WATER RESOURCES DEPARTMENT

AQUIFER TEST REPORT

FOR

STAGE GULCH RANCH
WELL #3

STANFIELD, OREGON

BY

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AQUIFER TEST OF THE GEHRKE WELL #3

UMATILLA COUNTY, OREGON

Introduction

Purpose of Study

This aquifer test was conducted from March 28 to March 31, 1979 to determine aquifer characteristics and possible interference among irrigation wells in an area of irrigated farmland east of Stanfield, Oregon. The test was one of a series of aquifer tests performed in the Stage Gulch area of Umatilla County and is part of a long term study of ground water problems in the Columbia Plateau region.

Location of test wells

Gehrke #3 (Pumping well)	NE¼, SW¼, Section 28, T4N, R30E
Gehrke #1 (Observation well)	SE¼, SW¼, Section 33, T4N, R30E
Gehrke #2 (Observation well)	SW¼, SE¼, Section 32, T4N, R30E
Gehrke #4 (Observation well)	NE¼, NE¼, Section 28, T4N, R30E
Kilgore #1 (Observation well)	SW¼, NW¼, Section 26, T4N, R29E
Zabransky #3 (Observation well)	NE¼, SE¼, Section 36, T4N, R29E
Zabransky #4 (Observation-well, Recorder)	SE¼, NE¼, Section 25, T4N, R29E
Lorenzen (Observation well)	SW¼, SE¼, Section 35, T4N, R30E

Summary of Conclusions

1) The average transmissivity of the basalt aquifer system in the vicinity of this test is 6,800 ft^2/day based on the test data.

2) The storage coefficient of the basalt aquifer system in the vicinity of this test ranges from 1.3×10^{-4} through 1.7×10^{-5}, based on the test data.

3) Variations in transmissivity and storage coefficient are due to the heterogeneous character of the aquifer system. These variations are probably due to variations in amount of fracturing and presence of hydraulic boundaries.

4) Prediction graphs based on the above information show that the Gehrke #3 well will lower the water table 54 feet at a distance of 5000 feet after 10 days of continuous pumping at a rate of 4800 gallons per minute.

5) An efficient hydraulic boundary exists between the Gehrke wells #3 and Zabransky wells #3 and #4.

Well Histories

The Gehrke #3 well (the pumped well) was constructed for Merle Gehrke and was completed January 5, 1978 by Larry Burd Well Drilling of Pendleton, Oregon. It was cased with 16 inch diameter casing to a depth of 32' and was drilled 15 inches in diameter to a total depth of 665 feet below land surface. When completed the well had approximately 1,000 gpm artesian flow at land surface with unknown confining pressure. A pump test performed by Valley Pump Co. produced 5958 gallons per minute with 90 feet of drawdown after 8 hours. This well produces water for irrigation under permit #G-7929 (application #G-8647) with a priority date of February 15, 1978. At the time of the test the well was equipped with a 500 hp electric turbine pump set approximately 300 feet below land surface and two 75 hp centrifuged booster pumps installed at land surface.

The Gehrke #1 well was constructed for Merle Gehrke and was completed October 3, 1977 by Larry Burd Well Drilling of Pendleton, Oregon. It was cased with 16 inch casing to a depth of 18 feet and was drilled 15 inches in diameter to a depth of 600 feet. When completed the static water level was 30 feet below land surface. A pump test by Valley Pump Co. produced 4000 gallons per minute with 260 feet of drawdown after 8 hours. This well produces water for irrigation under permit #G-8647 (application #G-7929) with a priority date of February 15, 1978. At the time of this test the well was equipped with a 500 hp electric turbine pump set approximately 350 feet below land surface, and a 75 hp centrifuged booster pump at land surface.

The Gehrke #2 well was constructed for Merle Gehrke and was completed October 18, 1977 by Larry Burd Well Drilling of Pendleton, Oregon. It was cased with 16 inch casing to a depth of 28 feet and was drilled 15¼" in diameter to a total depth of 600 feet. When completed the well had an undetermined amount of artesian pressure

at land surface. A pump test performed by Valley Pump Co. produced 5,100 gallons per minute with 72 feet of drawdown after 8 hours. This well produces water for irrigation - under permit #G-7929 (application #G-8647) with a priorty date of February 15, 1978. At the time of this test the well was equipped with a 500 hp electric turbine pump set approximately 310 feet below land surface and two 75 hp centrifuged booster pumps at land surface.

The Gehrke #4 well was constructed for Merle Gehrke and was completed February 1, 1978 by Larry Burd Well Drilling of Pendleton, Oregon. It was cased with 18" casing to a depth of 23 feet and was drilled 15¼" to a total depth of 950 feet. When completed the well had a static water level of 98 feet below land surface. A pump test performed by Valley Pump Co. produced 4000 gallons per minute with 90 feet of drawdown after 8 hours. This well produces water for irrigation under permit #G-7929 (application #G-8647) with a priority date of February 15, 1978. At the time of this test the well was equipped with a 500 hp electric turbine pump set approximately 410 feet below land surface.

The Kilgore #1 well was constructed for Ron Kilgore and was completed February 27, 1978 by Larry Burd Well Drilling of Pendleton, Oregon. It was cased with 16 inch casing to a depth of 48 feet and was drilled 15½ inches in diameter to a total depth of 750 feet. When completed the well had a static water level of 182 feet below land surface. A pump test performed by Valley Pump Co. produced 4000 gallons per minute with 90 feet of drawdown after 8 hours. This well produces water for irrigation under permit #G-7965 (application #G-8181) with two priority dates, May 23, 1977 and February 16, 1978. At the time of this test the well was equipped with a 400 horsepower electric turbine pump set approximately 470 feet below land surface.

The Zabransky #3 well was constructed for Zabransky & Sons and was completed December 30, 1977 by Melvin Collier under a landowner's bond. It was cased with 16 inch casing to a depth of 79 feet and was drilled 16 inches in diameter to a total depth of 1,023 feet. When

completed the well had 5 pounds of artesian pressure at land surface. No record of a pump test is recorded. This well produces water for irrigation under permit #G-8207 (application #G-8665) with a priority date of February 27, 1978. At the time of this test the well was equipped with a 400 horsepower electric turbine pump set approximately 500 feet below land surface.

The Zabransky #4 well was constructed for Zabransky and Sons and was completed March 7, 1979 by Larry Burd Well Drilling of Pendleton, Oregon. It was cased with 16 inch diameter casing to a depth of 35 feet and was drilled 12¼ inches in diameter to a total depth of 475 feet. When completed the well had a static water level of 30 feet below land surface. An air lift test performed by the driller produced 1,000 gallons per minute with 300 feet of drawdown after 1 hour. This well has no permit, application No. G-9062 is pending. No pump or motor had been installed at the time of this test.

Aquifer Test of the Gehrke #3 Well

During March 28 through March 30, 1979, drawdown and recovery tests were made at the Gehrke #3 well. Six nearby irrigation wells were monitored during these tests. Data was gathered and interpreted by Robert Almy and Phil Oberlander, Hydrogeologists with assistance from Jim Bull, Engineering Assistant, all of whom were employed by the Oregon Water Resources Department. Elevation of all well installations and distances from the well to observation wells were measured from locations plotted on topographic maps and are listed in Table I. Static water level measurements obtained before pumping began are also listed in Table I. Adjacent property owners were contacted and agreed to refrain from pumping during and 24 hours prior to the test.

Test Methods

During the aquifer tests of the Gehrke #3 well, the production rate from the well averaged 4,800 gallons per minute. It was pumped for 46 hours 8 minutes beginning 12:12 hrs March 28, 1979. Water level measurements were made during pumping and recovery with an airline and calibrated pressure guages. (O.W.R.D. #H-211) Instantaneous flow rate measurements were made with a Polysonics model UFM-PD noninvasive ultrasonic flowmeter calibrated at the Portland Water Works meter calibration lab and installed according to manufacturers specifications. Water was pumped against a constant head controlled by the discharge elevation of Mr. Gehrke's storage reservoir.

Water level measurements in the Lorenzen well, and the Kilgore #1 well were made with airline and calibrated guage. Artesian pressures in the Gehrke #1 and #2 and Zabransky #3 wells were measured using a calibrated guage installed at the well head. Water levels in the Gehrke #4 well were measured using a soiltest electric tape. Water level in the Zabransky #4 well was monitored with a Stephens type F recorder. All wells involved directly in the test were allowed

to recover at least 48 hours prior to the start of the aquifer test. No large production wells were known to be pumping within 5 miles of the pumped well during the test - Zabransky #2 started up on second day.

Guages used for pressure measurements were calibrated February 22, 1979, in the Oregon State University Civil Engineering Department by Robert Almy under the supervision of Dr. G.E. Thornburgh.

Test data were interpreted using the Theis non-equilibrium well method and the Jacob modified non-equilibrium well method.

Chemical Quality

Periodic samples of water produced by the pumped well were tested for conductivity and temperature. These measurements are listed as part of Table II.

In addition, a 40 gallon water sample was taken after approximately 1780 minutes of pumping. The sample was transported to a nearby motel room and carbonate extracted from it using Dowex 1-X8 ion exchange resin. This resin was than shipped to Washington State University for carbon 14 age dating by Dr. John Sheppar of the Chemical Engineering Department. Results of these tests will be added to this report when available, see appendix.

Pump Efficiency

Total volume of water pumped from the Gehrke #3 well was approximately 13,286,000 gallons or 40.76 Acre feet between 12:12 hours March 28th and 10:20 hours March 30th. The total amount of electricity used during the test was 18,660 Kilowatthours. Overall "Wire to Water" efficiency based on the method of Campbell and Lehr (1973, p. 601) is 66.9%.

Disposal of Water Withdrawn

Water produced during this test was pumped to a reservoir then distributed through Mr. Gehrke's underground distribution system and applied to selected fields with center pivot irrigation equipment.

Observations and Conclusions

Drawdown Test

The water level decline in the Gehrke #3 well was measured to be 69.6 ft. 105 minutes after pump startup. Complete measurement data for the Gehrke #3 well is contained in Table II. Water level in the Gehrke #4 well, 4,200 feet N.E. of the pumped well, began dropping significantly approximately 25 minutes after pump startup. The predicted effect after 30 days continuous pumping the Gehrke #3 well at 4800 gallons per minute is approximately 69.5 ft. of drawdown in the Gehrke well #4. Complete measurement data for the Gehrke #4 well is contained in Table III.

Water levels in the Gehrke #1 well located 6,100 ft. south of the pumped well began dropping significantly approximately 45 minutes after pump startup. No predictions are made since insufficient data was obtained from the artesian pressure decline, and the airline was nonfunctional. Complete measurement data for the Gehrke #1 well is contained in Table IV.

Water level in the Gehrke #2 well 7,100 feet S.W. of the Gehrke #3 well, to drop significantly approximately 40 minutes after pump startup. The predicted interference effect after 30 days of continuous pumping the Gehrke #3 well at 4800 gallons per minute is 66.7 feet. Complete measurement data for the Gehrke #2 well is contained in Table V.

