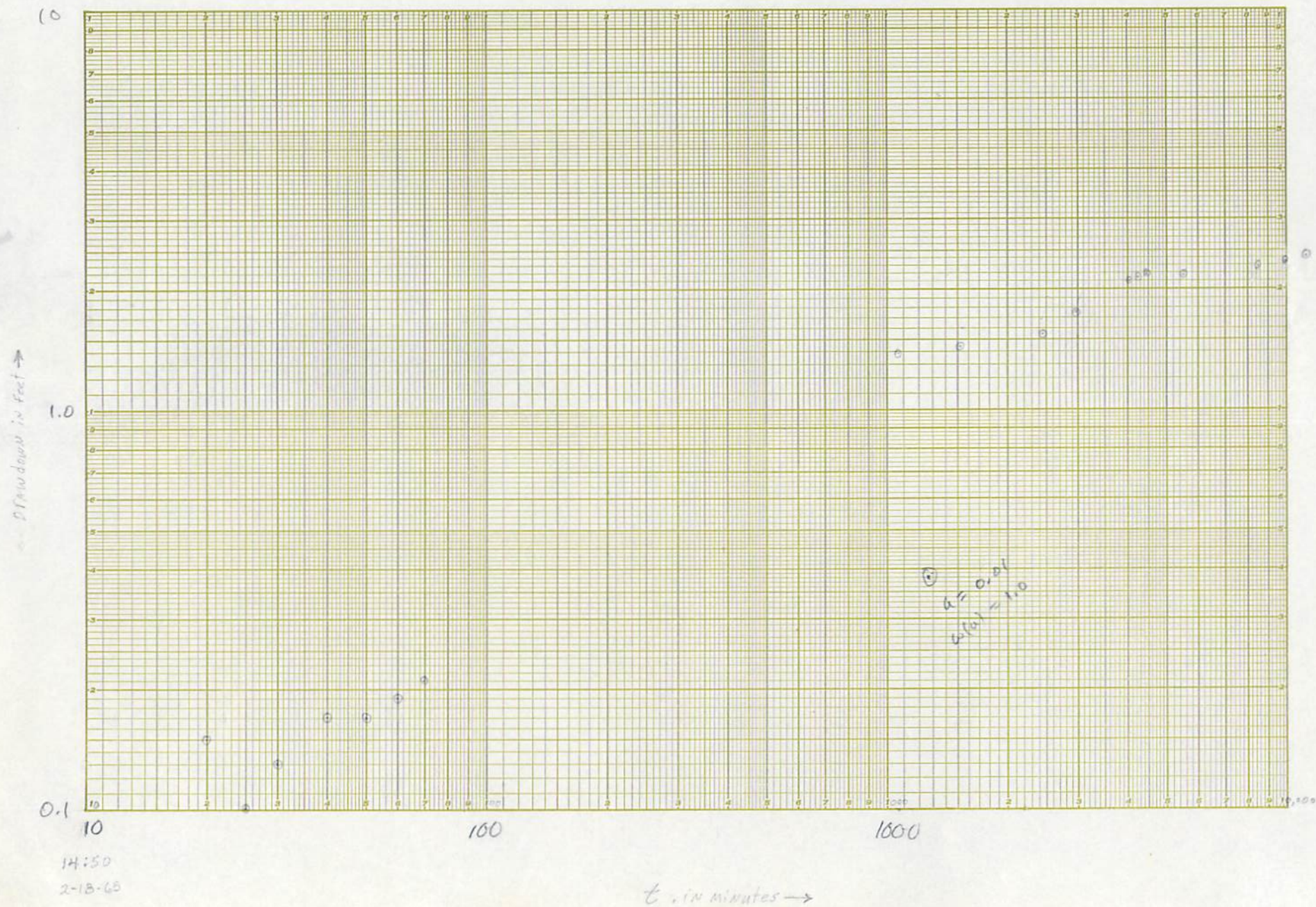


