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US GEOLOGICAL SURVEY WRD IOWA DISTRICT

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CASING AND SCREEN (SIZE, TYPE, INTERVALS);

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DATE 20 JAN. (970	DATE	DATE	NO
CODED BY D. AARONSON	PUNCHED BY	VERIFIED BY	SKETCH ON REVERSE: YES

WELL NO. 098-31W-21 AB

## UNITED STATES DEPARTMENT OF THE INTERIOR

Water Resources Division  Water Resources Division  Water Quality (ppm)  Water Quality (ppm)  Card Q  State:  Local Well No. 098-3 W-2 AB  Aquifer Code(s) C355 OILP  When States Name Ringsred, La #3 19  White No. 19943030 No. 1 Date 072054  Sampling  Water Resources Division  Local Well No. 098-3 W-2 AB  Aquifer Code(s) C355 OILP  When States Name Ringsred, La #3 19  White No. 19943030 No. 1 Date 072054  Sampling Hold 7	233
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## UNITED STATES DEPARTMENT OF THE INTERIOR Geological Survey

Water Resources Division

Local Well No. 098-3/W-Z/AB

Aquifer Code(s) C355 Water Quality Owner's Name RINGSTED, LOVA (ppm) W Number \_\_\_\_\_ 5759 Card Q County: EMMET 0943030 Well No. Sampling Depth SiO<sub>2</sub> Na HCO3 SO4 Card R Duplicate Columns 1-25 from Card Q F Mn Hardness Calc. Determined No. Color Card S Duplicate Columns 1-25 from Card Q SAR BrABS RSC Alpha (pc/1) (pc/1)Recorded by: 1) AARONSON Punched by: Date: Published:

### UNITED STATES DEPARTMENT OF THE INTERIOR Geological Survey

Local Well No. 098-31W-ZIAB

Water Resources Division Aquifer Code(s) (355 Water Quality Owner's Name RINGSTED, 1 (ppm) W Number \_\_\_\_\_ 5759 Card Q County: Enner State: Well No. Sampling 5 4 Depth SiO2 Na HCO3 SO4 Card R Duplicate Columns 1-25 from Card Q F Mn Hardness Calc. Determined Color Card S Duplicate Columns 1-25 from Card Q Alk. as SAR  $\mathtt{Br}$ ABS RSC Alpha (pc/1) (pc/1) Recorded by: DARRONSON Punched by: Date: Published:

## UNITED STATES DEPARTMENT OF THE INTERIOR Geological Survey

Geological Survey Water Resources Division Local Well No. 098~3/w-7/4/	2
Water Resources Division Local Well No. 098~3/W-Z/#1  Aquifer Code(s) C335 0/LP	
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(ppm) W Number 5759	
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## M . 5759

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

	RECORD OF WELL	CASIKO BIAGHAM	
Location:	( N 73 )	ezle	Loc Brev
Town: Ringsted	$\begin{pmatrix} N & E \\ S & W \end{pmatrix}$ : County $E_{N}$	nmet	
Town: Ringsted sec. 21 T 9	8 N. R. 3/ W.	Twp.	
Well name and number Ringste			
Owner Town of Ringste	Addres	6	
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Contractor Knut Bonnick	sen Addres	6	
Drillers Don & Harry	Bonnicksen		
Drilling dates	Sept. 23, 195	2	
Well data:	0 to Tan 1 and 2		feet
Elevations: Drilling curb	reet; Land Suria	ce	ieet
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De to control 1 leaves			
Determined by	4-4-2		
Topographic position			
Total depth: Reported 1060	_feet, Measured		feet
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Drilling method Cable too			
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Original depth to water	ft. below	Date	
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Sources of water: Principal.		; Others	Lucida de la composición della