Water level in the Kilgore #1 well, located 9,100 feet E.N.E. of the Gehrke #3 well, began to drop significantly approximately 300 minutes after pump startup. The predicted affect after 30 days continuous pumping Gehrke #3 well at 4800 gallons per minute is approximately 53.5 ft. of drawdown in the Kilgore #1 well.

Water level in the Zabransky #4 well, located 12,850 feet west of the pumped well and equipped with a recorder, showed no discernable effect from pumping the Gehrke #3 well. The recorder trace is shown in Figure II. Water level in the Zabransky #3 well located 13,950 feet S.W. of Gehrke #3 well showed no measureable effect either. Measurement data for this well are contained in Table VII. Extrapolation of distance drawdown data obtained from Gehrke #4 and Gehrke #2 (Graph IX) predict that the drawdown should be 16 and 15 feet respectively in the Zabransky #4 and Zabransky #3 wells. Since this is approximately 25 times the resolution of the guage used to measure the artesian pressure in the Zabransky #3 well and 1,500 times the resolution of the recorder at the Zabransky #4 well; it is likely at least a partial hydraulic boundary exists between the Gehrke #3 well and the two Zabransky wells monitored. Based on water level measurements made in March 1979, there is approximately 158 feet of static lead difference between the Zabransky #4 well and the Gehrke #3 well. This fact, and the absence of effect upon the Zabransky wells by pumping the Gehrke #3 well indicate that the hydrologic boundary between these wells is an efficient boundary.

Recovery Test

During the recovery test of the Gehrke #3 well, the water level rose to a level 8.0 feet above land surface (3.5 lbs of artesian pressure) 100 minutes after pump shutdown (Graph II). Recovery data exhibits two distinct breaks in slope when calculated drawdown (s-s') is plotted on semilog paper vs time.

Water level in all four observation wells which had shown decline, showed strong recovery after the Gehrke #3 well was shut off. Water level in the Gehrke #4 well began to rise within 35 minutes after the start of the test, Graph IV. The water level in the Gehrke #2 well began to rise within 45 minutes after shutdown of Gehrke well #3, Graph VI. The water level in the Kilgore #1 well began to rise within 105 minutes of shutdown of Gehrke well #3, Graph VIII. Complete recovery data is listed in Tables II through VI.

Aquifer Characteristics

A wide range of Transmissivity values were obtained from calculations based on data from aquifer tests of the Gehrke #3 well. Time(log) vs drawdown plots for the Gehrke #3 well, the Gehrke #4 well and the Gehrke #2 well exhibit distinct breaks in slope indicative of changes in aquifer characteristics or the presence of hydrologic boundaries.

Transmissivity calculated from early drawdown data in the pumped well is 61,400 ft^2/day based on the method of Cooper and Jacobs (1946). Transmissivity calculated from later data (t 100 min.) using the same method yields T values of 8,400 ft^2/day and 6,600 ft^2/day. These latter two values agree with transmissivity calculated from both drawdown and recovery data obtained from the Gehrke #4, Gehrke #2 and Kilgore #1 observation wells. T values are summarized in Table VIII. These figures represent an average transmissivity for the entire saturated basalt column developed by the Gehrke #3 well. Deviation of various calculated observation well transmissivity from those obtained from pumped well data are probably due to local aquifer heterogeneity which is to be expected.

Storage coefficient calculated from observation well data utilizing the method of Cooper and Jacob are summarized in Table VIII. Values calculated range from 1.3×10^{-4} to 1.7×10^{-5}. The range is probably due to local aquifer heterogeneity. Values this low are typical for artesian systems in Columbia River Basalt.

Changes in slope exhibited in several time (log) vs drawdown plots, absence of effects in the Zabransky #3 and #4 wells and an apparent delay in effects predicted to occur in the Kilgore #1 well indicate the presence of both efficient hydraulic barriers and inefficient (partial) hydraulic barriers. Specific location and extent of the efficient barrier is not known, however, it lies between the Gehrke #3 well and the Zabransky #4 well and probably extends south between the Gehrke #2 well and the Zabransky #3 well.

The partial boundary, which is probably due merely to a moderate change in aquifer characteristics, occurs between the Gehrke #4 well and the Kilgore #1 well. Its extent is unknown.

The aquifer charateristics computed from test data allow predictions of water table decline caused by pumping the Gehrke #3 well. Distance vs drawdown predictions are shown plotted in Graph IX.

This graph is based on data from both the Gehrke #4 and Gehrke #2 wells. Graph IX represents the maximum predicted drawdown caused by pumping the Gehrke #3 well at a rate of 4,800 gpm. Local variations in geology and position of other wells in relation to hydraulic boundaries can have a significant effect upon these values.

Geology and Hydrogeology

The Merle Gehrke property is located approximately 6 miles east of Stanfield, Oregon, in the north central area of the Oregon portion of the Columbia River Plateau. This entire region is underlain by a minimum of 2500 feet miocene age Columbia River Basalts. Locally the Columbia River Basalts occur as stratified, nearly horizontal, massive basalt flows typically 75 to 200 feet thick. The extreme top and bottom portions of these flows are often vesicular and/or extremely fractured. Where saturated, the resulting interflow zones are excellent aquifers and are capable of producing large quantities of water to wells. Since these zones are relatively thin; only a small amount of water is stored within them. Only the widespread nature of the Columbia River Basalt makes them suitable as major production zones. Ground water contained in the Columbia River Basalts is usually under artesian pressure.

Structures in the Columbia River Basalts in the test area are difficult to trace due to the lack of marker beds and thick soils which result in generally poor exposure. These structures, however, are significant to ground water flow because they often act as barriers to movement. Structures in or near the test area include one major feature and two inferred structures.

The major feature, mapped by Newcomb (1967), is an extension of The Dalles - Umatilla Syncline which as mapped trends northwest to southeast through the Gehrke property. It is a subtle feature and no evidence for it has been seen in the test area. However, any flexure of this type could be expected to cause fracturing of the relatively brittle basalt. This fracturing, in addition to the interflow zones, could cause higher transmissivity of the aquifer systems located near the synclinal axis. The high initial transmissivity value obtained from early pumping well drawdown data may be due to this effect.

The minor features, whose nature and location are postulated from the test data are subtle features that are not expressed at land surface. The efficient hydraulic boundary which occurs between the Gehrke #3 and Zabransky #4 and #3 wells is probably a fault. The partial boundary which occurs between the Gehrke #3 and the Lorenzen #1 and Kilgore #1 wells may be a small fault, a minor unconformity, a pinching out of a major interflow zone or other variation of the aquifer system.

High transmissivity values (6,500 to 35,000 ft^2/day) and low storage coefficient (1.3×10^{-4} to 1.7×10^{-5}) indicate that widespread interference effects among closely spaced major production wells are certain to occur. Observed seasonal fluctuation of ground water (35 ft. above Land Surface to 212 feet below land surface in the Gehrke #3 well) are due to large withdrawal rates during the irrigation season.

Appendix

The composite carbon 14 age of the water from Gehrke #3 well is 15,360 years ago $\pm$ 230 years. This indicates that the water in the basalt was most recently exposed to the atmosphere during the last ice age. The age of the water will be compared with other wells in the area as testing continues.

Table I

Well	Elevation Feet above M.S.L.	Distance to Pumped Well, feet	Elevation of waterlevel before pump startup, feet	Waterlevel above (+) or below (-) land surface, feet
Gehrke #3	850	--	886	36^{+}
Gehrke #1	835	6,050	848	13^{+}
Gehrke #2	790	7,100	842	52^{+}
Gehrke #4	913	4,250	849	63.5^{-}
Kilgore #1	1010	9,100	830	180^{-}
Zabransky #3	790	13,900	800	10^{+}
Zabransky #4	712	12,800	692	20^{-}

Table II

Complete waterlevel measurements, chemical data and derived data for the Gehrke #3 well.

Drawdown Test

Time Since Pump Startup, Minutes	Depth to Water, Feet	Drawdown (s) in Feet	Temperature Degrees centigrade	Specific Conductance umhos/cm
0	36.4 above MP	0	16 degrees	309
4	19.7 below MP	56.1		
5	20.3	56.7		
7	20.9	57.3		
10	20.9	57.3		
13	20.9	57.3		
15	20.9	57.3		
20	21.5	57.9	21 degrees	340
25	21.5	57.9		
30	22.0	58.4		
35	22.4	58.8	18 degrees	340
40	22.6	59.0		
45	22.6	59.0		
50	22.6	59.0		
60	22.0	58.4		
70	22.6	59.0	20 degrees	339
80	22.6	59.0		
90	23.2	59.6		
105	23.2	59.6	21 degrees	304
120	23.8	60.2		
135	23.8	60.2		
150	24.3	60.7	21 degrees	335
165	24.7	61.1		
180	24.7	61.1		
200	24.3	60.7	21 degrees	335
220	24.3	60.7		
240	24.9	61.3		
270	24.9	61.3		
300	26.1	62.5		
330	26.7	63.1		
360	27.2	63.6	20 degrees	329
420	27.8	64.2		
450	30.1	66.5		
468	30.1	66.5		
528	30.7	67.1		
648	32.4	68.8		
753	33.0	69.4	20 degrees	330
948	35.3	71.7	23 degrees	328
1026	35.9	72.3		
1146	36.5	72.9		

Table II
(continued)

Time Since Pump Startup, Minutes	Depth to Water, Feet	Drawdown (s) in Feet	Temperature Degrees centigrade	Specific Conductance μmhos/cm
1271	39.9	76.3		
1421	40.5	76.9		
1603	42.8	79.2		
1788	42.2	28.6		
2073	44.5	80.9	21 degrees	328
2726	46.3	82.7	21 degrees	330
2768	47.4	83.8		

Recovery Test

Gehrke #3 well

Time Since Pump Startup, Minutes	Time Since Pump Shutdown, Minutes	Depth to Water	Drawdown (S') in Feet	Calculated Recovery (S-S') in Feet
2768.5	0.5	9.3	45.7	38.1
2769	1	2.4	38.8	45.0
2769.5	1.5	0.1	36.5	47.3
2770	2	0.5 ALS*	35.9	47.9
2770.5	2.5	1.1	35.3	48.5
2771	3	0.5	35.9	47.9
2772	4	1.1	35.3	48.5
2773	5	0.5	35.9	48.0
2774	6	2.8	33.6	50.3
2775	7	2.2	34.2	49.7
2776	8	2.8	33.6	50.3
2777	9	2.8	33.6	50.3
2778	10	3.9	32.4	51.4
2780	12	3.4	33.0	50.9
2783	15	3.4	33.0	50.9
2788	20	4.5	31.8	52.1
2793	29	5.1	31.3	52.6
2798	30	5.7	30.7	53.2
2803	35	5.7	30.7	53.3
2808	40	6.3	30.1	53.9
2818	50	6.3	30.1	53.9
2828	60	6.8	29.5	54.5
2838	70	6.8	29.5	54.6
2848	80	9.2	27.2	56.9
2858	90	9.2	27.2	56.9
2868	100	8.0	28.4	55.8
2898	130	9.2	27.2	57.1
3223	455	13.8	22.6	62.9
3503	735	16.6	19.7	66.7

*Above Land Surface

Table III

Complete Water Level Measurement Data
for the Gehrke #4 Well.

