Province of British Columbia
Ministry of Environment
Water Investigations Branch

HYDROLOGY of the THOMPSON RIVER BASIN

Thompson River Basin
Pre-Planning Study

by: E. Weiss
Surface Water Section

December, 1979

THE THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROLOGY

SUMMARY

To properly assess the water resources and related resources of the Thompson River Basin, a hydrometeorologic data base is required. The purpose of this report is to give a general overview of the basin climate and hydrology and to compile a list of the hydrometeorologic stations which have reliable data. Tables showing both active and discontinued stations are presented by sub-basin. General spatial and temporal trends of the various climatic components such as precipitation, temperature, snow water equivalent, evapotranspiration and runoff are shown with isomaps and graphs. The hydrometric, climatic, and snow course networks have been reviewed as to their adequacy according to the specification outlined by the World Meteorological Organization. It is concluded that two remote stations equipped with Data Collection Platforms (DCP's) be established in the North Thompson Basin to enhance the flood warning capability on the Thompson River system. Streamflow, precipitation, temperature, and snowpack data would be sent to the forecasting centre either by satellite or by microwave. It is also concluded that the hydrometric network is adequate in the Thompson Basin, but it would be desirable to expand the meteorologic network by operating more stations in mountainous areas where at present the network is sparse, and operate one or two more snow course stations in the Bonaparte River sub-basin to comply with the World Meteorologic Organization minimum requirements.

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THOMPSON RIVER BASIN PRE-PLANNING STUDY

1 INTRODUCTION

The Thompson River basin drains an area of approximately 55,900 square kilometres (including the Nicola sub-basin) and has within its boundaries varied climatic and hydrologic areas. An overview of the basin's climate and hydrology is briefly given in the following sub-sections.

1.1 North Thompson

The North Thompson sub-basin is approximately 21,500 square kilometres in area. Heavy annual precipitation occurs in Wells Gray Park, located in the Cariboo Mountains of the North Thompson sub-basin. The North Thompson and Clearwater Rivers drain these high elevations producing the highest unit runoff in the Thompson River basin. The major tributaries to the Clearwater River are the Murtle and Mahood Rivers. The Murtle River is also located in Wells Gray Park and produces a significant amount of runoff, but runoff from the Mahood River originates on a high western plateau which produces far less runoff per unit area due to lower annual precipitation in this region. Mahood River flows are routed through a series of lakes, namely Horse, Canim, and Mahood Lakes, which attenuate peak flows on the river. Downstream of the confluence of the Clearwater and North Thompson Rivers, the Barriere and Louis Rivers drain two major sub-basins on the east side of the North Thompson River.

1.2 South Thompson - Shuswap Lake

The South Thompson sub-basin is approximately 16,400 square kilometres in area. Large amounts of precipitation fall on the Monashee Mountain range, in the South Thompson River - Shuswap Lake sub-basin producing heavy runoff from the mountains. The Adams, Eagle and Shuswap Rivers originate in this range. The Adams River is routed through Adams Lake and the Shuswap River is routed through Sugar and Mabel Lakes before entering Shuswap Lake. The Salmon River basin to the south is far less elevated and produces only a fraction of the unit runoff produced by those streams originating in the Monashee Mountains. The South Thompson River

below Shuswap Lake does not peak as sharply as the North Thompson River due to the lake storage available on the South Thompson River system.

1.3 Thompson

The Thompson sub-basin excluding the Nicola sub-basin is approximately 10,700 square kilometres in area. The Nicola sub-basin drains an area of about 7,280 square kilometres. Precipitation in the western part of the basin is very low and there is a net loss in the water budget for this area. The Bonaparte, Deadman, and Nicola Rivers drain the major sub-basins downstream of the confluence of the North and South Thompson Rivers. These basins produce very little runoff in comparison with the rest of the basin.

1.4 Purpose and Scope

A number of meteorologic, snow course and hydrometric stations have been established in the basin to monitor precipitation, temperature, snow water equivalent, streamflow, etc. The purpose of this report is to compile lists of stations for which hydrometeorologic data are available. To present the station listings, the basin is divided into three hydrologic sub-basins (see Figure 1);

North Thompson River above Kamloops
South Thompson River above Kamloops
Thompson River below Kamloops (except Nicola River sub-basin)

All of the basin will be considered in this report excepting the Nicola River sub-basin which will be reviewed in a separate study.

In addition to presenting an inventory of available hydrometeorologic data stations, the general spatial and temporal trends of various climatic components will be shown using isomaps and graphs.

The hydrometric, climatic, and snow course networks were also reviewed to determine if the density of each network was adequate. There are basically three types of stations within a network:

Principal or base stations
Secondary stations
Special stations

The principal stations are continuous and supply the basis for statistical studies. Secondary stations are operated only long enough

to establish a good correlation between them and principal stations and other physiographic and climatic variables. Special stations are operated for specific purposes or to augment the network of base and secondary stations. The networks were analyzed with respect to their adequacy for regional runoff studies and long term data collection. Guidelines set out by the World Meteorologic Organization were used for this analysis.

2 THE METEOROLOGIC NETWORK

Atmospheric Environment Service (AES), Environment Canada, is responsible for the federal meteorologic network in British Columbia. Besides this network, the Resource Analysis Branch (RAB), of the Ministry of Environment operates a provincial climate network.

In 1978, there were 38 federal stations and no provincial stations operating in the Thompson River basin. There were 102 AES stations that were discontinued prior to 1978 and 243 provincial stations that were operated for a limited time in the late 1960's and early 1970's. A listing of AES stations and RAB stations collecting temperature, precipitation, and evaporation data is shown on Table 1. Figures 2a and 2b show the locations of the AES stations within the basin.

The active station density on the Thompson River basin is approximately one station per 1450 square kilometres. According to the World Meteorological Organization, mountainous regions of temperate zones indicate a minimum network density of one station per 100-250 square kilometres, while more arid zones may have a sparser network. At present, AES tries to operate their base station network with a maximum of 150 kilometres between stations. An additional local network of short term stations is also operated. The stations tend to be well distributed throughout the basin, but are concentrated in valley bottoms and in populated areas and are lacking in more mountainous terrain. However, the operation of climate stations in mountainous terrain is difficult because of lack of observers in these areas, technical problems with measuring precipitation at high elevations, and accessibility to these remote stations. These factors make it very difficult to meet the WMO guidelines.

2.1 Mean Annual Precipitation

Figure 5 provides an isomap of mean annual precipitation. This map is based largely on the isomap prepared for the whole province by the British Columbia Agro-Climatology Committee, ARDA, in 1965-1966 for the Canada Land Inventory. The isolines on the map indicate conditions on a regional scale only and may not indicate conditions at specific sites. However, a definite areal distribution pattern of precipitation can be seen over the Thompson River basin. Due to orographic effects, the largest amounts of precipitation fall on the Wells Gray Park area in the

Cariboo Mountains and on the east side of the basin in the Monashee Mountains. The density of the network at these higher elevations is quite sparse and therefore, it is difficult to delineate isolines accurately. The area above 1000 mm was delineated with no attempt being made to estimate the maximum precipitation within the areas. Snow course data was used where possible to supplement winter precipitation data in drafting the final isolines.

Precipitation in the river valleys and in the Bonaparte River basin is low, with the mean annual evapotranspiration exceeding precipitation. The area directly around Kamloops Lake and in the valley downstream of the lake receives the least amount of annual precipitation in the basin.

2.2 Annual and Monthly Precipitation Variability

Figure 11 shows a number of stations which have been selected to show the monthly variability of precipitation throughout the year. The winter months receive the heaviest precipitation throughout the basin with spring precipitation normally being quite low. Summer precipitation in the south central portion of the basin as a percentage of the total annual precipitation is higher than in other regions in the basin. This is due primarly to a larger number of summer convective storms in the region. Figure 11 also shows the variation in annual precipitation for the same stations. The variation from year to year tends to be slightly more pronounced in the valleys than in mountainous regions. For example, the coefficients of variation, Cv, for Kamloops A is 0.20 whereas for Blue River North in the North Thompson sub-basin Cv is 0.14.

2.3 24-Hour, 25-Year Return Period Precipitation

Figure 6 is an isomap of the 24-hour, 25-year return period rainfall in the Thompson River basin. This map is based on Danard's report 24-Hour Rainfall Amounts For Various Return Periods For South-central And Southeastern British Columbia (Report #21). The 24-hour precipitation increases from approximately 30 mm in the southwest of the basin and Kamloops Lake region to 55 mm in Wells Gray Park.

2.4 Mean January and July Temperatures

Figure 7a and 7b show isomaps for mean January and July temperature based on isomaps prepared for the Canada Land Inventory in 1965-1966.

The isolines on the map indicate conditions on a regional scale only and may not indicate conditions at specific sites. Temperature decreases with an increase in altitude and this is demonstrated by the more mountainous areas having relatively lower temperatures while valleys have milder winters and hotter summers.

2.5 Annual and Monthly Temperature Variability

Figure 12 shows the average monthly temperature variation throughout the year for a number of selected stations. January is the coldest month while July is the hottest month on average throughout the basin.

Summer months tend to be more stable in terms of temperature from year to year. For example, the mean July temperature at Blue River North varies from a minimum of 14.5° C to a maximum of 19.2° C during the period 1958-1977. The mean January temperature during this same period varied from -2.4° C to -18.5° C.

2.6 Mean Annual Potential Evapotranspiration

The isomap shown on Figure 8 illustrating mean annual potential evapotranspiration is based on the isomap prepared for the Canada Land Inventory in 1965-1966. Evapotranspiration computations were made using Thornthwaite's equation. Evapotranspiration tends to decrease with a decrease in temperature or an increase in elevation, however, it is fairly uniform throughout the basin, ranging from a mean of less than 500 mm in the mountainous areas and greater than 600 mm in the south central portion of the basin.

3 THE SNOW COURSE NETWORK

The provincial Water Investigations Branch of the Ministry of Environment is responsible for the snow course network in British Columbia. At present there are 35 snow courses and one snowpillow operating in the Thompson River basin. Normally snow courses are installed at high elevation locations to improve the monitoring of accumulated winter snowfall. Valley precipitation stations do not at times reflect the amount of precipitation falling on mountainous regions, which are the heavy runoff producing areas. Table 2 shows a listing of snow courses located within the Thompson River basin and Figure 3 shows their locations. The World Meteorologic Organization suggests that one course per 2000 - 3000 square kilometres is a reasonably good network density for homogenious regions and one course per 5000 square kilometres for homogenious plains regions. The density of the existing snow course network is one station per 1500 square kilometres. The network appears to be suitable for most of the basin except for the Bonaparte sub-basin and Horse Lake areas. The snow course network is operated primarily to ensure that the data needs of water resource managers are met, but it may be advantageous to establish one or two snow courses in this region to monitor the snowpack in this relatively water short area.

3.1 Mean April 1 Snowpack Water Equivalent

The isomap of April 1 water equivalent shown in Figure 9 was derived using data over the past ten years for specific snow course locations. Precipitation data and topography were used as guides to drawing the isolines. Snow course water equivalents tend to increase with elevation and this is demonstrated by snow courses in the Monashee Mountains and Wells Gray Park and in the river valley between Lytton and Kamloops.

3.2 Annual and Monthly Snowpack Water Equivalent Variability

The maximum snowpack in a season usually occurs between April 1 and May 1, but the maximum snowpack may be observed later than this, especially at higher elevations courses. Snowpack accumulation generally begins in late October or early November. Figure 13 shows the average variation of snowpack water equivalent in the winter months for a number of selected snow courses.

Seasonal snowpacks may vary significantly from year to year due to

the shortness of the snow accumulation season and other climate factors such as ablation and drifting. This is especially true of lower elevation stations. For example, Knouff Lake (#80) has a coefficient of variation, Cv of 0.32 compared to Trophy Mountain No. 1 (#51) which has a Cv of 0.20 for the period 1958-1977. Figure 13 also shows the variation in April 1 snowpack for a number of selected snow courses for this period.

4 THE HYDROMETRIC NETWORK

Water Survey of Canada of the Inland Waters Directorate is responsible for the hydrometric network in British Columbia. Data is collected in co-operation with Provincial and other agencies using conventional river gauging methods. Flow records in the Thompson River basin began in 1911 and there are now a total of 85 stations being operated in the basin. A listing of both active and discontinued stations is presented in Table 3, and a location map is shown in Figure 4.

The network is fairly dense and meets the guidelines for network operation set our by the World Meteorologic Organization. The WMO recommends that for mountainous regions of temperate zones, a minimum of one station in 300 - 1000 square kilometres should be maintained. At present, the density of the hydrometric network in the Thompson River basin is one station per 650 square kilometres. Water Survey of Canada is at present in the process of reviewing the hydrometric network in British Columbia, so some changes to the network may be made in the near future.

4.1 Mean Annual Runoff

The mean annual runoff for a number of mainstem locations and tributary streams were computed to determine the areal distribution of annual runoff per unit area (Figure 10). Where possible, data from 1958-1977 was used in the computations. An annual runoff per unit area map prepared by Ingledow in its report British Columbia Hydrometric Network Study was also used to prepare the runoff isomap shown in Figure 10. Due to the large variation of runoff with elevation, the isolines were drawn on a gross scale and therefore the isomap is indicative of conditions on a regional scale only and may not indicate conditions at specific sites. However, the general areal distribution of runoff is well defined. The higher elevation regions in Cariboo Mountains located in Wells Gray Park produce heavy annual runoff as do the higher elevation regions of the Monashee Mountains on the east side of the basin. The high plateau regions around Adams Lake and also around Canim Lake produce moderate annual runoff. The Salmon River area, the area around Kamloops and the Thompson River valley are low runoff producing areas. There are some areas producing zero runoff.

4.2 Annual and Monthly Runoff Variability

Figure 14 shows a number of stations which have been selected to show the annual and monthly variability in streamflow within the basin. The graphs show that snowmelt runoff contributes approximately half of the annual runoff at these stations. Monitoring winter snowfall therefore is an important aspect in forecasting runoff volume and peak flows.

Annual runoff from mountainous areas does not vary greatly from year to year. In this basin, the coefficient of variation for the selected locations ranges from Cv of 0.13 for the Clearwater River near Clearwater Station to 0.19 for the Shuswap River at Enderby. Because of these low coefficients of variations, fairly accurate forecasts of seasonal runoff volumes can be made by using observed hydrometeorologic data as predictor variables.

4.3 Streamflow and Seasonal Runoff Forecasting

Severe flooding occasionally occurs at the confluence of the North and South Thompson at Kamloops as a result of snowmelt in May and June. The timing of both hydrographs is important, but the North Thompson tends to arrive more quickly with higher peak flows whereas peak flows on the South Thompson River are attenuated considerably by the lakes in the South Thompson system.

To forecast peak flows, the hydrologic processes are simulated using large computer models. Using snow survey results and daily meteorological data, the streamflow at various points is modelled, the results being compared with flows recorded at Water Survey of Canada gauging sites. Using meteorological forecasts supplied by the AES and by routing water downstream it is possible to make streamflow and stage estimates up to 5-days ahead. The major area of concern is normally at the confluence of the North and South Thompson Rivers at Kamloops, but streamflow forecasts are made at the following locations:

Thompson River at Kamloops
South Thompson River at the outlet of Shuswap Lake
Clearwater River near Clearwater Station
North Thompson at Birch Island
North Thompson at McLure
Thompson at Spences Bridge

and estimates of lake levels are also made for Shuswap and Kamloops lakes.

Seasonal volume runoff forecasts are made on February 1, March 1, April 1, and May 1, of each year for the following stations:

Clearwater River near Clearwater Station
North Thompson at McLure
South Thompson near Chase
Thompson River near Spences Bridge

The April 1 and May 1 forecasts are published in the Ministry of Environment's publication, Snow Survey Bulletin.

4.4 Conclusion and Recommendations

The text has given a general overview of the climate and hydrology of the Thompson River basin and has discussed the hydrometeorologic networks in some detail.

There are a number of problems concerning the water resources in the basin especially in extreme water years. In high runoff years, flooding is a serious problem in river valleys and around lakes, particularly in the Kamloops and Shuswap Lake areas. In low runoff years, water supply becomes a critical problem, particularly in and around the Kamloops area.

An accurate assessment of the hydrology is required to determine what measures should be undertaken to solve specific hydrologic problems. To obtain an accurate assessment of the hydrology, the hydrologist will require certain detailed hydrometeorologic and physiographic data to provide peak flow estimates, design hydrographs, low flow durations, etc. It is therefore suggested that the following recommendations be considered for implementation to ensure that more complete and reliable data is available for the purpose of real-time streamflow forecasting or when future hydrology studies are undertaken to assess conditions for specific sites. It is recommended that:

1. two remote Data Collection Platforms (DCP's) be established in the North Thompson basin to enhance flood warning capability. North Thompson River flows are highly variable and can change rapidly from day to day and are therefore, critical during the spring freshet, but difficult to model. At present, meteorological data from the valley bottom stations of Blue River, Vavenby, Salmon Arm and Kamloops are used in streamflow simulation but additional meteorological data from a higher level station would be of considerable benefit. One DCP should be installed at a high elevation site from which real-time

temperature and precipitation data could be relayed via satellite or microwave to the forecasting centre. One possible site for this installation is at the Mt. St. Anne snowpillow. The snowpillow data could also be relayed and would provide a very useful check on the model simulation.

During a major flood, it is essential that data from indicator streams be available to show trends before they are apparent on the main stem of the rivers. At present, Bone Creek near Blue River in the North Thompson is read daily, but during a critical flood period, the ability to get readings on indicator streams on demand is essential. Therefore, a DCP on this or another indicator stream is recommended.

2. one or two snow courses be established in the headwaters of the Bonaparte sub-basin. Snow course data is sparse in this area and additional data would be beneficial in undertaking water supply studies in this water short region.

3. consideration be given to installing several precipitation stations at higher elevations in areas that are sparsely covered at present. Monthly precipitation storage gauges or precipitation recording gauges could be potentially useful in the following areas:

    Wells Gray Park
    Canim - Mahood Lakes
    Bonaparte Lake
    Adams River above Adams Lake
    Shuswap River above Sugar Lakes
    North Barriere Lake

4. special hydrometric stations be established as required for specific studies.

5. existing co-operation with AES and WSC regarding the operation of networks be continued.

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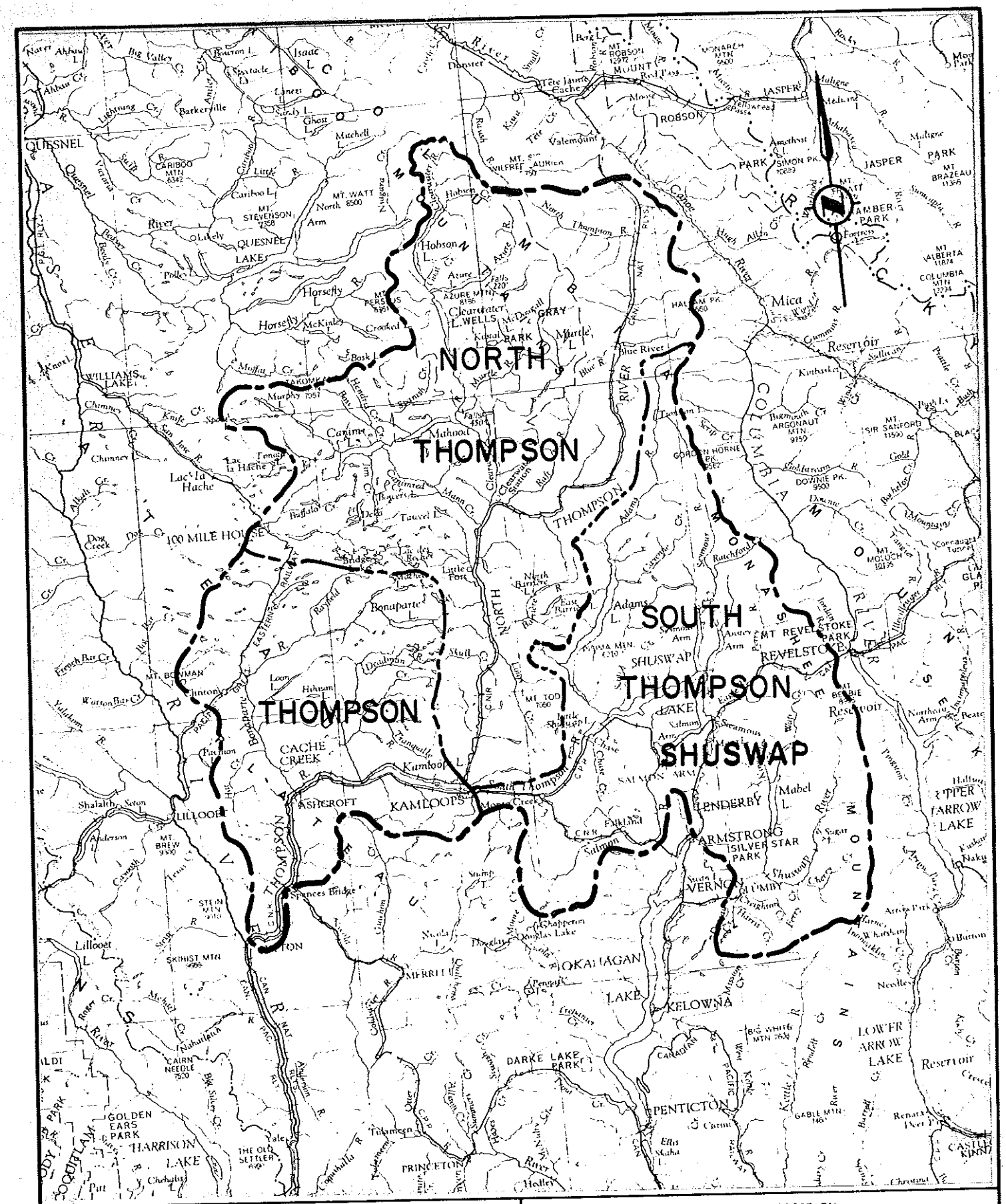