Production data:	Date_	CANAL TO THE PARTY OF THE PARTY		
Static depth to water	Measur	ing point		
Pumping level	atat		g.p	.m. 14
	The state of the s			
Specific capacity	g.p.m. per f	t. drawdown;	Temperature	°F.
Pump data: Type pump	Column Dia		Length	
Cylinder or bowls: Dia.	Length	S		3
Power		Airline		
Estimated rate of production		g.p.m.	for	hrs. a day
Use of water				
	WATER ANALYSES	(in parts pe	r million)	
Date samples	2772			
Sampled by	and the second second			
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Alkalinity (Phn)				
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Microscopic study  Gen. log		strip log (Correl. by	NORTHUR	655-1060-086-195
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### March 4, 1953

Mr. Knut Bonnicksen Ringsted, Iowa

### Dear Mr. Bonnicksen:

We have completed the examination of the drill cuttings from the well you are now drilling for the Town of Ringsted. The present depth of the well, as indicated by the samples, is 655 feet. The last 22 feet of the sample is St. Peter sandstone and is expected at this location to be about 75 to 80 feet thick. The nature of the sandstone may be expected to vary in grain size and hardness.

If a suitable supply of water is not found in the St. Peter sandstone and the well is drilled deeper, a dolomite (limestone) should be encountered at approximately 710 feet. This dolomite should be about 250 feet thick. It is believed that crevices will be encountered within this section which should furnish a sufficient supply of water.

The geologic section drilled to a depth of 655 feet and forecast from 655 to 960 feet is as follows:

Formation and description	From	(feet)	То
Pleistocene			
Glacial drift (clay and sand)	0	į	30 <b>5</b>
Cretaceous system			
Dakota formation (shale)	305	á	364
Ordovician system			
Maquoketa formation (dolomite)	364	.4	435
Galena formation (limestone-dolomite)	435	ş	515
Decorah-Platteville formation (limestone and shale)	515	(	633

Mr. Knut Bonnicksen	- 2 -	March	4, 1953
St. Peter sandstone		633	710
Prairie du Chien formation (de some sandstone near middle	•	710	960
Jordan sandstone		960	

We are very much interested in this well and hope you are able to obtain a good supply of water for the town. If you have further questions, please do not hesitate to write us.

Very truly yours,

H. G. Hershey

HGH: JBC:emh

Iowa State Geological Survey Iowa City, Iôwa.

Att Dr Garland Hershey

Dear Sir: --

Bonnicksen & Sons have been in the process of drilling a well for the Town of Ringsted since last September. Today they have reached a depth of 920 feet and not sufficient water as yet.

The Town Council directed me to write you for any information which you can give relative to the prospect of finding water in this area.

Respectfully yours

Town of Ringsted

Town Clerk

Mr. John A. Andreasen Town Clerk Ringsted, Iowa

#### Dear Mr. Andreasen:

We are replying to your letter of May 26 concerning the water supply problem at Ringsted, Iowa. Information bearing on this problem was obtained from the open files of the cooperative ground-water investigations of the Iowa and U. S. Geological Surveys.

Drilling samples of the new Ringsted well down to 655 feet were obtained from the contractor, Bonnicksen & Sons, about 2 months ago and examined by our geologists. The geologic section drilled to 655 feet and additional anticipated strata down to the Jordan sandstone are given below:

Formation and description	Thickness (ft.)	Dept From	h (ft.)
Pleistocene system			
Glacial drift (clay and sand)	305	0	305
Cretaceous system			
Dakota formation (shale)	59	30 <b>5</b>	364
Ordovician system			
Maquoketa formation (dolomite)	71	364	435
Galena formation (limestone and dolomite)	80	435	515
Decorah-Platteville formation (limestone and shale)	118	515	633
St. Peter sandstone	22	633	655
Additional anticipated strata:			
St. Peter sandstone	55	655	710

Prairie du Chien sandy dolomite 250 710 960

Cambrian system

Jordan sandstone

960

We are somewhat surprised to hear that a sufficient amount of water for Ringsted (1950 population, 508) has not been developed after drilling 920 feet. A yield of 75 gallons a minute would seem to be an adequate supply for a community of this size. The existing town well drilled in 1945 produced 90 gallons a minute from the Maquoketa and Galena dolomites from 364 to 505 feet. The initial static water level was reported to be 80 feet and the pumping level 120 feet. In July 1951 a pumping test of half an hour's duration reportedly obtained 100 gallons a minute from this well.