Drawdown Test

Time Since Pump Startup, Minutes	Depth to Water, Feet	Drawdown (S) in Feet
0	63.5	0
58	66.5	3.0
320	72.4	8.9
392	73.6	10.1
473	75.2	11.7
533	76.1	12.6
573	76.7	13.2
735	78.9	15.4
1016	82.1	18.6
1185	83.9	20.4
1354	86.0	22.5
1525	87.1	23.6
1705	88.6	25.1
1912	90.1	26.6
2088	91.4	27.9
2706	95.4	31.9
2748	95.7	32.2

Recovery Test

Time Since Pump Startup, Minutes	Time Since Pump Shutdown, Minutes	Depth to Water Feet	Drawdown (S) in Feet	Calculated Recovery (S-S') in Feet
2808	40	93.2	29.7	2.5
2928	100	90.6	27.1	5.7
3263	435	86.5	23.0	11.2
3610	782	83.2	19.7	16.0
4353	1525	85.1	21.6*	

*Interference from nearby irrigation well

Table IV

Complete Water Level Measurement Data
for the Gehrke #1 Well.

Drawdown Test

Time Since Pump Startup, Minutes	Water Level Above Land Surface, Feet	Drawdown (S) in Feet
64	10.4	0.5
218	5.8	5.1
363	0.0	10.9

Table V

Complete Water Level Measurement Data
for the Gehrke #2 Well.

Drawdown Test

Time Since Pump Startup, Minutes	Water Level Above Land Surface, Feet	Drawdown (S) in Feet
0	51.7	0
133	45.9	5.8
228	43.6	8.1
325	41.3	10.4
664	38.4	13.3
971	32.1	19.6
1254	30.9	20.8
1405	28.6	23.1
1578	25.7	26.0
1758	25.1	26.6
2133	24.0	27.7
2735	18.2	33.5

Recovery Test

Time Since Pump Startup, Minutes	Time Since Pump Shutdown, Minutes	Water Level above Land Surface, Feet	Drawdown (S) in Feet	Calculated Recovery (S-S') in Feet
2820	55	21.1	30.6	1.5
2940	175	24.6	27.1	5.5
3065	300	29.8	21.9	11.3
3410	645	32.7	19.0	15.5
4270	1505	30.3	21.4*	

*Interference from nearby irrigation well.

Table VI

Complete Water Level Measurement Data
for the Kilgore #1 Well.

Drawdown Test

Time Since Pump Startup, Minutes	Depth to Water, Feet	Drawdown (S) Feet
163	168.59	-1.15
303	170.32	0.58
715	174.36	4.62
1001	174.36	4.62
1209	180.72	10.98
1369	181.3	11.56
1548	181.87	12.13
1728	184.18	14.44
2103	187.07	17.33
2678	189.96	20.22

Recovery Test

Time Since Pump Startup, Minutes	Time Since Pump Shutdown, Minutes	Depth to Water, Feet	Drawdown (S) in Feet	Calculated Recovery (S-S') in Feet
2968	200	186.49	16.75	4.23
3161	393	182.45	12.71	9.01
3443	675	180.14	10.40	12.31
4188	1420	178.98	9.24	15.75

Table VIII

Summary of Aquifer Characteristics

Well	r (feet)	T (ft^2/day)	S	Method
Gehrke #3		10,100	-	Theis (Late data) drawdown (curve match).
		61,400	-	Cooper Jacob (early data) drawdown.
		8,400	-	Cooper Jacob (middle data) drawdown.
		6,600	-	Cooper Jacob (late data) drawdown.
		35,200	-	Cooper Jacob (early data) recovery.
		15,500	-	Cooper Jacob (middle data) recovery.
		7,400	-	Cooper Jacob (latest data) recovery.
Gehrke #4	4,250	7,400	-	Theis drawdown (curve match)
		9,000	$9.2X\ 10^{-5}$	Cooper Jacob (early data) drawdown.
		5,700	$1.3X\ 10^{-4}$	Cooper Jacob (early data) drawdown.
		20,000	$3.5X\ 10^{-5}$	Cooper Jacob (early data) recovery.
		9,000	$9.3X\ 10^{-5}$	Cooper Jacob (late data) recovery.
Gehrke #2	7,100	7,600	--	Theis drawdown (curve match)
		15,500	$1.9X\ 10^{-5}$	Cooper Jacob (early data) drawdown.
		5,800	$4.0X\ 10^{-5}$	Cooper Jacob (late data) drawdown.
		12,800	$1.7X\ 10^{-5}$	Cooper Jacob, recovery.
Kilgore #1	9,100	3,500	--	Theis drawdown (curve match)
		6,300	$5.3X\ 10^{-5}$	Cooper Jacob, drawdown.
		11,100	$2.2X\ 10^{-5}$	Cooper Jacob, recovery.

FIG. # 1

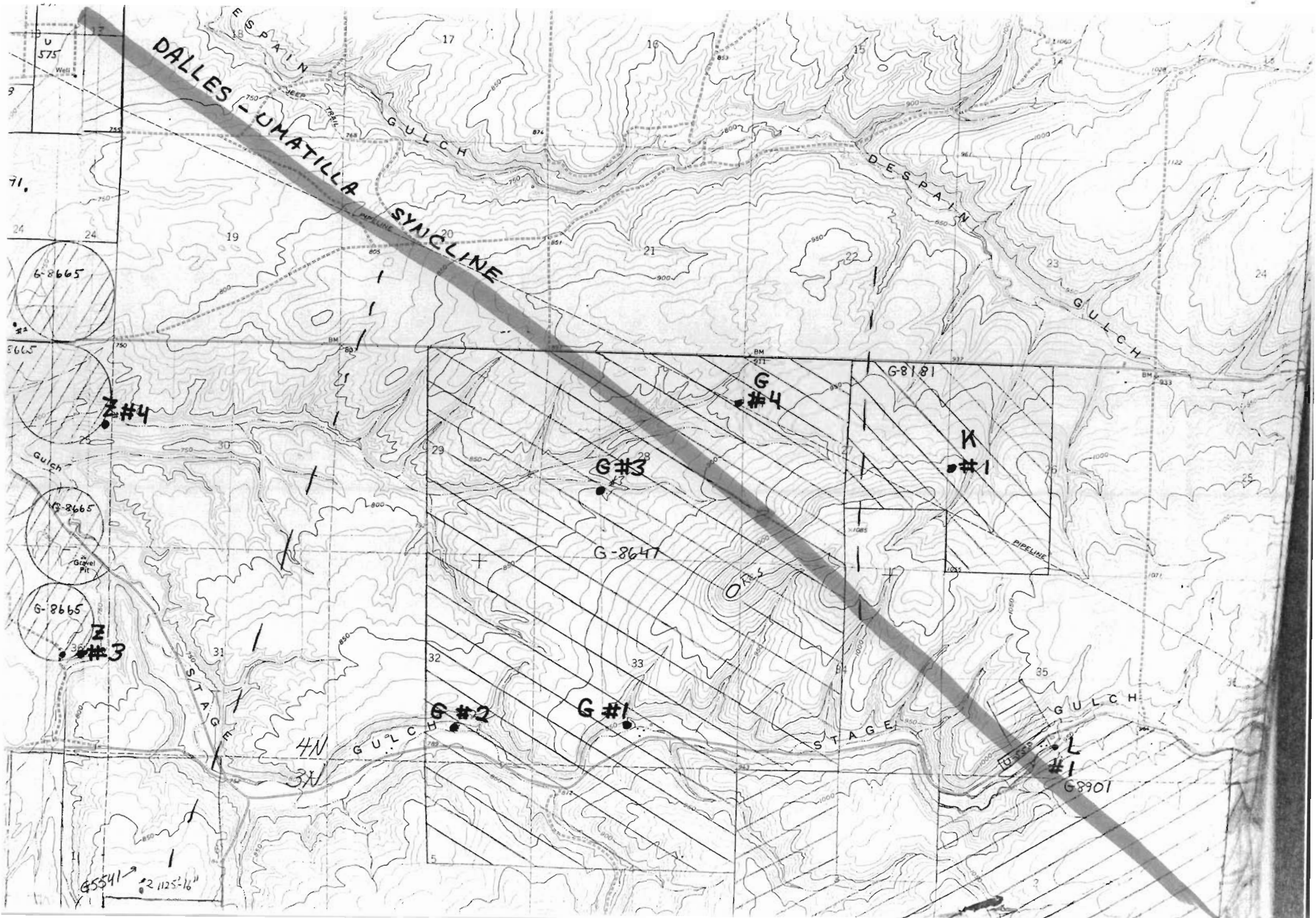
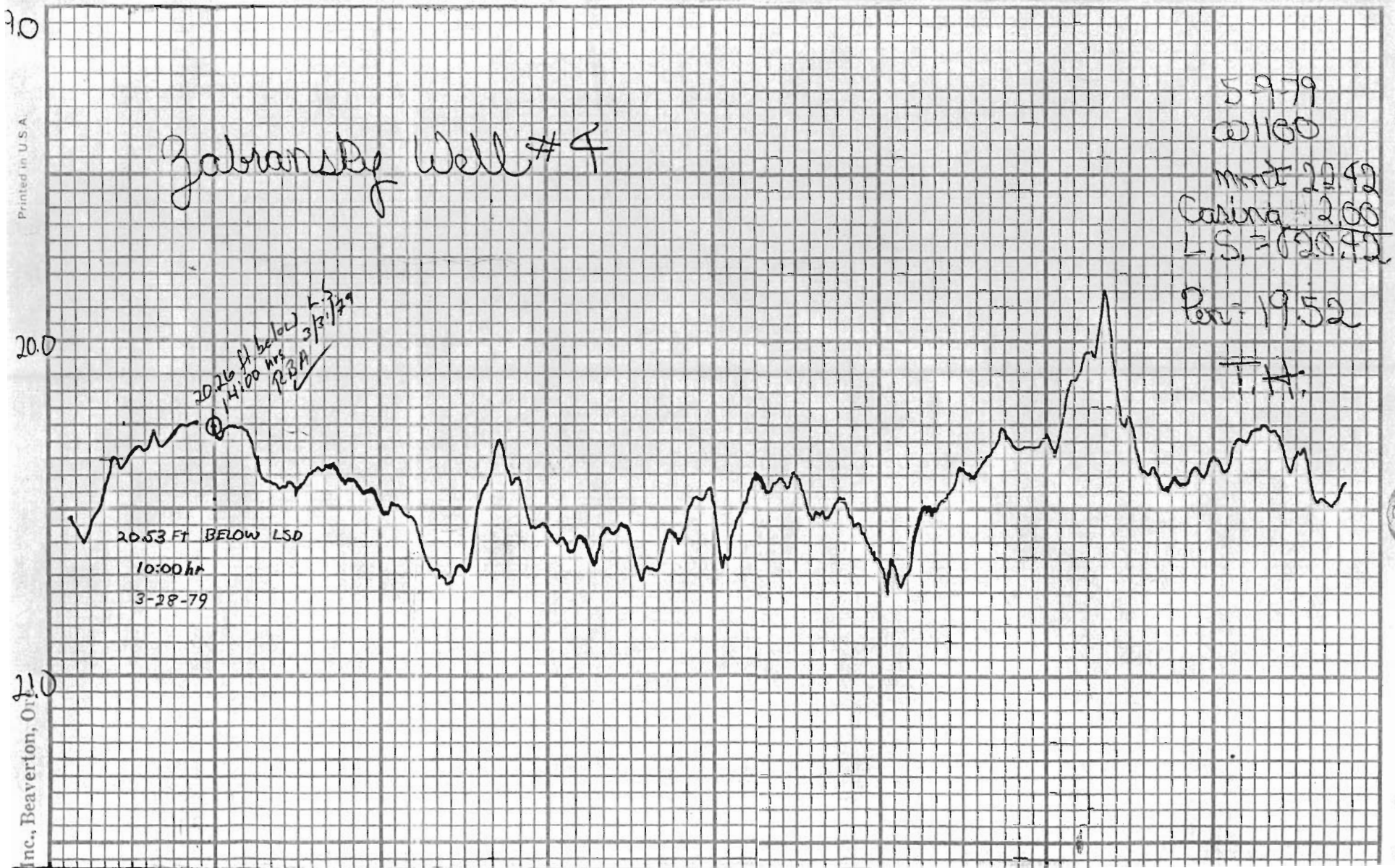
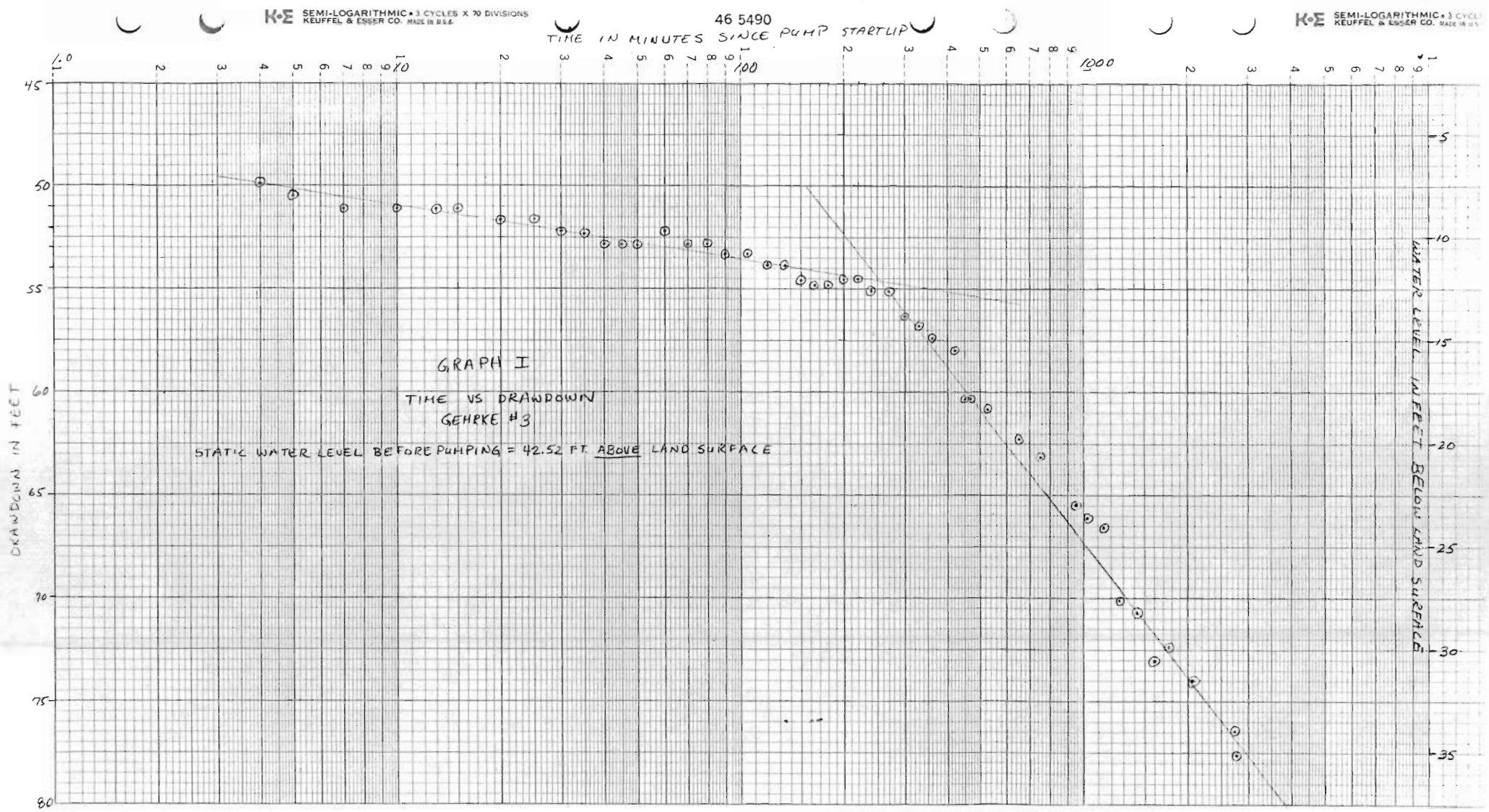