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WATER INVESTIGATIONS BRANCH

TO ACCOMPANY REPORT ON
THOMPSON RIVER BASIN PREPLANNING STUDY
THOMPSON RIVER BASIN
EXCLUDING NICOLA RIVER SUB-BASIN

SCALE: 1 inch = 30 miles

DATE: DEC. 1979

ENGINEER

FILE No. DWG. No. FIGURE 1

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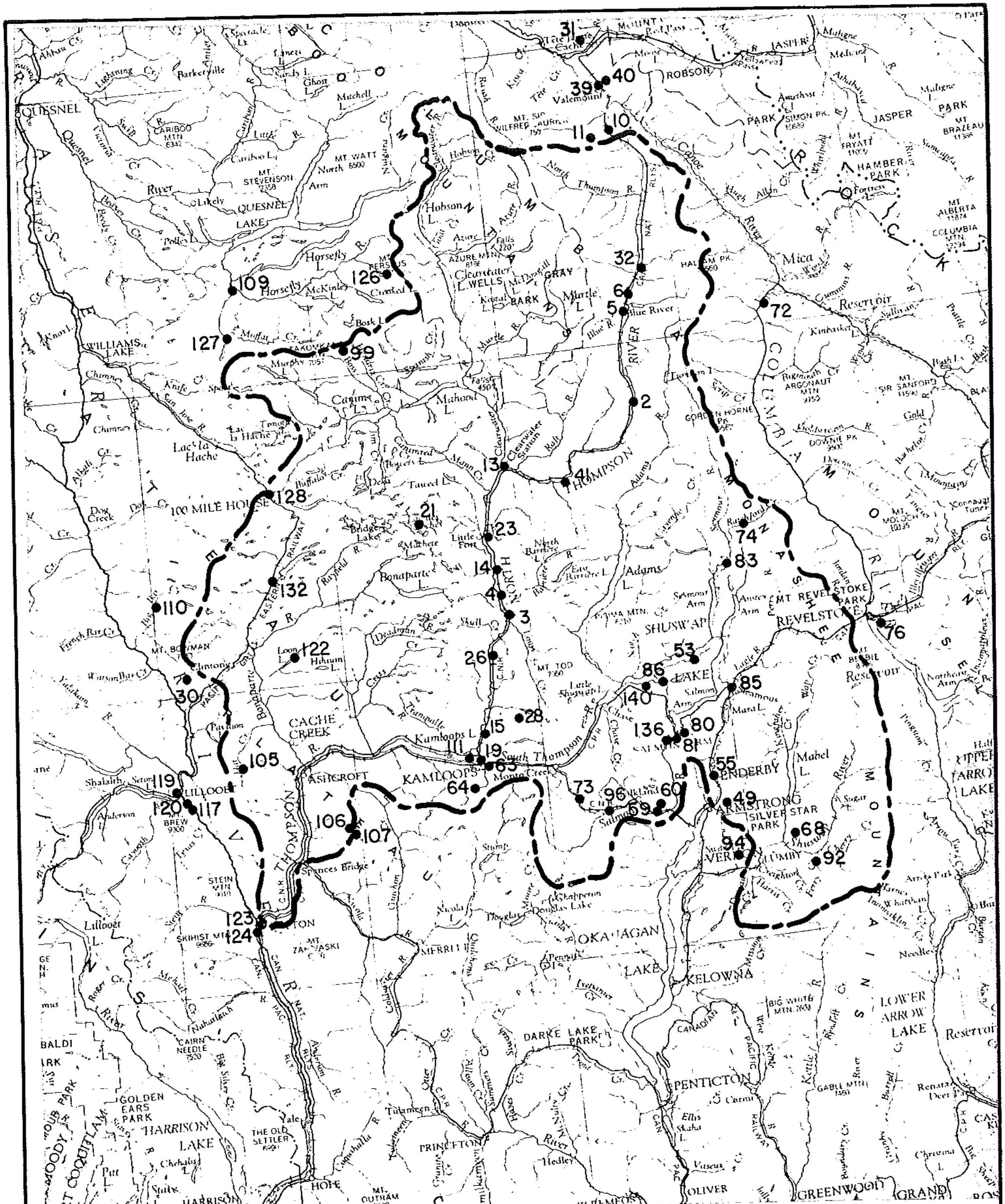

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TO ACCOMPANY REPORT ON
THOMPSON RIVER BASIN PREPLANNING STUDY
ACTIVE A.E.S. METEOROLOGICAL STATIONS

SCALE: VERT. 1 inch = 30 miles
HOR. ....

DATE
DEC. 1979

.... ENGINEER

FILE No. .... DWG. No. FIGURE 2A

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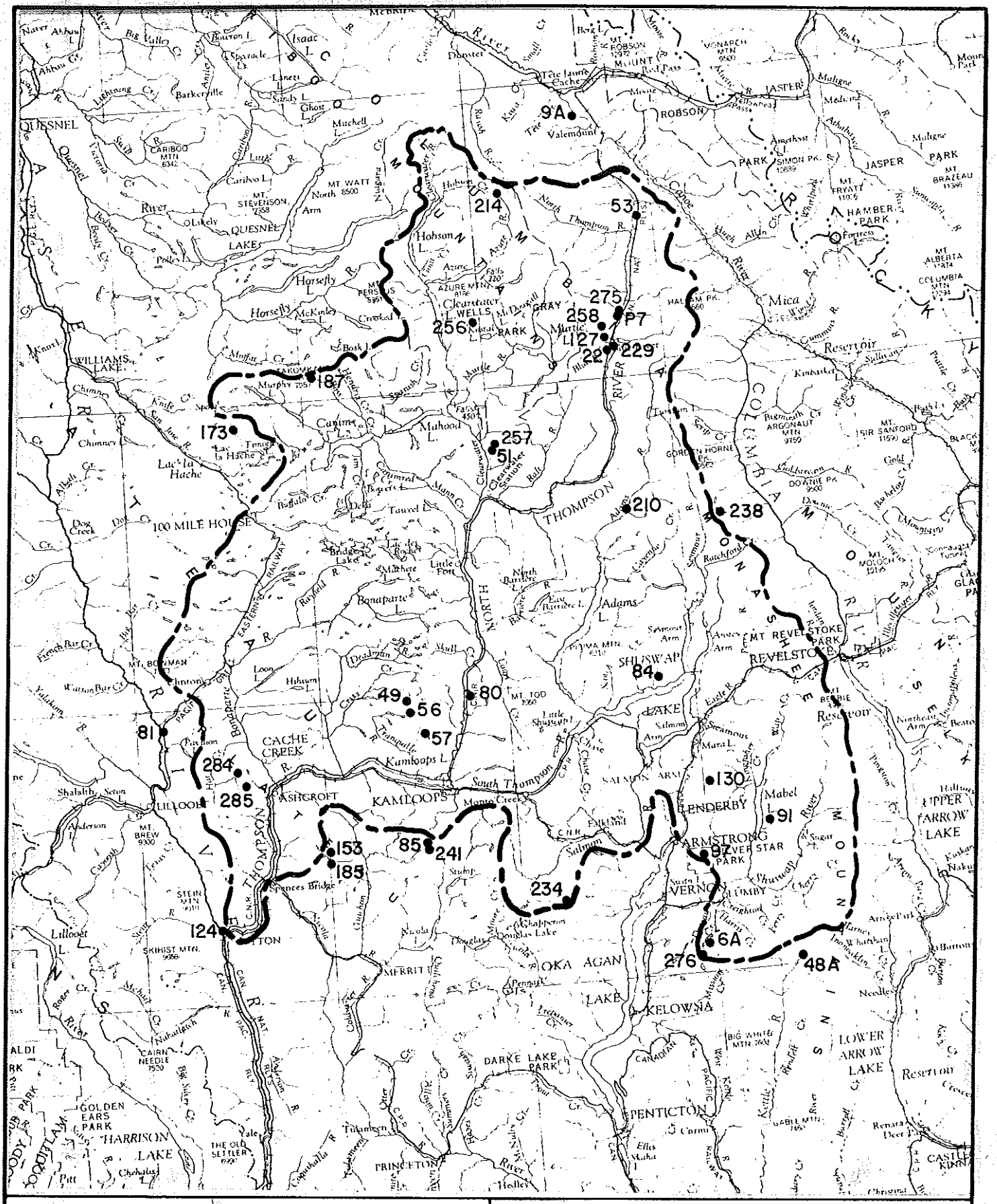

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TO ACCOMPANY REPORT ON
THOMPSON RIVER BASIN PREPLANNING STUDY
W.I.B. SNOW COURSE STATIONS

SCALE: VERT. 1 inch = 30 miles
HOR.

DATE
DEC. 1979

ENGINEER

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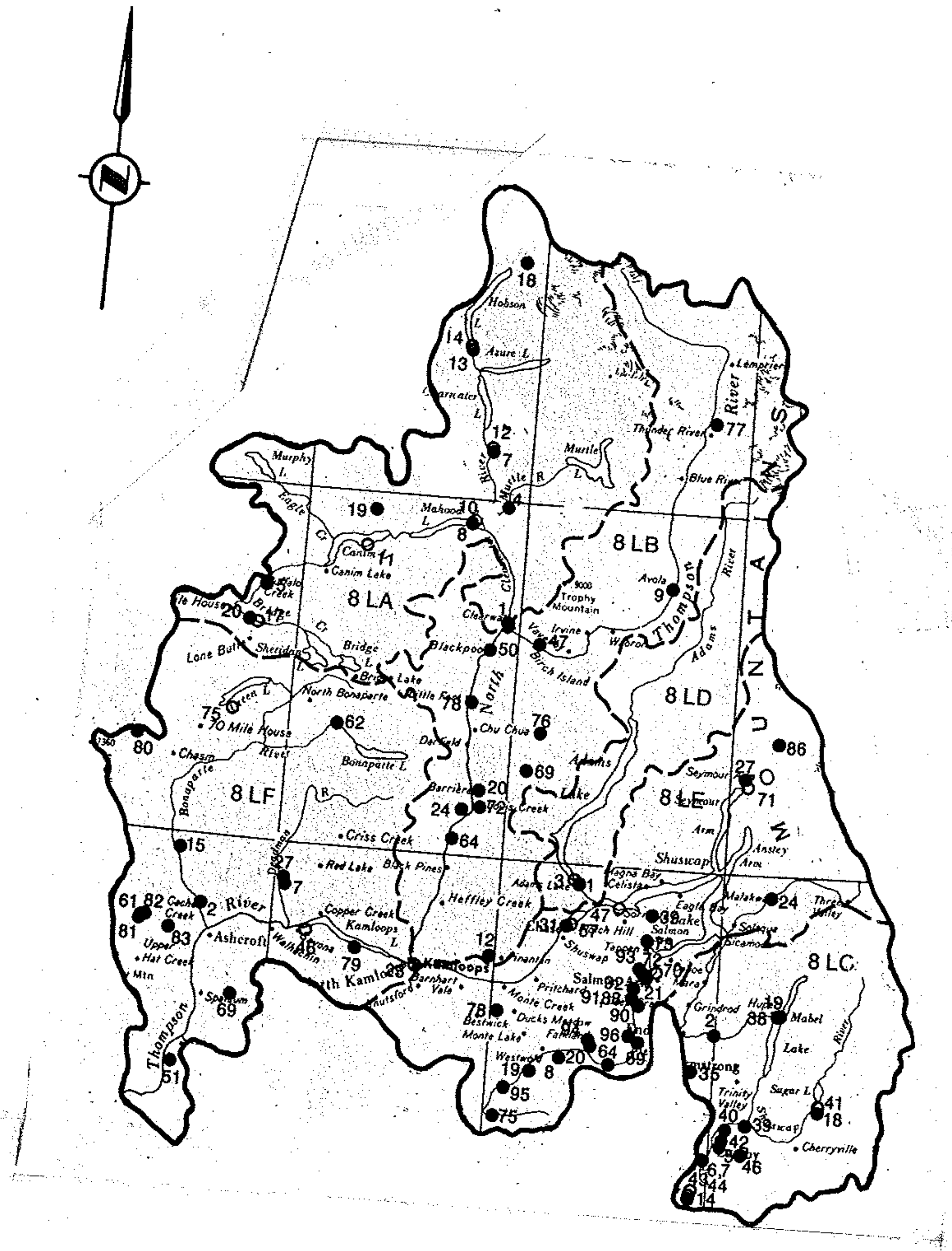

LEGEND FOR ACTIVE STATIONS

● 62 STREAM FLOW

○ 75 WATER LEVEL ONLY

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TO ACCOMPANY REPORT ON
THOMPSON RIVER BASIN PREPLANNING STUDY
ACTIVE W.S.C. HYDROMETRIC STATIONS

SCALE: 1 inch = 30 miles

DATE 1979

ENGINEER

FILE No. DWG. No. FIGURE 4A

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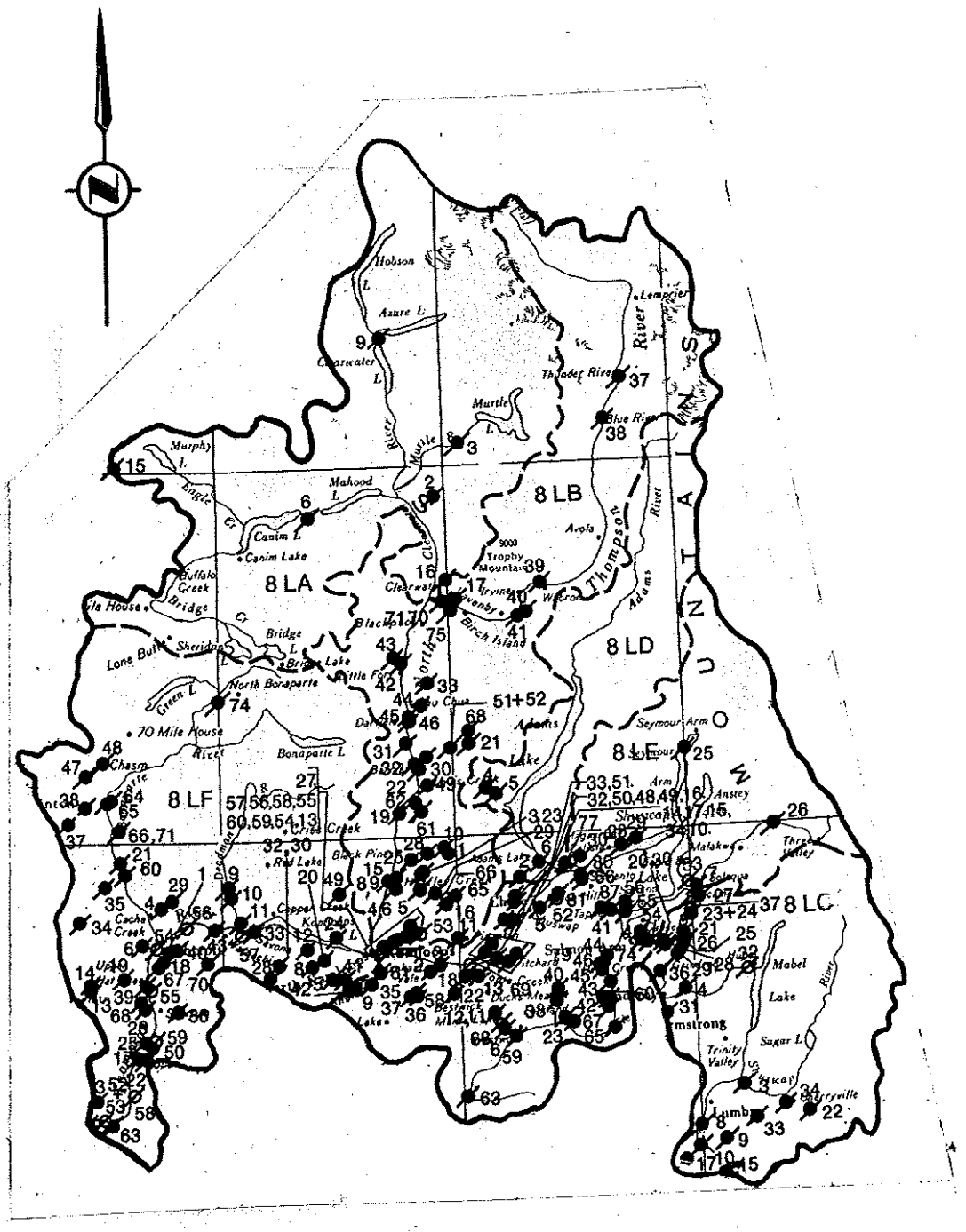

LEGEND FOR DISCONTINUED STATIONS

63 STREAM FLOW

58 WATER LEVEL ONLY

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TO ACCOMPANY REPORT ON
THOMPSON RIVER BASIN PREPLANNING STUDY
DISCONTINUED W.S.C. HYDROMETRIC STATIONS

SCALE: 1 inch = 30 miles

DATE: DEC. 1979

ENGINEER

FILE No. DWG. No. FIGURE 4B

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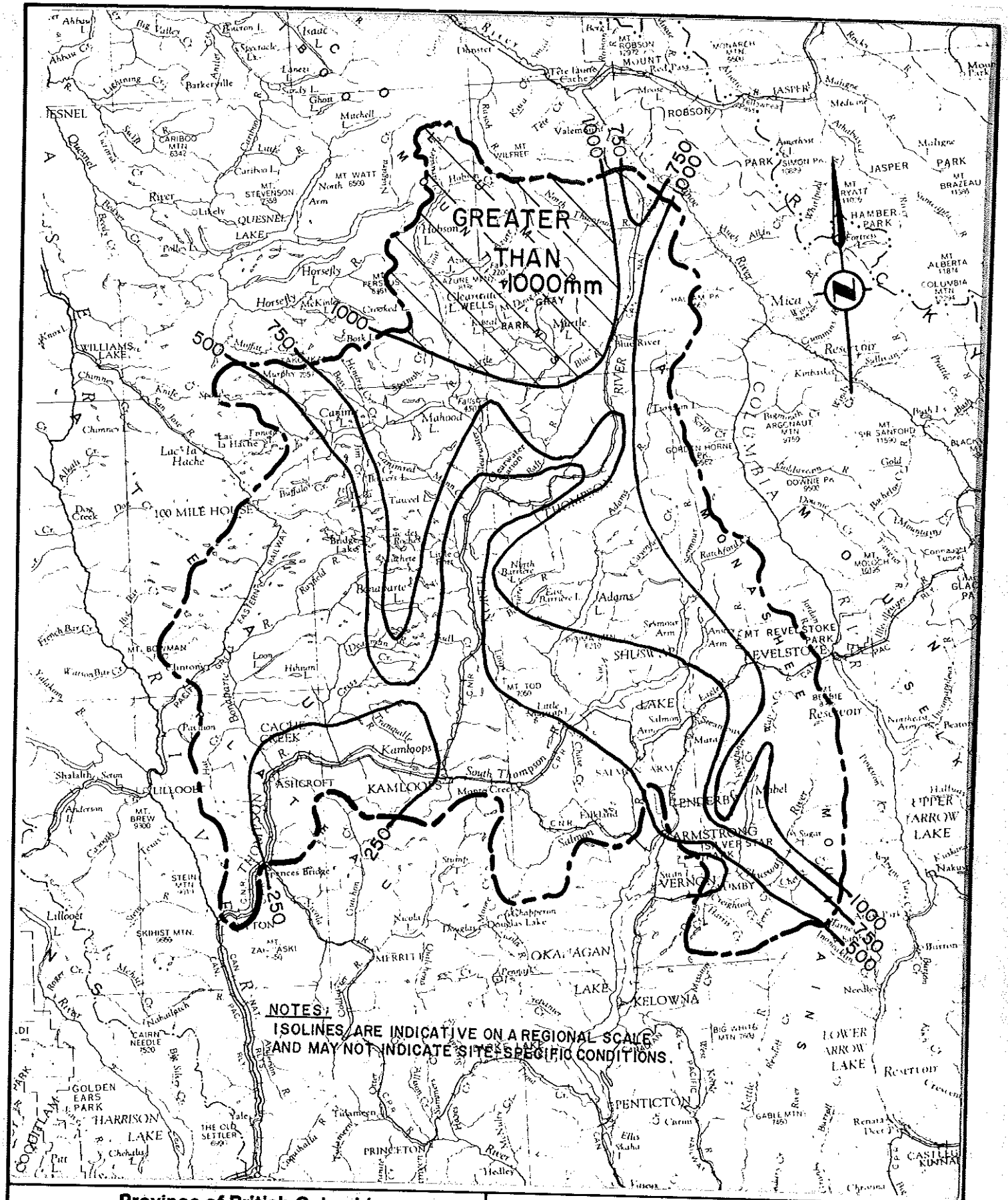

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TO ACCOMPANY REPORT ON
THOMPSON RIVER BASIN PREPLANNING STUDY
MEAN ANNUAL PRECIPITATION
IN MILLIMETRES

SCALE: 1 inch = 30 miles

DATE: DEC. 1979

ENGINEER

FILE No. ..... DWG. No. FIGURE 5

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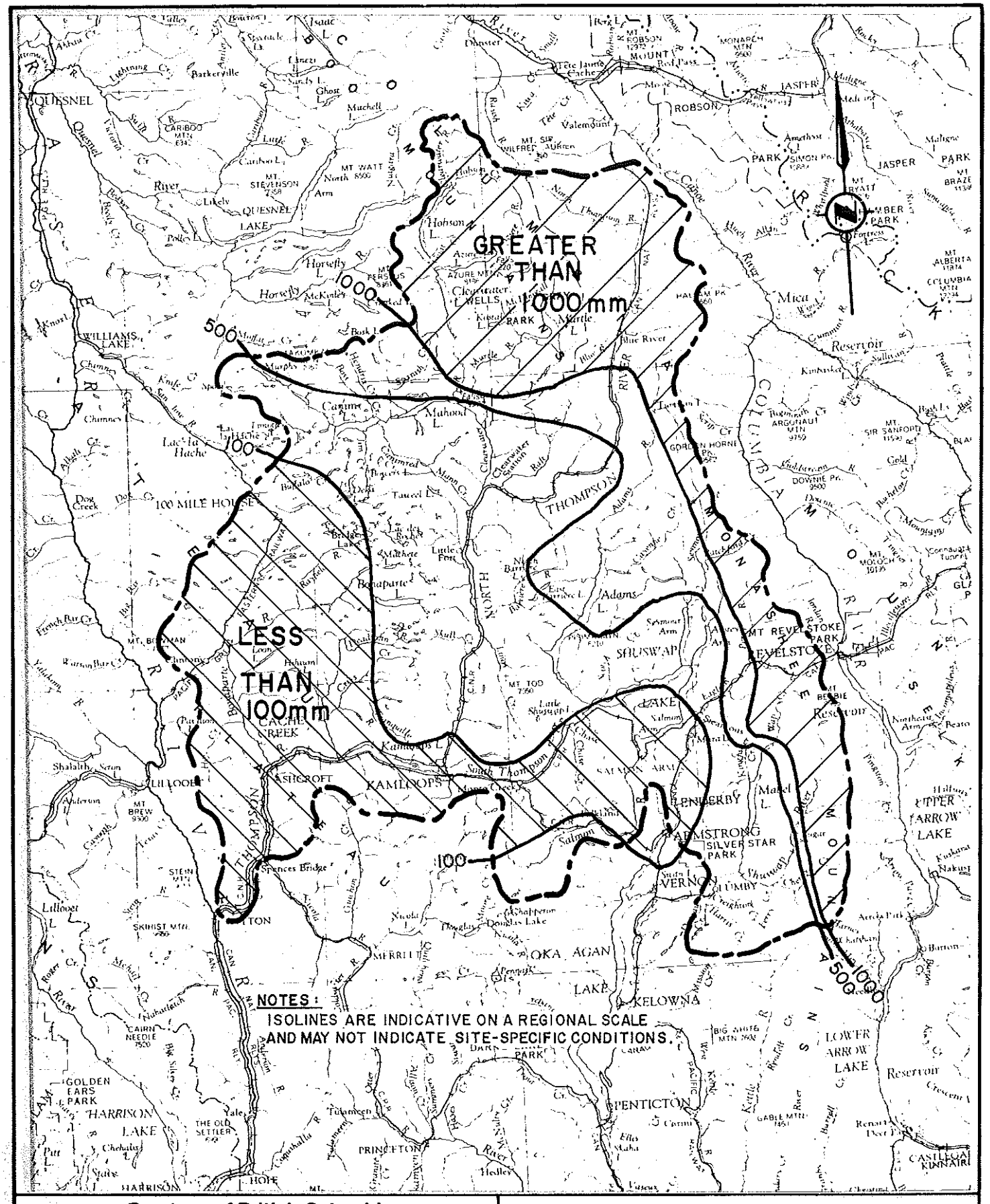

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TO ACCOMPANY REPORT ON
THOMPSON RIVER BASIN PREPLANNING STUDY
MEAN ANNUAL RUNOFF
IN MILLIMETRES

SCALE: 1inch = 30 miles

DATE: DEC. 1979

ENGINEER

FILE No.