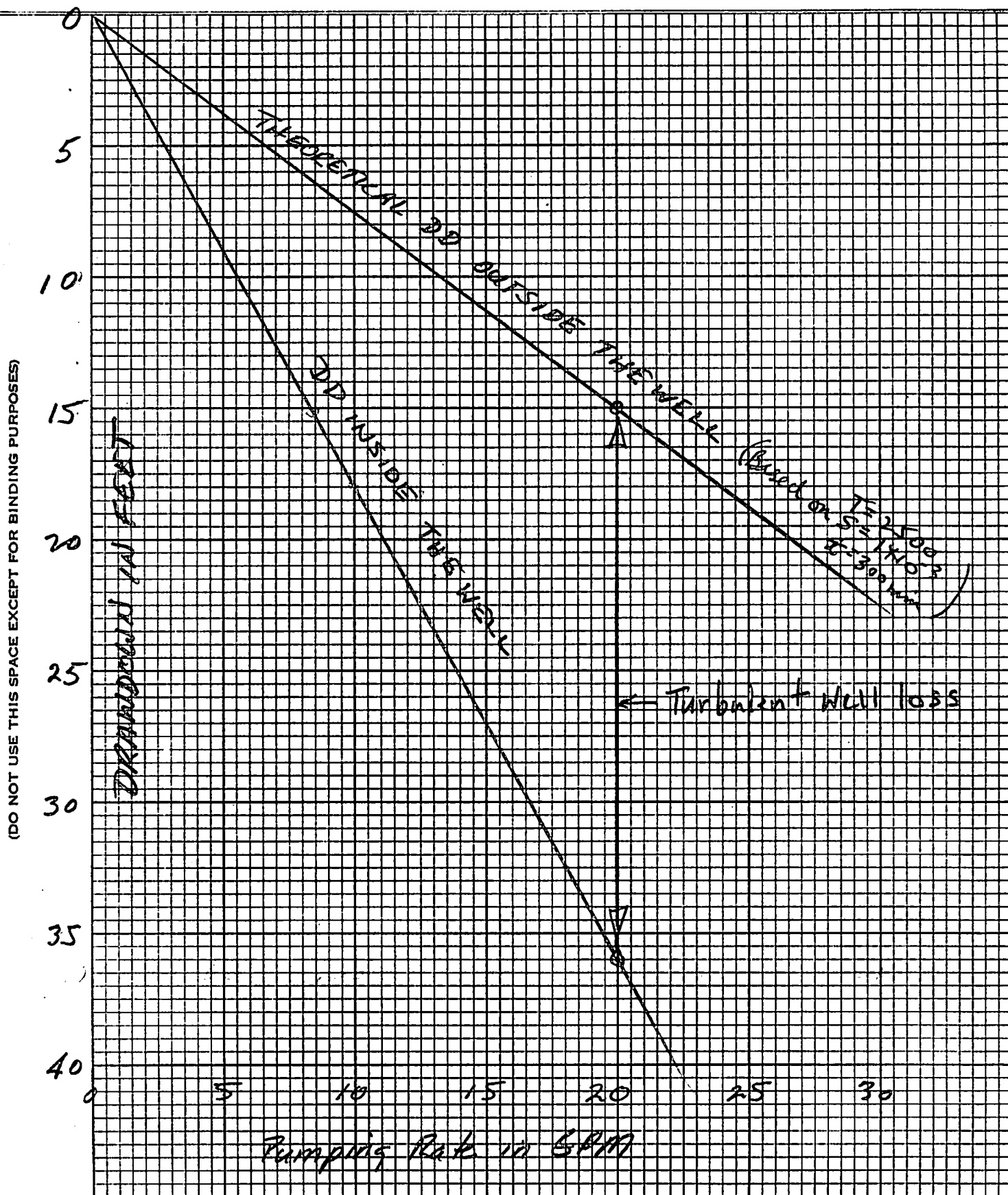
Tiffin (observation well)

