

ROBINSON, ROBERTS & BROWN LTD.
GROUND WATER GEOLOGISTS
~~4424 WESTERN AVENUE~~ 1632 McGuire Ave.
NORTH VANCOUVER, BRITISH COLUMBIA
TEL. 885-1293

AFFILIATED OFFICES
TACOMA, WASHINGTON
PORTLAND, OREGON

October 30th, 1970

Public Utilities Commission
P.O. Box 1204
Victoria, British Columbia

Attention Mr. T.A. Prentice, P.Eng.

Subject Groundwater Development
100 Mile Water Utilities Ltd.
Production Well No. 2
Your file No. U-369-1

Dear Sirs,

Mr. R.G. Marks of the 100 Mile Water Utilities Ltd. has forwarded a copy of your letter dated October 8, 1970 to us and has requested that we reply directly to the Commission.

The specific capacities of the well are as follows

at 170 U.S. gpm	2.6 gpm/foot
200	2.1
230	1.44

A marked decrease in capacity with increased discharge rates can be explained by various phenomena all of which are judgments based upon experience. In this case the water could be made turbid at high rates of discharge. The well was "rawhided" for 10 hours on July 29, 1970 at rates that varied from 170 gpm to 400 gpm. At the high rates the water level in the well and therefore the specific capacity decreased markedly. Since laminar flow through the slotted casing was most probably still existing at even the high rates the marked lowering of the pumping water level cannot be attributed to well design or construction. We obviously do not know whether or not turbulent flow with subsequent loss of efficiency took place in the fractures outside of the well. This is a possibility. However, it was our judgment that since fine material started moving at high rates that the "valving off" opinion was justified to explain the sharp decrease in specific capacity.

In answer to your question (c) concerning the capability of the well as designed, constructed and developed to produce water, we can only reiterate our conclusion expressed in our August 1970 report. We believe that the prudent safe perennial

Public Utilities Commission
Victoria, British Columbia

October 30th, 1970
Page two

rating is 200 gpm. This not only gives a safety factor of approximately 100% with a pump setting of 250 feet, but also keeps the pumping level at a depth of 135 feet safely above the top of the perforations at 165 feet. Thus the deleterious effects of water cascading into the well from the top fractures will be non-existent. Since the well was a test-production well it is only 8 inches in diameter. This meant that from the start the well would only properly accept a pump capable of discharging between 200 and 250 gpm. We felt constrained to prove our hydro-geologic concepts before spending great sums of our client's money on large diameter wells. As mentioned in our letter of October 5, 1970 a 16-inch well should be drilled at a suitable location in the future when the need arises. Such a well should be able to produce between 500 and 1000 gpm if properly designed, constructed and developed.

We understand the Commission's concern and assure you that it is our concern also and most probably the concern of 100 Mile Water Utilities Ltd. to get the most amount of water for every penny spent. However, more than 20 years in the field of subsurface exploration and development of both oil and water has shown the wisdom of being conservative until most of the unknowns become known. All of the presently used standard testing and evaluation methods are based upon mathematical assumptions that make geologic nonsense in the great glaciated valleys of British Columbia. However, experience has shown that when granular aquifers are present, empirical relationship can be used so that fairly accurate assessments of productive capacities can be made.

In this specific case we are dealing with fracture porosity and permeability so that the standard methods are more removed from reality than is the case for granular aquifers. We were the first to advocate properly designed and located bedrock wells (i.e. Sidney). We have carefully watched them over several years. Records have allowed us to double our initial rating on the first well. This is obviously much more satisfactory than having the well run dry. We have recommended a monitoring program for the subject well and hope that it will be diligently adhered to so that after a few years we can make a more precise evaluation of the subject well and of the area.

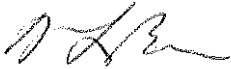
Even though the 1969-70 winter and the 1970 summer and fall were extremely dry, none of our wells have failed to meet their requirements. The static water levels in many of the wells have shown marked lowerings but fortunately our safety factors have been sufficient to accommodate this abnormally dry period.

Public Utilities Commission
Victoria, British Columbia

October 30th, 1970
Page three

I would like to meet with you and any other interested confreres in the near future. We believe that our reports and conclusions are carefully and sufficiently detailed for those who are not Groundwater Geologists or Hydrologists. Also, since every well and its setting are unique, neither the reports nor the testing and evaluation programs can be stereotyped. However, if you wish to examine raw data or calculations, etc., it is simple enough to include these so that time consuming correspondence is prevented. I shall phone in the next few weeks.

Yours truly,



W.L. Brown, P.Eng.

WLB/hb

cc: Mr. R.G. Marks, 100 Mile Water Utilities Ltd.
Box 7, 100 Mile House, B.C.