DWG. No. FIGURE 10

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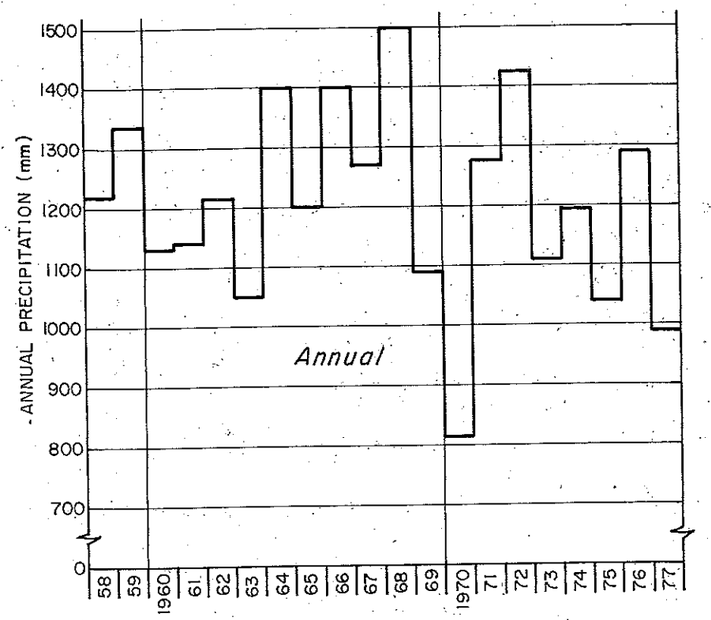
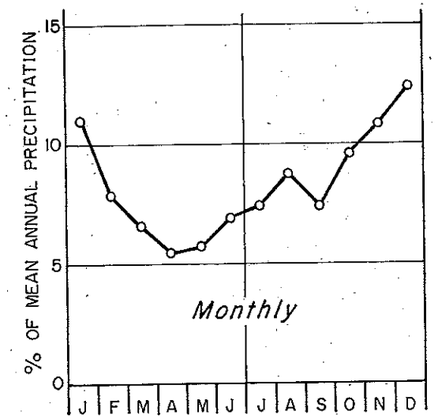
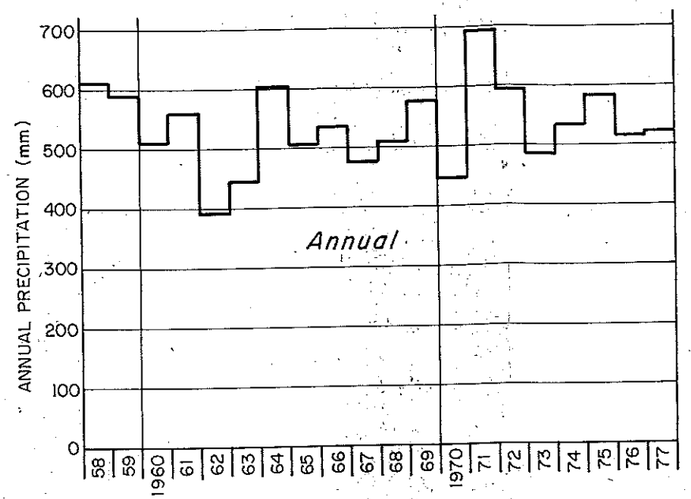
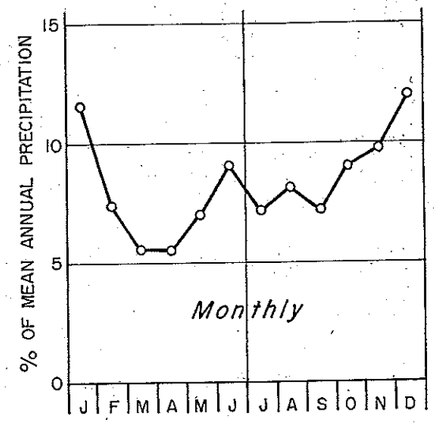
BLUE RIVER NORTH



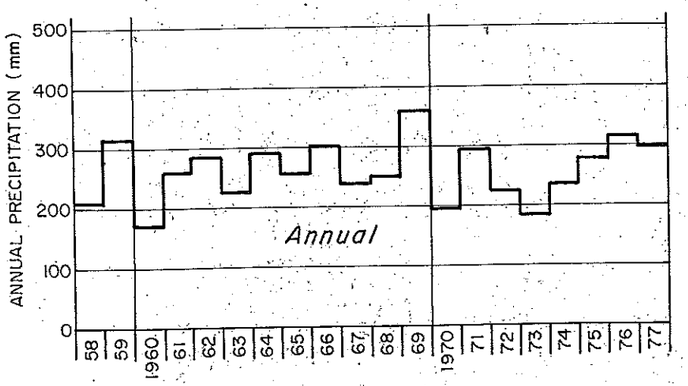


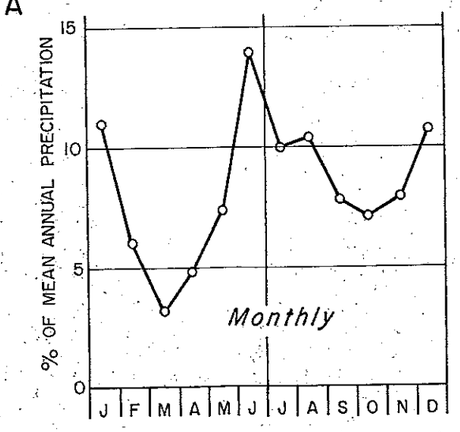
SALMON ARM



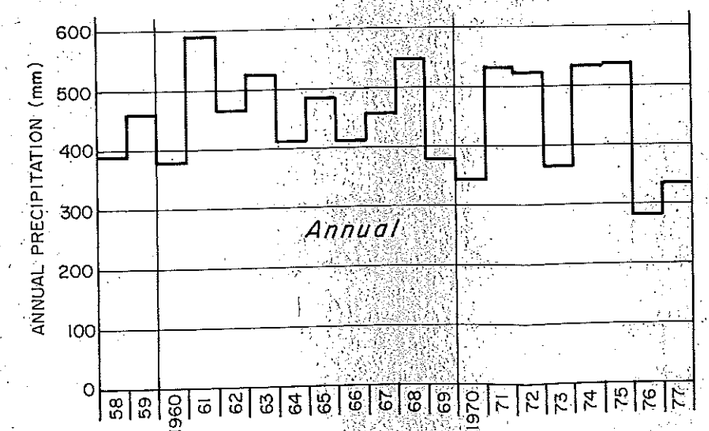


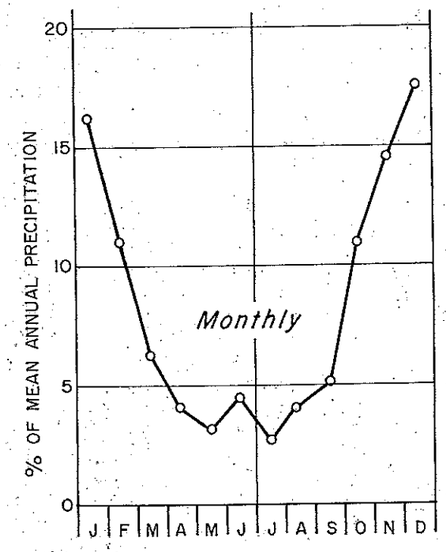
KAMLOOPS A





LYTTON





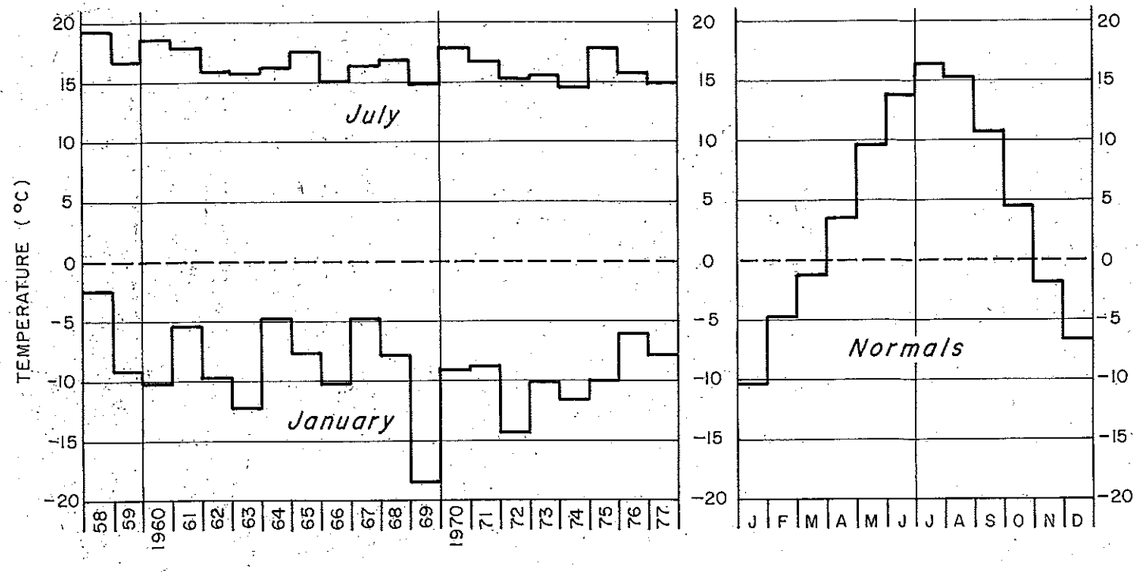
NOTE: Figure shows 1. Total annual precipitation for the period 1958–77.
2. Average distribution of precipitation within the year (Jan. to Dec.) based on 1941–70 normals.

THOMPSON RIVER BASIN PRE-PLANNING STUDY

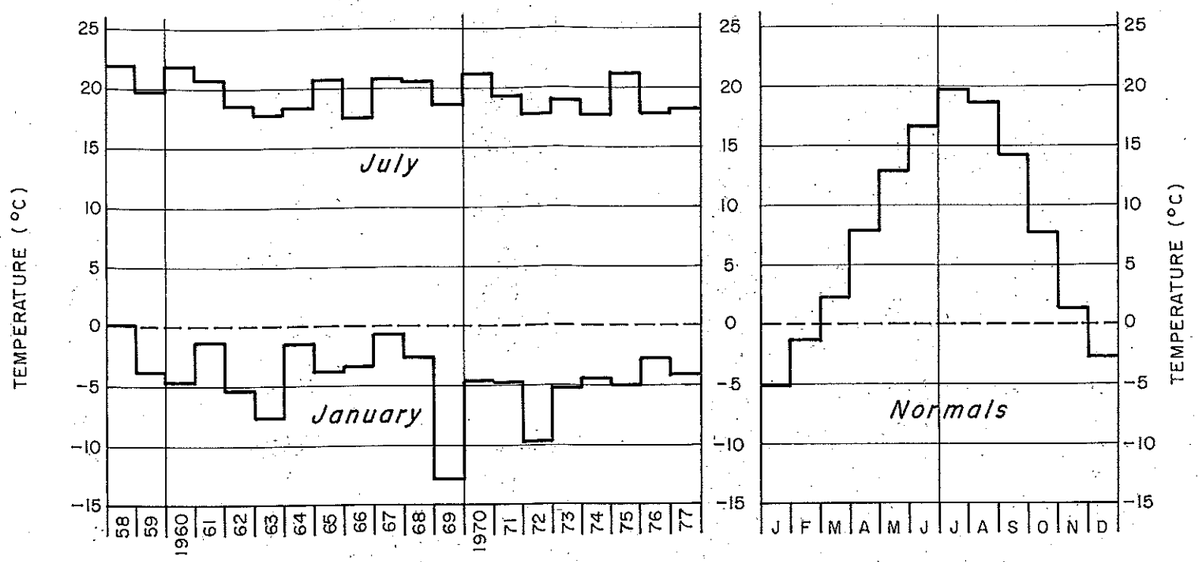
PRECIPITATION DATA AT SELECTED STATIONS

Figure 11

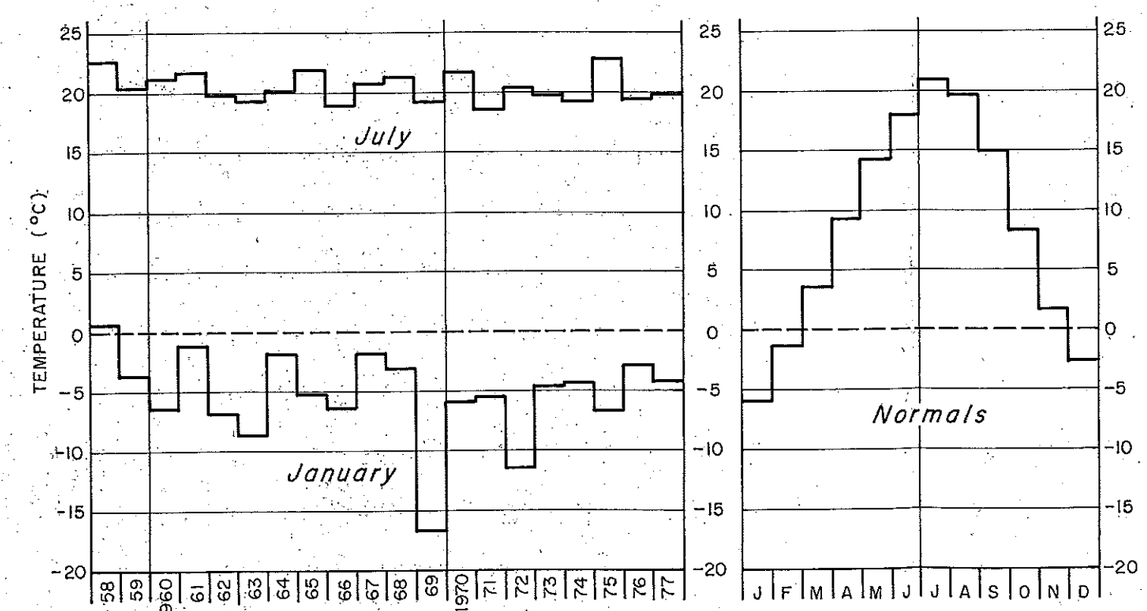
BLUE RIVER NORTH



SALMON ARM

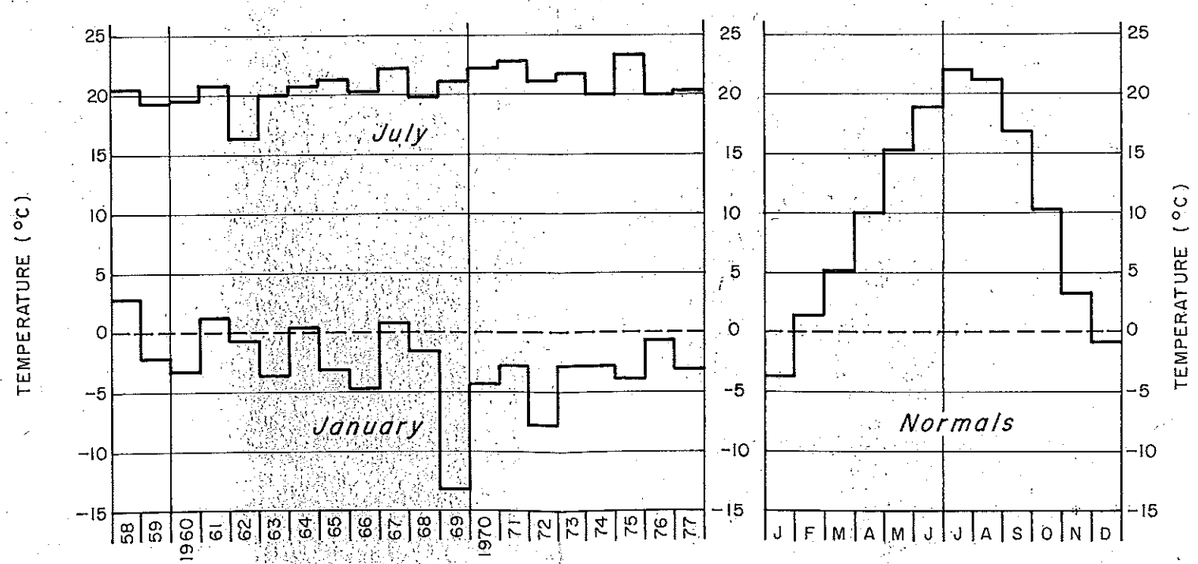


KAMLOOPS A



NOTE: Figure shows 1. Mean monthly temperature for the hottest and coldest months.
2. 1941-70 normal mean monthly temperatures.

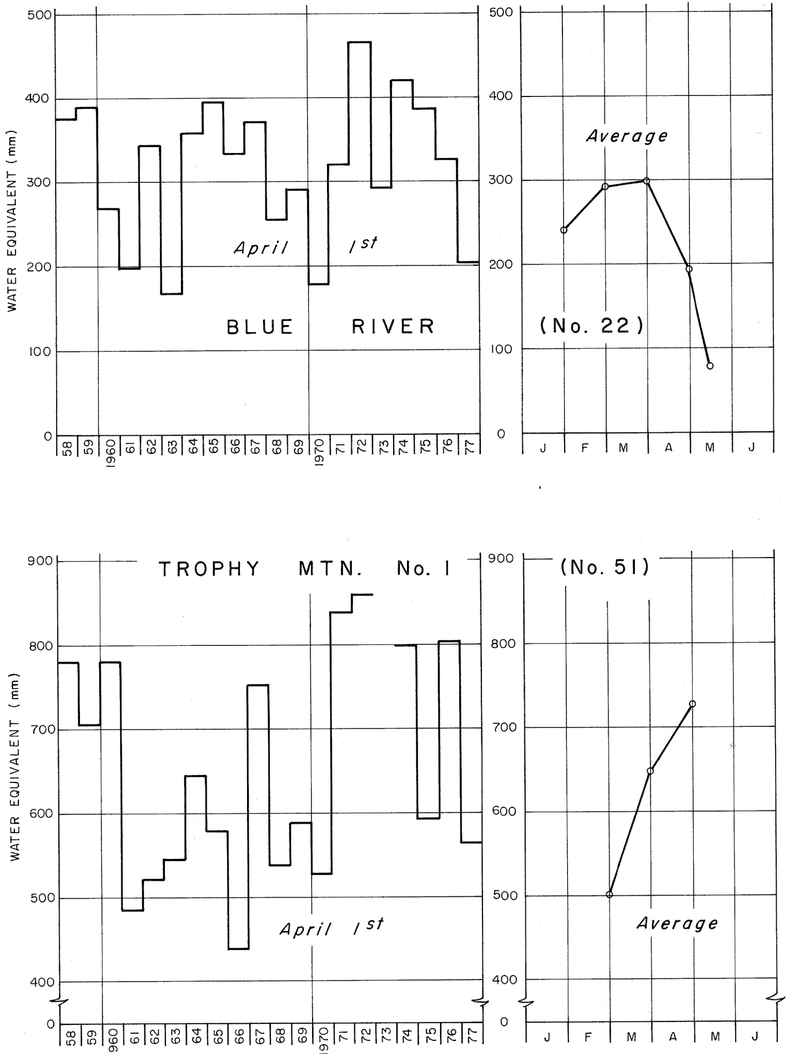
LYTTON



THOMPSON RIVER BASIN PRE-PLANNING STUDY

TEMPERATURE DATA AT SELECTED STATIONS

Figure 12



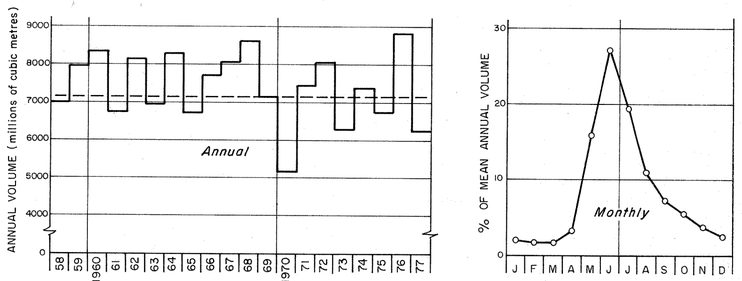
NOTE: Figure shows 1. April 1st water equivalent for the period 1958-77.
2. Average distribution of water equivalent within the year based on records to 1978.

