

WRD Exp. (GW)
Aug. 1964

Verified PMJ

U. S. DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Water Resources Division Well Schedule Form

MASTER CARD

Record by D. AARONSON Source of data FILE Date 8/31/65 Map 1:63,360 COUNTY HWY

State IOWA County (or town) PALO ALTO 7-4

Latitude: 42° 57' 31" N Longitude: 094° 27' 08" W Sequential number: 2

Lat-long accuracy: 2 T 94 S, R 31 Sec 13 SWSW 4, SW 5, NE 5

Local well number: 09431W13a c c c Other number: W-1529

Local use: 01529 42CITY 2 Owner or name: WEST BEND

Owner or name: WEST BEND IOWA Address: WEST BEND, IA

Ownership: County, Fed Gov't, City, Corp or Co, Private, State Agency, Water Dist M

Use of water: (A) Air cond, (C) Comm, Dewatering, (F) Fire, (H) Irr, (I) Ind, (P) P-S, Stock, (T) Instit, (U) Unused P

Use of well: (A) Anode, (D) Drain, (G) Seismic, (O) Obs, (P) Oil-gas, (R) Recharge, (S) Spring, (T) Test, (U) Unused, (W) Withdraw, (X) Waste, (Z) Destroyed W

DATA AVAILABLE: Well data 3 Freq. W/L meas.: INVENTORY Field aquifer char. 72

Hyd. lab. data: 73

Qual. water data: type: 74

Freq. sampling: 75 Pumpage inventory: yes 76 no, period: 77

Aperture cards: 77

Log data: GEOLOGIST LOG 6 78 79

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD Depth well: 415? ft Meas. 415 accuracy 6

Depth cased: (first pert.) 208 ft Casing type: STEEL; Diam. 8 in

Finish: (C) porous gravel w. concrete, (F) gravel w. (perf.), (H) horiz. gallery, (O) open perf., (P) screen, (S) sd. pt., (T) shored, (U) other 31

Method Drilled: (A) air rot, (B) bored, (C) cable, (D) dug, (H) jetted, (J) air rot., (P) percussion, (R) multiple, (T) reverse, (V) trenching, (W) driven, (X) wash, (Z) other 32

Date Drilled: 1942 9-4-2 Pump intake setting: 36 ft 38

Driller: BEN GERBER

Lift (type): (A) air, (B) bucket, (C) cent, (D) jet, (L) multiple, (M) (cent.), (N) turb., (P) none, (R) piston, (S) submerg, (T) turb, other 39 Deep 40 Shallow

Power (type): nat diesel, elec, gas, gasoline, hand, gas, wind, H.P. 41 Trans. or meter no. 40

Descrip. MP LSD ft above 1163 below 1163 lsd, Alt. MP 1163

Alt. LSD: 1163 Accuracy: (source) ALTIMETER 47 7

Water Level: 10 ft above MP; 10 ft below lsd Accuracy: DRILLER'S LOG 52 3

Date meas: 1942 4-2 Yield: 50 gpm 50 Method determined 61

Drawdown: 150 ft 150 Accuracy: 3 Pumping period: 60 hrs 68

QUALITY OF WATER DATA: Iron 69 Sulfate 70 Chloride 71 Hard. 72

Sp. Conduct 73 Temp. 74 76 Date sampled 77 79

Taste, color, etc.

Well Number 42,5731 ^N 094,27,08
d m s d m s

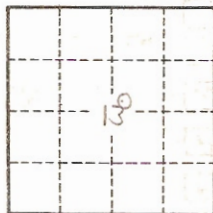
HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD		Physiographic Province: <u>CENTRAL LOWLAND</u> <u>1:2</u>		Section: <u>WESTERN</u>	
<u>LAKE</u> <u>B</u>		Drainage Basin: <u>DES MOINES</u> <u>2:5:B</u>		Subbasin: _____	
Topo of well site: local depression, flat surface, hilltop, hillside, terrace, valley flat, _____ <input checked="" type="checkbox"/>					
MAJOR AQUIFER: <u>DEVONIAN</u>		series: <u>MIDDLE</u> <u>D:2</u>		aquifer, formation, group: _____	
Lithology: _____		Origin: _____		Aquifer Thickness: _____ ft	
Length of well open to: _____ ft		Depth to top of: _____ ft		_____ ft	
MINOR AQUIFER: _____		series: _____		aquifer, formation, group: _____	
Lithology: _____		Origin: _____		Aquifer Thickness: _____ ft	
Length of well open to: _____ ft		Depth to top of: _____ ft		_____ ft	
Intervals Screened:					
Depth to consolidated rock: _____ ft		Source of data: _____		_____	
Depth to basement: _____ ft		Source of data: _____		_____	
Surficial material: _____		Infiltration characteristics: _____		_____	
Coefficient Trans: _____ gpd/ft		Coefficient Storage: _____		_____	
Perm: _____ gpd/ft ² ; Spec cap: <u>3</u> <u>3</u>		gpm/ft; Number of geologic cards: _____		_____	

CASING!