DALLES - UMATILLA SYNCLINE
ESPAIN
JEEP TRAIL
GULCH
DESPAIN
GULCH
PIPELINE
G-8665
G-8665
G-8665
Gravel Pit
G-8181
G #4
G #3
G-8641
G #2
G #1
K #1
L #1
G-8901
STAGE
GULCH
4N
3N
G5541
2 1125-16"

FIG. #2

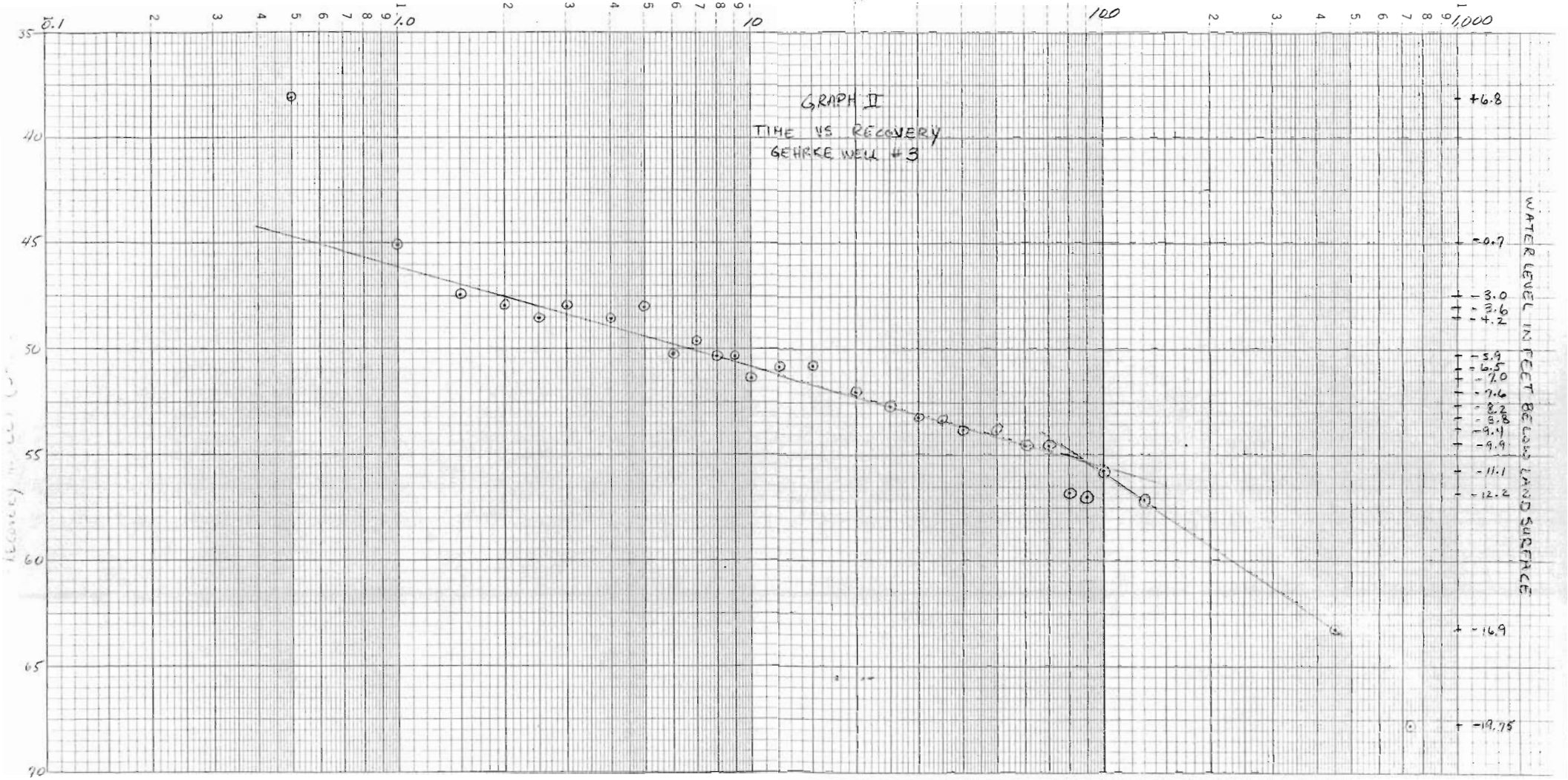


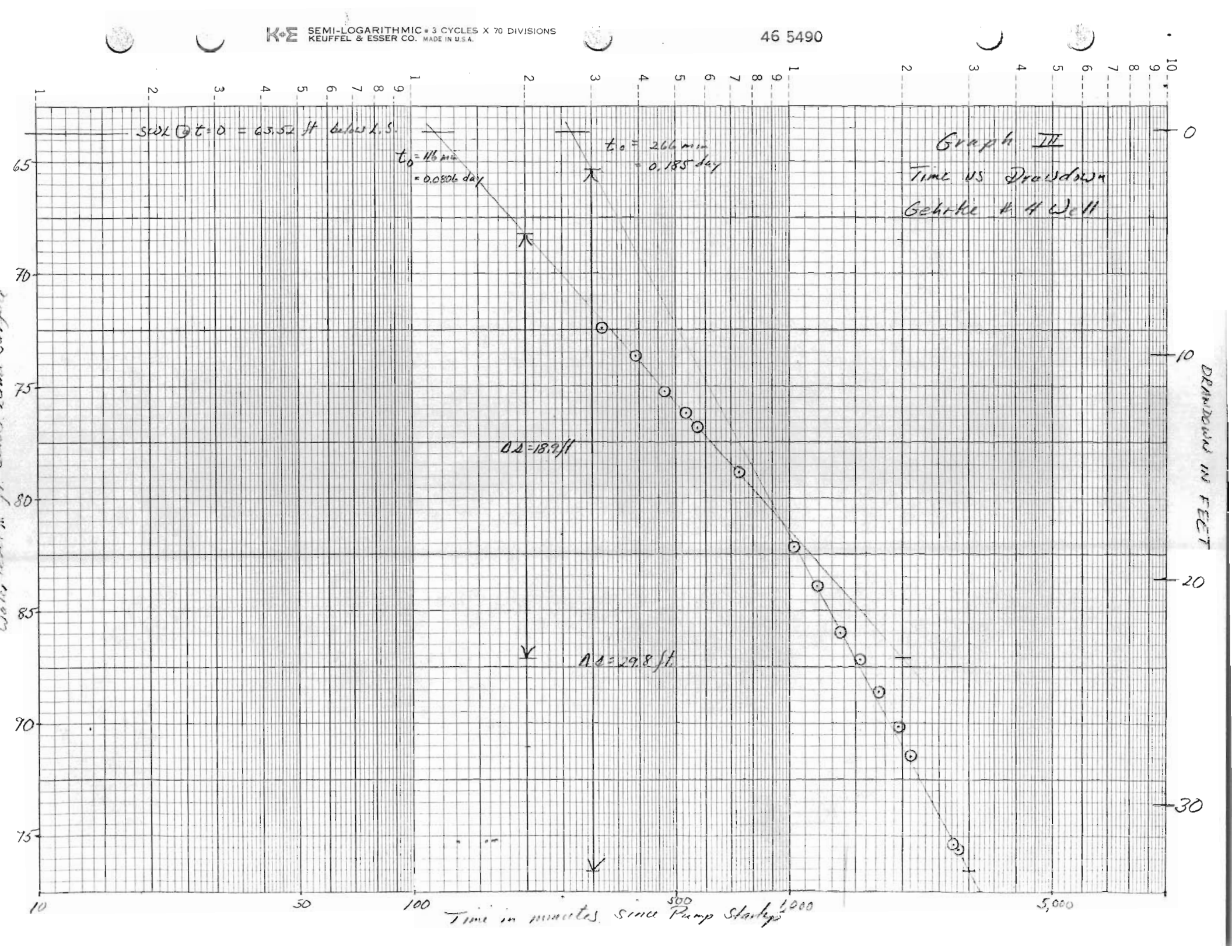

SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490
TIME IN MINUTES SINCE PUMP STARTUP
DRAWDOWN IN FEET
WATER LEVEL IN FEET BELOW LAND SURFACE
45
50
55
60
65
70
75
80
5
10
15
20
25
30
35
GRAPH I
TIME VS DRAWDOWN
GEHRKE #3
STATIC WATER LEVEL BEFORE PUMPING = 42.52 FT. ABOVE LAND SURFACE

