GOVERNMENT OF BRITISH COLUMBIA

MEMORANDUM

TO J. L. Raudsepp
Chief Engineer
Water Investigations Branch

FROM J.C. Foweraker, Senior Geological Engineer
Groundwater Division
October 5th 1967

SUBJECT Notes on surficial geology, well logs, and a proposed rotary test drilling program at Williams Lake

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During this summer, Groundwater Division personnel carried out field work on the surficial geology and groundwater possibilities of the area from Mile 80 to Williams Lake. The geological investigations were terminated during the season due to staff limitations and further field work is needed to complete the work.

Well Inventory:

A well inventory of the Williams Lake area has been completed by Mr. Johanson. At the west end of the lake, available well logs show fairly impermeable stony clays and till (?) to about 100 feet. At the northeast end of the lake just inside the western boundary of the Indian Reserve, are logs to 250 feet below lake level in stony clay, hardpan and some sand and gravel. On the south side of the lake toward the east half of the community on South Lakeside Road well logs show water-bearing sands and gravels below 250 feet of sandy clay.

Some observations on the Surficial Geology in the Williams Lake area:

Field evidence would suggest that ice had moved into the Williams Lake Valley from the east and north. Ice contact material has been found on the sides of the valley and up tributary valleys at an elevation of approximately 2800 feet and was probably deposited laterally by the ice. Till found at still higher elevations is probably from an earlier ice episode. The prominent "fresh-looking" moraine mounds present near 150 Mile House are probably a late feature of the final ice retreat from the valley.

To the northwest of Williams Lake, Williams Lake River has cut down through over 200 feet of silts, sands and gravels, which are prominently exposed on the valley side slopes. These deposits could have been laid down prior to the ice advance which moved into the Williams Lake Valley. The proportion of fine material found in exposures downstream in Williams Lake River, which is a tributary of the Fraser River, would suggest a temporary blockage further downstream in the Fraser. If this were not the case, one would suspect that the finer fractions exposed in Williams Lake River would have been deposited elsewhere. A blockage in the Fraser River at this time would also account for the high delta built up at the exit of Williams Lake River into

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the Fraser River, and the delta remnant (?) left on the west side of the Fraser River at this point. Once the Fraser River blockage was removed, the base level for Williams Lake River was lowered, and this river then began to erode its way back upstream into the thick deposits of silt, sand and gravel which are now left exposed on both sides of the valley.

The thickness of material underlying Williams Lake is not known exactly. However, from available well logs, we can expect thicknesses in excess of three hundred feet in clays, silts, sands and gravels, together with thicknesses of stony clay and till. The mounds or low hills which almost block the valley at the west or outlet end of Williams Lake consist of minor stratified materials, but mainly stony silts; the depth and areal extent of these more impermeable materials at this end of the lake is not known at present.

On the west side of the town of Williams Lake are rusty gravels in steeply dipping forset beds which contain gasterpods and other shells. Topset beds overlie the foreset beds and indicate that the lake level at one time was about 40 feet higher than at present. On the south side of the lake on South Lakeside Road are raised gravel deltas;also there is a raised delta about 40 feet above present lake level towards the east end of the lake.

Proposal for rotary test drilling at Williams Lake:

In order to assess the groundwater possibilities in the Williams Lake area it will be necessary as a first step to obtain subsurface stratigraphic information and information on the thickness and extent of possible aquifer materials in the lake area. I would propose a rotary test drilling program of at least three holes and as many as six holes, if necessary.

We might expect coarser materials towards the east end being nearer the source, and I propose two holes could be drilled at the east end of the lake along the section line A-B (see map) and a third hole (C) (see map), be drilled on the lower slopes of Asahal Creek fan. At the west end of the lake, shallow holes and exposures indicate more impermeable stony clays for the upper part of the section at least. Two holes are proposed at this end of the lake along section line DE.

The approximate cost of this program allowing for six holes and 2400 feet of drilling at $3.30 per foot (including price of mud, etc.) would be about $8,000.00. It will be imperative to start this program before severe winter conditions set in, which could cause an early termination of this contract, or at least a postponement until early spring. Test hole sites could be arranged by Groundwater Division personnel early next week, and if we are successful in obtaining sites quickly, then letters to drilling firms regarding bids could be sent out about the middle of next week - October 11th. If bids close on Monday, October 23rd, It should be possible to start drilling at the beginning of November. This is getting very late in the season, however, and part of the work may not be completed before winter forces are shut down.

