Water supply - Marinette. 1933-1934

Thwaites, F. T. (Fredrik Turville), 1883-1961
[s.l.]: [s.n.], 1933-1934

https://digital.library.wisc.edu/1711.dl/4QKKQNPRSMX528L

Report on Sources of underground water at Marinette, Wis.

In response ~~xx~~ to the request of Mr. Higley I made a brief investigation of the sources of underground water in the vicinity of the plant of the Ansul Chemical Co. at Marinette, Wis.

I found that the plant is at present supplied by two wells, 680 and 430 feet deep each six inches diameter in the rock. Both draw on a sandy limestone bed at the depth of about 430 feet. As the two wells are only a few feet apart only one can be pumped at a time.

The following projects may be suggested for increasing the amount of water:

(1) Installation of an air lift of approved design. (in existing wells)

(2) Shooting one or both ~~of the~~ wells.

(3) Deepening of one of the wells to "granite."

(4) Drilling a new well of larger diameter.

(5) Removal of the plant to a place underlain by gravel where shallow wells of large capacity could be secured.

(6) Cooling of present supply by artificial means

(1) From data available the writer concluded that the present ~~supplied~~ output of the well is good for about two gallons per minute per foot of draw down. For 300 g.p.m. this would mean lowering the water

150 feet which is not prohibitive, ~~but would be nearly out of the question if 600 g.p.m. were sought for.~~ such a low capacity. It is the opinion of the writer that sufficient submergence could not be obtained for any ~~the~~ latter yield and that the diameter of the deeper of the two wells, reduced as it is to 5 fnches by the liner, is too small for much over 150 g.p.m.

(2) The yield of many wells has been increased by shooting them but on the other hand other wells, such as that at the pulp plant in Peshtigo, have been entirely ruined by this process. The writer advises against shooting because so little is known of the formations penetrated by the wells that there is no data by which to place the shots. If shooting failed it would undoubtedly cause both wells to cave in such a manner that they could never be used again.

(3) The shallower of the two wells might be deepened to the "granite" or pre-Cambrian rocks but inasmuch as the formations cave badly and the hole is only 6 inches at the surface this proceeding would appear to be uneconomical unless investigation shows that no liner will be necessary in this well in which case an effort might be placed in both wells.

(4) Drilling a new well of not less than eight inch

diameter at the bottom appears to the writer to be the best chance for ~~improving~~ increasing the underground water supply. In order to indure this diameter at the bottom the well should be started with not less than 10 inch pipe and preferably with 12 inch, especially if a deep well pump is to be used. If possible this well should be drilled on a production guarentee basis although that will cost more than simply drilling a hole. It is ~~recommended~~ suggested that this well might be located several hundred feet north of the present wells so as to minimize the interference due to the eastward flow of the underground waters. It is also suggested that this well and the old wells be equipped with air lifts so that there would always be one well in reserve. Said air lifts should discharge into a cistern from which water would be drawn by the present centrifugal pump. It is possible, however, that a deep well pump would be cheaper as it would discharge the water just where needed. Unfortunately there is not available information on ~~the yield of~~ the city well, which appears to have been the only well in the city to reach the deeper strata which has ever been tested for yield, others being simply used for the natural flow. According to the man at the water works this well was abandoned on account of the amount of iron in the water and not because of the small yield.

From experience elsewhere the writer thinks that there is little

Conclusion On the whole the writer feels that a better air light combined with deepening of one of the wells might be sufficient for the present unit. At any rate it is certain that ~~more water can be obtained~~ whether 600 g p m can be obtaid from ~~ground~~ wells is decidedly uncertain and it is possible that artificial cooling of river water during the summer months would prove cheaper. It is suggested that bids be asked on a complete installation on a guarantee basis thus placing the risk on the contractor.

doubt but that ~~considerable~~ some water could be obtained from the lower sandstones. The following data is all that could be obtained on the deep wells in and near Marinette. The sucessful well at The Peshtigo Paper and Pulp Co. in Peshtigo is encouraging but the deep dry hole across the river shows that there are unknown ~~factors~~ conditions as yet some in the underlying rocks which make the finding of water in large quanity more or less ~~of a gamble~~ uncertain. Further investigation should be made of ~~this~~ the city well to see if it could now be tested at Peshtigo. The temperatures ascribed to the water are unquestionably at least 10 degrees too low. The water from the deep sandstones is undoubtedly warmer than from the level at which water is now obtained but if that has a temperature of less than 51 degrees the temperature should not exceed 54 degrees.

