

## WELL SCHEDULE

U. S. DEPT. OF THE INTERIOR

GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

## MASTER CARD

Record by D. Gackel Source of data File Date 9-16-66 Map County Hwy  
State Towa 1 16 County Keokuk 5 4  
Latitude: 41 21 38 N Longitude: 09 15 71 W Sequential number: 2  
Lat-long accuracy: 2 T. 076 S. R. 10 Sec. 25, NENE, SWSW, NE 1/2 5  
Local well number: 07610W25ACCAA Other number: W-1794  
Local use: 01794 #7 (#7) Owner or name: Keota City Well #7  
Owner or name: KEOTA CITY WELL Address: \_\_\_\_\_  
Ownership: County, Fed Gov't, City, Corp or Co, Private, State Agency, Water Dist M  
Use of Air cond, Bottling, Comm, Dewater, Power, Fire, Dom, Irr, Med, Ind, P S, Rec, water: P  
Stock, Instit, Unused, Repressure, Recharge, Desal-P S, Desal-other, Other P  
Use of well: (A) (D) (G) (H) (P) (R) (T) (U) (W) (X) (Z) W  
Anode, Drain, Seismic, Heat Res, Obs, Oil-gas, Recharge, Test, Unused, Withdraw, Waste, Destroyed  
DATA AVAILABLE: Well data 1 Freq. W/L meas.: Inventory X Field aquifer char. 72  
Hyd. lab. data: 73  
Qual. water data; type: Complete 74  
Freq. sampling: I Pumpage inventory: no period: 76  
Aperture cards: 77  
Log data: Geolog 1st log Drillers log G:D 78 79

## WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD Depth well: 153 ft 1 5 3 Meas. Drillers log 24  
Depth cased: 65'2" ft 6 5 Casing type: steel; Diam. 8 in 8  
Finish: porous gravel w. (G) (H) (P) (S) (T) (W) (X) (Z) X  
concrete, (perf.), (screen), gallery, end, open perf., screen, sd. pt., shored, open hole, other  
Method: (A) (B) (C) (D) (H) (J) (P) (R) (T) (V) (W) (Z) C  
Drilled: air bored, cable, dug, hyd jetted, air reverse trenching, driven, drive wash, other  
rot, rot., percussion, rotary, other  
Date Drilled: 1943 9 4 3 Pump intake setting: \_\_\_\_\_ ft 36 38  
Driller: D-F. Edward, West Branch address \_\_\_\_\_  
Lift (A) (B) (C) (J) multiple, multiple, (N) (P) (R) (S) (T) (Z) T Deep D  
(type): air, bucket, cent, jet, (cent.) (turb.) none, piston, rot, submerg, turb, other Shallow  
Power (type): diesel, (elec) nat gas, gasoline, hand, gas, wind; H.P. 5 Trans. or meter no. \_\_\_\_\_  
Descrip. MP LSD ft above LSD. Alt. MP 783  
Alt. LSD: 783 7 8 3 Accuracy: Altimeter 47  
Water Level 35 ft above MP; Ft below LSD 3 5 Accuracy: Drillers log 52  
Date meas: 1943 4 3 Yield: 90 gpm 9 0 Method determined 61  
Drawdown: 40 ft 4 0 Accuracy: Drillers log 3 Pumping period \_\_\_\_\_ hrs 66 68  
QUALITY OF WATER DATA: Iron 70 4 Sulfate 83.3 3 Chloride 2.0 0 Hard. 469 7  
ppm ppm ppm ppm ppm  
Sp. Conduct K x 10<sup>6</sup> 6 Temp. 74 76 Date sampled Jan 12, 1974 1 4 4  
Taste, color, etc. 77 79

Verified ERG

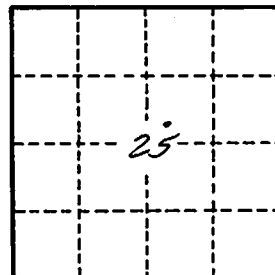
Punched FCH

Well No. 076-10W-25ACCAA

Well No. 076-10W-25 ACCALatitude-longitude 41.21.38 <sup>N</sup> 091.57.15  
d m s d m s

## HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD Physiographic Province: Central lowland Section: Dissected  
 Till Plain E Drainage Basin: SKUNK Subbasin: 2.5C  
 (D) (C) (E) (F) (H) (K) (L)  
 Top of depression, stream channel, dunes, flat, hilltop, sink, swamp,  
 well site: (Q) (P) (S) (T) (U) (V)  
 offshore, pediment, hillside, terrace, undulating, valley flat upland  
 MAJOR  
 AQUIFER: Miss. lower M.1 Kinderhook Wass. K.W.  
 system series aquifer, formation, group  
 Lithology: med. Dolo 3.0 Origin: marine 6 Aquifer Thickness: 6 ft  
 Length of well open to: 23 ft Depth to top of: 130 ft  
 MINOR  
 AQUIFER: Miss. lower M.1 Osage Burl. Q.B.  
 system series aquifer, formation, group  
 Lithology: Cherty Dolo Q.D. Origin: marine 6 Aquifer Thickness: 62 ft  
 Length of well open to: 60 ft Depth to top of: 67 ft  
 Intervals Screened: None  
 Depth to consolidated rock: 60 ft Source of data: 64  
 Depth to basement: 63 ft Source of data: 69  
 Surficial material: 70-71 Infiltration characteristics: 72  
 Coefficient Trans: 73 gpd/ft Coefficient Storage: 76  
 Coefficient Perm: 77 gpd/ft<sup>2</sup>; Spec cap: 2.25 gpm/ft; Number of geologic cards: 79

Well No. 076-10W-25 ACCA

IOWA GEOLOGICAL SURVEY  
Water Well Data SheetSurvey  
Number

W-1795

Town Keota County Keokuk T. 76 N., R. 10 W.Name Town of Keota No. 7 Location C-SW  $\frac{1}{4}$  NE  $\frac{1}{4}$ , Sec. 25Contractor D. E. Edwards Driller — Use City SupplyConstruction Drilled Drilling Dates 1943 Drilling Depth —Topog. Upland Curb Elev. 783 Ref. H. Level Total Depth 153Final aboveStatic below Pumping Draw — Time —Level curb Level — down — gpm — pumped — Date —Depth to — Calc. g/ft. — Prin. —bot. pump — ft. with — ft. suction pipe. drawdown — Prod. —Producing —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                                 

## Laboratory Data

Sample range 63-152 Number samples 10 Number Duplicates 10 Cond. poorLog Yes Cond.   Boxed Kringel Range 63-152 Date 1/17/44

Location ..... Date Drilled ..... Analyst .....

63 60

63 Dolo-med to lt brn. - wh with brn spks - 40%  
(bff)

67 sts-med brn - dolomitie - 60%

cht-wht to bff-50% - conch. - dull

sts-med brn - dolomitie - 50%

Dolo-med brn - v. finly xln - dense - 15%

sts - lt to med brn, bff - dolomitie 100%

cht - wht, - subconch - with dolo emb - (some dark grn frags) 15%

Dolo - lt brn to bff - v. finly xln to sacch. - med. porous - 75%

Dolo - wht to bff - silty - 95%

cht - wht to lt gry - 50%

quartz xtns

Dolo - med gry - v. silty - dense

cht - trace - wht.

Dolo-med brn - v. finly xln - 50% - med porous

cht - wht - subconch to weathered - 50%

Dolo - v. lt. gry to wht - v. silty - soft - 90%

fossiliferous (brachs?)

cht - 10% - wht - conch -

ls - med to lt gry - dolo. emb - dense - 90%

cht - wht - <sup>to bff</sup> - lrrag. - 10%

brachs

ls - same - 20%

Dolo - med gry - 60% - v. porous - silty

crinoid

cht - wht to med gry - oolitic 20%

sn - med gry - silty

Hampton

# D. E. EDWARDS

WELL DRILLING, ELECTRIC PUMPS  
and SUPPLIES

PHONE 278

WEST BRANCH, IOWA

June 21 1943.

JUN 22 1943

.....DATA OF WELLS DRILLED IN KEOTA BY D.E.EDWARDS.....

In 1937, two wells were drilled just north of the paving in the extreme west part of town, under the supervision of the State Geology Survey Office and the State department of health, at an approximate depth of 140', these wells produced under continuous pumping 22 GPM, one of these wells was drilled through the Kinderhook shale and into the limestone below the shale with practically no infeed below the mentioned 140' level.

Under the suggestion of D.E.Edwards, a 6" well was drilled about 8' east of the old brick pump house, and between 120' and 125' approximately 60 GPM was encountered, this test was made only with a plunger type pump for approximately 8 hrs, the hole was then reamed to 10" and 10" casing was set to the top of the rock approximately 63', and the well was drilled to the top of the shale to a depth of 152', during the reaming process the water vein was plugged to where the well furnished only approximately 25 GPM, it was then attempted to re-open the water vein by the use of acid, but the rock seemed to contain so much churt that the acid took very little effect and did no good, the well was then dynamited with no results.

