Return to Groundwater Files

Province of British Columbia

MEMORANDUM

To: Mr. J.H. Dyck, P. Eng.
Regional Engineer
Water Rights Branch
6th Floor, Scotia Bank Bldg.
1488 - 4th Ave.
Prince George, B. C.
V2L 4Y2

Date: August 3, 1979

Our File: 93K1
Your File: 20.2C

Fr: J.C. Foweraker, Head
Groundwater Section
Hydrology Division
Water Investigations Branch

Re: Vanderhoof Groundwater Availability

As requested in your memorandum of July 24, 1979, our staff have reviewed the concerns of the Regional District on the effects of logging and land clearing on water availabiliry in the Vanderhoof area. We would advise as follows:

Groundwater in the Vanderhoof area primarily occurs under confined artesian conditions and most wells completed in the area are subsequently flowing artesian. Locally groundwater also occurs under relatively shallow conditions. The major sand and gravel aquifers, however, are relatively deep, lying up to 550 feet below ground surface beneath a thick confining layer of silt and clay. This artesian basin straddles the valley of the Nechako River and important recharge areas for the artesian aquifers occur on the undulating uplands north and south of Vanderhoof. Water level fluctuations have been monitored since 1972 in the area at an observation well site (WR-105-72) located north of the Nechako River west of Vanderhoof (Figure 1). There has been a gradual decline in water levels as shown in the hydrograph (Figure 2) for the well. The cause of this decline might be attributed to an overall increase in water withdrawals from the artesian aquifers and/or some wastage of water through uncontrolled free flowing artesian wells. Locally some interference between wells may occur resulting in lowering of water levels and a decrease or cessation in free flow. Some regional lowering of water levels may be inevitable once groundwater development of an artesian basin proceeds.

If the natural vegetation, soil and drainage conditions are sufficiently disturbed in the recharge areas through widespread land clearing, drainage of lakes, construction of roads, etc., some affects on groundwater availability downslope might be expected; i.e., groundwater recharge could be reduced. These affects, however, might be expected to be more pronounced within the recharge areas themselves. The natural groundwater recharge processes; where, when, how and under what conditions groundwater recharge from precipitation takes place are not adequately understood at this time. Site specific studies would be required in any particular area to determine what local affects, logging might have in a watershed as this will depend for example, upon the type of logging practiced, extent of logging,

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steepness of slopes, nature of soils and parent material, geological conditions, climate etc.