The few deep well records from this part of the State indicate the St. Peter sandstone, Prairie du Chien dolomite, and Jordan sandstone formations usually are additional sources of supply. Of course, there is always a possibility that these aquifers may be locally cemented so tightly as to yield little water which might be the case in the new Ringsted well. However, the Jordan aquifer remains to be tested. Based on the drill cuttings of the new Ringsted well and our forecast of additional underlying strata, about 40 feet of drilling will be required before the well penetrates the Jordan sandstone at 960 feet. Algona city well No. 3 reportedly obtained its main supply from the upper part of the Prairie du Chien formation and the Jordan sandstone. A yield of 200 gallons a minute with 100 feet of drawdown was developed from this well. The static water level in 1925 was 100 feet below surface.

Below the Jordan sandstone the principal rock types are dolomite and sandstone containing glauconite. Little information is available on the water-bearing characteristics of these deep strata in the Ringsted area.

If a satisfactory supply well is not obtained after completely penetrating the Jordan sandstone, the yield of the well might be increased appreciably by acidizing the Galena limestone, which apparently was the chief water-bed in the town well of 1945.

We are very interested in the water development program at Ringsted and plan to have one of our field men stop for the samples below 655 feet in a few days.

We hope this report contains the information you wished. If you have any questions on the foregoing data or if we can be of further service in this matter, please let us know.

Very truly yours,

June 9, 1953

Mr. Chalmer Bonnicksen Ringsted. Iowa

Dear Mr. Bonnicksen:

Examination has just been completed on the samples taken from the Ringsted city well from 650 to 950 feet. The section shows St. Peter sandstone to 720 feet. Prairie du Chien dolomite, sandy dolomite and sandstone from 720 to 890 feet, and Jordan sandstone from 890 to 950 feet. We are very interested in the progress on this well and in the geologic section shown in the samples. Thank you for your usual kind cooperation with the Survey.

We are rather surprised that the St. Peter, Frairie du Chien, and Jordan formations have all failed to yield water in commercial quantities. The Prairie du Chien and Jordan are usually very reliable water-bearing formations in Iowa, although admittedly very few wells have penetrated this deep in the northwest part of the State. As a result, we do not have too much to go on as to quantity or quality of water likely to be obtained. We do note that the sandstone in the St. Peter, Jordan, and sandy zones in the Prairie du Chien are rather fine grained for the most part, which might account for a somewhat small yield of water. Also, these sandstones may be cemented with a clayey material makeing them impervious, although such a cement would not necessarily show up in the cuttings. The dolomite in the Prairie du Chien showed very little porosity, although crevices would be more important as a source of water.

It might pay to "shoot" the Jordan sandstone after drilling through it. Many wells which have produced no water or only a small amount have had their yields increased substantially by shooting, and such a method might be of value at Ringsted. However, shooting should be used only as a last resort. Another alternative would be to acidize the dolomites in the Prairie du Chien formation. This procedure is also used extensively to increase production in wells, especially in oil wells where accumulation is in limestone or dolomite. If neither of the above methods is employed, there are possibilities of water in the St. Lawrence dolomite immediately below the Jordan and in the underlying sandstones. Just how much of this underlying section is present at Ringsted is a bit uncertain as no nearby wells have drilled through the entire section. The Algona city well No. 3 encountered 450 feet of Cambrian dolomite, sandstone, and shale between the base of the Jordan sandstone and granite,

Please feel free to call on us if we can be of further service.

Very truly yours,

H. G. Hershey

HCH: RCW: ges

cc: City Clerk Ringsted, Iowa