Under the suggestion of D.E.Edwards and the City Council, a well was then drilled about 10' due east of the mentioned 10" well, this well was also drilled to the top of the shale approximately 152' and this well produced approximately 60 GPM, but with in less then one year the well had cut down to approx. 35 GPM, at first we could revive the well by back washing but this soon failed to do any good.

Under the suggestion of D.E.Edwards, a 10" well was drilled to the top of the shale in the extreme south east corner of the city park, this rock consisted of almost all churt, and had an infeed of approximately 15 GPM, it was abandoned and under the suggestion of D.E.Edwards, an 8" well was drilled in the extreme south east corner of a vacant lot which is 400' S.W. of the old brick pump house, this well was also drilled to the top of the shale at a depth of 150', the top portion of the rock was quite churty, but at 116' a very loose broken rock was encountered, this rock was loose and broken-down to 130', the water fed in freely into the well, but a considerable amount of fine dirty sand fed in with the water.

The well was heavily surged which removed a large amount of sand and a 24 hr. pumping test was made, the well started pumping at about 90 GPM, gradually cutting back to about 75 GPM and after 10 hrs. pumping, the water was lowered below the pump in the well that is just east of the old brick bldg. or in other words the water must be feeding in from the S.W. and when we pumped the total source of infeed, we lowered the water 400' to the N.E. almost to the pumping level of this well.

# D. E. EDWARDS

WELL DRILLING, ELECTRIC PUMPS  
and SUPPLIES

PHONE 278

WEST BRANCH, IOWA

2

This well was put into use in the spring of 1939, and in March 1940 the sand had worked in and shut off the water, the well was again surged and the water supply was restored, the well was then back washed at different periods and a considerable amount of sand was removed each time the well was back washed. In January 1943, the well had cut down to less than 40 GPM and the pump was again removed and the well was surged and very little sand was removed with the surge, but the water supply was restored to 80 GPM, the pump was re-installed and after a short time pumping, the water supply cut to approximately 30 GPM and we again back washed the well, a fine sand started flowing into the well at such a rate that the pump impellers were completely ruined, and the sand continued to come.

In April 1943, it was suggested by D.E. Edwards that a well be drilled as near as possible to one half way between this well that produced lots of water with sand, and the well east of the old brick pump bldg. which was still in use and furnishing approx. 30 GPM, the idea in mind was that by divideing this distance maybe we could find a place in the rock where it was loose enough to permit the water to feed in and would also furnish enough filter to keep the fine sand from bothering.

This was decided on at a regular council meeting and D.E. Edwards moved his equipment onto the job, but the Town Council then decided that in place of drilling the well at this mentioned divided distance they would try another well at a location about 50' due east of the water tower or about 25' N.E. of the well that was then in use and furnishing approx. 30 GPM. This well was drilled to the top of the shale at 153' and the main water supply was encountered between 120' and 125', which furnished 25 GPM, the rock at this location is so tight, the pores are so small, that by pumping the two wells one had no effect on the other. You could pump them both to a pumping level of 125' and either well would effect the other one a noticeable amount, this well was abandoned and in May 1943, a well was drilled on the west side of the street about 150' S.W. of the well that was then in use furnishing approx. 30 GPM.

## LOG OF THE WELL IN THE STREET:

*called well #7 by I.G.S.  
located at N. edge of street forming W. boundary  
of city park.*  
Drift to 63' 9" and there was 65' 2" of 8" casing set here, at 61' about 3 feet of gravelly formation was encountered and a boulder of a sufficient size that had to be blown out of the way. This gravelly formation had a slight infeed of water with a static head of 32', the rock from 63' 9" to 115' was a brown limestone carrying a considerable amount of churt, at 115' we had less than 5 GPM infeed, from 115' to 120' we had a brown silty rock, at 120' we had less than 10 GPM infeed, from 120' to 130' the rock changed from a brown silty rock to a yellow limestone, from 130' to 135' we encountered the main supply of water, a bailer test was then made at an approx. 50 GPM with 6' of draw down, and when the pump in the well east of the brick pump house was running for one hour it lowered the water in this well 2', and we could bail the 50 GPM with an 8' of draw down as the water was automatically 2' lower by the other pump running.

# D. E. EDWARDS

WELL DRILLING, ELECTRIC PUMPS  
and SUPPLIES

PHONE 278

WEST BRANCH, IOWA

3

The well was then drilled to the top of the shale at 153' and the pump was then set with a setting of 128' 6" and the pumping test was started at 3:30 PM Friday June 11 1943, pumping 60 gal. in 39 sec. which is a little over 90 GPM.