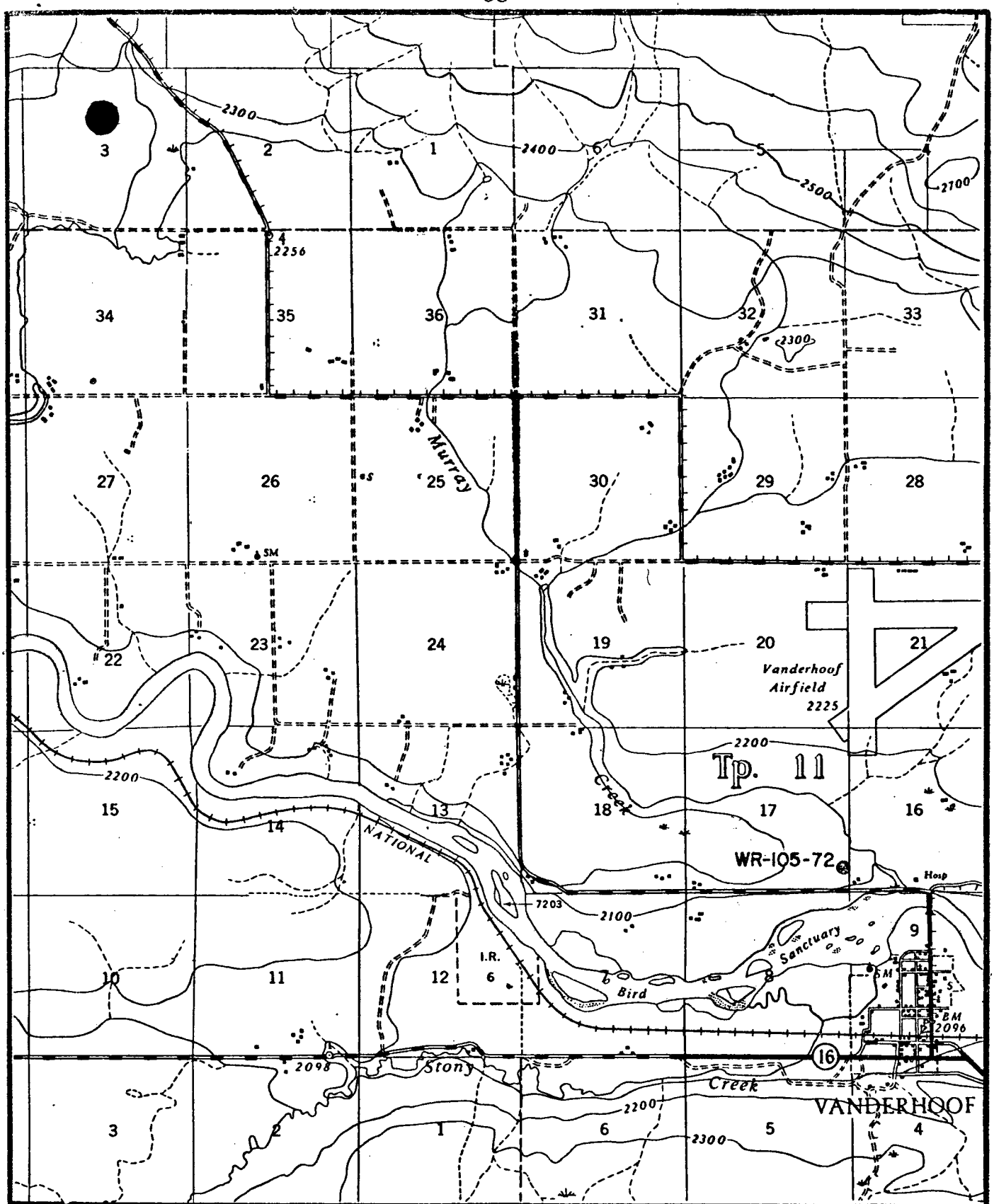
With regard to water availability in the Vanderhoof area, increased groundwater consumption, uncontrolled wastage of water from free flowing wells and local well interference problems would be expected to be the cause of lowered water levels in the artesian aquifers. Through the deepening of wells, selection of larger well diameter, and utilizing proper development techniques and adequate well construction practices (installation of continuous slot well screens for example), indications are that adequate groundwater supplies can be readily obtained throughout most of the area. The aquifers are sufficiently deep, highly permeable, and productive to sustain high capacity wells with only a small amount of water level lowering.

I hope the above comments are of some assistance to you on this matter. Should you require any clarification on the above or additional information, do not hesitate in contacting this office again. If the Regional District wishes to retain a consultant to undertake any site specific studies in the area, I have attanched a list of active groundwater consultants for their consideration. Due to our present staff commitments and limited funding we are unable to provide assistance for such site specific investigations.

for J. C. Foweraker, Head
Groundwater Section
Hydrology Division
Water Investigations Branch

APK/hw

Attachs.



BRITISH COLUMBIA
DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES
WATER RESOURCES SERVICE
WATER INVESTIGATIONS BRANCH

SCALE: 1:50,000
1.25 inch = 1 mile Approx.