Insert here

next page

(5) Removal of the plant to a location where shallow waters from inexpensive wells and at low temperature could be obtained is a last resource. In order to pick such a locality a special study of the geology is necessary, ~~and the~~ followed by taking of an option on a suitable tract with privilige of putting down a test well. Such tract should be large enough to secure a permanent supply ~~from~~ even in dry years. and prevent drainage by neighboring wells another possibility in the shape of green sand underneath could later also be secured at depth.

(6) The writer does not feel competent to pass on the suggestion of artificial cooling of present supply.

over

Deep wells in Marinette.

Old Stephenson well on Riverside st.

Data from Vaughan, Ann. Rept. Michigan Geol. Survey for 1903, pp. 121-131.

drilled in 1895-6. The first water struck at 405 and main supply from a crevice from 410-414. The original head was 15 feet above the ground and the temperature of the water was variously stated as 55.5 and 50.5 deg. F. It is apparent that the former figure was a typographical error. The well is cased to 415 feet and plugged at 457. There was no increase in head below that depth. It is interesting to note that the present temperature of the water is the same as stated above. There are also deep wells at the hotel, at Oakwood Beach 3½ miles south of the city, at the Stephenson old oil test 2 miles south of Stephansons with water at 51.8 degrees, farm 3 miles to the west of the city, at the A. C. Merriman residence, at the Marinette waterworks, and apparently at a number of places in Menomonee.

~~Unfortunately no data could be secured as to the yield of these wells on pumping as they were apparently simply drilled for the natural flow.~~

Proposals, specifications, and contract for the water supply for the Ansul Chemical Co., Marinette, Wisconsin

Location

The Ansul Chemical Co. Plant is situated on the low ground southwest of Menomonee River in NWSW Sec. 5, T. 30 R. 24 E. If a well is drilled it is to be located either alongside the present wells or at a point several hundred feet to the north.

Definitions and conditions.

The Ansul Chemical Co. shall be herein referred to as the Owner and the person, firm, or corporation that is to furnish the materials, apparatus, appliances, and labor herein called for is herein referred to as the Contractor.

Before submitting a tender the Contractor shall visit the premises and make a thorough and careful examination to familiarize himself with all conditions existing, and in awarding the contract it will be assumed that such examination has been made.

The work must be commenced within such time from the date of the execution of the contract as shall be agreed upon with the Owner in writing and shall be prosecuted uninteruptedly with sufficient force to insure the speedy completion of the contract.

The Contractor shall not be entitled to any claim for damages, for

any hinderance or delay from any source or cause whatsoever in the progress of the work or any portion thereof, but such hindrance will entitle the Contractor to such extension of time for completing the contract as may be determined by the Owner provided that notice be given in writing at the time of such hindrance or the cause of detention.

The Contractor must sustain all losses and damages arising from the action of the elements, flood waters, or the nature of the work to be done under these specifications and he will be held responsible for any and all material or work to the full amount of the payments made thereon and he will be required to make good at his own cost any injury or damage which said materials or work may sustain from any source or cause whatsoever before the final acceptance thereof.

The Contractor shall indemnify and save harmless the said Owner or its officers or agents from any and all claims for remuneration or indemnity for or on account of any injury or damage to person or property received or sustained by any person or persons, firm, or corporation by or from the said Contractor or by or in consequence of any materials used in around or upon the said work, or by or on account of any improper material or workmanship used or employed in the construction, or by or on account of any accident or any act or omission of the said Contractor or his agents or servants or ermplyees, and so much of the money that is due or to become

Contractor under his contract as shall be con sidered necessary by the Owner may be retained by the Owner until such suits or claims for damages shall have been finally determined and settled.