Draw down:	3:45	9ft.
	4:00	10ft 11"
	5:10	14ft 6 1/2"
	7:30	13ft 2 1/2"

or a rise in head of 8'.

The pump, in the old well was shut off during this time but it was started at 8:30 PM, at 9:30 PM the water was lowered to the point that the pump had to be shut off and no change in the flow of the water in the new well noticed the pump in the old well was again started at 8:30 AM on Saturday June 12, and at 9:15 AM they could not even get it to prime, and the water in the new well had a draw down of 28' 7 1/2", at 10:30 AM, 28' 11 1/2", checked 90 GPM, 12:00 noon 29' 3 1/2", 1:30 PM 29' 11 1/2". at 2:30 AM Sun. June 13, the draw down 31' 3", the pump was then stopped and temporarily connected into the water main at 11:06 AM pumping at 63 GPM.

at	11:21 AM	draw down	5'	4"
	11:47 AM	" "	7'	
	12:30 PM	" "	9'	
	3:13 PM	" "	13'	

The tank was full at 3:13 and the pump was shut off.

This draw down test from Friday June 11 1943 at 4:15 PM to Sunday 13 1943, at 2:30 AM while the pump was pumping at no pressure and showed a total draw down of 31' 3" pumping 90 GPM at the end of the pumping test, was taken by Mr Harold Tiedt water superintendent, who also took the pumping test pumping into the main which was started at 11:06 AM at 63 GPM and showed a total draw down of 13' at 3:13 PM June 13 1943.

The peculiar characteristic of this well is that while it is about 5' lower than the other wells the top of the rock was encountered at almost the same depth as well as the top of the shale was almost the same, also the water in the other wells the main flow was fed in from 115' to 125' and in this one we had very little water at this depth and the main flow was between 130' to 135' also the rock in this hole re-acted quickly to acid.

The writers opinion is, that due to the fact that the water is fed in through the lower portion of the water bearing strata, which is a clean medium coarse limestone, that this well may not give any trouble by becoming clogged with the fine silt, or pump any sand with the water.

# D. E. EDWARDS

WELL DRILLING, ELECTRIC PUMPS  
and SUPPLIES

PHONE 278  
WEST BRANCH, IOWA

4

Should this well ever become clogged with the fine silt, before it is abandoned the writer would suggest that the well be thoroughly sealed at the top and an acid pipe set at 135' and at least three charges of 100 gal. of acid each be pumped into the well, leaving each charge set not less than 10 hrs. and thoroughly surge and clean the well between each charge of acid, as this rock reacts so thoroughly to acid I can not help but feel that a very large opening could be ate out with the acid.

As we have had an excessive amount of rainfall in 1942 and 1943, this may account for this well produceing the 90 GPM over such a long pumping period which would be a considerable amount more infeed then is necessary to supply the towns water demand, but the writers opinion is that if we would have 2 or 3 extremely dry years in sucession this infeed may be cut considerable but would undoubtably be sufficient to supply the Towns water demands.

The rock formations of this well was kept in glass containers properly labeled, and is now in the possession of the town of Keota, from which the State Geology Survey Office will be given samples of same.

Copies of this letter made for and sent to The Town of Keota, and to the State Geology Office at Iowa City Iowa.

obtained  
I.C.E.A.  
1-12-44

Signed this 21 day of June 1943.

*D. E. Edwards*

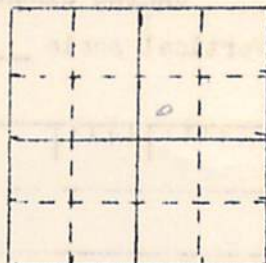
DEE/AEE

D.E. Edwards.

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

W-1794

RECORD OF WELL



Location:

Town: Keota ( N E)  
( S W); County Keokuk  
E.  
C-SW-NE sec. 25 T. 76 N., R. 10 W. Twp.

Well name and number Town of Keota #7

Owner \_\_\_\_\_ Address \_\_\_\_\_

Tenant \_\_\_\_\_ Address \_\_\_\_\_

Contractor D. E. Edwards Address West Branch

Drillers Frank Keaton

Drilling dates 1943

Well data:

Elevations: Drilling curb 783 feet; Land surface \_\_\_\_\_ feet

Determined by H. Level

Topographic position Upland

Total depth: Reported 153 feet, Measured \_\_\_\_\_ feet

Drilling method cable

Hole and casing data 65'2" of 8" casing from 0-65'2" 8" open

(Give amount, size, kind, and depth of all casing; type and  
hole to bottom.  
position of seals and packers; cementing; how finished--perforated pipe, screen,  
gravel pack, open hole, etc.)