THOMPSON RIVER BASIN PRE-PLANNING STUDY

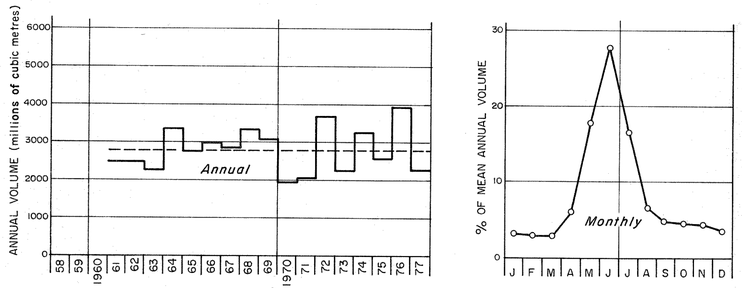
SNOWPACK WATER EQUIVALENT DATA AT SELECTED STATIONS

Figure 13

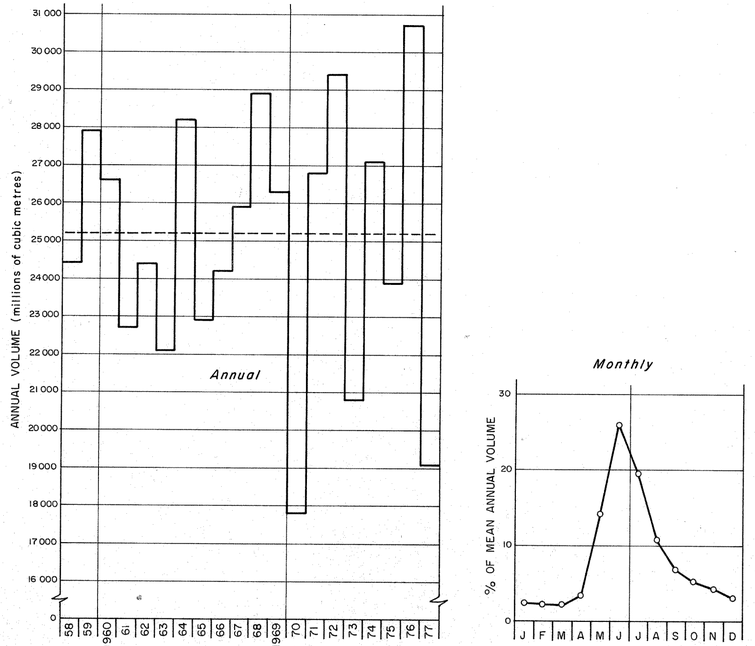
CLEARWATER RIVER NEAR CLEARWATER STATION



SHUSWAP RIVER NEAR ENDERBY

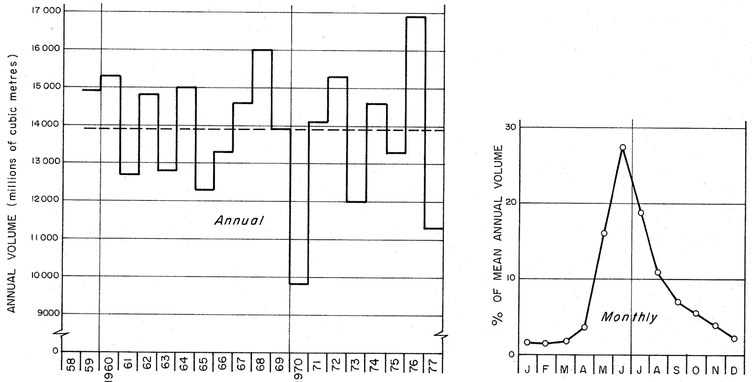


THOMPSON RIVER NEAR SPENCES BRIDGE

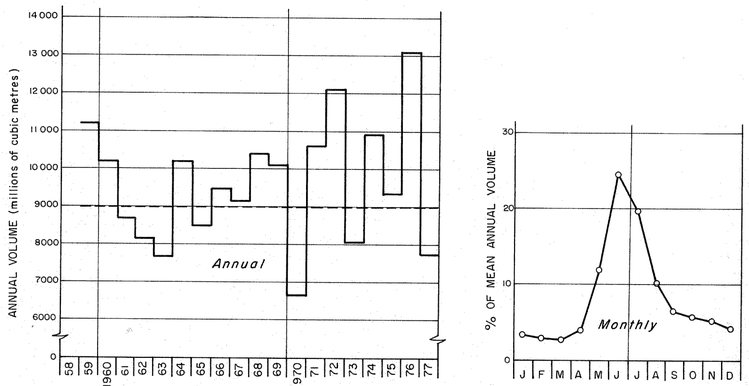


------ AVERAGE VOLUME FOR PERIOD OF RECORD TO 1976

NORTH THOMPSON RIVER AT McLURE



SOUTH THOMPSON RIVER AT CHASE



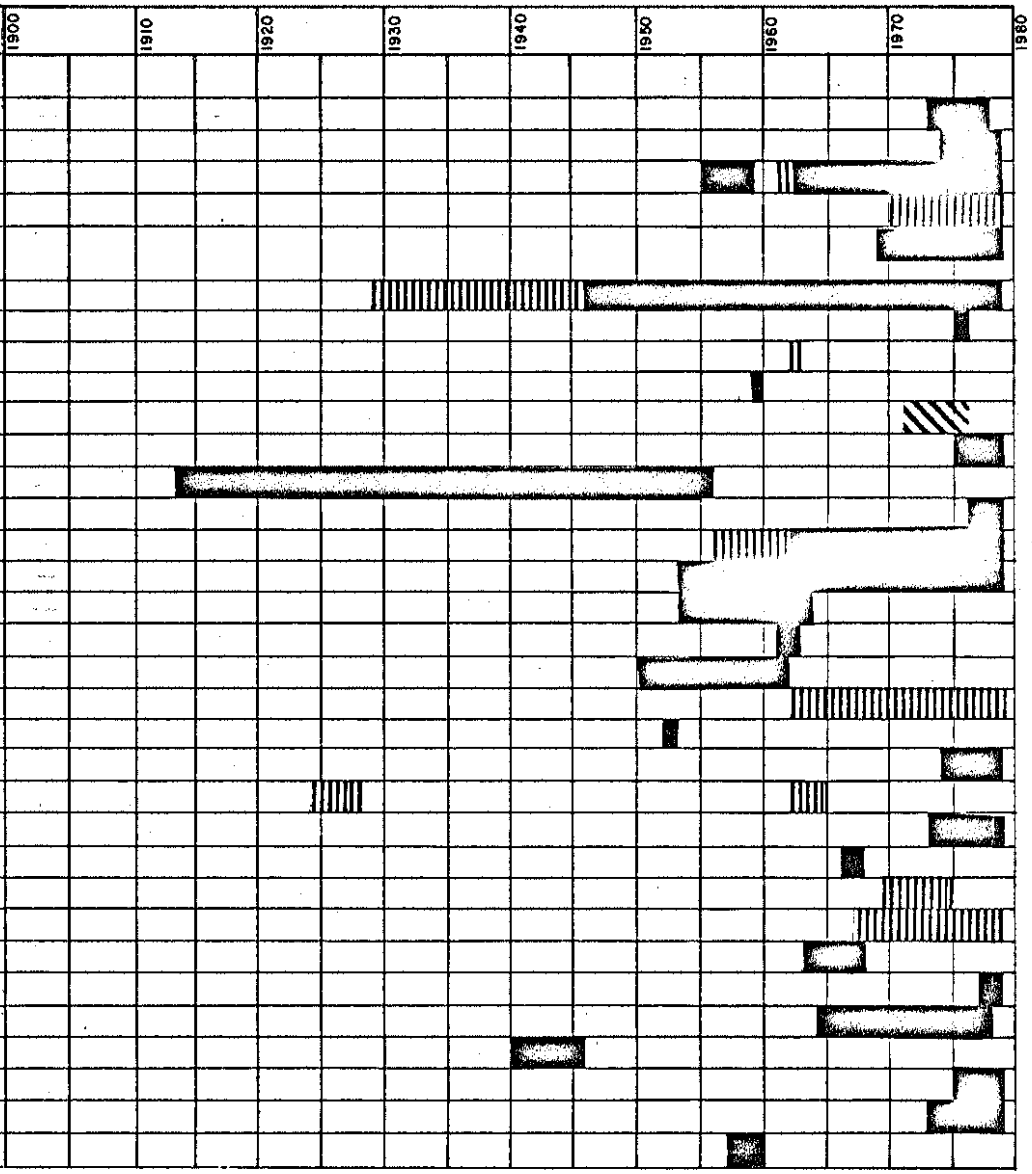
THOMPSON RIVER BASIN PRE-PLANNING STUDY

STREAMFLOW DATA AT SELECTED STATIONS

Figure 14

NOTE: Figure shows 1. Total annual runoff volumes for the period 1958-77.
2. Average distribution of runoff within the year (Jan. to Dec.) based on records to 1976.

MAP NO.	STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
	NORTH THOMPSON					
1	1170237	Albreda	873	52°40'	119°12'	
2	1160565	Avola	610	51°47'	119°20'	
3	1160670	Barriere	375	51°11'	120°07'	
4	1160673	Barriere North	389	51°14'	120°09'	
5	1160899	Blue River	683	52°07'	119°18'	Evap. data from 1975
6	1160900	Blue River North	689	52°09'	119°17'	
7	1160985	Bridge Lake	1158	51°32'	120°44'	
8	1161104	Buffalo Creek	914	51°42'	121°11'	
9	1091305	Canim Lake	945	51°54'	120°47'	
10	1171313	Canoe River	953	52°44'	119°23'	
11	1171393	Cariboo Lodge	1128	52°44'	119°28'	
12	1161590	Chinook Cove	404	51°15'	120°11'	
13	1161655	Clearwater	455	51°39'	120°02'	
14	1162265	Darfield (EPF)	390	51°18'	120°11'	
15	1163400	Heffley Creek	683	50°55'	120°11'	
16	1163450	Hemp Creek Clearwater	640	51°55'	120°03'	
17	1093598	Horsefly	780	52°20'	121°25'	
18	1093600	Horsefly Lake	788	52°23'	121°27'	
19	1163875	Kamloops Valleyview	360	50°41'	120°16'	
20	1164381	Knouff Lake 2	1113	50°57'	120°08'	
21	1164445	Lac des Roches	1143	51°30'	120°37'	
22	1094455	Lac la Hache	814	51°50'	121°36'	
23	1164636	Little Fort	457	51°27'	120°17'	
24	1164715	Lone Butte	1173	51°39'	120°50'	
25	1164720	Louis Creek Mel-Bar	625	51°02'	120°02'	
26	1165030	McLure	381	51°02'	120°13'	
27	1165210	Moul Creek Clearwater	713	51°52'	120°01'	
28	1165224	Mt. Lolo Admin. Kam.	863	50°47'	120°11'	
29	1165225	Mt. Lolo Kamloops	1737	50°48'	120°08'	
30	1095229	Mt. Robson	-	53°07'	119°09'	Summer only.
31	1095289	Mt. Robson Ranch	869	53°01'	119°14'	
32	116EB89	Mt. St. Anne	1783	52°16'	119°14'	
33	1095790	100 Mile House	930	51°39'	121°16'	Summer only.



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TEMPERATURE
PRECIPITATION
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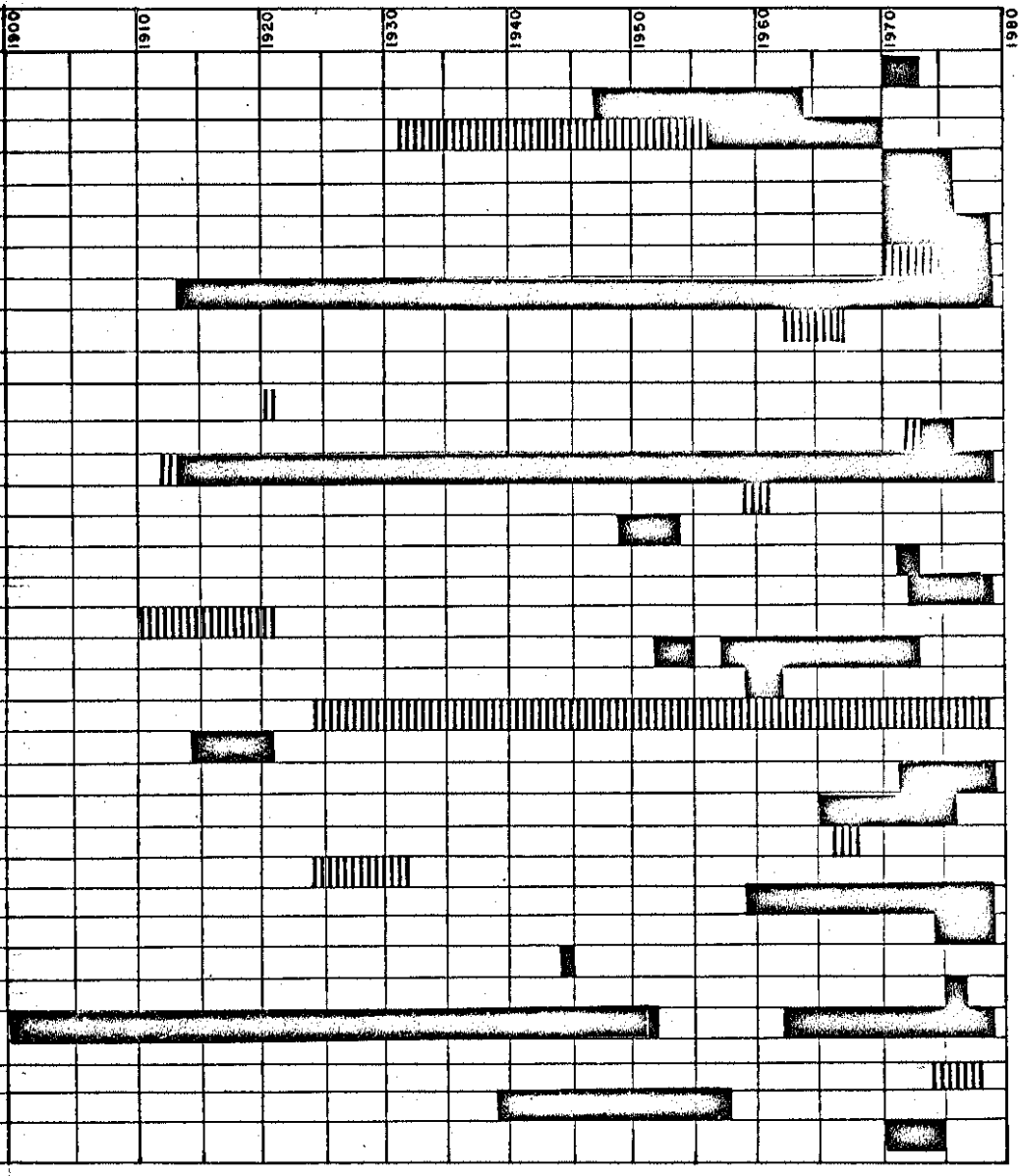
THOMPSON RIVER BASIN PRE-PLANNING STUDY
METEOROLOGICAL STATION RECORDS
Atmospheric Environment Service

Table I-A

MAP NO.	STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
34	1095796	108 Mile House	957	51°45'	121°20'	
35	1095820	150 Mile House	738	52°07'	121°56'	
36	1096660	Red Pass Junction	1059	53°00'	119°00'	
37	1096665	Red Pass Mt. Robson	1067	52°59'	119°00'	
38	1172070	Valemount	797	52°49'	119°15'	
39	1178JL9	Valemount BCFS	792	52°50'	119°16'	
40	1178CL9	Valemount North	892	52°51'	119°15'	
41	1168520	Vavenby	447	51°35'	119°47'	
42	1168667	Vinsulla	357	50°56'	120°15'	
	SOUTH THOMPSON-SHUSWAP LAKE					
43	1120055	Aberdeen L. Dam	1282	50°06'	119°06'	
44	1160075	Adams L. Skwaam	457	51°05'	119°48'	
45	1160450	Armstrong	375	50°26'	119°12'	
46	1120475	Armstrong Grandview	503	50°24'	119°17'	
47	1160480	Armstrong Grand. Flat	488	50°24'	119°17'	
48	1160483	Armstrong Mtn. View	463	50°28'	119°07'	
49	1160485	Armstrong North	389	50°29'	119°09'	
50	1161312	Canoe Point	353	50°48'	119°04'	
51	1161470	Chase	355	50°48'	119°42'	
52	1161506	Cherryville	664	50°14'	118°35'	
53	1162580	Eagle Bay	411	50°56'	119°13'	
54	1162642	Edith Lake	-	50°37'	120°33'	
55	1162680	Enderby	354	50°33'	119°08'	
56	1162682	Enderby Ashton	351	50°33'	118°55'	
57	1162683	Enderby Valecairn	335	50°32'	119°10'	
58	1162782	Falkland	588	50°30'	119°33'	
59	1162784	Falkland Salmon R.	457	50°28'	119°22'	
60	1162785	Falkland Spanish	823	50°30'	119°30'	
61	1163039	Fruitlands	345	50°41'	120°21'	
62	1163306	Griffin Lake	434	50°58'	118°32'	
63	1163779	Kamloops	379	50°40'	120°20'	Data available from 1878.
64	1163815	Kamloops Cherry 2	701	50°39'	120°35'	
65	1163840	Kamloops Hiss. Flats	345	50°41'	120°21'	
66	1163873	Kamloops Tunstall	442	50°40'	120°19'	



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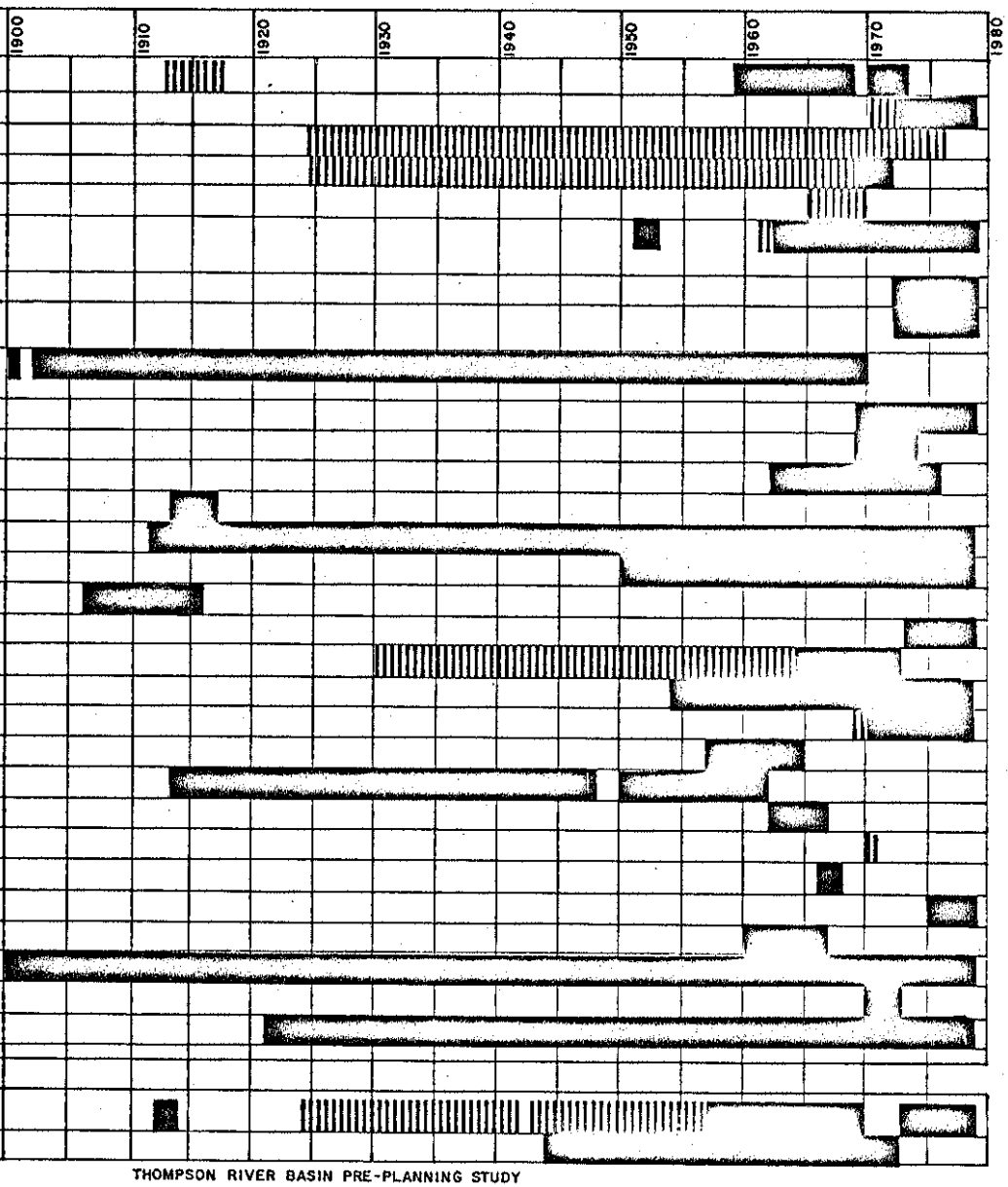
PRECIPITATION
TEMP. & PREC.