$$T = 3000$$

$$S = 2.4 \times 10^{-4}$$

$$S.W.L. = 24.40'$$





PUMP WELL

PIPE WELL

TIME HR+MIN	T MIN	HOLD	± Ft	W/L	SECONDS TO FILL BUCKET	TEMP	TIME HR+MIN	HOLD	WET	W/L	5	
2:15P		25.39	+1.68	(27.07 - SWL)			2:40	25.00	0.60	24.40		
2:40		25.34	+1.67									
	1	30.60	-1.51	29.09	2.02		1	"	.66			
	2		-2.11	28.49	1.42		2	"				
	3		-2.20	28.40	1.33		4	"				
	4		-2.15	28.45	1.38		7	"				
	5		-2.16	28.44	1.37		9		.60	24.40		
	6		-2.20	28.40	1.33		10	"	"			
	7		-2.10	28.50	1.43		15		.56	24.44	0.04	
	8		-2.05	28.55	1.48		20		.45	24.55	0.15	
	9		-2.07	28.53	1.46		25		.50	24.50	0.10	
	10		-2.06	28.54	1.47		30		.47	24.53	0.13	
	12		-2.02	28.58	1.51	75 sec	40		.43	24.57	0.17	
	22	30.60	+0.65	31.25	4.18	3208/1 min	50		.43	24.57	0.17	
	23		+0.70	31.30	4.23		60		.41	24.59	0.19	
	24		+0.74	31.34	4.27		3:50		.39	24.61	0.21	
	25		+0.79	31.39	4.32							
3:05	30		+0.93	31.53	4.46	32-33						
3:10	35		+1.00	31.60	4.53		54					
	40		1.08	31.68	4.61							
	45?		+1.16	31.76	4.69							
3:35	60		1.20	31.80	4.73							
3:50	70		1.28	31.88	4.81							
9:06a		35.85	-2.64	33.21	6.14	31 1/2	54	9:14	26.00	0.21	25.79	1.39
4:30 PM		35	-2.81	33.04	5.97	34	53	4:45 PM	26.00	0.16	25.84	1.44
8:15 AM		33	-3.03	32.82	5.75	34	53	8:30 AM	26.00	0.05	25.95	1.55
4:30 PM		33	-9.05	34.90	7.83	34	54	4:45 PM	27.00	8.04	26.16	1.76
9:20a		40.05	-3.16	37.89	10.82	34 3/4	53	9:25a	27.00	0.50	26.50	2.10
12:55P		40	-2.68	38.37	11.30	34	53	1:05 PM	27.00	0.46	26.54	2.14
4:30p		40	-5.28	38.77	11.70	34	53	4:45 PM	27.00	0.42	26.58	2.18
9:13a		40.05	-1.03	40.02	12.95	34	53	9:15a	27.00	0.43	26.57	2.17

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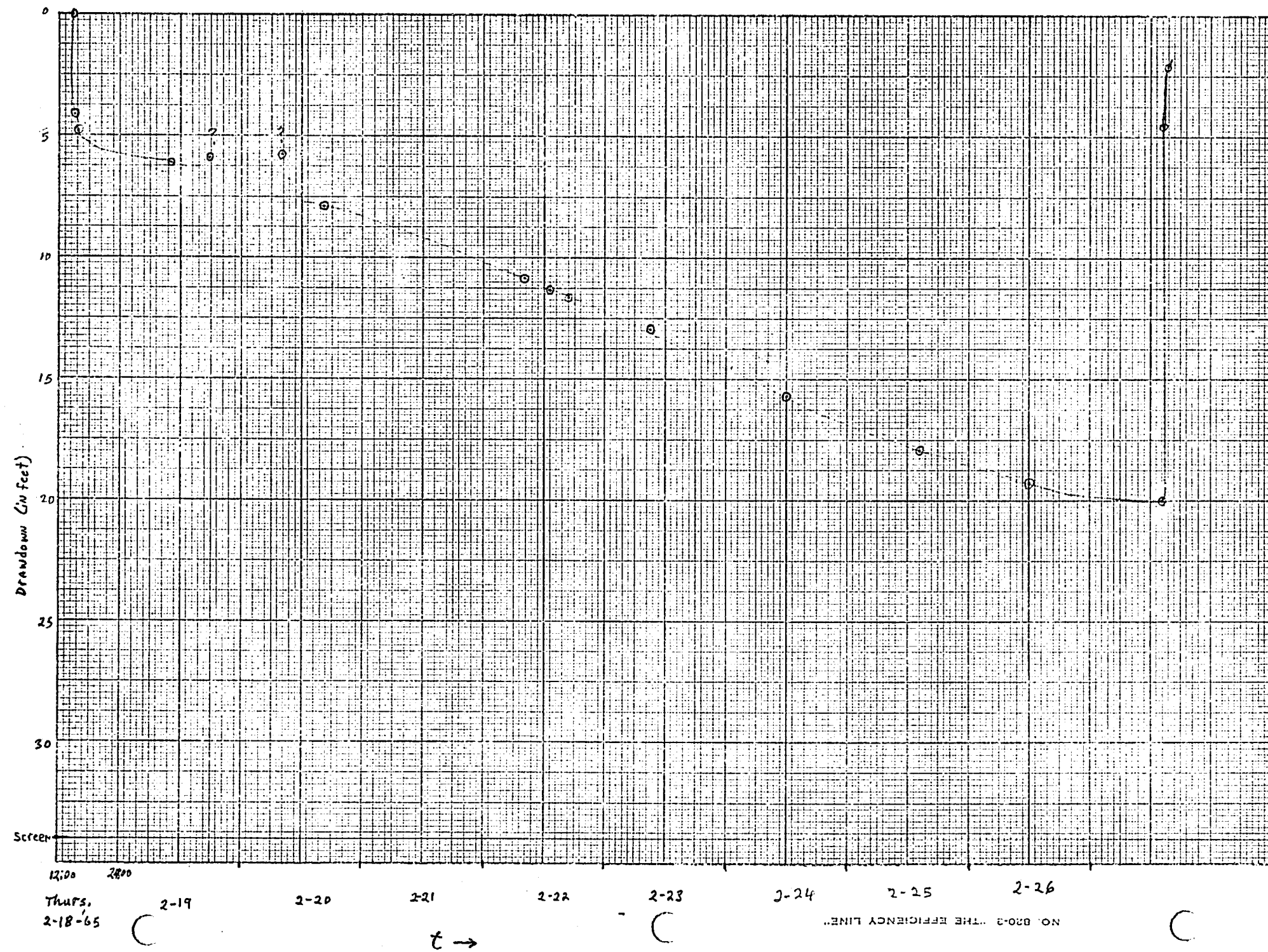
PUMP WELL