192' OF 8" CASING

208' OF 6" CASING FROM SURFACE



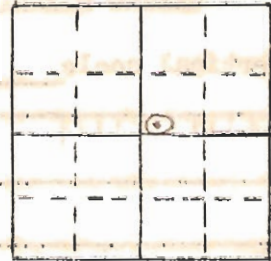
IOWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey

W-1529

RECORD OF WELL

Location:

Town: West Bend (N E)
(S W): County Pala Alto
SW/4 NE 1/4 sec. 13 T 94 N., R. 31 W. West Bend Twp.



Well name and number West Bend City No 2

Owner _____ Address _____

Tenant _____ Address _____

Contractor Ben Gerber Address _____

Drillers _____

Drilling dates March 1912

Well data:

Elevations: Drilling curb 1161 feet; Land surface _____ feet

CRISP (inst) 1203'

Determined by _____

Topographic position valley

Total depth: Reported 415 ? feet, Measured _____ feet

Drilling method _____

Hole and casing data 192' of 8" casing

198' to 208' of 6" casing from surface

Original depth to water _____ ^{above} ft. below _____ Date _____

Original elevation of water level _____ ft.; Source of data _____

Sources of water: Principal _____ ; Others _____

Production data:

Date

Static depth to water 10 Measuring point

Pumping level 160 at 50 g.p.m.

Specific capacity g.p.m. per ft. drawdown; Temperature °F.

Pump data; Type pump Column Dia. Length

Cylinder or bowls: Dia. Length Suction pipe

Power Airline

Estimated rate of production: g.p.m. for hrs. a day

Use of water city supply

WATER ANALYSES (in parts per million)

Date samples	_____	_____	_____	_____
Sampled by	_____	_____	_____	_____
Total solids	_____	_____	_____	_____
Insoluble matter	_____	_____	_____	_____
Alkalinity (Meo)	_____	_____	_____	_____
Alkalinity (Phn)	_____	_____	_____	_____
pH	_____	_____	_____	_____
Fe ₂ O ₃ + Mn ₂ O ₃ +Al ₂ O ₃	_____	_____	_____	_____
Alkali as sodium	_____	_____	_____	_____
Calcium	_____	_____	_____	_____
Magnesium	_____	_____	_____	_____
Iron (unfiltered)	_____	_____	_____	_____
Manganese	_____	_____	_____	_____
Nitrate	_____	_____	_____	_____
Fluoride	_____	_____	_____	_____
Chloride	_____	_____	_____	_____
Sulfate	_____	_____	_____	_____
Bicarbonate	_____	_____	_____	_____
Hardness (ppm)	_____	_____	_____	_____
Hardness (gpg)	_____	_____	_____	_____
Remarks	_____			

Laboratory data:

Sample storage location

Sample range 290-415 No. spls. 19 No. dupls. & cond. 19 good

Spls. prepared by Hawkins Washed range by

Driller's log and cond. No

Insoluble residues: Prepared by Studied by Strip log

Microscopic study strip log March 30, 1942, D.A.D.

Gen. log Correl. by HARRIS

IOWA GEOLOGICAL SURVEY
Water Well Data Sheet

Survey Number **W-1524**

Town West Bend County Palo Alto T. 94 N., P. 31 W.

Name West Bend City Well No 2 Location SW 1/4 NE 1/4, Sec. 13

Contractor Ben Gerber Driller _____ Use City Supply

Construction Drilled Drilling Dates _____ Depth 415*

Topog. Valley Curb Elev. 1163 Ref. CR147 (inst) Total Depth _____

Final above Static below Pumping Level curb Level _____ Draw down _____ gpm _____ Time pumped _____ Date _____

Depth to bot. pump _____ ft. with _____ ft. suction pipe. drawdown _____ Calc. g/ft. _____ Prin. _____

Producing _____ Prod. _____

Horizons _____

Water levels and pumping tests on various horizons during drilling:

Depth Range	Stat. Level	Pump Level	Draw down	gpm.	Temp.	Producing horizons	Producing formations	Formations cased out

Additional information SWL = 10'