THOMPSON RIVER BASIN PRE-PLANNING STUDY
METEOROLOGICAL STATION RECORDS
Atmospheric Environment Service

TABLE I-B

MAP NO.	STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
67	1164729	Lumby	509	50°15'	118°58'	
68	1164730	Lumby Sigalet Road	549	50°22'	118°46'	
69	1164770	Mabel Lake	399	50°23'	118°47'	
70	1164830	Malakwa	360	50°55'	118°47'	
71	1164903	Mara Lake	354	50°43'	119°02'	
72	1175122	Mica Creek (Dam)	579	52°23'	118°35'	Evap. data from 1975.
73	116NJ97	Monte L. Pax. Valley	845	50°32'	119°48'	
74	1176652	Ratchford Creek	640	51°22'	118°47'	Rate of rainfall only.
75	1176750	Revelstoke	456	51°00'	118°12'	Data available from 1898.
76	1176751	Revelstoke A	443	50°58'	118°11'	
77	1176753	Revelstoke Copeland	1847	51°12'	118°23'	
78	1166760	Richland	716	50°13'	118°30'	
79	1166761	Richlands	-	50°18'	118°35'	
80	1166945	Salmon Arm	506	50°42'	119°15'	
81	1166946	Salmon Arm 2	396	50°41'	119°17'	
82	1166947	Salmon Arm 3	-	50°42'	119°18'	Data avail. 1893-97.
83	1167193	Seymour Arm	427	51°15'	118°56'	
84	1167260	Shuswap Falls	427	50°18'	118°49'	
85	1167275	Sicamous	427	50°48'	119°00'	
86	1167592	Sorrento East	488	50°53'	119°24'	
87	1167778	Sugar Lake	610	50°20'	118°32'	
88	1167980	Tappen	442	50°45'	119°20'	
89	1167982	Tappen Ford Road	567	50°48'	119°18'	
90	1167984	Tappen North	488	50°48'	119°18'	
91	1167986	Tappen Tulari Farm	381	50°40'	119°18'	
92	1168A5H	Thimble Ranch	425	50°14'	118°35'	
93	1128554	Vernon B.X.	518	50°17'	119°13'	
94	1128580	Vernon Coldstream	482	50°14'	119°12'	
95	1128584	Vernon S.S. Lodge	1615	50°22'	119°04'	
96	1168880	Westwold	616	50°28'	119°45'	
	THOMPSON					
97	1160511	Ashcroft	366	50°44'	121°16'	
98	1160540	Ashcroft M (R)	488	50°43'	121°20'	



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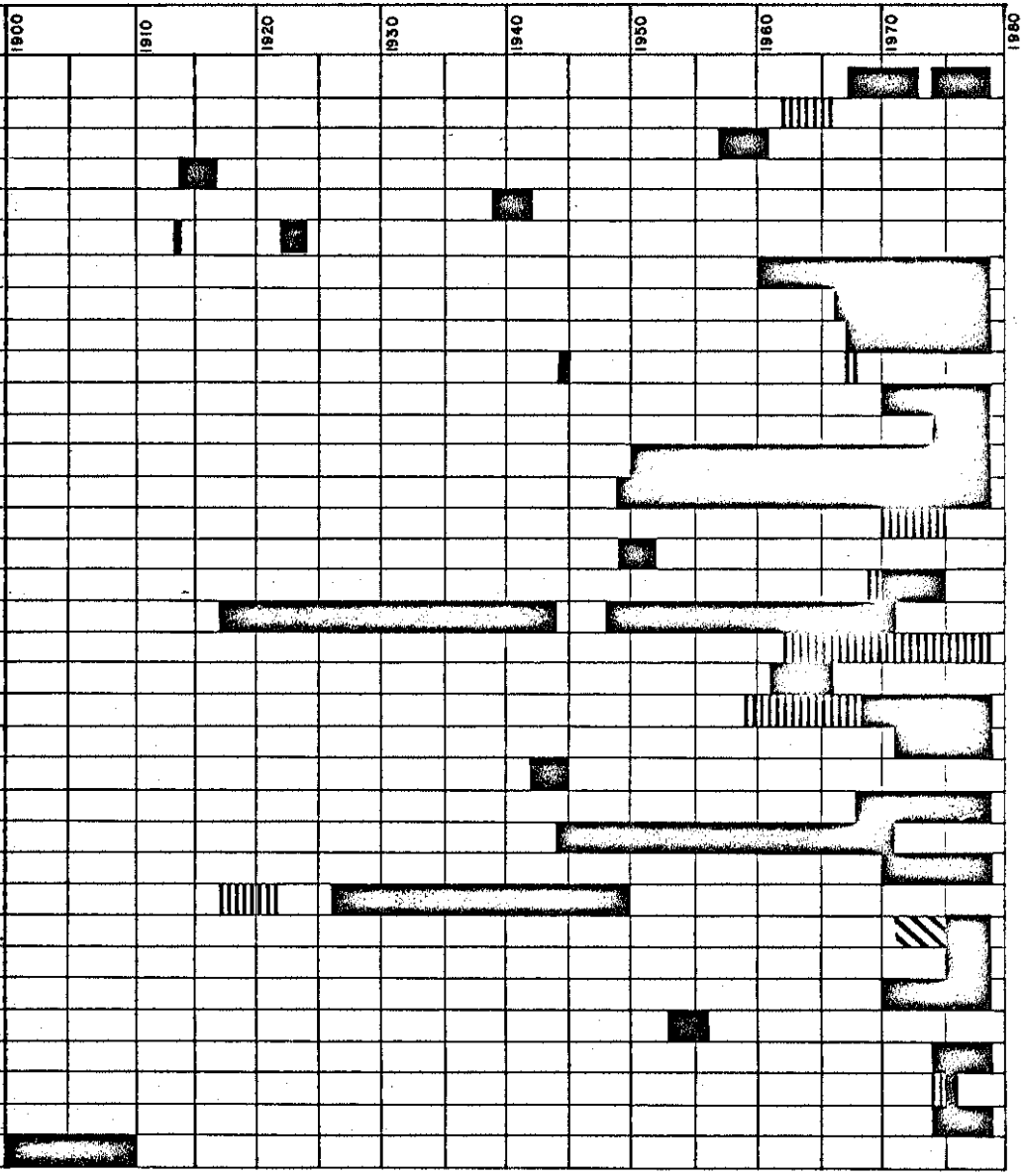
PRECIPITATION
TEMP. & PREC.

THOMPSON RIVER BASIN PRE-PLANNING STUDY
METEOROLOGICAL STATION RECORDS
Atmospheric Environment Service

TABLE I-C

MAP NO.	STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
99	1090904	Boss Mountain	1532	52°06'	120°53'	
100	1161660	Clinton	892	51°05'	121°24'	Data avail. 1881-89.
101	1112625	East Lillooet	270	50°42'	121°55'	
102	1162872	15 Mile Ranch		50°50'	120°50'	
103	1113036	Fountain	226	50°41'	121°56'	
104	1163336	Harpers Ranch	475	50°41'	120°29'	
105	1163340	Hat Creek	899	50°45'	129°35'	1960-78 T & P.
106	1123468	Highland Val. BCCL	1554	50°31'	121°01'	Evap. data fr. 1972.
107	1123469	Highland Val. Lornex	1276	50°28'	121°01'	
108	1163530	Hoopatatkwa Lake	1402	51°12'	120°29'	
109	1093599	Horsefly BCFS	754	52°20'	121°25'	
110	1093730	Jesmond	1158	51°16'	121°58'	
111	1163780	Kamloops A	346	50°42'	120°27'	
112	1163810	Kamloops CDA	351	50°43'	120°26'	
113	1163814	Kamloops Cherry Creek	556	50°41'	120°35'	
114	1163870	Kamloops Pass Lake	945	50°50'	120°30'	
115	1114435	Kwotlenemo Lake	919	50°40'	120°48'	
116	1114620	Lillooet	290	50°42'	121°56'	Data avail. 1878-83.
117	1114621	Lillooet Cedar Falls	555	50°36'	121°52'	
118	1114623	Lillooet Heights	299	50°42'	121°56'	
119	1114626	Lillooet Russell	244	50°42'	121°56'	
120	1114627	Lillooet Seton	198	50°40'	121°55'	
121	1114630	Lillooet 2	255	50°41'	121°56'	
122	1164717	Loon Lake	838	51°07'	121°17'	
123	1114740	Lytton	175	50°14'	121°34'	
124	1114741	Lytton	258	50°14'	121°35'	
125	1114745	Lytton 2	183	50°16'	121°34'	
126	1094785	MacKay River	1219	52°23'	120°42'	Rate of rainfall only.
127	1095195	Moffat Creek	968	52°14'	121°29'	
128	1165791	100 Mile House	914	51°39'	121°18'	
129	1116060	Pavilion	1067	50°52'	121°50'	
130	1116204	Porcupine Creek	1189	51°02'	121°48'	
131	1166658	Red Lake	1210	50°57'	120°49'	
132	1167191	70 Mile House	1106	51°18'	121°24'	
133	1167635	Spences Bridge	232	50°25'	121°30'	Data avail. 1872-89.



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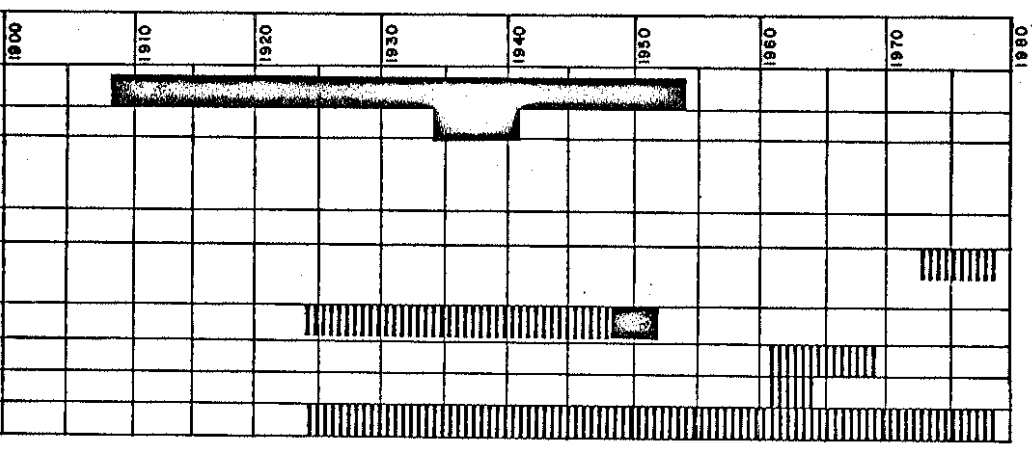
TEMPERATURE
PRECIPITATION
TEMP. & PREC.

THOMPSON RIVER BASIN PRE-PLANNING STUDY
METEOROLOGICAL STATION RECORDS
Atmospheric Environment Service

TABLE I-D

MAP NO.	STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
134	1168220	Tranquille	360	50°43'	120°31'	
135	116HFF6	Vidette Lake	1189	51°19'	120°52'	
	ADDITIONAL STATIONS					
136	1163252	Gordon Creek	457	50°40'	119°23'	1973-78 rate of rainfall.
137	1164380	Knouff Lake	1143	50°58'	120°08'	
138	1165197	Monte Lake	683	50°31'	119°51'	
139	1165198	Monte Lake 2	701	50°31'	119°51'	
140	1167590	Sorrento	390	50°53'	119°29'	

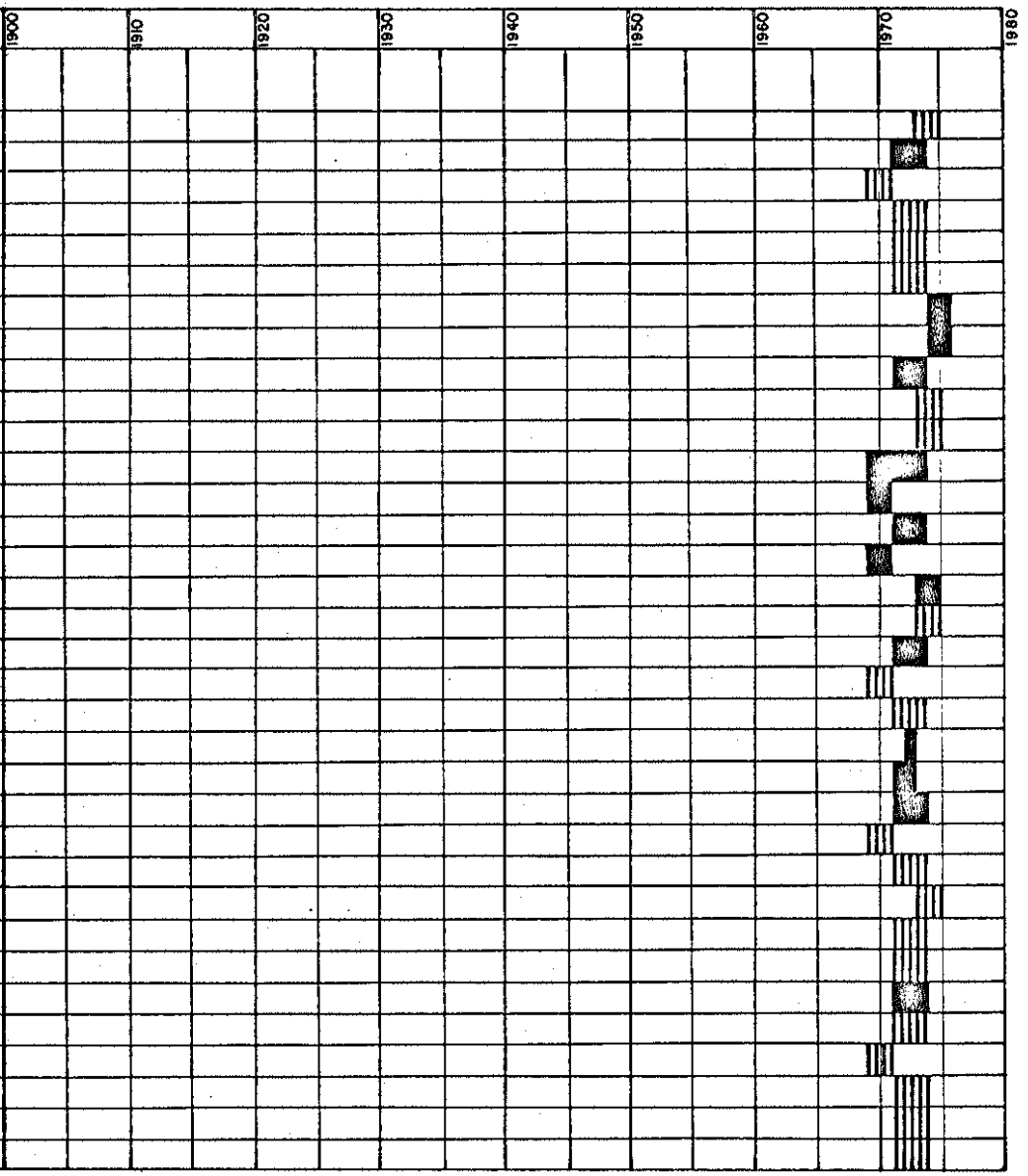


LEGEND
TEMPERATURE
PRECIPITATION
TEMP. & PREC.

THOMPSON RIVER BASIN PRE-PLANNING STUDY
METEOROLOGICAL STATION RECORDS
Atmospheric Environment Service

TABLE 1-E

STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
NORTH THOMPSON					
116609	Aquanaut	732	52°26'	119°10'	
116290	Avola	579	51°47'	119°19'	
116013	Balfour	1140	51°41'	120°49'	
116283	Birch Island	507	51°36'	119°53'	
116286	Blackburg	562	51°40'	119°40'	
116113	Blackpool	432	51°35'	120°07'	
116616	Blue River 3500	1142	52°04'	119°28'	
116617	Blue River 4000	1178	52°04'	119°35'	
116260	Bluebeard	424	51°31'	120°10'	
116602	Bluebell	684	52°00'	119°21'	
116607	Bone	731	52°16'	119°12'	
116024	Bridge Lake	1175	51°31'	120°44'	
116007	Buffalo Creek	880	51°44'	121°09'	Also evaporation.
116115	Candle	678	51°41'	120°01'	
116005	Canim Lake	788	51°46'	120°55'	Also evaporation.
116106	Canoe Terrace	872	52°47'	119°18'	
116603	Catkin	700	52°04'	119°20'	
116292	Christie Creek	806	51°35'	119°40'	
116003	Christmas	935	51°54'	120°48'	
116284	Chuck	536	51°35'	119°44'	
116510	Community Lake	1446	50°55'	120°04'	
116296	Darfield	385	51°18'	120°11'	
116280	Dawson Falls	817	51°58'	120°08'	
116012	Deka	1092	51°36'	120°53'	
116266	Dome	367	50°45'	120°20'	
116611	Dora	830	52°33'	119°07'	
116112	Dunn	420	51°27'	120°11'	
116114	Dutch	453	51°39'	120°03'	
116150	East Barriere	311	51°15'	119°56'	
116271	Exlou	418	51°07'	120°08'	
116020	Fawn	1151	51°32'	121°00'	
116152	Fish Trap	657	51°07'	120°13'	
116149	Garrison	623	51°14'	120°02'	
116276	Garter	698	51°48'	120°01'	



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PRECIPITATION

TEMPERATURE

PRECIP. & TEMP.

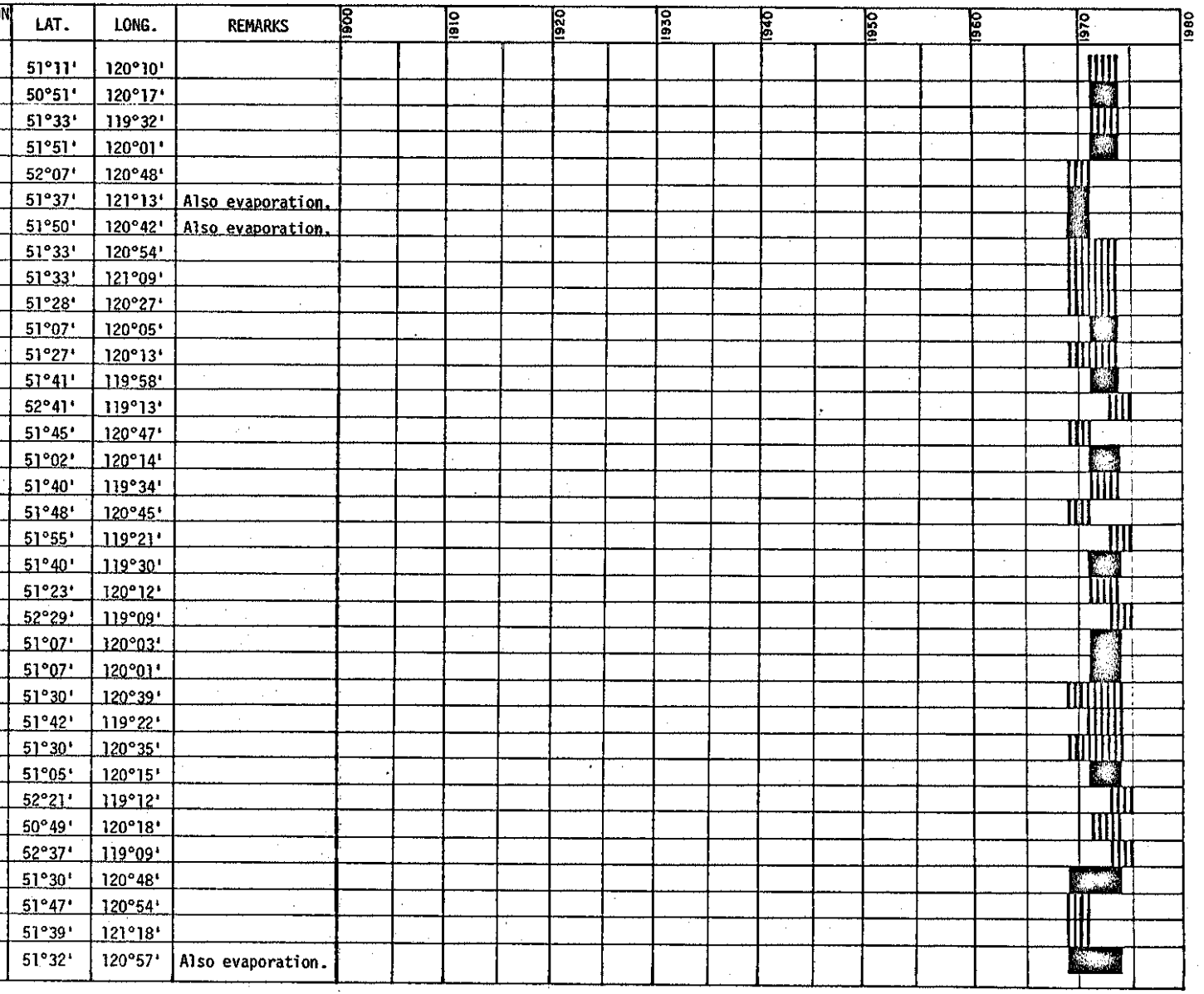
THOMPSON RIVER BASIN PRE-PLANNING STUDY

METEOROLOGICAL STATION RECORDS

Resource Analysis Branch

Table I-F

STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
116151	Hagen	595	51°11'	120°10'	
116268	Heffley Creek	362	50°51'	120°17'	
116132	Hellibar	1278	51°33'	119°32'	
116278	Hemp Creek	742	51°51'	120°01'	
116001	Hendrix	1108	52°07'	120°48'	
116011	Horse	1013	51°37'	121°13'	Also evaporation.
116016	Jim Creek	794	51°50'	120°42'	Also evaporation.
116022	Lesser Fish	1137	51°33'	120°54'	
116019	Long Bow	1162	51°33'	121°09'	
116027	Long Island	1102	51°28'	120°27'	
116148	Louis Creek	623	51°07'	120°05'	
116028	Lovelley	606	51°27'	120°13'	
116282	Lower Raft	1077	51°41'	119°58'	
117105	Lulu	846	52°41'	119°13'	
116014	Marmite	1160	51°45'	120°47'	
116270	McLure	381	51°02'	120°14'	
116287	McMurphy	561	51°40'	119°34'	
116015	McNeil	1148	51°48'	120°45'	
115601	Messiter	772	51°55'	119°21'	
116288	Mona	569	51°40'	119°30'	
116111	Montigny	418	51°23'	120°12'	
116610	Moonbeam	750	52°29'	119°09'	
116146	Mt. Fraser 3100	936	51°07'	120°03'	
116147	Mt. Fraser 4500	1398	51°07'	120°01'	
116025	Muddy	1215	51°30'	120°39'	
116289	Otter	586	51°42'	119°22'	
116026	Phinetta	1200	51°30'	120°35'	
116154	Poplar Bluff	805	51°05'	120°15'	
116608	Pyramid	744	52°21'	119°12'	
116267	Rayleigh	380	50°49'	120°18'	
116612	Robina	882	52°37'	119°09'	
116023	Roe Lake	1165	51°30'	120°48'	
116004	Round	809	51°47'	120°54'	
116010	Savon	929	51°39'	121°18'	
116021	Sheridan	1146	51°32'	120°57'	Also evaporation.