K·E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

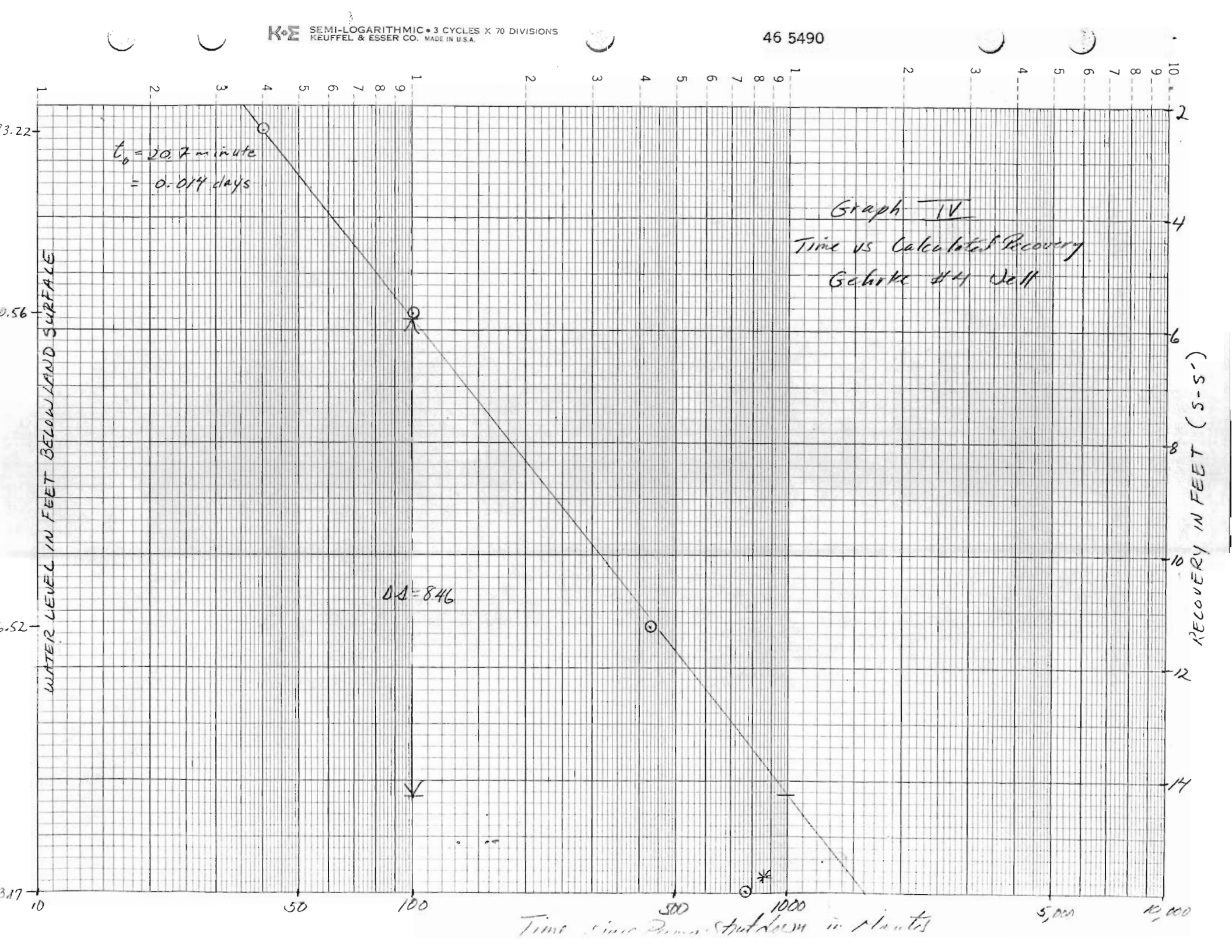
46 5490

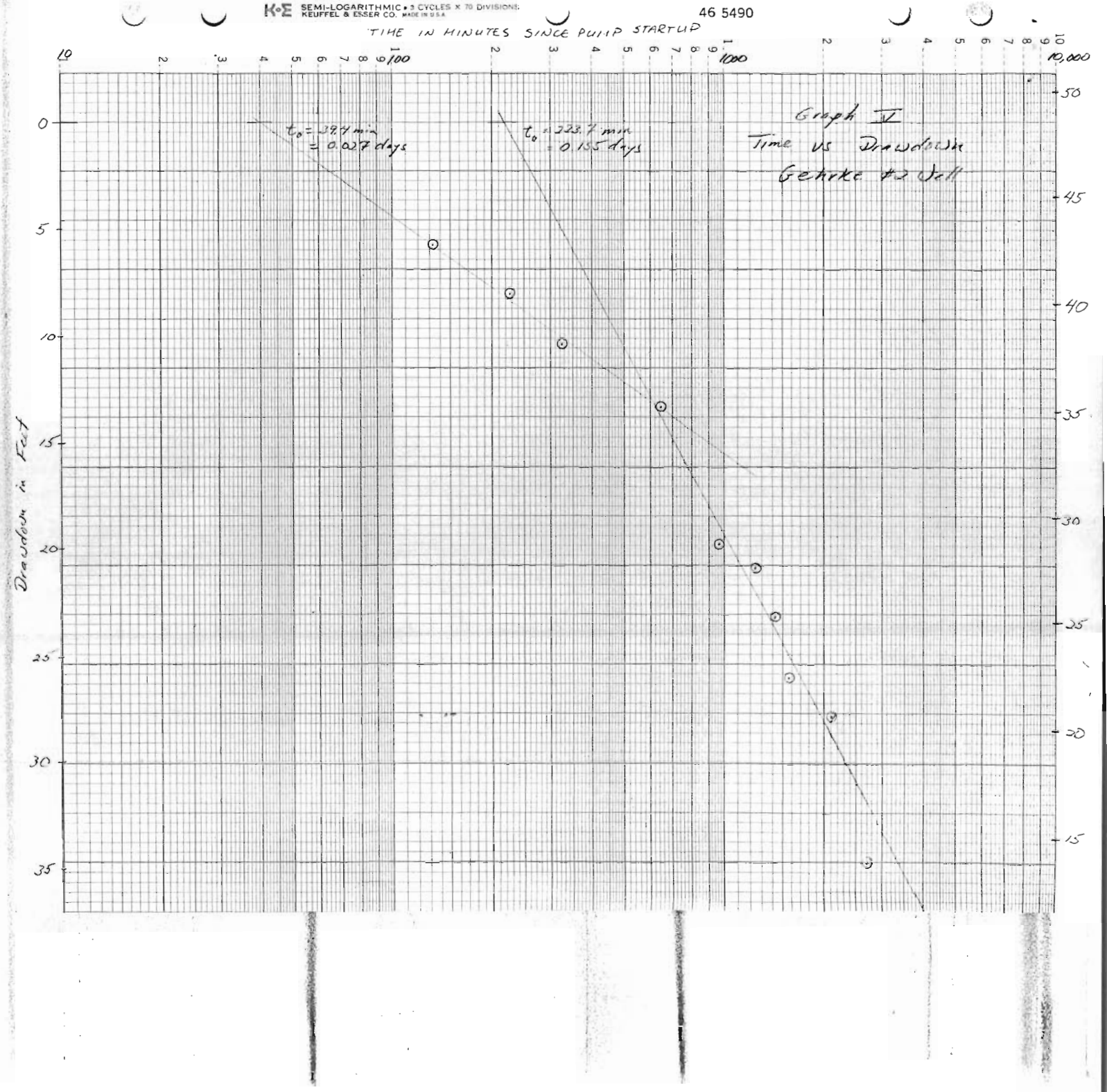
TIME IN MINUTES SINCE PUMP SHUT OFF

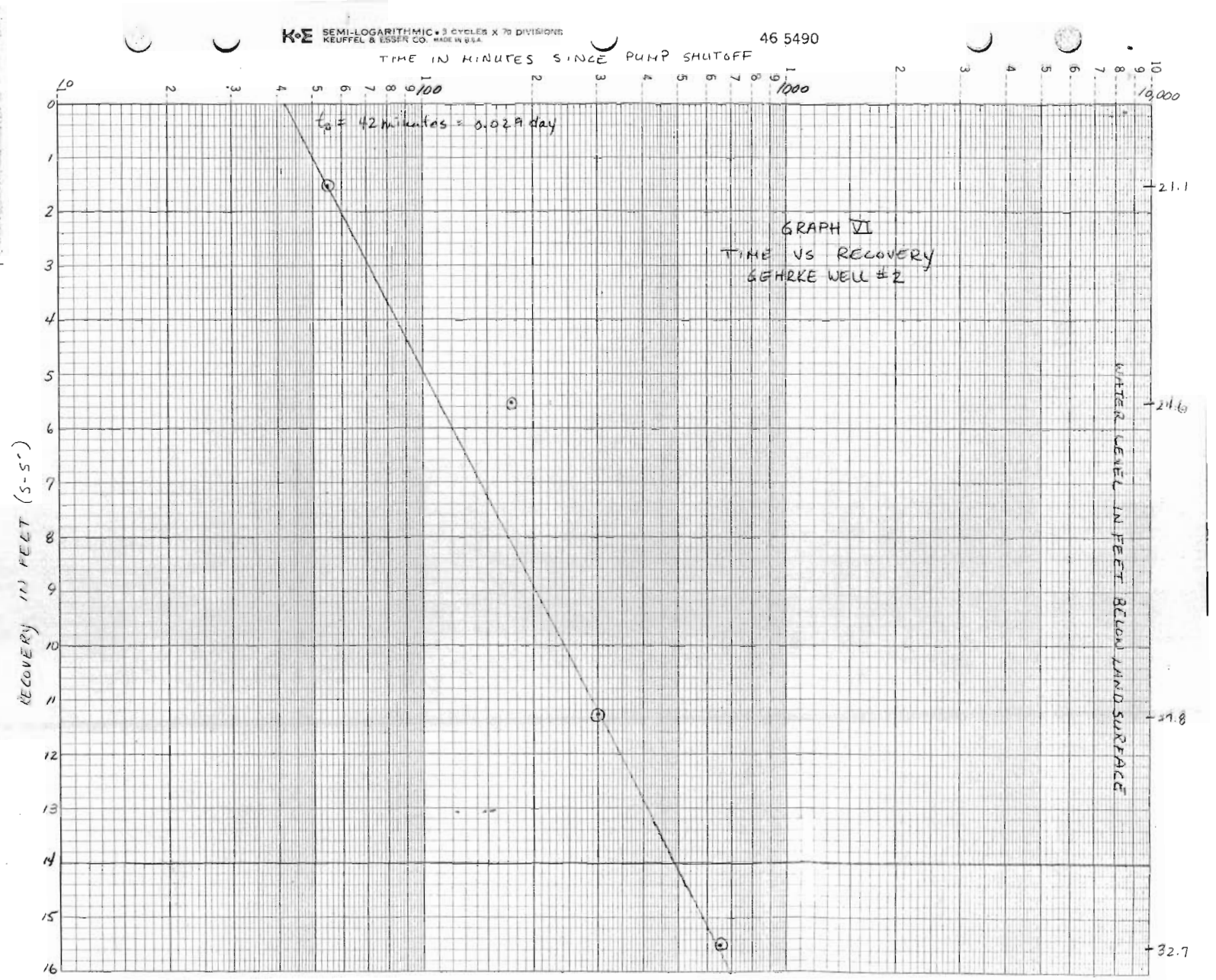


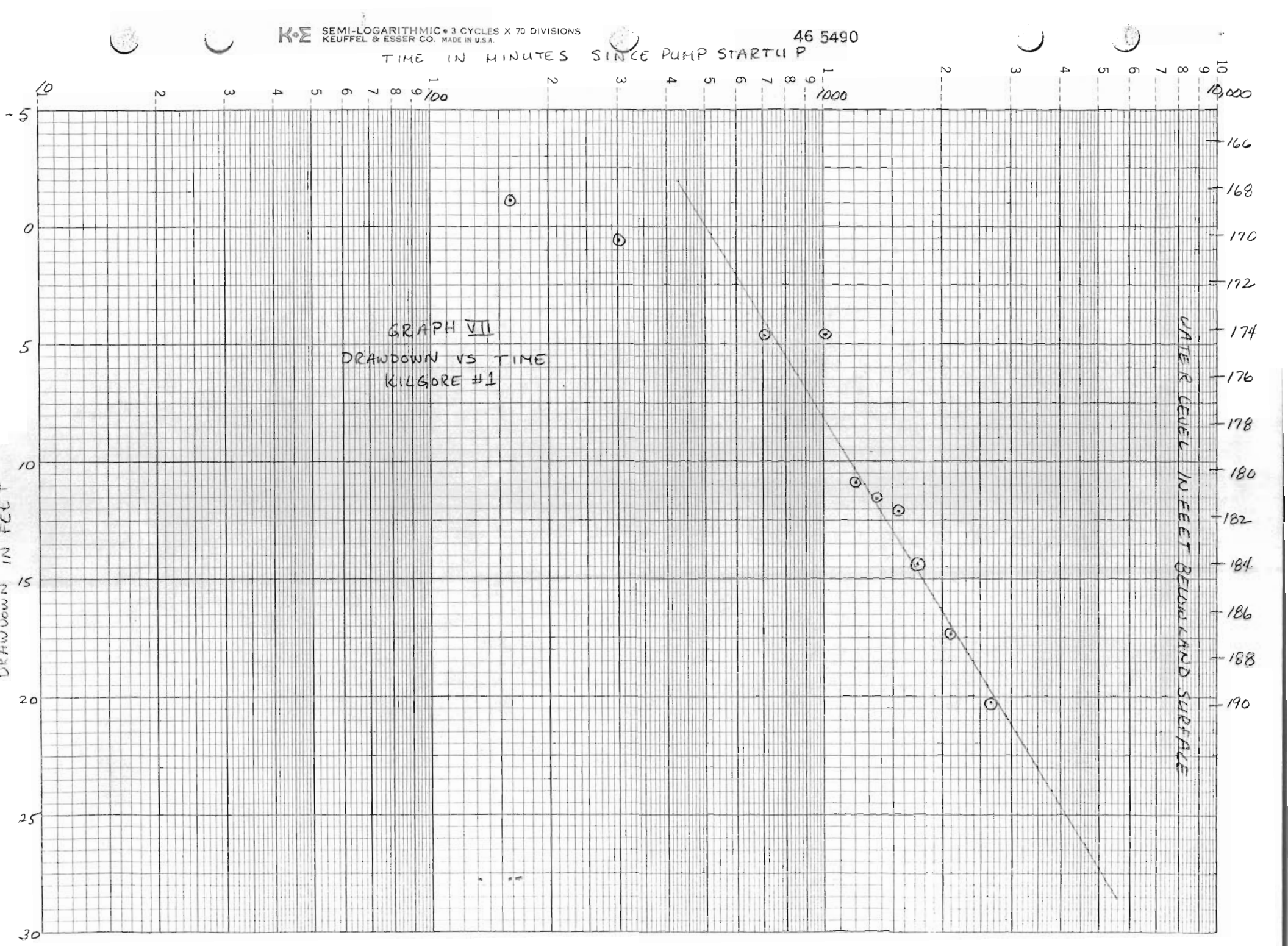