Laboratory Data

Sample range 290-415' Number samples 19 Number Duplicates 19 Cond. good

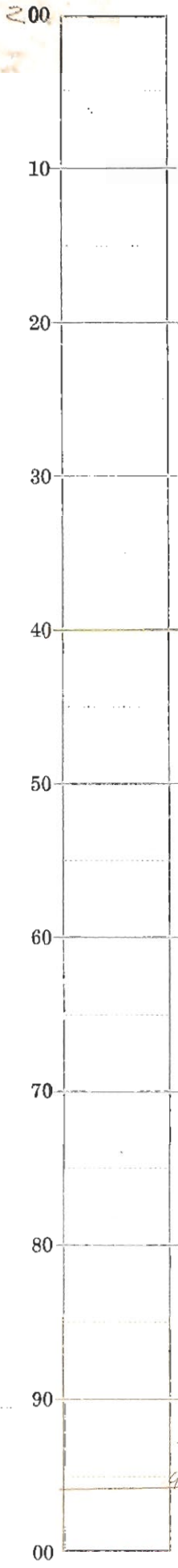
Log Cond. _____ Boxed Hawkins Range 290-415' Date 3/30/42

Remarks one sample unmarked

Microscopic Study Range <u>290-415</u>	Strip Log <u>DAD 3-30-42</u>	Gen. Log	Blue Print	Samples Washed
Insol. Res. Study Range _____	Strip Log	Gen. Log	Insol. Res. Prepared	Well Corel.

Sheet No. 3 Name of Well. West Bend city #2 Survey No.

Location Date Drilled Analyst Davis 3-30-42



Handwritten notes on the form:

At approximately 40 feet depth: *W.S. 11-290*

At approximately 90 feet depth: *sol. 40% magy, f. gran dse 0% pale graysh
yell, m-crse xl, Tr. sd*

At approximately 96 feet depth: *sol, pale yell, crse xl dse 15% - gray, f. gran dse*

00
10
20
30
40
50
60
70
80
90
00

02 Dol, pale yell, m xl, subsac m part, 10% lt. gry, f. gran Tr. grnsh

28 Dol, pale yell drbsh m part f. d. se 20% dol. lt. m gry, f. gran dse. 5% drk m. sac. Tr. sh. grn.

13 Dol, pale drbsh lt. m 30% pale drbsh to m gry f. d. Tr. sh. grn

18 Dol, pale drbsh lt. m 40% dol. pale gry, f. gran dse

23 Dol, pale lt. yell, sl. drbsh, f. m. xl d. 15% dol. pale - lt. gry f.

30 Dol. A-med. brn

35 lt. brn f. dse. 40% gran dse

40 Dol. lt. m. brn, drbsh in part. f. d. se sl. calc

45 Dol. wht-v. pale grn. v. f. dse. 10% dol. lt. gry m. gran 15% dol. pale brn, m. gran dse

50 Dol. pale + lt. gry, f. gran dse calc. mottle-w. drk

spie

65 Dol, pale - lt. gry, f. gran 30%

70 Dol. Pale yell-pale brn, m-sac to dse, 40% 25% dol. v. pale gry, f. gran. 35% ls, wh, fxl.

75 Dol, pale gry, yellow to drbsh, f. m. dse sac in part 10% ls, a.c. 10% sh. lt. grnsh, gry. flaky.

85 Dol. lt. drk to lt. drbsh 40% m sac porous 60% v.f. - sub lith.

95

Sheet No. 5 Name of Well West Bend #2 Survey No.

Location Date Drilled Analyst Davis 3-30-42

Waps
with

zs, pale to m to drk gray mottle, v.f - m sub sac
in part 25% dol, pale drbsh gray - pale yell.

Dol pale drb, t - m gray sub sac

15

4

00

10

20

30

40

50

60

70

80

90

00

April 17, 1942

Dr. P. O. Dorweiler
West Bend, Iowa

Dear Dr. Dorweiler:

There are several drilling companies in the State who are experienced in acidizing wells. Among the most experienced are Thorpe Well Company, 2340 Sixth Avenue, Des Moines, Layne-Western Company, 611 Eleventh Street, Ames, Iowa, C. W. Varner Well Drilling Company, 905 Dubuque Building, Dubuque, Iowa, and D. E. Edwards, West Branch, Iowa.

None of these companies are located close to West Bend and undoubtedly it will be relatively costly to have them do the work. Unfortunately, however, I know of no one near West Bend who has had acidizing experience.

If I can be of further service, please feel free to call on me.

Very truly yours,

H. G. Hershey

HGH:N

P. O. DORWEILER, D. V. M.
WEST BEND, IOWA
—
PHONE 74

4-14-42

Mr. N. G. Kershney
Asst State Geologist
Iowa City Iowa.

Dear Mr Kershney;

I am writing in answer
to your letter of 4-1-42 in regard to
acidizing this well. we here do not
know of anyone that is competent
in acidizing, and consequently would
like you to refer us to someone that has
done this before so we may get in contact
with them.