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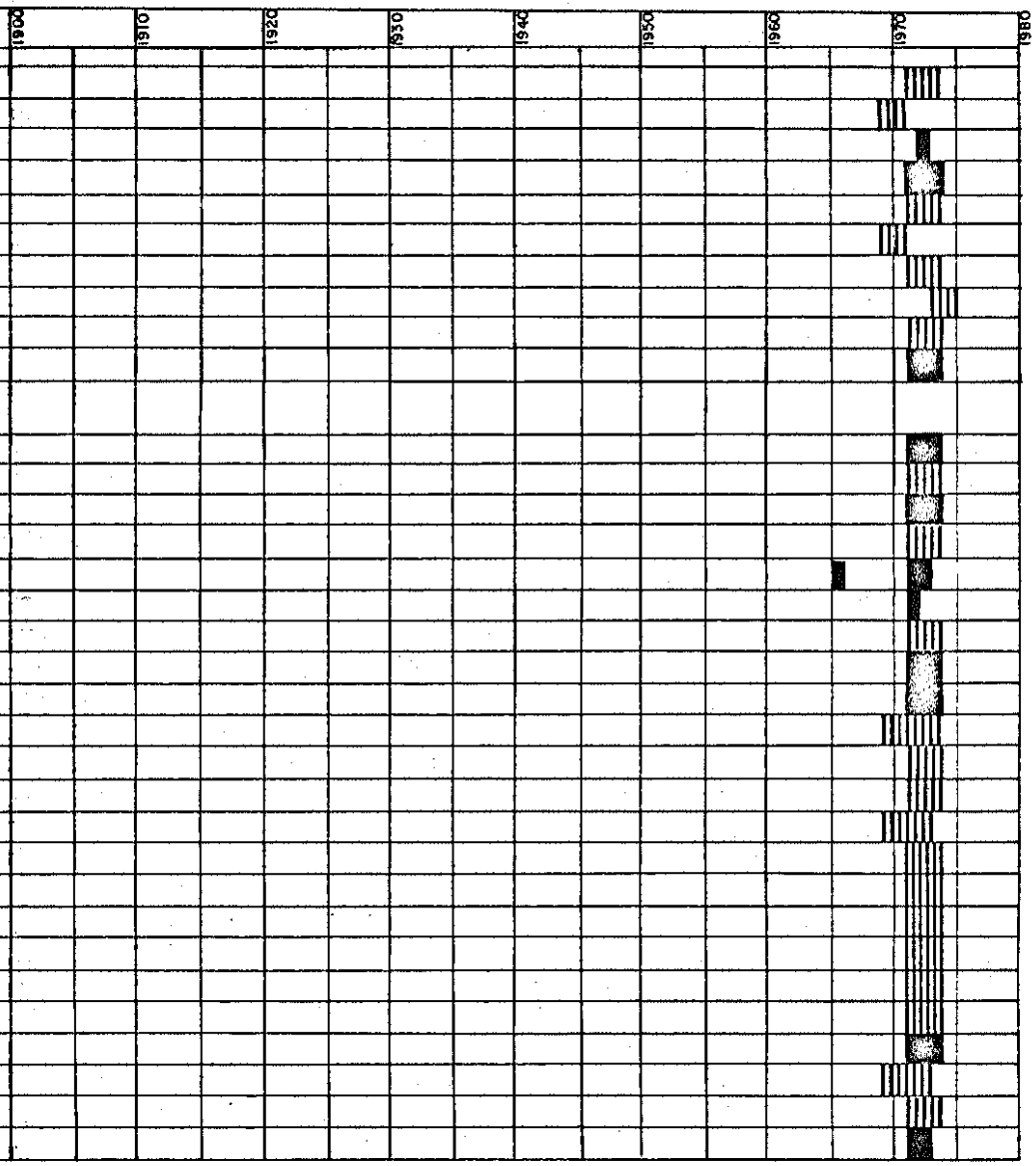
PRECIPITATION
TEMPERATURE
PRECIP. & TEMP.

THOMPSON RIVER BASIN PRE-PLANNING STUDY

METEOROLOGICAL STATION RECORDS
Resource Analysis Branch

Table I-G

STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
116275	Spahose	769	51°44'	120°01'	
116002	Speedy	1095	52°03'	120°45'	
116516	Sullivan Lake	1323	50°59'	120°05'	
116291	Upper Vavenby	1040	51°34'	119°42'	
116131	Victory	1200	51°34'	119°35'	
116006	Webb	825	51°47'	120°01'	
116279	Wells Grey	718	51°56'	120°03'	
116606	Whitewater	699	52°11'	119°15'	
116155	Whitewood	471	51°04'	120°15'	
116153	Woodtick	654	51°05'	120°14'	
SOUTH THOMPSON-SHUSWAP LAKE					
116175	Adams Lake	546	50°47'	119°42'	
116173	Adams River	426	50°46'	119°37'	
116189	Albas	374	51°12'	119°01'	
116183	Anglemont	350	50°59'	119°07'	
116121	Ashton 3200	945	50°34'	118°58'	
116122	Ashton 4900	1528	50°37'	118°54'	
116170	Balmoral	438	50°51'	119°20'	
116248	Beresford	882	50°36'	120°17'	
116188	Berry Blue	931	51°12'	119°04'	
116075	Bisson	1215	50°02'	118°33'	
116136	Black Bear	453	51°19'	119°29'	
116145	Bluchar Hall	612	51°06'	119°59'	
116067	Bluestrings	515	50°15'	118°57'	
116165	Boysse	397	50°49'	119°40'	
116295	Brannen	507	51°10'	119°39'	
116197	Buttercup	630	50°28'	119°41'	
116196	Caboose	608	50°30'	119°34'	
116178	Celista	355	50°57'	119°23'	
116192	Charcoal	840	50°38'	119°39'	
116264	Charles Lee	1180	50°48'	120°08'	
116064	Cherry	526	50°14'	118°37'	
116176	Corning	360	50°55'	119°32'	
116098	Crossman	535	50°38'	119°12'	



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PRECIPITATION
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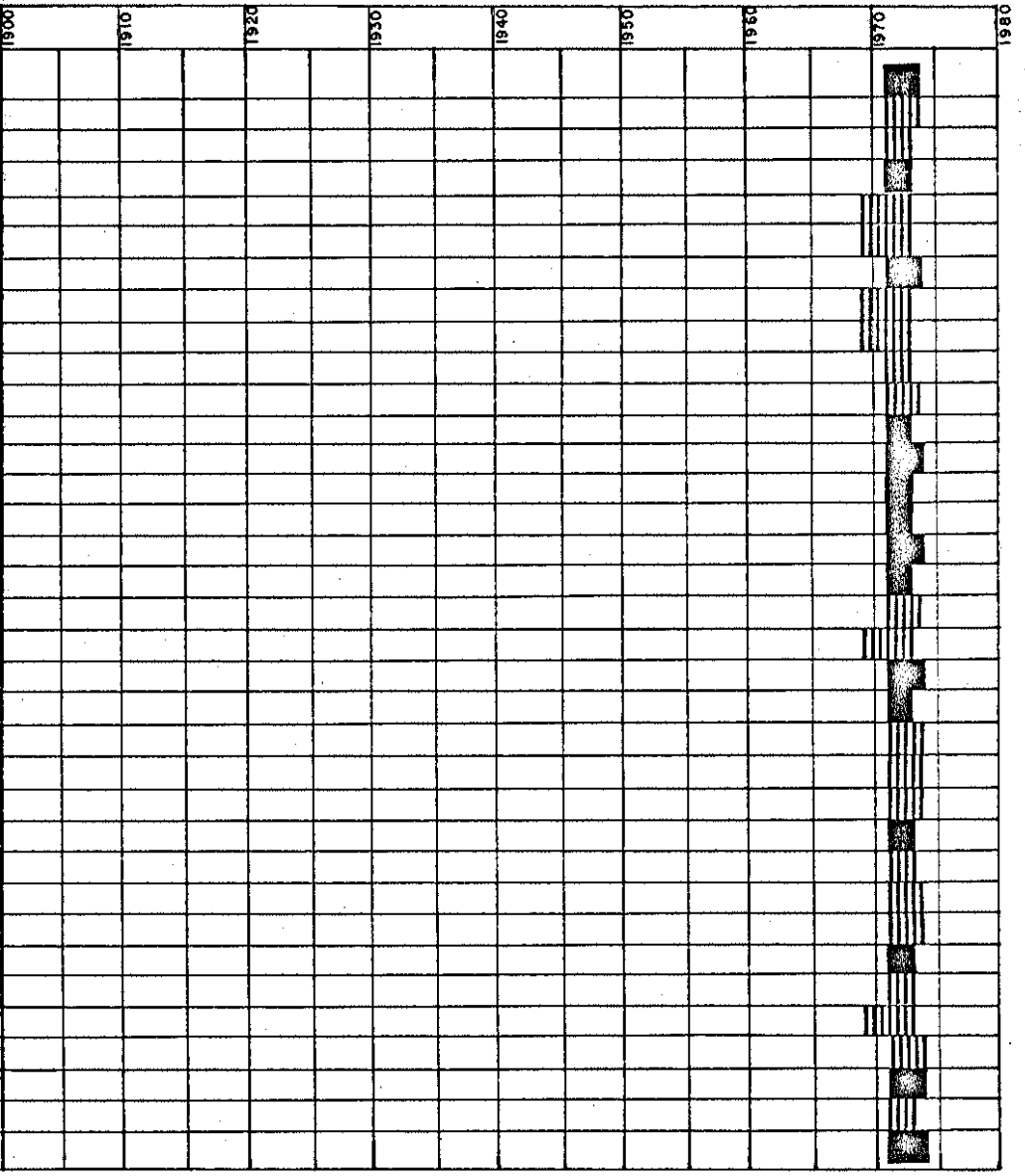
PRECIP. & TEMP.

THOMPSON RIVER BASIN PRE-PLANNING STUDY

METEOROLOGICAL STATION RECORDS
Resource Analysis Branch

Table I-H

STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
116182	Crowfoot	1496	51°01'	119°14'	
116169	Cruickshank	358	50°53'	119°32'	
116116	Deafies	754	50°23'	118°56'	
116101	Dettlebach	511	50°43'	119°15'	
116060	Ditch	477	50°14'	119°12'	
116061	Dry Lake	1200	50°07'	118°30'	
116162	Duck Range	879	50°37'	119°49'	
116063	Dude	777	50°13'	118°34'	
116068	Dure	566	50°15'	119°03'	
116139	Duteau	634	50°13'	119°03'	
116137	Echo	460	51°15'	119°32'	
116125	Elbow	583	50°41'	118°45'	
116195	Ferris	931	50°30'	119°30'	
116103	Fly Hill 2500	794	50°41'	119°23'	
116104	Fly Hill 4900	1477	50°42'	119°24'	
116186	Fowler	548	51°09'	119°02'	
116083	Glenemma	535	50°30'	119°17'	
116135	Gordon Creek	414	51°25'	119°28'	
116066	Gothic	631	50°15'	118°50'	
116167	Greenacres	414	50°44'	119°47'	
116088	Grindrod	355	50°38'	119°06'	
116163	Harper	354	50°43'	119°46'	
116142	Hindu	441	51°07'	119°43'	
116157	Hopspur	355	50°40'	120°07'	
116082	Hullear	563	50°29'	119°15	
116124	Hupel	502	50°37'	118°46'	
116250	Jacko	913	50°36'	120°27'	
116193	Joyce	834	50°34'	119°36'	
116085	Kendry	368	50°28'	119°09'	
116123	Kingfisher	397	50°35'	118°52'	
116069	Lavington	511	50°13'	119°07'	
116171	Little White	487	50°53'	119°18'	
116263	Lolo STP	842	50°47'	120°11'	
116128	Mabel	774	50°47'	118°40'	
116179	Magna Bay	354	50°58'	119°14'	



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PRECIPITATION

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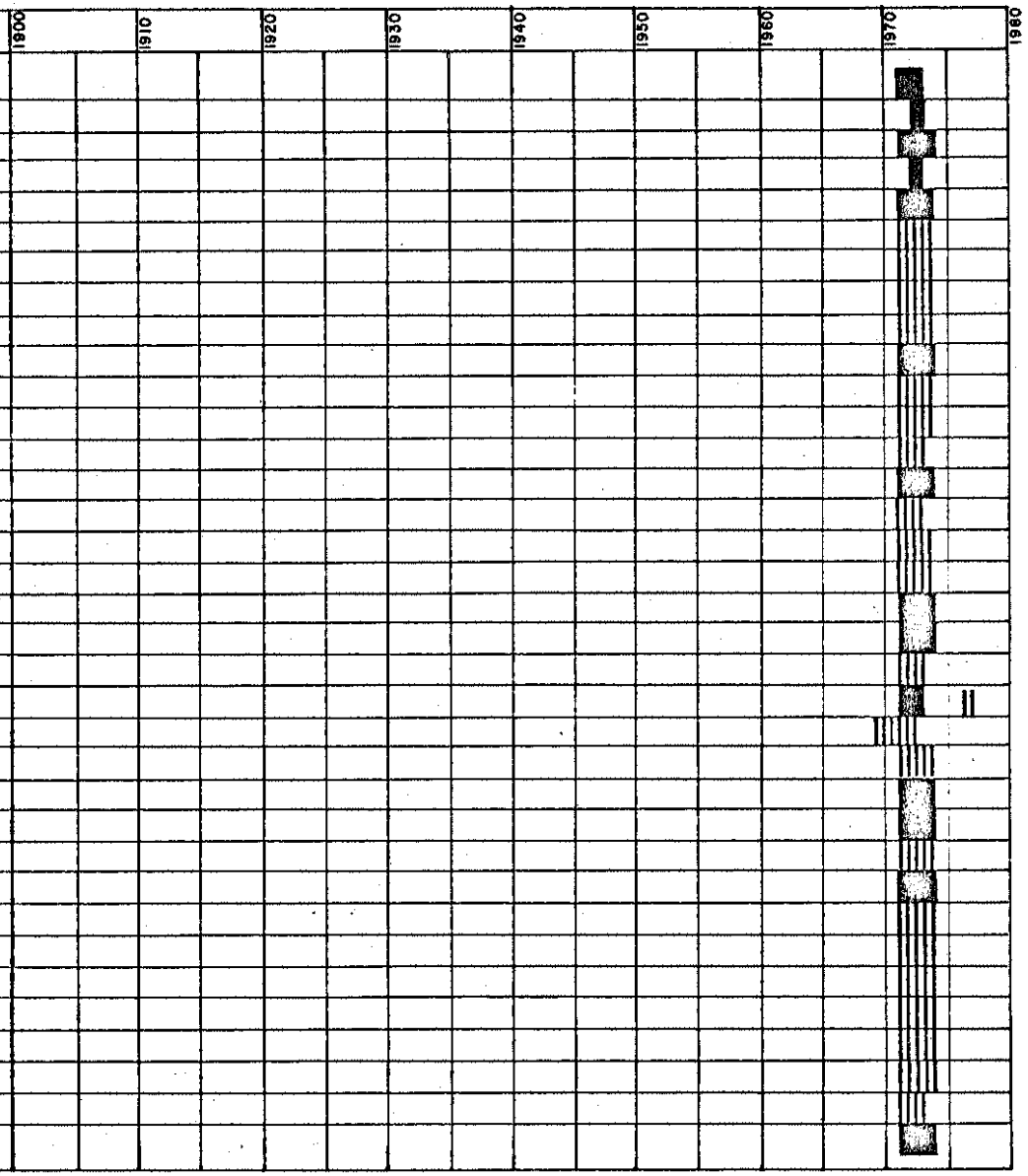
THOMPSON RIVER BASIN PRE-PLANNING STUDY

METEOROLOGICAL STATION RECORDS

Resource Analysis Branch

Table I-I

STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
116081	Maid	398	50°25'	119°13'	
116515	Martin Mtn.	1354	50°36'	119°34'	
116156	McCraken	358	50°40'	120°13'	
116097	Metcalf	751	50°41'	119°08'	
116133	Michael Creek	798	51°22'	119°24'	
116158	Monte 1 Creek	366	50°39'	119°59'	
116201	Monte 2 Creek	557	50°38'	119°55'	
116200	Monte 3 Creek	635	50°36'	119°53'	
116199	Monte 4 Creek	681	50°34'	119°53'	
116161	Neds	652	50°39'	119°50'	
116164	Nescaine	351	50°46'	119°44'	
116166	Nisconlith	379	50°48'	119°43'	
116126	Noisy	731	50°44'	118°42'	
116134	North Adams	456	51°27'	119°28'	
116119	Oleen	542	50°31'	118°57'	
116191	Osland	742	50°42'	119°38'	
116198	Pringle	703	50°30'	119°50'	
116160	Pritchard	382	50°41'	119°48'	
116172	Reienecker	891	50°51'	119°15'	
116087	Ricardo	366	50°33'	119°06'	
116110	Rimco Mara	2006	49°45'	120°49'	
116065	Riverside	492	50°15'	118°42'	
116159	Rocky	354	50°39'	119°54'	
116249	Rosehill	1016	50°37'	120°16'	
116180	Ross Creek	540	50°59'	119°14'	
116204	Salmon Lake	959	50°17'	119°60'	
116141	Samatosum	916	51°07'	119°43'	
116177	Scotch Creek	401	50°56'	119°28'	
116184	Seymour	494	51°02'	119°03'	
116247	Shumway	695	50°32'	120°15'	
116144	Sinmax	570	51°08'	119°54'	
116143	Skwaam	410	51°04'	119°47'	
116262	Skydiver	604	50°44'	120°13'	
116086	Sneezby	369	50°28'	119°09'	
116174	Snow Lily	543	50°47'	119°38'	



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PRECIPITATION
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PRECIP. & TEMP.