PIPE WELL

TIME HR+MIN	T MIN	HOLD	±FT	W/L	S	Seconds to Fill BUCKET	TEMP	TIME HR+MIN	HOLD	WET	W/L	S
2-24-65	12.05a	40.00 ^{41.05}	+1.70	42.75	15.68	35 1/2	53 1/2	11.55a	27.00	0.32	26.68	2.28
2-25-65	2.30p	45.00 ^{46.26}	-1.27	44.99	17.92	34	53	2.30	28.00	1.26	26.74	2.34
2-26-	12.05	46.26	+0.06	26.32	19.25	36	53 1/2	12.05	28.00	1.18	26.82	2.42
2-27	1.40p	46.26	+0.90	47.16	20.09	36	54 1/2	1.40p	28.00	1.25	26.75	2.35
Recovery												
2-1.45p							shut off					
4		35.00	3.41	31.59	4.52							
6		32.00	1.83	30.17	3.10							
8		31.00	1.26	29.74	2.67							
10		29.00?	0.05?	28.95?	1.88	??						
15		30.00	0.75	29.25	2.18							
20		30.00	0.84	29.16	2.09							
30		30.00	0.92	29.04	1.97							
45		30.00	1.10	28.90	1.83							
very good measurements												
0 5 10 15 20 25 30 35 40 45												
1												
2												
3												
4												
5												

Static Water Level = 27.07' below mouth of casing.

Tiffin (pumping well)