DATE

FRASER WATERSHED

OBSERVATION WELL LOCATION

VANDERHOOF

FIG. 1

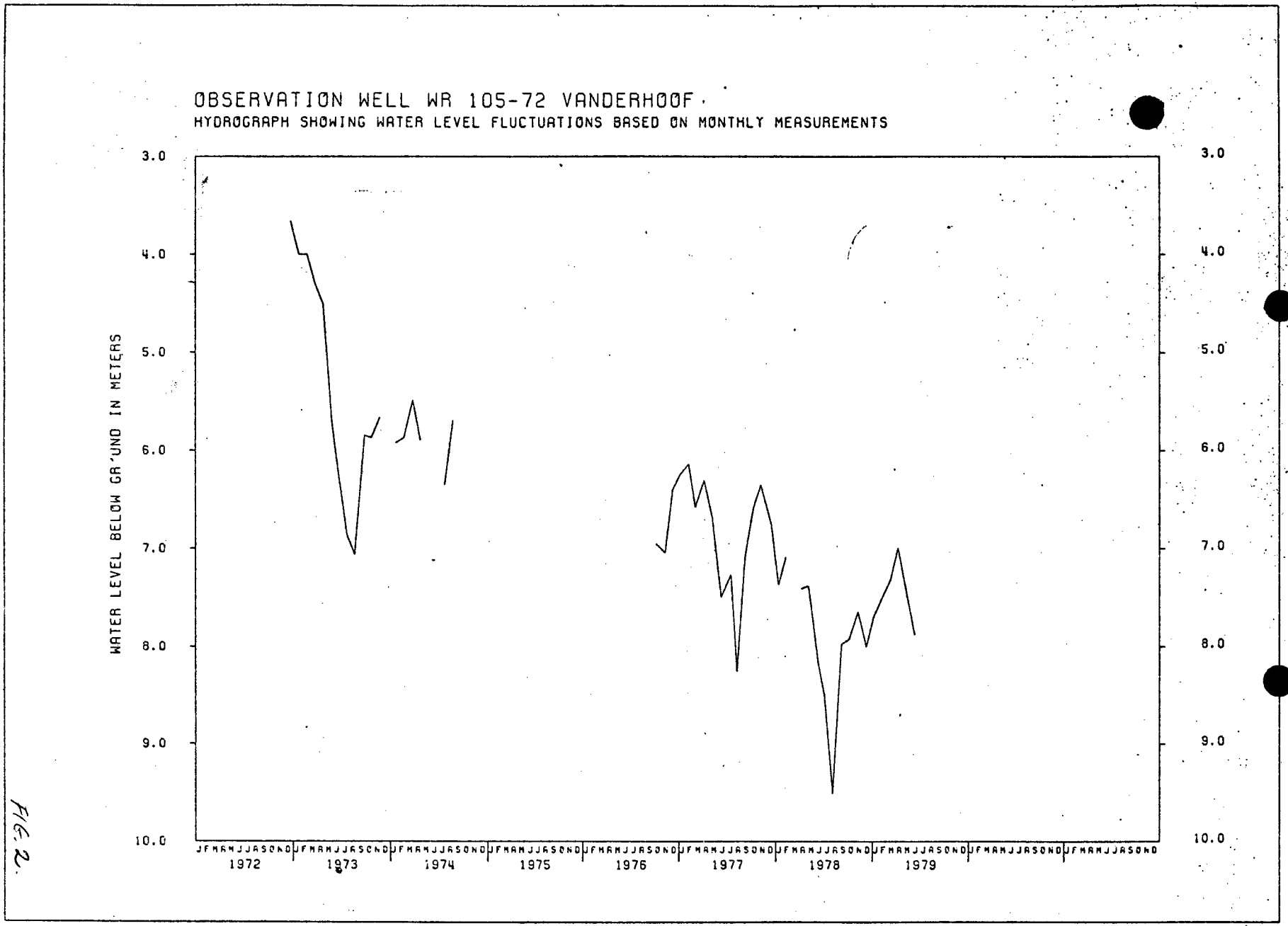

OBSERVATION WELL WR 105-72 VANDERHOOF
HYDROGRAPH SHOWING WATER LEVEL FLUCTUATIONS BASED ON MONTHLY MEASUREMENTS
WATER LEVEL BELOW GROUND IN METERS
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
J F M A M J J A S O N D
1972
1973
1974
1975
1976
1977
1978
1979

FIG. 2.