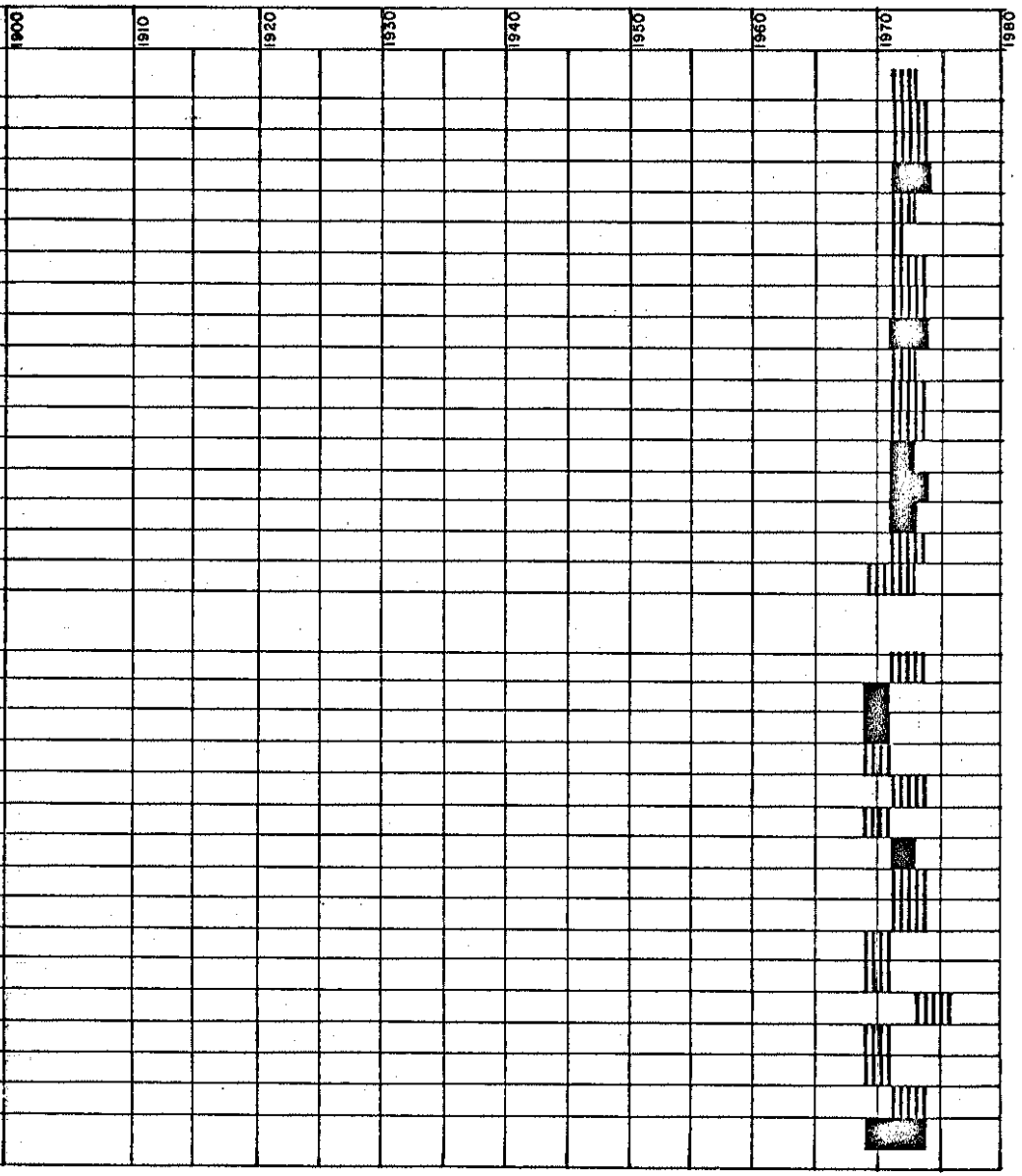
THOMPSON RIVER BASIN PRE-PLANNING STUDY

METEOROLOGICAL STATION RECORDS

Resource Analysis Branch

Table I-J

STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
116108	Spa	538	50°30'	119°22'	
116293	Spapiteum	451	51°10'	119°35'	
116168	Squilax	352	50°51'	119°36'	
116251	Stave Lake	1350	50°31'	120°29'	
116099	Stephy	523	50°40'	119°13'	
116106	Silver	389	50°35'	119°22'	
116194	Sweetsbridge	556	50°27'	119°28'	
116187	Two Mile	407	51°10'	119°02'	
116181	Upper Ross	866	51°00'	119°13'	
116117	Vance	666	50°27'	118°58'	
116202	Vanity	712	50°24'	119°50'	
116190	Vixen	664	50°46'	119°39'	
116127	Wap	532	50°46'	118°35'	
116294	West Adam	714	51°10'	119°37'	
116107	Yankee Flats	537	50°32'	119°22'	
116203	Yelbelmar	985	50°20'	119°57'	
116062	Yeoward	882	50°10'	118°31	
THOMPSON					
116228	Anne	858	50°40'	120°46'	
116057	Beaver Dam	1132	51°16'	121°36'	Also evaporation.
116043	Begbie L.O.	1243	51°23'	121°22'	Also evaporation.
116058	Bullock	1100	51°24'	121°23'	
116233	Chartrand	1052	50°31'	120°51'	
116051	Chasm	1062	51°13'	121°31'	
116517	Chuwhels	1446	50°35'	120°37'	
116210	Dufferin	688	50°40'	120°25'	
116229	Durand	1089	50°37'	120°49'	
116042	Edmund	1191	51°35'	121°20'	
116032	83 Mile	1126	51°24'	121°16'	
116476	Gladwin	231	50°15'	121°32'	
116056	Good Enough	1129	51°20'	121°39'	
116039	Graham	1034	51°24'	120°58'	
116232	Guichon	1183	50°35'	120°51'	
116030	Gwennie	1240	51°31'	121°08'	



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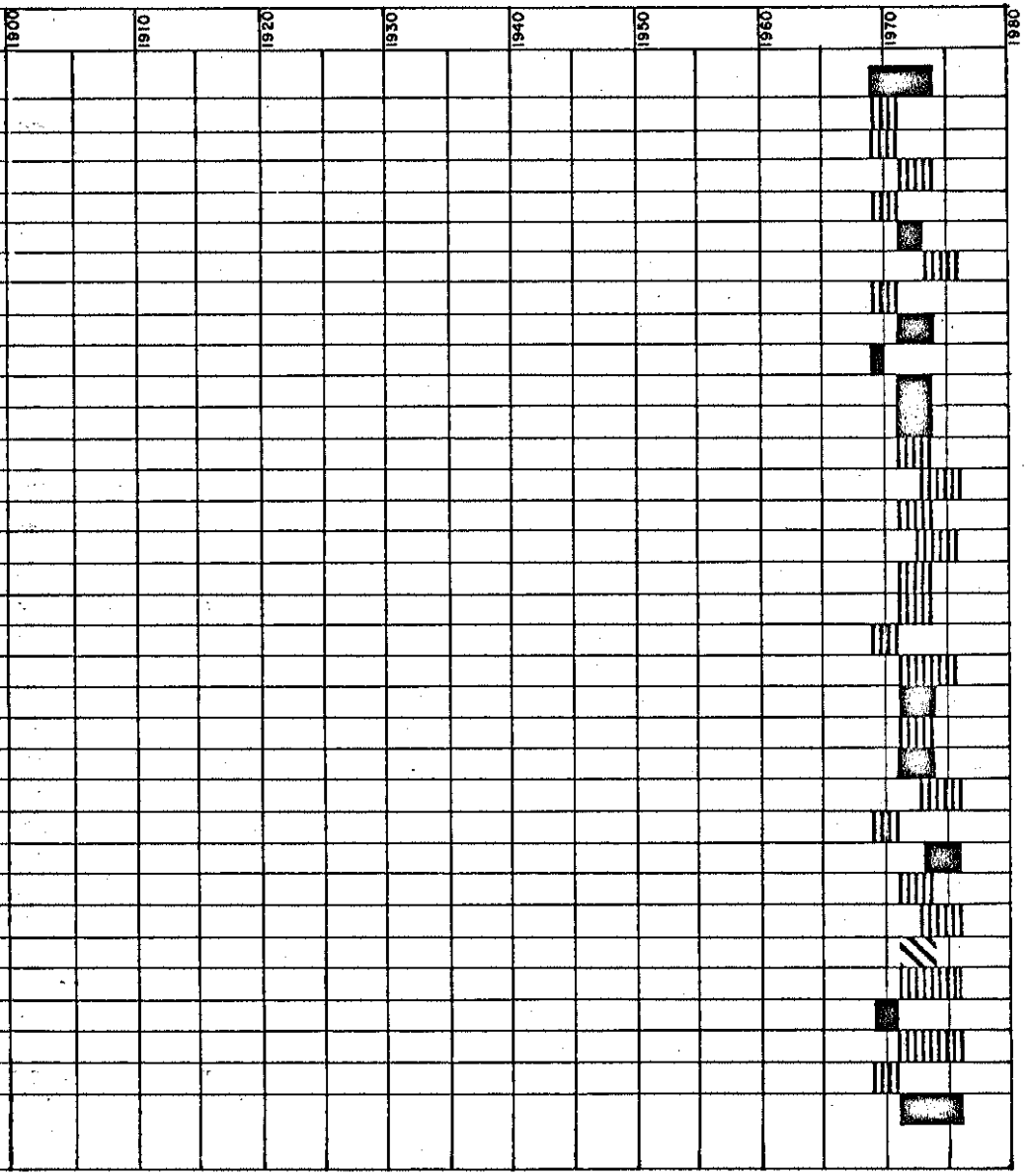
PRECIPITATION
TEMPERATURE
PRECIP. & TEMP.

THOMPSON RIVER BASIN PRE-PLANNING STUDY

METEOROLOGICAL STATION RECORDS
Resource Analysis Branch

Table I-K

STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
116029	Hereford	1174	51°32'	121°10'	
116017	Holden	1191	51°34'	121°19'	
116040	Hooligan	1197	51°23'	120°50'	
116211	Hughes	645	50°40'	120°32'	
116052	Illahee	1192	51°09'	121°30'	
116301	Kamloops BCFS	538	50°40'	120°21'	
116378	Klak	292	50°20'	121°24'	
116050	Koster	1102	51°16'	121°27'	
116231	Leighton	1275	50°39'	120°51'	
116018	Lone Butte	843	51°33'	121°12'	Evaporation only.
116226	Mad Dog	552	50°45'	120°48'	
116227	Mt. Savona	1525	50°42'	120°49'	
116224	Mowich	662	50°11'	120°55'	
116396	Pimainus	283	50°28'	121°18'	
116221	Pipe	491	50°50'	120°56'	
116408	Quiltanton	1231	50°29'	121°02'	
116215	Rabbit 1	367	50°46'	120°45'	
116214	Rabbit 2	504	50°46'	120°46'	
116038	Rayfield	1028	51°22'	121°06'	
116219	Redskin	645	50°46'	120°54'	
116225	Rock Lake	1089	51°07'	120°49'	
116212	Roper Ranch	453	50°42'	120°36'	
116213	Six Mile Ranch	385	50°44'	120°41'	
116379	Soap	298	50°22'	121°23'	
116036	Sodium	1003	51°20'	121°20'	
116380	Spences	262	50°26'	121°19'	
116222	Split Rock	530	50°53'	120°58'	
116377	Thompson	246	50°16'	121°24'	
116230	Tunkwa	1163	50°37'	120°51'	
116217	Walachin	445	50°46'	120°59'	
116031	Watch Lake	1091	51°29'	121°07'	Also evaporation.
116216	Wendego	439	50°45'	120°53'	
116041	Wilson	1102	51°24'	120°43'	
116220	Yellowpine	893	50°47'	120°54'	



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PRECIPITATION
TEMPERATURE
PRECIP. & TEMP.

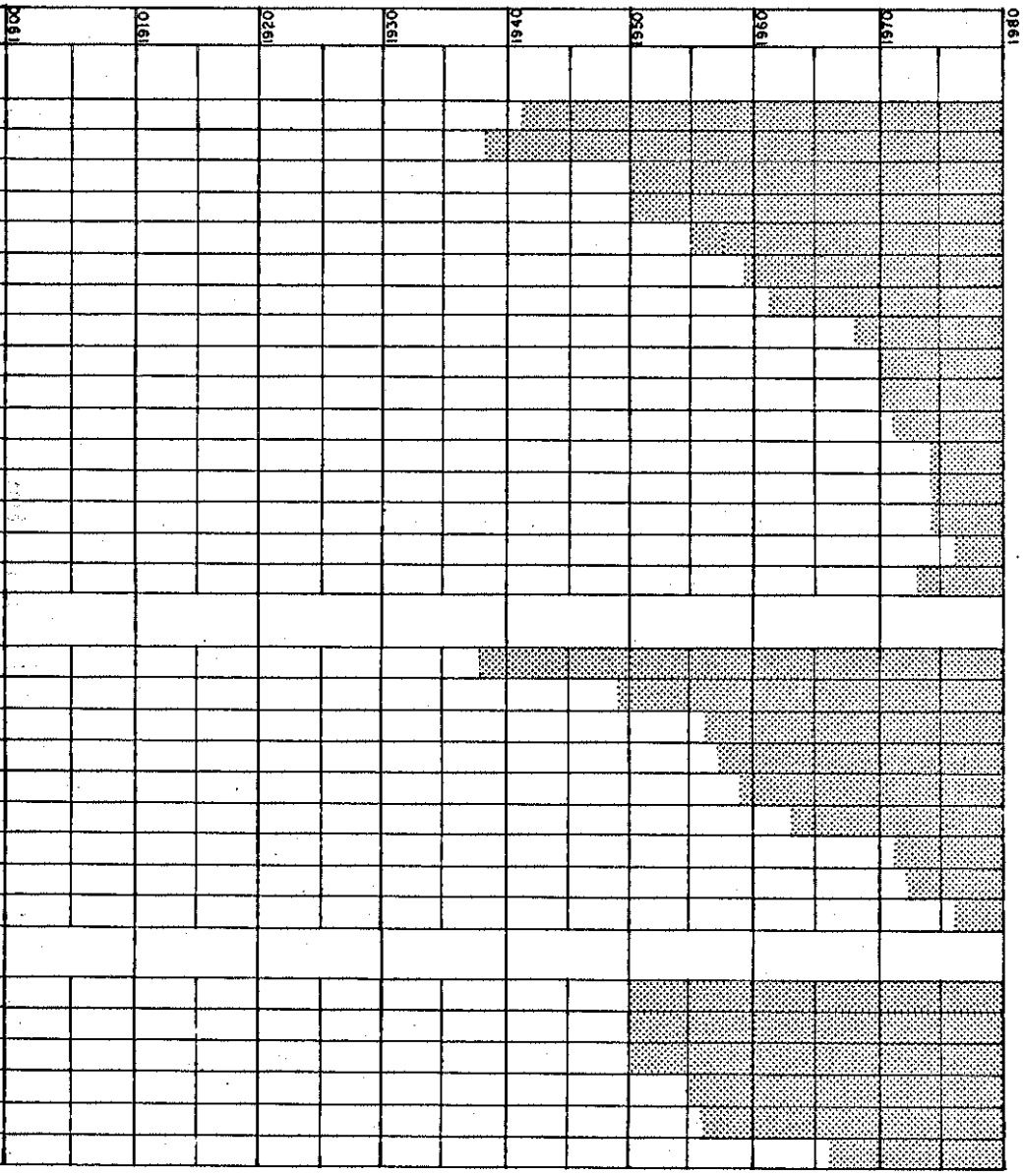
THOMPSON RIVER BASIN PRE-PLANNING STUDY

METEOROLOGICAL STATION RECORDS

Resource Analysis Branch

Table I-L

STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS
NORTH THOMPSON					
9A	Canoe River	910	52°47'	119°17'	
22	Blue River	690	52°08'	119°15'	
51	Trophy Mtn. No. 1	1900	51°49'	119°56'	
53	Mount Albreda	1920	52°30'	119°03'	
80	Knouff Lake	1200	50°59'	120°08'	
127	Cook Forks	1390	52°10'	119°19'	
173	Mount Timothy	1660	51°54'	121°16'	
187	Boss Mountain Mine	1520	52°06'	120°52'	
210	Adams River	1720	51°35'	119°23	
214	Azure River	1620	52°37'	119°43'	
229	Blue River Town	670	52°08'	119°15'	
256	Kostal Lake	1770	52°12'	120°02'	
257	Trophy Mtn. No. 2	1860	51°49'	119°57'	
258	Mount Cook No. 2	1580	52°11'	119°19'	
275	Mount St. Anne	1770	52°16'	119°14'	
P7	Mount St. Anne	1770	52°16'	119°14'	Snow pillow.
SOUTH THOMPSON-SHUSWAP LAKE					
6A	Aberdeen Lake	1310	50°09'	119°03'	
48A	Monashee Pass	1370	50°05'	118°30'	
84	Anglemont	1190	51°00'	119°11'	
91	Park Mountain	1890	50°27'	118°36'	
99	Silver Star Mtn.	1840	50°22'	119°03'	
130	Enderby	1900	50°39'	118°55'	
234	Bouleau Lake	1400	50°17'	119°39'	
238	Kirbyville Lake	1750	51°34'	118°46'	
276	Haddo Lake	1300	50°06'	119°05'	
THOMPSON					
49	Porcupine Ridge	1830	50°58'	120°33'	
56	Tranquille Lake	1420	50°56'	120°33'	
57	Pass Lake	870	50°51'	120°30'	
81	Pavilion	1230	50°55'	121°49'	
85	Lac Le Jeune (Lower)	1370	50°28'	120°30	
124	Lytton	270	50°15'	121°34'	



THOMPSON RIVER BASIN PRE-PLANNING STUDY

SNOW COURSE STATION RECORDS

Water Investigations Branch

Table 2-A

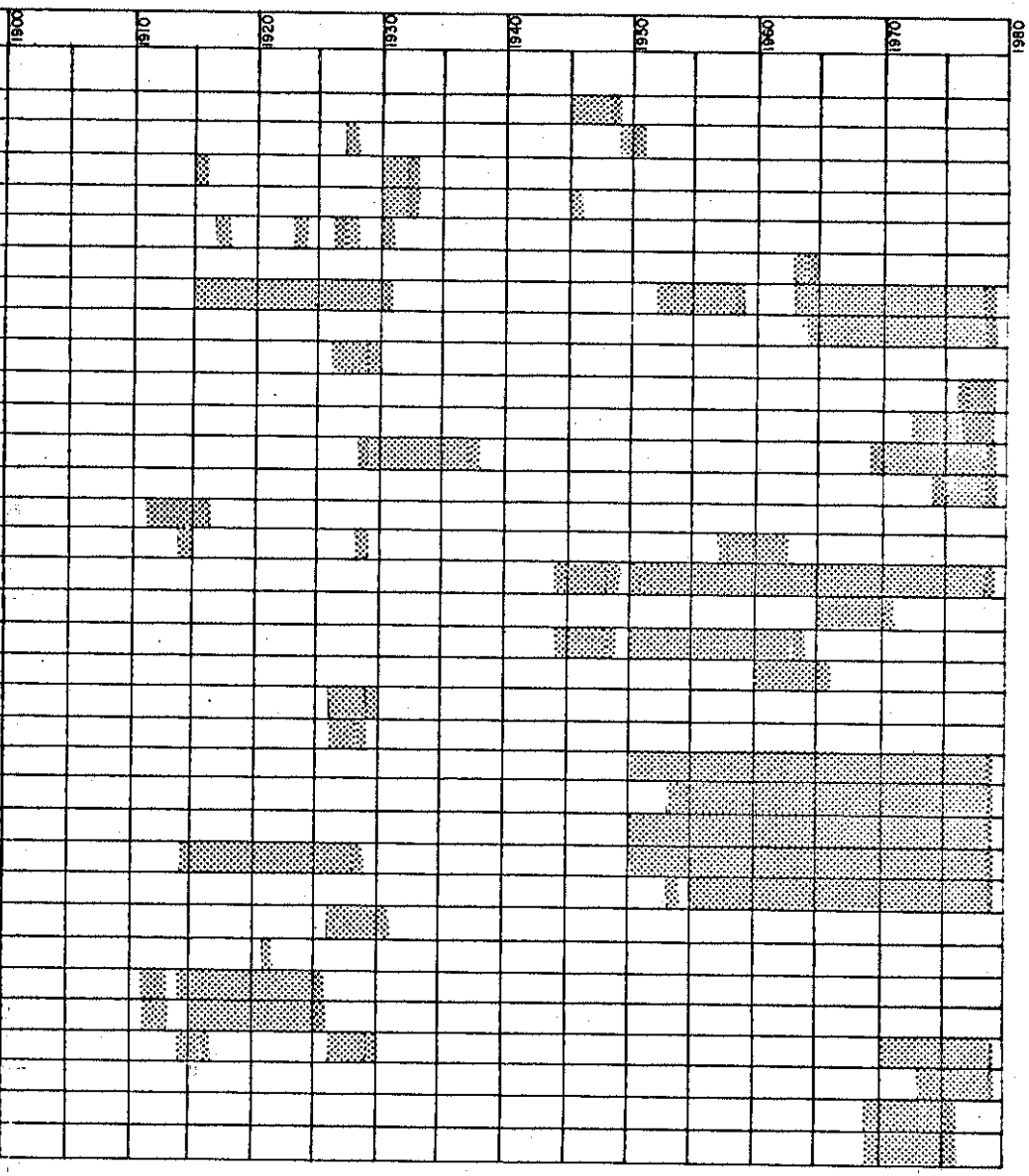
STN. NO.	STATION NAME	ELEVATION (m)	LAT.	LONG.	REMARKS	1900		1910		1920		1930		1940		1950		1960		1970		1980
153	Highland Valley No. 2	1510	50°30'	120°59'																		
185	Gnawed Mountain	1580	50°26'	120°59'																		
241	Lac Le Jeune (Upper)	1460	50°28'	120°30'																		
284	Harry Lake	1350	50°47'	121°33'																		
285	Cornwall Hills	2000	50°42'	121°27'																		

THOMPSON RIVER BASIN PRE-PLANNING STUDY

SNOW COURSE STATION RECORDS

Table 2-8

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)	
NORTH THOMPSON			
08LB061	Badger Creek near Heffley Creek	21.2	
08LB062	Badger Creek near Louis Creek	29.0	
08LB051	Barriere River near Barriere (at Dam)	1,026	R
08LB052	Barriere River B.C.E.R. Flume near Barriere	-	R
08LB021	Barriere River (East Fork) near Barriere	155	R
08LB068	Barriere River below Lee Creek	585	
08LB020	Barriere River at the Mouth	1,140	
08LB069	Barriere River below Sprague Creek	624	
08LB038	Blue River near Blue River	280	
08LB077	Bone Creek near Blue River	267	
08LA019	Boss Creek above Hendrix Creek	122	R
08LA005	Bridge Creek near 100 Mile House	1,326	
08LA020	Bridge Creek at Outlet of Horse Lake	912	
08LB001	Cahilty Creek near Louis Creek	57.2	
08LA016	Candle Creek near Clearwater Station	25.1	
08LA011	Canim Lake near Canim Lake	-	*
08LA015	Canim Creek at Outlet of Spout Lake	65.2	
08LA006	Canim River at Outlet of Canim Lake	-	
08LB065	Christian Creek near Heffley Creek	8.0	
08LB044	Chu Chua Creek near Chu Chua	104	
08LB041	Chuck Creek near Vavenby	78.0	
08LA012	Clearwater Lake near Clearwater Station	-	*
08LA009	Clearwater River at Inlet to Clearwater Lake	2,383	
08LA007	Clearwater River at Outlet of Clearwater Lake	2,953	
08LA001	Clearwater River near Clearwater Station	11,189	
08LA013	Clearwater River at Outlet of Hobson Lake	904	
08LB045	Darlington Creek near Chinook Cove	78.0	
08LB033	Dunn Creek near Chu Chua	-	
08LB003	Edwards Creek near Heffley Creek	39.0	R
08LB023	Edwards Creek (Lyon's Diversion) near Heffley Creek	-	R
08LB024	Fishtrap Creek near McLure	135	
08LB076	Harper Creek near the Mouth	168.1	
08LB071	Hascheak Creek above Russell Creek	8.0	R
08LB070	Hascheak Creek below Russell Creek	24.3	R