J C Foweraker

J.C. Foweraker

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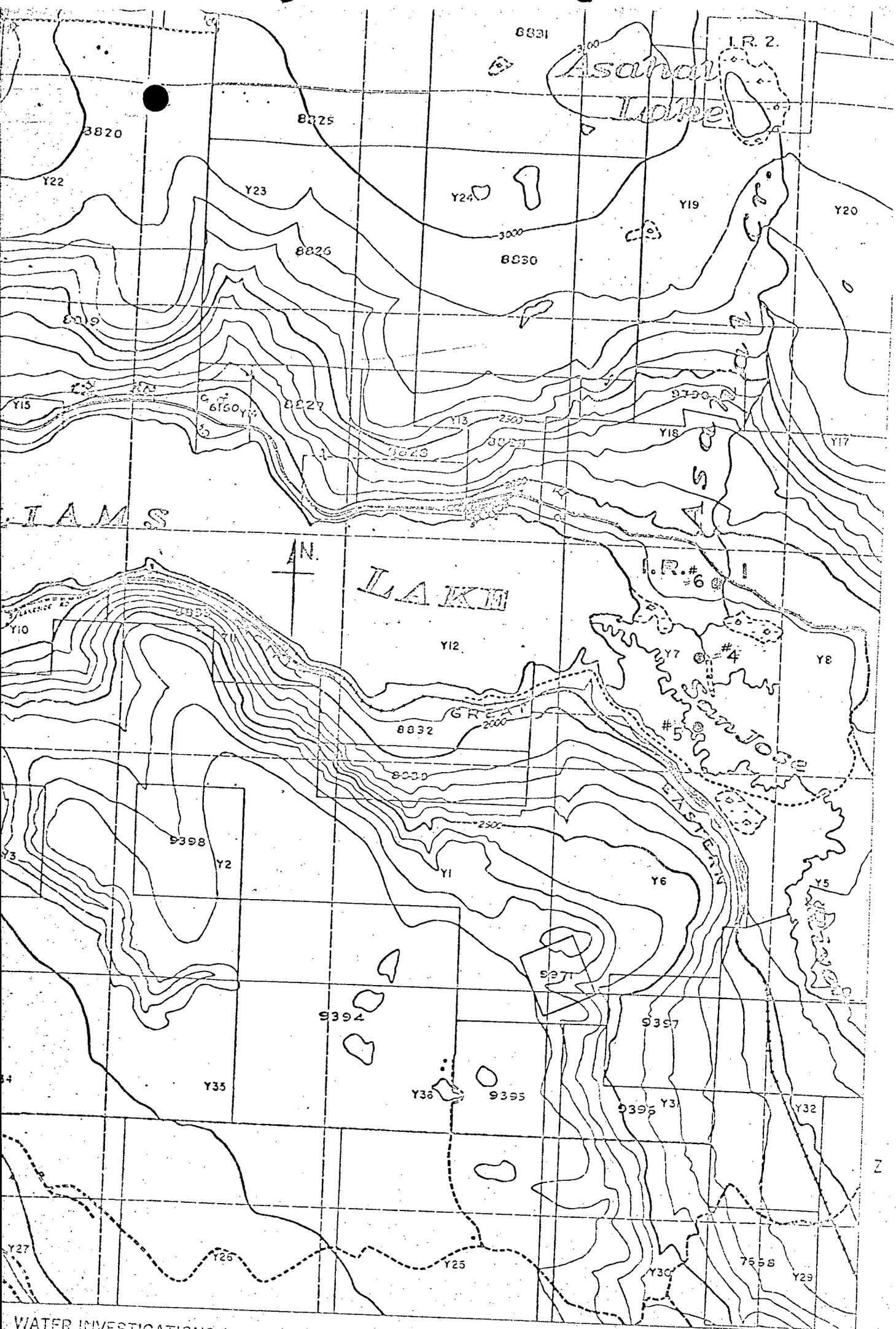