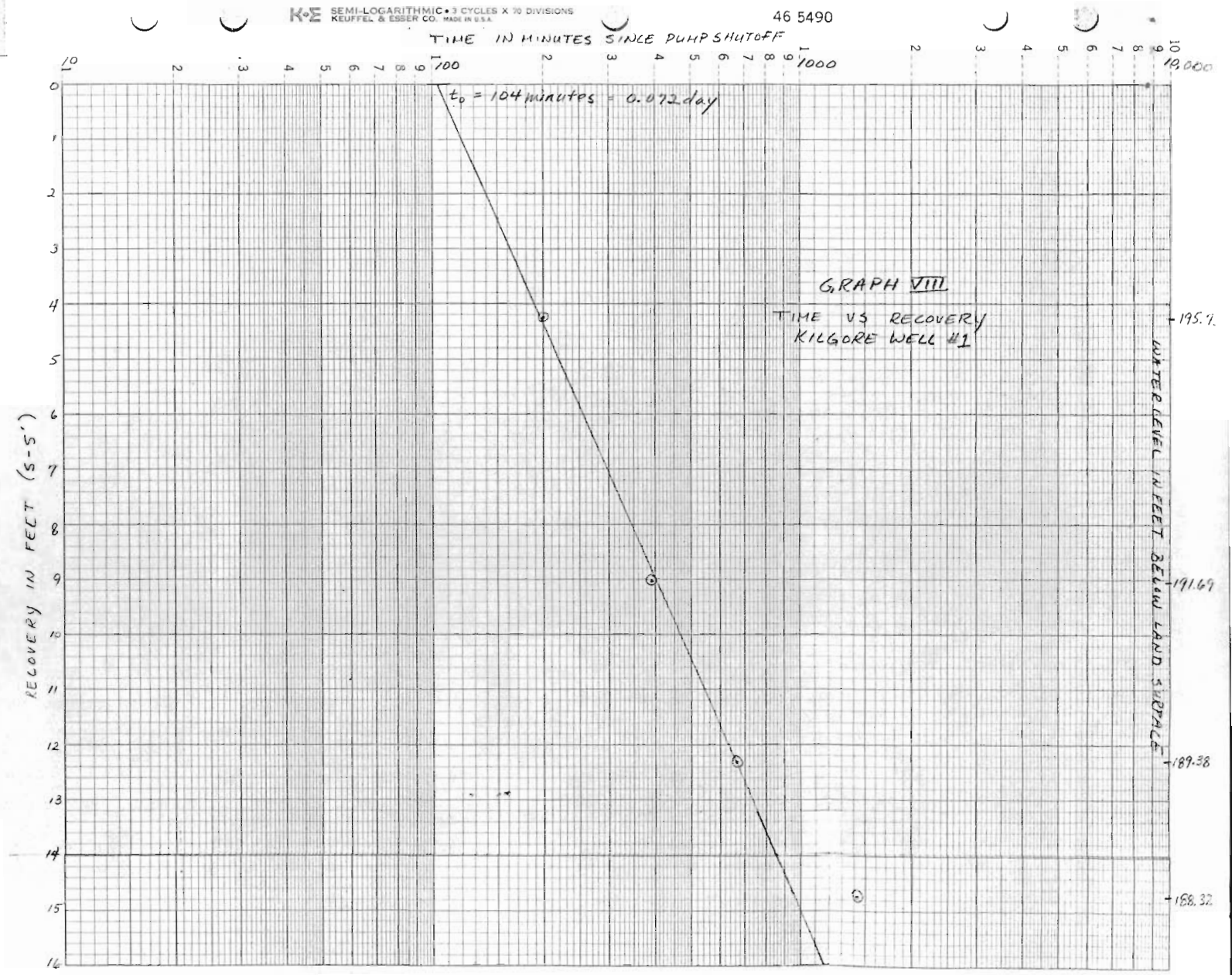
46 5490




K·E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490
TIME IN MINUTES SINCE PULP STARTUP
10
100
1000
10,000
t_0 = 39.4 min = 0.027 days
t_0 = 223.7 min = 0.155 days
Graph V
Time VS Drawdown
Gehrke #2 Well
Drawdown in Feet
0
5
10
15
20
25
30
35
40
45
50