We are also wondering what you would
think of shooting this well with dynamite
or nitroglycerine at the same depth as
you advised acidizing it. I am

Very truly yours
P. O. Dorweiler

APR 15 1942

April 1, 1942

Dr. F. O. Dorweiler
West Bend, Iowa

Dear Dr. Dorweiler:

Thank you very much for the information on the difference in elevation between your new well and the top of rail at the Rock Island depot. Your letter reached the office before my return.

We have now had an opportunity to examine the samples and compare them with other wells in the vicinity of West Bend. At a depth of 415 feet the rock is dolomite of the Wapsipinicon formation. Similar dolomites and limestones should continue downward for several hundred feet. Normally these formations yield small amounts of water and I believe that the production of your well could be increased by deeper drilling. Large supplies do not usually occur at any particular horizon but depend on cracks and crevices which run heterogeneously throughout the rock. Occasionally large supplies are found in an abnormally large opening, but it is impossible to predict where these occur. In all probability small additional supplies will be encountered at various horizons as the hole is deepened.

The deeper waters in the vicinity of West Bend are moderately highly mineralized but I believe that the hardness of the water would not be materially increased by drilling an additional 100 feet. At the same time it is doubtful that by drilling an additional 100 feet you could double the present capacity of the well.

The production of limestone and dolomite wells such as yours can often be greatly increased by acidizing. The usual method of doing this is to run a small pipe down to the horizon to be acidized and then pouring in commercial hydrochloric acid (muriatic). The horizon to be acidized should be one which is known to produce some water and the best results are obtained when the largest producing horizon is tried. In the case of the West Bend well I feel sure that some water was encountered at a depth of approximately 335 feet.

Acidizing demands a certain amount of experience and unless Mr. Gerber has used acid before, I feel that you would not be wise to have him attempt it on your well.

Dr. P. O. Dorweiler

-2-

April 1, 1942

If you have any questions or if I can be of further service, please do not hesitate to let me hear from you.

Very truly yours,

H. G. Hershey

HGH:N

New town well

Loc: SW/c-NE-13-94-31

Elev: Estimated 40-50' below railroad station, City promises to send us a level run from station to well curb. (Station = 1203')

Mr. Ben Gerber, West Bend, driller
Mr. Al Gearhart, water works supt.
Dr. P. O. Dorweiler, member of council

Rock from 196' on

Drilling depth at 416'--soft water but not enough of it. SWL 10'±
Water in well and outside casing not the same. Outside water higher.

At depth 135' the well flowed. Water contained fine sand & silt.

PWL 160' @ 50 gpm.

192' of 8" 16' or 6' additional of 6-inch which comes to surface

chunks from depth 335' seem to indicate opening.

Town would like to have 100 gpm.

P. O. DORWEILER, D. V. M.
WEST BEND, IOWA

March 26, 1942

Mr. H. G. Hershey
Iowa Geological Survey
Iowa City, Iowa

Dear Sir:

Inclosed you will find the information that you requested.

Will you please let us know what your suggestions are as to the depth we might drill safely without getting a serious change in the water.

Very truly yours ,

A handwritten signature in cursive script, appearing to read "P. O. Dorweiler". The signature is written in dark ink and is positioned below the typed name.

POD:jh

MAR 27 1942

West Bend Iowa

March - 25 - 1942

To Dr. P.O. Deruelle -

Elevation of Top of Rail opposite #6 } 196.90'
Rock Island depot }

Ground Elevation at site of new well } 155.20'
at City Pump Station }
= 41.7'

Elevations given are Datum of
Sanitary Sewers.

1197
41.7
1155.3

Rec. Cliff.

1205.
42.
1163.

December 3, 1941

The Mayor
West Bend, Iowa

Dear Sir:

We have just been informed that the town of West Bend has let contracts for a new city well. We will appreciate it greatly if you will request the driller to save a set of samples, a log, and a record of the constructional features of the well for the Geological Survey. Information obtained from the study of the samples and other information obtained during drilling will be of great value to us and I believe to the town of West Bend.

I have written a similar letter to Mr. Gerber and have sent him sample containers and a log book to facilitate the sample collection.

Very truly yours,

H. G. Hershey

HGH:N

December 3, 1941

Mr. Ben Gerber
West Bend, Iowa

Dear Mr. Gerber:

Word has reached me that you have been awarded the contracts for drilling and equipping a new main well for the town of West Bend. The Iowa Geological Survey is anxious to obtain well cuttings in the vicinity and particularly in the town of West Bend. We will appreciate it greatly if you can find it possible to save a complete set of samples for us along with a log and constructional record of the well. Under separate cover I am sending you a supply of sample containers and log book for this purpose. We should like to have samples from each five-foot interval drilled or from each bailing if your drilling intervals between bailings is greater than five feet.

I am writing a letter to the Mayor of West Bend making a similar request.

Very truly yours,

H. G. Hershey

HGH:N