Defective materials may be condemned by the Owner and when so condemned shall be destroyed or removed and shall not be used by the Contractor on any part of the work. In case of failure to remove or destroy such condemned mateials, after written notice has been served by the Owner, within the time specified in said notice, the Owner may cause the said condemned materials to be destoyed or removed and acceptable materials substituted therefore. The cost of such substituted material and the cost of removing or destroying said condemned materials, shall be deducted from any amount due to to become due to the Contractor.

The Contractor shall strictly observe and comply with any and all Ordinances of the city of Marinette and statutes of the State of Wisconsin and shall obtain any a nd all permits, inspections, and otherwise which shall be required.

In case a well is drilled the contractor shall preserved full records of the material encountered together with samples of the cuttings from every five (5) feet of depth. Samples are to be kept in bags furnished by the Owner. Record must also be furnished of the diameter of the hole. depth and size of all pipe. depth of water-bearing

Guarantee.

The contractor guarentees, without reservations or understandings not expressly mentioned in these specifications, that he will install equipment to supply the Ansul Chemical Co. with six hundred (600) gallons per minute

over

formation and all other information called for by the Owner

of water which has at no time of the year a temperature of over (55) degrees Fahrenhite. No restriction is made on quality or source of water.

well casing all pipe used in the well shall be genuine wrought iron.

Information for bidders

The following information is offered to bidders as the best that is available to the Owner who does not guarentee its accuracy.

The depth to rock at the plant of the Owner is approximately 38 feet. The nature of the drift or surface formation is not known but it is believed that it is not water-bearing. The bed rock is limestone which is in many places is broken by fissures. The top 10 feet of the rock is much broken and may contain water although it is thought from wells in Menomonee that warm water from the river may be thus obtained. There are now two six inch wells on the premises. The deeper one is 680 feet deep and is lined to a depth of 400 feet with 5 inch pipe. There is a lost string of tools in the bottom. The other well is unlined and is about 450 feet in depth. Both wells flow and either one will deliver water to the amount of about 2 gallons per minute per foot of draw down. The temperature of the water which comes from a depth of about 430 feet is approximately 50 degrees. There is a 200 foot dry hole ~~just~~ a few rods north of these wells. A well at the Sawyer-Goodman mill southeast of the Ansul plant was nearly dry at 250 feet on June 11, 1926.

There are a number of deep flowing wells in and near the city but no information is available as to the quanity of water than may be pumped from them. Temperature of the water from the shallower flows at 400 to 450 feet is from 49 to 51 degrees F. The Oakwood Beach well is reported to show 53 deg. F.

The following log of the ~~old city~~ well at the Marinette waterworks gives an idea of the geology of the deeper formations.

0-69 Sand and gravel
69-100 Limestone, yellow (Galena-Black River?
100-125 Limestone, blue sandy
125-145 Dolomite, white, and blue, sandy
145-160 Limestone, gray to white, crystalline, sandy (Total Galena-Black
160-175 Lower Magnesian-limestone, gray, sandy River 91 ft.
175-190 Limestone, gray
190-215 Limestone white, and yellow, , some shale, and sand.
215-225 Limestone, gray and yellow, some floating sand
225-245 Limestone, yellow and gray
245-260 Sandstone, white, very limy, apparently no water
260-275 Limestone, brown, sandy
275-290 Shale, blue, limy
290-325 Limestone, gray, much pyrite
325-365 Sandstone, white, limy, little water
365-400 Limestone, white to yellow, sandy
400-420 Limestone, white, with some dark red shale and sandy limesone
4 Total Lower Magnesian 260 ft.
420-460 Jordan-sandstone, white, somewhat limy, source of flowing wells at Ansul plant, Stephenson house, etc.
460-560 Trempealeau-Sandstone, fine grained, very limy, gray to white ranging below to sandy limestone.
560-580 Mazomanie-sandstone, white
580-600 Sandstone, gray
600-660 Sandstone, pure white
660-700 Sandstone, green, apparently little water to this depth
Total Mazomanie 140 ft.
700-760 Dresbach-sandstone, white
760-775 Sandstone, red
775-795 Sandstone, white with pebbles of red quartzite
Total Dresbach 95 ft.
795-978 Pre-Cambrian-quartzite, red, some water at 860.
PreCambrian penetrated 83 ft.

Note: caves may be expected to a depth of not less than 400 feet.

Here add specifications for pumping equipment