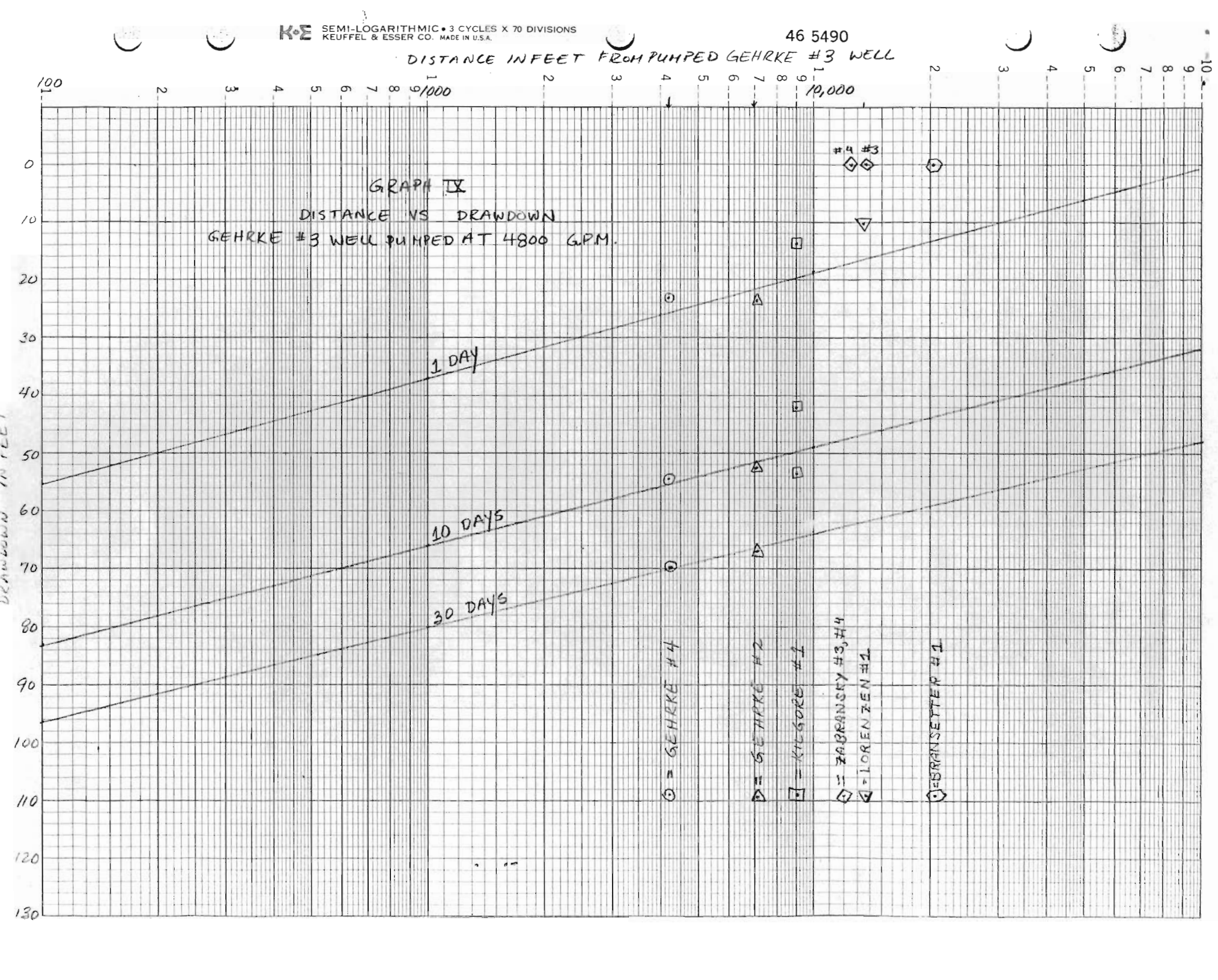

K&E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490
TIME IN MINUTES SINCE PUMP SHUTOFF
t_p = 42 minutes = 0.029 day
GRAPH VI
TIME VS RECOVERY
GEHRKE WELL #2
RECOVERY IN FEET (s-s')
WATER LEVEL IN FEET BELOW LAND SURFACE
21.1
21.6
27.8
32.7


K&E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490
TIME IN MINUTES SINCE PUMP STARTED
GRAPH VII
DRAWDOWN VS TIME
KILGORE #1
DRAWDOWN IN FEET
WATER LEVEL IN FEET BELOW LAND SURFACE
-5
0
5
10
15
20
25
30
166
168
170
172
174
176
178
180
182
184
186
188
190


K&E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490
TIME IN MINUTES SINCE PUMP SHUTOFF
t_o = 104 minutes = 0.072 day
GRAPH VIII
TIME VS RECOVERY
KILGORE WELL #1
RECOVERY IN FEET (s-s')
WATER LEVEL IN FEET BELOW LAND SURFACE
195.7
191.69
189.38
188.32

46 5490

DISTANCE IN FEET FROM PUMPED GEHRKE #3 WELL



NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

Copy to NC

WATER WELL REPORT
STATE OF OREGON
(Please type or print)

RECEIVED
DEC 23 1977
WATER RESOURCES DEPT.

(Do not write above this line)

State Well No. 4N/30E-3

State Permit No.

(1) OWNER:
Name MERLE CHRITE
Address ECHO ORE 97826
RT 2 BOX 13

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☑ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☑ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☑
16 " Diam. from +2 ft. to -18 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☒ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☑ Yes ☐ No If yes, by whom? VALLEY
Yield: 4000 gal./min. with 260 ft. drawdown after 8 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 69° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used PORTLAND CEMENT
Well sealed from land surface to 18 ft.
Diameter of well bore to bottom of seal 24" TO 19" in.
Diameter of well bore below seal 15 1/4 in.
Number of sacks of cement used in well seal 12 sacks
How was cement grout placed? GRAVITY

Was a drive shoe used? ☐ Yes ☒ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County UMATILLA Driller's well number
SE 1/4 SW 1/4 Section 33 T. 4N R. 30 E W.M.
Bearing and distance from section or subdivision corner
#1 BY HOUSE

(11) WATER LEVEL: Completed well.
Depth at which water was first found 320 ft.
Static level 30 ft. below land surface. Date 10-4-77
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 15 1/4
Depth drilled 600 ft. Depth of completed well 600 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
SAND	0	8	
BASALT BROKEN	8	12	
" GREY	12	57	
BLACK	57	82	
GREY	82	135	
BLACK	135	164	
BLACK SCORIA	164	200	
" "	200	295	
BLACK & BROWN/SS	295	320	
" SOFT	320	405	
GREY	405	442	
BROWN	442	452	
BLACK	452	459	
BLACK SCORIA	459	465	
BLACK	465	475	
BLACK & BROWN	475	510	
BLACK	510	560	
BROWN BROKEN	560	590	
BLACK	590	600	

Work started 9-22 19 77 Completed 10-3 19 77
Date well drilling machine moved off of well 10-3 19 77

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Tony Burd (Drilling Machine Operator) Date 10-3, 1977
Drilling Machine Operator's License No. 933

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Tony Burd Well Drilling (Person, firm or corporation) (Type or print)
Address 5543 S W Douglas Dr
[Signed] Tony Burd (Water Well Contractor)
Contractor's License No. 544 Date 10-4, 1977

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45070-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER-WELL REPORT
STATE OF OREGON
(Please type or print) (Do not write above this line)

RECEIVED DEC 22 1977 WATER RESOURCES DEPT SALEM, OREGON

State Well No. 4N/30E-32

State Permit No.

(1) OWNER:
Name MERLE GOHRE
Address C-Ko one 97526
RT 2 Box 13

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☑ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☑ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☑
16 " Diam. from +2 ft. to -25 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☑ No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☑ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☑ Yes ☐ No If yes, by whom? Valley
ld: 5000 gal./min. with 72 ft. drawdown after 8 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 62° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used PORTLAND CEMENT
Well sealed from land surface to 25 ft.
Diameter of well bore to bottom of seal 24" TO 15" in.
Diameter of well bore below seal 15 1/4 in.
Number of sacks of cement used in well seal 15 sacks
Number of sacks of bentonite used in well seal sacks
Brand name of bentonite
Number of pounds of bentonite per 100 gallons of water lbs./100 gals.
Was a drive shoe used? ☐ Yes ☑ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☑ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☑ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County UMATILLA Driller's well number
SW 1/4 SE 1/4 Section 32 T. 4N R. 30E W.M.
Bearing and distance from section or subdivision corner
2 WEST OF HOUSE 1 MILE

(11) WATER LEVEL: Completed well.
Depth at which water was first found 300 ft.
Static level 0 ft. below land surface. Date 10-15-77
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 15 1/4
Depth drilled 600 ft. Depth of completed well 600 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. *Report each change in position of Static Water Level and indicate principal water-bearing strata.*

MATERIAL	From	To	SWL
SOIL	0	8	
BASALT BROKEN	8	18	
" GREY	18	40	
" BLACK	40	60	
" GREY	60	130	
BLACK	130	140	
BROWN SCORIA	140	165	
BLACK SCORIA	165	205	
BLACK	205	300	
BLACK SOFT	300	350	
GREY	350	455	
BLACK SOFT	455	465	
GREY	465	472	
BLACK	472	490	
BROWN SOFT	490	495	
GREY	495	557	
BROWN SCORIA	557	570	
GREY	570	583	
BLACK SCORIA	583	600	

Work started 10-4 19 77 Completed 10-16 19 77
Date well drilling machine moved off of well 10-16 19 77

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Jerry Burd (Drilling Machine Operator) Date 10-25, 1977
Drilling Machine Operator's License No. 933

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Jerry Burd Well Drilling Contractor (Person, firm or corporation) (Type or print)
Address 5543 S.W. Douglas Dr.
[Signed] Jerry Burd (Water Well Contractor)
Contractor's License No. 544 Date 10-18, 1977

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
STATE ENGINEER, SALEM, OREGON 97310
within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

RECEIVED
FEB - 3 1978
WATER RESOURCES DEPT.
SALEM, OREGON

State Well No. 4N/30E-28L
State Permit No.