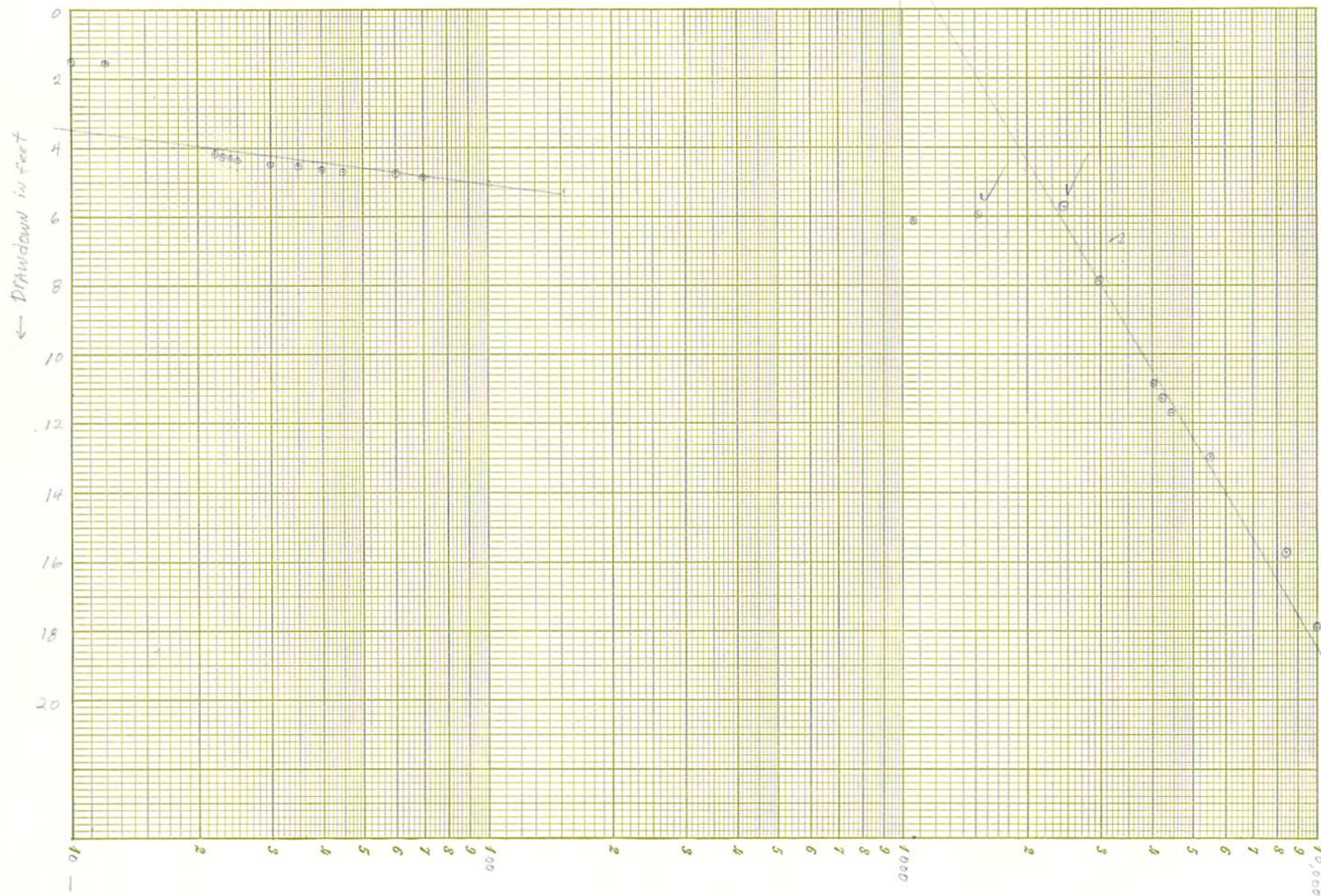
0

0

0

Tiffin (pumping well)

SWL = 27.07'



14:50

2-18-65

t in minutes

Loc. - E across street from locker plant in alley at 1st power pole

[illegible]

Measurements at Well #1 (Firestation)
During pumping of Well #2 showed
a drawdown of 0.17 feet

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E across street from
Locker in the alley at 1st power pole

1969

[illegible]
$$\begin{array}{r} \cancel{24} \times \cancel{60} \\ 24 \times = 300 \\ x = 12.28 \end{array}$$

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TIFFIN - Well #1 { Town Park at Firestation - obs

TIME	TIME ELAPSED	HEAD	Wet	W/L	dd							
10:00		30.00	10.57	19.43						STATIC		
9:10		20.00	1.14	18.86								
9:20		20.00	1.13	18.87								
9:30		20.00	1.12	18.88								
9:40		20.00										
	10:00		1.13									
	11:00		1.10									
	2 MIN		1.12									
	2:45		1.12									
	3:30		1.12									
	4:00		1.12									
9:45	5:00		1.11									
	6 MIN		1.10									
	7 MIN		1.10									
	8 MIN		1.10									
	9 MIN		1.10									
9:50	10 MIN	20.00	1.10	18.90								
	12 MIN		1.09									
	14 MIN		1.10									
	16		1.10									
	18		1.09									
10:00	20	20.00	1.09	18.91								
	22		1.08									
	24		1.08									
	26		1.07									
	28		1.07									
10:10	30 MIN	20.00	1.06	18.94	0.07							
10:15	35 MIN		1.05									
10:20	40		1.04									
10:25	45 MIN		0.97									
10:27			0.96									

[illegible]