WATER INVESTIGATIONS BRANCH

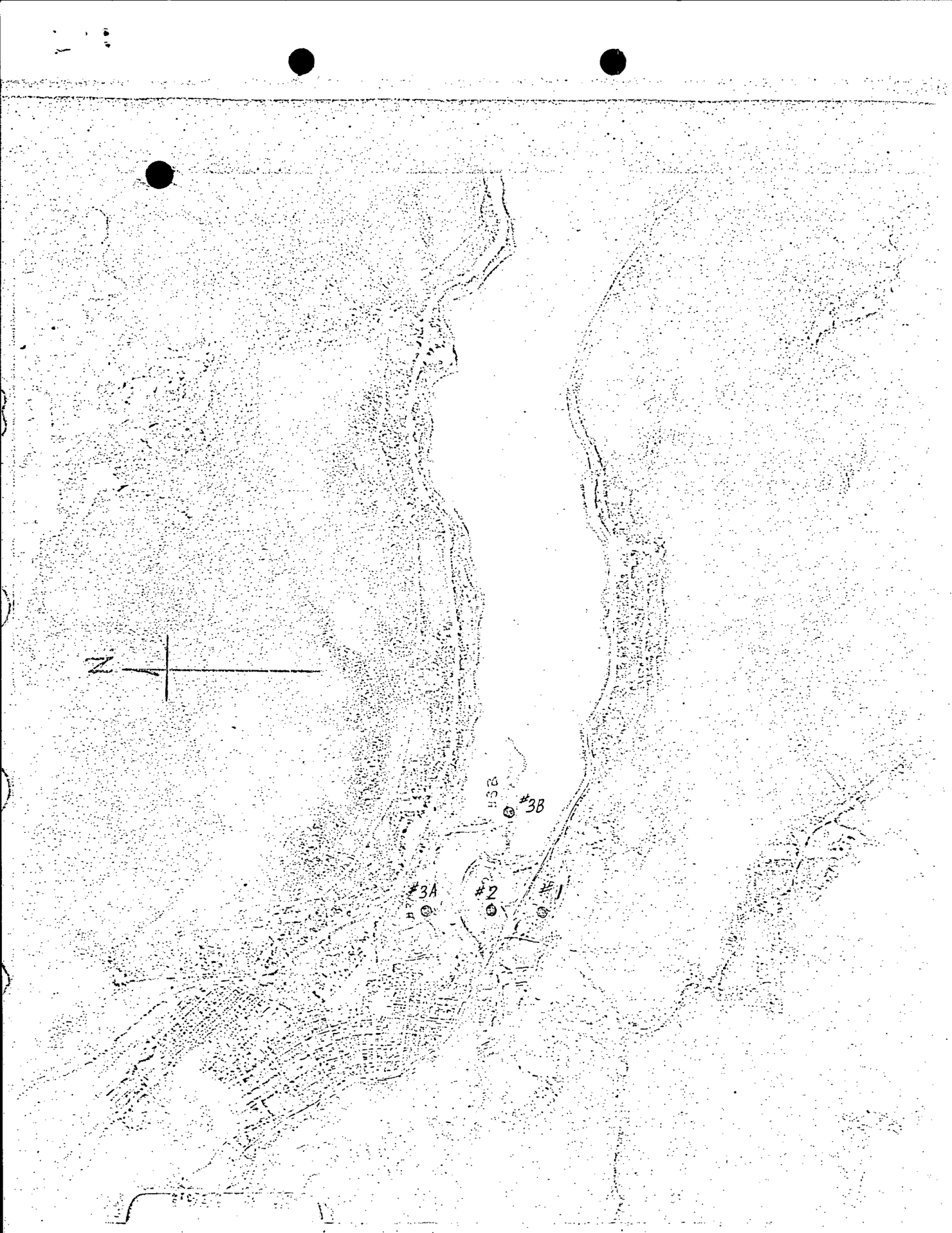
WATER RESOURCES SERVICE
DEPT. OF LANDS, FORESTS AND WATER RESOURCES
VICTORIA, B.C.

DATE Oct 17, 1967

CARIBOO DISTRICT 45

SHEET NO. II /

SCALE 1" = 2640'



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