Original depth to water \_\_\_\_\_ ft. above \_\_\_\_\_ ft. below \_\_\_\_\_ Date \_\_\_\_\_

Original elevation of water level \_\_\_\_\_ ft.; Source of data \_\_\_\_\_

Sources of water: Principal 115-150 Mississippi; Others \_\_\_\_\_

Production data: Date \_\_\_\_\_  
 Static depth to water 35 ± Measuring point \_\_\_\_\_  
 Pumping level 75 at 90 g.p.m.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Specific capacity \_\_\_\_\_ g.p.m. per ft. drawdown; Temperature 52 °F.  
 Pump data; Type pump Turbine Column Dia. \_\_\_\_\_ Length 128'  
 Cylinder or bowls: Dia. \_\_\_\_\_ Length \_\_\_\_\_ Suction pipe 2'  
 Power Elec. Motor Airline \_\_\_\_\_  
 Estimated rate of production: \_\_\_\_\_ g.p.m. for \_\_\_\_\_ hrs. a day  
 Use of water City Supply

WATER ANALYSES (in parts per million)

Date sampled	<u>Jan. 12, 1944</u>	_____	_____	_____
Sampled by	<u>K.F. Anderson</u>	_____	_____	_____
Total solids	<u>533</u>	_____	_____	_____
Insoluble matter	<u>21.5</u>	_____	_____	_____
Alkalinity (Meo)	<u>432.0</u>	_____	_____	_____
Alkalinity (Phn)	<u>0.0</u>	_____	_____	_____
pH	<u>7.4</u>	_____	_____	_____
Fe <sub>2</sub> O <sub>3</sub> + Mn <sub>2</sub> O <sub>3</sub> + Al <sub>2</sub> O <sub>3</sub>	<u>3.0</u>	_____	_____	_____
Alkali as sodium	<u>30.9</u>	_____	_____	_____
Calcium	<u>115.4</u>	_____	_____	_____
Magnesium	<u>43.7</u>	_____	_____	_____
Iron (unfiltered)	<u>0.70</u>	_____	_____	_____
Manganese	<u>0.00</u>	_____	_____	_____
Nitrate	<u>5.3</u>	_____	_____	_____
Fluoride	<u>0.2</u>	_____	_____	_____
Chloride	<u>2.0</u>	_____	_____	_____
Sulfate	<u>83.3</u>	_____	_____	_____
Bicarbonate	<u>527.0</u>	_____	_____	_____
Hardness (ppm)	<u>469.</u>	_____	_____	_____
Hardness (gpg)	<u>27.4</u>	_____	_____	_____
Remarks	_____			

Laboratory data: Sample storage location \_\_\_\_\_  
 Sample range 63-152 No. spls. 10 No. dupls. & cond. 10- poor  
 Spls. prepared by Kringel Washed range \_\_\_\_\_ by \_\_\_\_\_  
 Driller's log and cond. No  
 Insoluble residues: Prepared by \_\_\_\_\_ Studied by \_\_\_\_\_ Strip log \_\_\_\_\_  
 Microscopic study 63-152 strip log July 3, 1945  
 Gen. log \_\_\_\_\_ Correl. by D.J. Baldwin

1794

Name Keota town well No. 7

Loc. C/SW NE 25-76-10W, Keokuk Co.

T.D. 153'

Drilled Edwards 1943

Log W-1794 Baldwin

Casing 65' 2" of 8" csg from 0-65' 2"

$$\frac{2.25}{85} = 2.7 \times 10^{-2}$$

Prod. data:

SWL 35 ±'

PWL 75'

Yield 90 gpm

$$\begin{array}{r} 2.25 \text{ up cap} \\ 40 \overline{) 90.} \\ \underline{80} \\ 100 \\ \underline{80} \\ 200 \end{array}$$

$$\begin{array}{r} 783 \\ 35 \\ \hline \text{pier. } 748 \end{array}$$

$$\begin{array}{r} .026\$ \\ 85 \overline{) 2.2500} \\ \underline{170} \\ 550 \\ \underline{510} \\ 400 \\ \underline{425} \end{array}$$

Water analysis: No. A-316 1/12/44

WELL FILLED SPRING 61

Is well being used? <sup>No</sup> They have a new deep well?

Elevation

curve 783

Formation

Depth

Top

Base

Keokuk.

63

720

716

Burl.

67

716

653

Wasson.

130

653