(1) OWNER:
Name MERLE GEHRKE
Address STANFIELD ORE

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☑ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☑ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☑
16 " Diam. from +1 ft. to -32 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☑ No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☑ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
d: 5425 gal./min. with 10 ft. drawdown after 8 hrs.
" 5200 " 60 " "
" 2461 " 25 " "
Bailer test gal./min. with ft. drawdown after hrs.
esian flow g.p.m.
Temperature of water 70 Depth artesian flow encountered Nil ft.

(9) CONSTRUCTION:
Well seal—Material used PORTLAND CEMENT
Well sealed from land surface to 32 ft.
Diameter of well bore to bottom of seal 22 in.
Diameter of well bore below seal 15 1/4 in.
Number of sacks of cement used in well seal 15 sacks
Number of sacks of bentonite used in well seal — sacks
Brand name of bentonite
Number of pounds of bentonite per 100 gallons of water lbs./100 gals.
Was a drive shoe used? ☐ Yes ☑ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☑ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County UMATILLA Driller's well number
SE ¼ NW¼ Section 28 T. 4N R. 30E W.M.
Bearing and distance from section or subdivision corner
1/4 mi

(11) WATER LEVEL: Completed well.
Depth at which water was first found 103 ft.
Static level 0 ft. below land surface. Date 1-9-75
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 15 1/4
Depth drilled 660 ft. Depth of completed well 660 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. *Report each change in position of Static Water Level and indicate principal water-bearing strata.*

MATERIAL	From	To	SWL
SAND	0	7	
BLACK BASALT	7	27	
GREY "	27	103	
BLACK & TALC	103	121	56
BLACK	121	340	
BLACK & BROWN w/TALC	340	360	400
BLACK	360	550	
BLACK & GR TALC	550	565	
GREY	565	590	
BROWN & TALC	590	610	500
BLACK & TALC	610	635	
RED	635	650	1000
BLACK	650	665	
ALL AQUIFERS	ARE		
ARTESIAN		TILL	CASED

Work started 12-5 19 77 Completed 1-5 1978
Date well drilling machine moved off of well 1-6 19 75

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Tony Bond (Drilling Machine Operator) Date 1-9, 1975
Drilling Machine Operator's License No. 933

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Tony Bond Well Drilling (Person, firm or corporation) (Type or print)
Address Box 272
[Signed] Tony Bond (Water Well Contractor)
Contractor's License No. 540 Date 1-9, 1978

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 4N/35E-27b
State Permit No.

(1) OWNER:
Name MERLE GEHRKE
Address ECHO ORE

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☑ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☑ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐
18" Diam. from +2 ft. to 40 ft. Gage
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☑ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☑ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☑ Yes ☐ No If yes, by whom? Valley
Yield: 4000 gal./min. with 90 ft. drawdown after 8 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 70° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used PORTLAND CEMENT
Well sealed from land surface to 23 ft.
Diameter of well bore to bottom of seal 22 in.
Diameter of well bore below seal 17 1/2 in. TO 125' 15 1/4 TO BOTTOM
Number of sacks of cement used in well seal 20 sacks
How was cement grout placed? GROUTY

Was a drive shoe used? ☐ Yes ☑ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☑ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☑ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County UMATILLA Driller's well number
SE 1/4 NW 1/4 Section 27 T. 4N R. 35E W.M.
Bearing and distance from section or subdivision corner
SE 4

(11) WATER LEVEL: Completed well.
Depth at which water was first found ft.
Static level 98' ft. below land surface. Date 1-24-78
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 17 1/2 TO 125' 15 1/4 TO 950'
Depth drilled 950 ft. Depth of completed well 950 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
SOIL	0	13	
HARDPAN	13	15	
BASALT Black w/talc	15	485	
BASALT Black w/talc	485	505	506
" Black	505	605	98'
" Black + Red/talc	605	649	520 &
" "	649	820	98'
" Brown w/talc	820	830	100+
" Black	830	950	95'

Work started 1-5 1978 Completed 2-1 1978
Date well drilling machine moved off of well 2-1 1978

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Tony Bond (Drilling Machine Operator) Date 2-1, 1978
Drilling Machine Operator's License No. 933

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Tony Bond well Drilling (Person, firm or corporation) (Type or print)
Address Pendleton ORE
[Signed] Tony Bond (Water Well Contractor)
Contractor's License No. 544 Date 2-1-78, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

NC

WATER WELL REPORT
STATE OF OREGON

RECEIVED
FEB 21 1978
UMATILLA WATER RESOURCES DEPT. SALEM, OREGON

(Please type or print)
(Do not write above this line)

State Well No. 4N/29E-36dc
State Permit No. .....

(1) OWNER:
Name Zabransky + Sons
Address Stanfield, Or 97875

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☒
16 " Diam. from 0 ft. to 79 ft. Gage .250
12 " Diam. from 610 ft. to 670 ft. Gage .250
" Diam. from ..... ft. to ..... ft. Gage .....

(6) PERFORATIONS:
Perforated? ☒ Yes ☐ No
Type of perforator used Cook 12" Liner
Size of perforations 3" long in. by 3/8" wide in.
80 FT perforations from 644 ft. to 665 ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☒ No
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom?
gal./min. with ft. drawdown after hrs.
" " "
" " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water Depth artesian flow encountered ..... ft.

(9) CONSTRUCTION:
Well seal—Material used Cement grout
Well sealed from land surface to 25 ft.
Diameter of well bore to bottom of seal 20 in.
Diameter of well bore below seal 16 in.
Number of sacks of cement used in well seal 60 sacks
How was cement grout placed? Pumped in from bottom up.
Was a drive shoe used? ☒ Yes ☐ No Plugs ..... Size: location ..... ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

(10) LOCATION OF WELL:
County Driller's well number
NE ¼ SE ¼ Section 36 T. 4N R. 29 E W.M.
Bearing and distance from section or subdivision corner
600 ft East + 80 ft. South of the NW corner of NE¼ SE¼ Sec. 36 T 4N R. 29

(11) WATER LEVEL: Completed well.
Depth at which water was first found 175 ft.
Static level flow ft. below land surface. Date
Artesian pressure 5 lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing .....
Depth drilled ft. Depth of completed well ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Brown Sandy clay	0	40	
Brown Clay WITH COARSE	40	50	
Brown Clay + Broken rock	50	60	
Broken rock	60	70	
Hard GRAY BASALT	70	79	
Hard Black Basalt	79	135	Strk. 80' G.W.B.
Hard GRAY Basalt	135	175	
Red Basalt soft	175	285	
Grey Basalt Med.	285	440	
Hard Gray Basalt	440	610	
GRAY BASALT Med.	610	650	
Soft Broken Basalt	650	690	
Hard Gray Basalt	690	860	
Med Hard Gray Basalt	860	995	
Black Basalt	995	1000	
Brown Basalt soft	1000	1023	Strk. Ground Level

Work started 11/1 1976 Completed 12-30-77 19
Date well drilling machine moved off of well 12-30-77 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Melvin Cahlin (Drilling Machine Operator) Date 12/30/, 19 77
Drilling Machine Operator's License No. 757

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name ..... (Person, firm or corporation) (Type or print)
Address .....
[Signed] ..... (Water Well Contractor)
Contractor's License No. ..... Date ....., 19.....

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*15660-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
APR 2 1979
WATER RESOURCES DEPT.
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 4N/29E-25
State Permit No.

(1) OWNER:
Name ZABRENSKY & SONS
Address RT 1 BOX 76
STANFIELD ORE

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☑ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☑ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☑
16" Diam. from -35 ft. to +2 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☑ No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☑ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a ~~pump~~ AIR test made? ☑ Yes ☐ No If yes, by whom? DRILLER
Yield: 1000 gal./min. with 300 ft. drawdown after 1 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 64° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used PORTLAND CEMENT
Well sealed from land surface to 35 ft.
Diameter of well bore to bottom of seal 18" in.
Diameter of well bore below seal 12 1/4 in.
Number of sacks of cement used in well seal 17 sacks
How was cement grout placed? TREMIE PIPE
Was a drive shoe used? ☐ Yes ☑ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☑ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☑ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County UMATILLA Driller's well number
SE ¼ NE ¼ Section 25 T. 4N R. 29E W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 373 ft.
Static level 30 ft. below land surface. Date 3-7-79
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 12 1/4
Depth drilled 475 ft. Depth of completed well 475 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Soil	0	16	
BASALT BROWN	16	27	
" GREY	27	65	
" BROWN	65	75	
" Black	75	83	
" RED	83	110	
" Black	110	127	
" BROWN	127	135	
" GREY	135	255	
" Black	255	365	
" Black	365	373	
" BROWN H2O	373	404	
" Black	404	407	
" BROWN H2O	407	417	
" Black	417	440	
" Black H2O	440	475	

Work started 3-5- 1979 Completed 3-7-79 19
Date well drilling machine moved off of well 3-7-79 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (Drilling Machine Operator) Date 3-7, 1979
Drilling Machine Operator's License No. 993

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name (Person, firm or corporation) Jerry Brandt Well Drilling (Type or print)
Address 5543 S.W. Douglas Dr.
[Signed] (Water Well Contractor)
Contractor's License No. 544 Date 3-7, 1979

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 4N/30E-26C
State Permit No.

(1) OWNER:
Name RON KILGORE
Address PENDLETON ORE

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☑ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☑ Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded ☑
16" Diam. from 42 ft. to 48 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

PERFORATIONS: Perforated? ☐ Yes ☑ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes ☑ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☑ Yes ☐ No If yes, by whom? Valley
Yield: 4000 gal./min. with 90 ft. drawdown after 8 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 70° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used PORTLAND CEMENT
Well sealed from land surface to 48 ft.
Diameter of well bore to bottom of seal 22 in.
Diameter of well bore below seal 15½ in.
Number of sacks of cement used in well seal 45 sacks
How was cement grout placed? GRAVITY
Was a drive shoe used? ☐ Yes ☑ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☑ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☑ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County UMATILLA Driller's well number
NW¼ SW¼ Section 26 T. 4N R. 30E W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 280 ft.
Static level 182 ft. below land surface. Date 2-27-78
Artesian pressure lbs. per square inch. Date

(12) WELL LOG: Diameter of well below casing 15½
Depth drilled 750 ft. Depth of completed well 750 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
SOIL	0	33	
BASALT BROKEN	33	41	
" BROWN	41	100	
" GREY	100	150	
" BLACK	150	280	
" RED & BRN w/talc	280	305	182
" BLACK	305	421	
" GREY	421	490	
" BLACK	490	515	
" GREY	515	560	
" BLACK	560	600	
" BLACK w/TALC	600	615	
" BLACK	615	710	
" BROWN w/RED/talc	710	736	182
" GREY	736	750	

Work started 2-9 19 78 Completed 2-27 19 78
Date well drilling machine moved off of well 2-27 19 78

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Tony Burd (Drilling Machine Operator) Date 2-27, 1978
Drilling Machine Operator's License No. 933

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name LARRY BURD WELL DRILLING (Person, firm or corporation) (Type or print)
Address 5543 SW DOUGLAS DR PENDLETON
[Signed] Tony Burd (Water Well Contractor)
Contractor's License No. 544 Date 2-27, 1978

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

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