R - Regulated

* - Stage only

THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROMETRIC STATION RECORDS

Water Survey of Canada

Table 3-A

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)		1900	1910	1920	1930	1940	1950	1960	1970	1980
08LB005	Heffley Creek near Heffley Creek	73.0	R									
08LB006	Heffley Creek (Anderson Diversion) nr. Heffley Creek	-	R									
08LB016	Heffley Creek at Inlet to Heffley Lake	18.1										
08LB004	Heffley Creek near Kamloops	168	R									
08LB066	Heffley Lake near Heffley Creek	-	*									
08LA002	Hemp Creek near Raft River	177										
08LA018	Hobson Creek below Bois Grenier Creek	162.4										
08LA014	Hobson Lake near Clearwater Station	-	*									
08LB008	Jamieson Creek above B.C. Fruitlands Diversion	230	R									
08LB009	Jamieson Creek below B.C. Fruitlands Diversion	-	R									
08LB025	Knouff Creek below Sullivan Lake	41.4	R									
08LB028	Knouff Creek at Outlet of Sullivan Lake	26.0	R									
08LB073	Lemieux Creek near the Mouth	443										
08LB042	Lemieux Creek near Mount Olie	195										
08LB030	Leonie Creek near Barriere	26.0	R									
08LB046	Lindquist Creek near Chinook Cove	78.0										
08LB010	Louis Creek at Boundary of Railway Belt	269										
08LB049	Louis Creek near Louis Creek	515										
08LB072	Louis Creek at the Mouth	515	R									
08LB075	McDougall Creek near Birch Island	18.0										
08LB039	Mad River near Irvine	230										
08LA010	Mahood Lake near Clearwater Station	-	*									
08LA008	Mahood River at Outlet of Mahood Lake	4,714										
08LB050	Mann Creek near Blackpool	295.3										
08LA003	Murtle River near Clearwater Station	1,241										
08LA004	Murtle River above Dawson Falls	1,378										
08LB043	Nehalliston Creek near Mount Olie	155										
08LB031	Nelson Creek near Barriere	13.0										
08LB022	North Thompson River near Barriere	17,690										
08LB047	North Thompson River at Birch Island	4,455										
08LB015	North Thompson River near Black Pines	-	R									
08LB064	North Thompson River at McLure	19,555										
08LB011	Paul Creek above Pinantan Lake	39.0										
08LB012	Paul Creek at the Outlet of Pinantan Lake	56.0										
08LB053	Paul Lake near Kamloops	-	R,*									

R - Regulated

* - Stage only

THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROMETRIC STATION RECORDS

Water Survey of Canada

Table 3-B

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)		1900	1910	1920	1930	1940	1950	1960	1970	1980
08LB032	Peterson Creek near Barriere	110	R									
08LB017	Raft River near Clearwater	764										
08LB040	Reg Christie Creek near Vavenby	72.0										
08LB029	Siwash Creek near Heffley Lake	11.1										
08LB037	Thunder River near Blue River	267										
08LB019	Whitewood Creek at Highway Bridge near Black Pines	34.0										
SOUTH THOMPSON-SHUSWAP LAKE												
08LC043	Aberdeen Lake at Outlet	-	R,*									
08LD003	Adams Lake near Squilax	-	*									
08LD001	Adams River near Squilax	3,082										
08LC039	Bessette Creek above Beaverjack Creek	604	R									
08LC005	Bessette Creek near Lumby	253	R									
08LC042	Bessette Creek above Lumby Lagoon Outfall	469	R									
08LE038	Blair Creek near Falkland (Lower)	78.0										
08LE040	Blair Creek near Falkland (Upper)	78.0										
08LC025	Blurton Creek near Mara	19.2										
08LE094	Bolean Creek near Mouth	224										
08LC029	Bongard Creek near Mara	13.0										
08LC004	Brash Creek near Enderby	33.0										
08LE002	Campbell Creek near Barnhart Vale	518										
08LE037	Campbell Creek near Barnhart Vale (Upper)	285										
08LE003	Campbell Creek near Monte Creek	-										
08LE058	Campbell Creek below Scuitto Creek	-	R									
08LE074	Canoe Creek above East Canoe Creek	39.1										
08LE004	Canoe Creek near Salmon Arm	70.2										
08LE025	Celista Creek near Albas	282.3										
08LE005	Chase Creek near Chase	-										
08LE081	Chum Creek near Squilax	-	R									
08LE052	Chum Lake near Squilax	-	*									
08LE077	Corning Creek near Squilax	26.2	R									
08LE026	Crazy Creek at Taft	117										
08LC046	Creighton Creek near Creighton Valley	-	R									
08LC033	Creighton Creek near Lumby	38.0										
08LC017	Dermont Creek near Lavington	-	R									
08LC014	Duteau Creek at Outlet of Haddo Lake	81.1	R									

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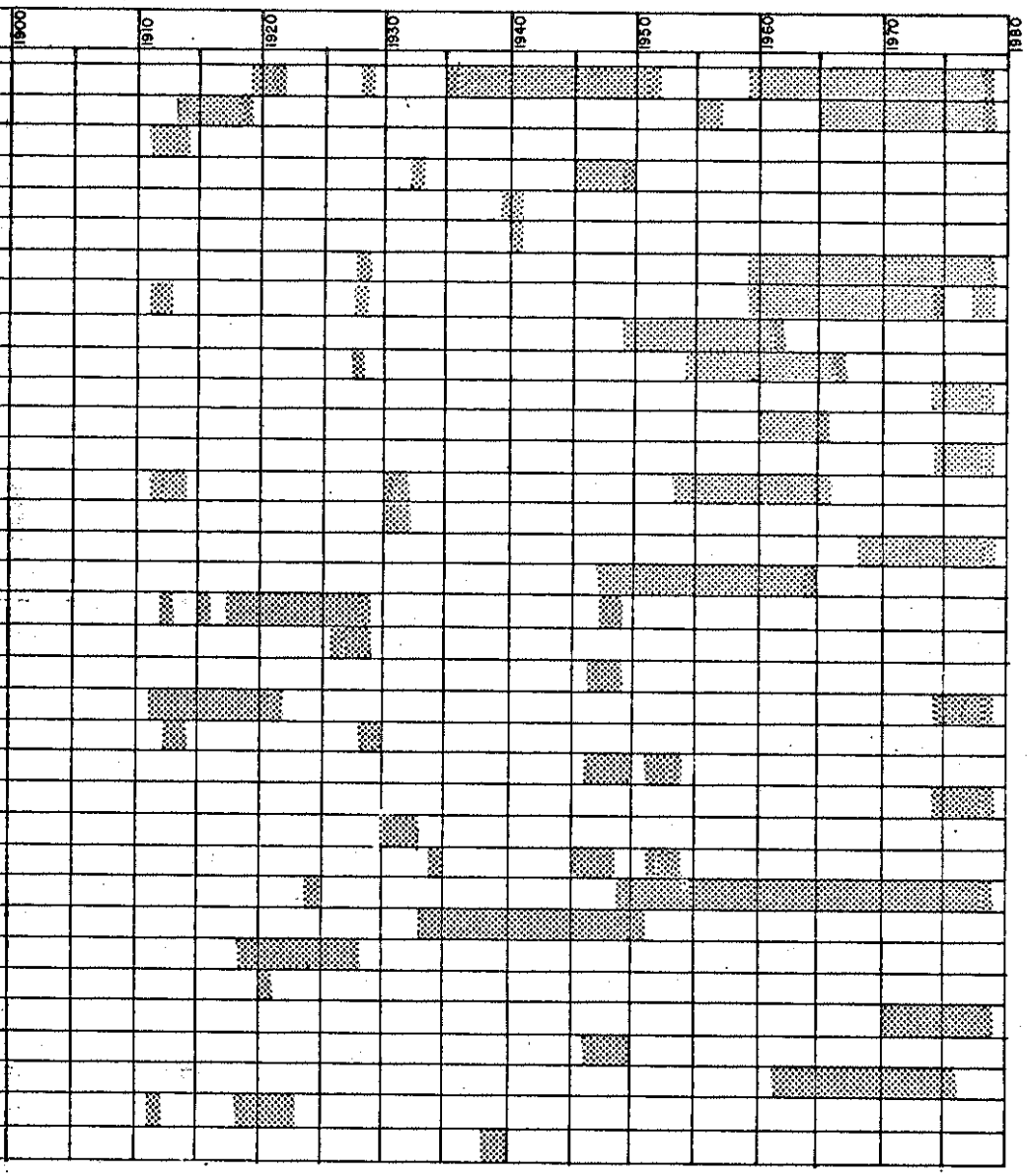
THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROMETRIC STATION RECORDS Table 3—C

Water Survey of Canada

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)	
08LC006	Duteau Creek near Lavington	-	R
08LE024	Eagle River near Malakwa	904	
08LE007	Eagle River near Sicamous	?	
08LE054	East Canoe Creek near Salmon Arm	21.0	
08LE055	Farrell Creek near Tappen	10.0	
08LE056	Farrell Creek near Tappen	-	
08LC034	Ferry Creek near Lumby	145	
08LC035	Fortune Creek near Armstrong	41.2	R
08LC031	Fortune Creek at Stepney	132	R
08LE067	Fowler Creek near Falkland	16.0	
08LE096	Fowler Creek at 2100-foot Contour	-	R
08LC036	Gardom Creek near Grindrod	26.0	
08LE092	Gordon Creek above Diversion	18.0	
08LE044	Gordon Creek near Salmon Arm	19.0	R
08LE045	Grier Creek near Salmon Arm	13.0	
08LC044	Haddo Lake at Outlet	-	R
08LD006	Hiuihill Creek near Squilax (Lower)	104.0	
08LD002	Hiuihill Creek near Squilax (Upper)	70.0	
08LD005	Homestake Creek near Louis Creek	17.0	
08LC023	Hummingbird Creek near Sicamous	23.3	
08LE008	Ingram Creek near Mouth	63.2	
08LE009	Jacko Creek near Kamloops	11.0	
08LC026	Johnson Creek near Mara	21.0	R
08LE091	Kernaghan Creek above Diversion	8.3	
08LE046	Kernaghan Creek near Salmon Arm	13.0	
08LC021	Larch Hill Creek near Mara	13.0	
08LE057	Little Shuswap Lake at Chase	-	*
08LE051	Loakin Creek (Indian Diversion) near Shuswap	-	R
08LE033	Loakin Creek above Indian Diversion	52.0	
08LC009	McAuley Creek near Lumby	33.0	
08LC038	Mabel Lake at Outlet	-	R,*
08LC024	Mara Creek near Sicamous	23.3	
08LC037	Mara Lake near Sicamous	-	*
08LE010	Martin Creek near Pritchard	39.0	
08LC022	Monashee Creek near Cherryville	311	



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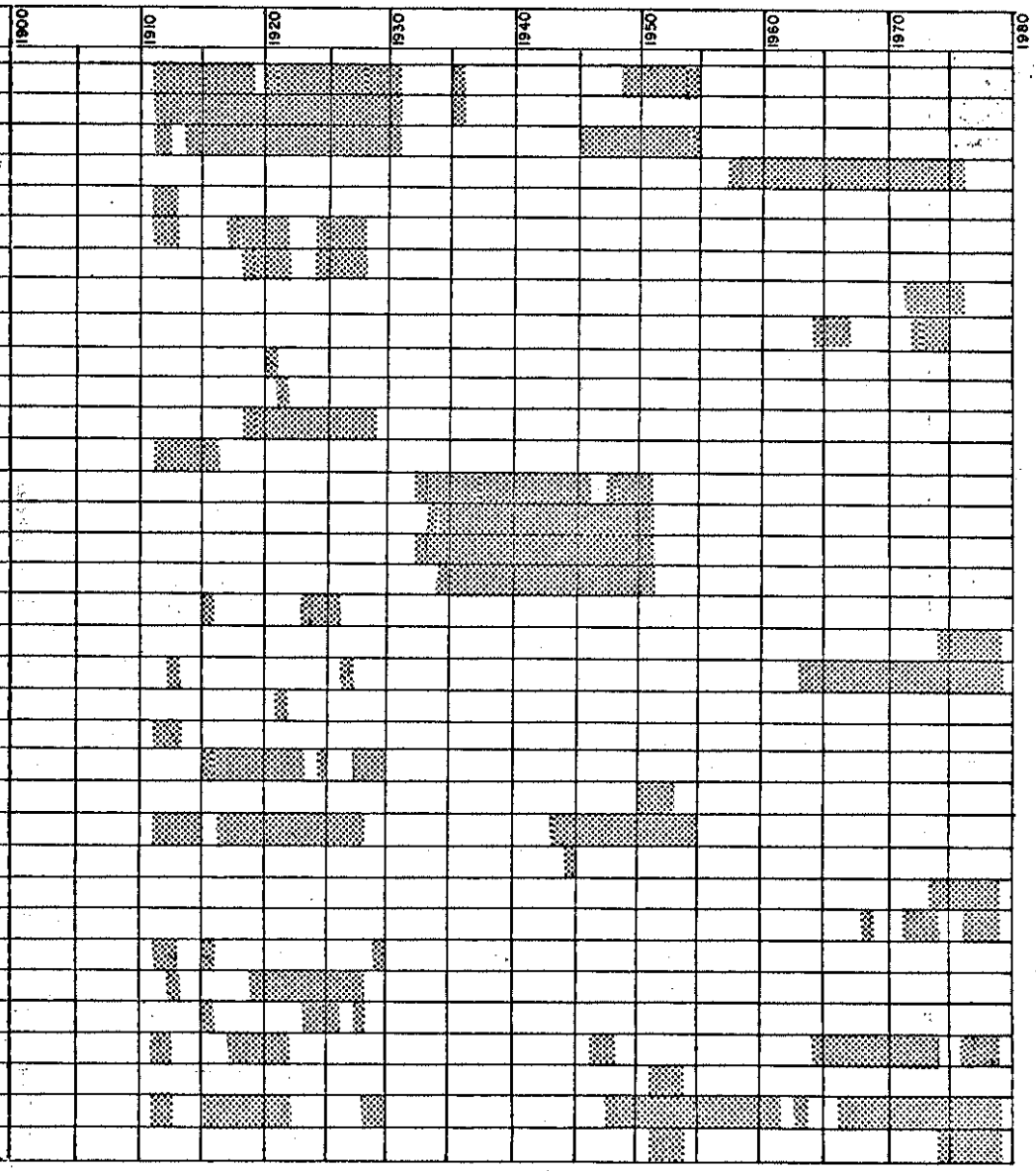
THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROMETRIC STATION RECORDS

Water Survey of Canada

Table 3-D

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)	
08LE012	Monte Creek near Monte Lake	61.0	R
08LE013	Monte Creek near Monte Lake	184	R
08LE011	Monte Creek (Diversion to Monte Lake) near Monte Lake	-	R
08LE068	Monte Lake near Monte Lake	-	R,*
08LE014	Moulton Creek near Pritchard	16.0	
08LE015	Neds Creek near Pritchard (Lower)	16.0	R
08LE034	Neds Creek near Pritchard (Lower)	5.2	R
08LE080	Newsome Creek at Mouth	24.9	R
08LE066	Newsome Creek at Sorrento	19.0	
08LC008	Nicklen Creek near Lumby (Lower)	31.0	
08LC010	Nicklen Creek near Lumby (Upper)	20.0	
08LE032	Niskonlith Creek above Niskonlith Lake	31.1	
08LE016	Niskonlith Creek near Shuswap	130	R
08LE049	Niskonlith Creek (Hoffman & Ross Diversion) nr. Shuswap	-	R
08LE048	Niskonlith Creek (Indian Diversion) near Shuswap	-	R
08LE079	Niskonlith Lake near Shuswap	-	R,*
08LE050	Niskonlith Lake Spillway	-	R
08LE028	Onyx Creek near Magna Bay	51.0	
08LE093	Palmer Creek above Diversions	16.0	
08LE072	Palmer Creek near Salmon Arm	18.1	R,*
08LC015	Paradise Creek near Lumby	14.0	
08LE017	Pemberton Creek near Pritchard	21.0	
08LE035	Peterson Creek near Kamloops	65.0	R
08LE061	Peterson Creek near Knutsford	103	
08LE006	Pringle Creek near Westwold	16.0	R
08LC028	Ptarmigan Creek near Mara	-	
08LE086	Ratchford Creek at 2000-foot Contour	253	
08LE078	Robbins Creek above Disdero Creek	32.1	
08LE018	Robbins Creek near Monte Lake (Lower)	39.0	R
08LE022	Robbins Creek near Robbins Range	16.0	
08LE029	Ross Creek near Anglemont	104	
08LE019	Salmon River above Adelphi Creek	547	R
08LE063	Salmon River near Douglas Lake	237	
08LE020	Salmon River at Falkland	1,036	R
08LE064	Salmon River near Falkland	1,116	R



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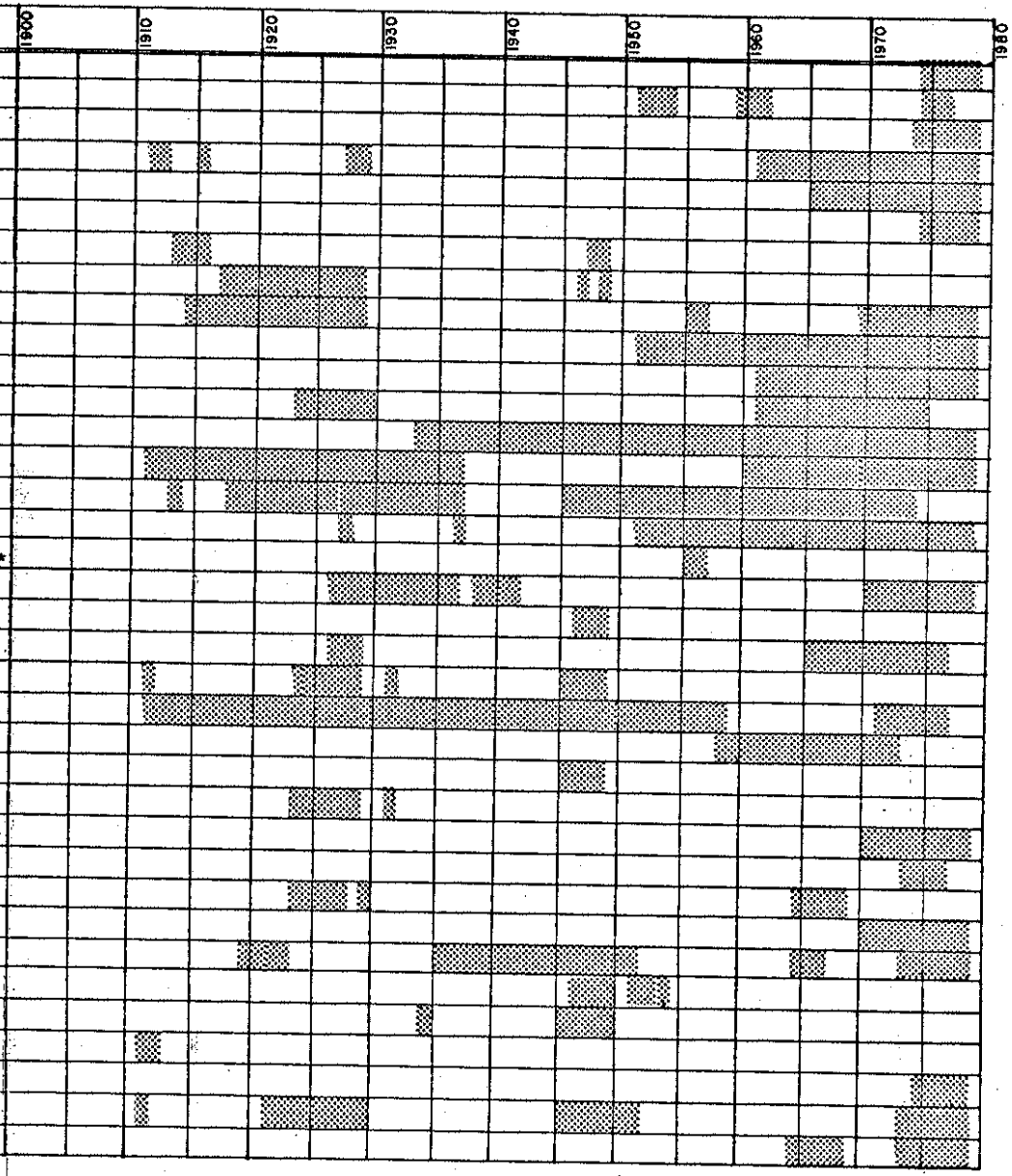
THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROMETRIC STATION RECORDS

Water Survey of Canada

Table 3-E

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)	
08LE089	Salmon River above Fowler Creek	1,072	R
08LE065	Salmon River at Glenemma	1,163	
08LE088	Salmon River above Kernaghan Creek	1,404	
08LE021	Salmon River near Salmon Arm	1,507	R
08LE075	Salmon River above Salmon Lake	143	
08LE090	Salmon River below Silver Creek	1,210	R
08LE030	Scotch Creek near Sorrento	635	
08LE036	Scuitto Creek near Barnhart Vale	122	
08LE027	Seymour River near Seymour Arm	806	
08LE070	Shuswap Lake at Salmon Arm	-	*
08LE071	Shuswap Lake at Seymour Arm	-	*
08LE053	Shuswap Lake near Sicamous	-	*
08LE047	Shuswap Lake near Sorrento	-	*
08LC002	Shuswap River near Enderby	4,688	R
08LC003	Shuswap River near Lumby	2,000	
08LC019	Shuswap River at Outlet of Mabel Lake	4,040	R
08LC032	Shuswap River below Skookumchuck Rapids	-	R,*
08LC018	Shuswap River at Outlet of Sugar Lake Reservoir	1,127	R
08LC027	Sicamous Creek near Sicamous	65.0	
08LD004	Sinmax Creek below Johnson Creek	130	
08LE043	Silver Creek near Salmon Arm	26.0	
08LE031	South Thompson River at Chase	16,162	
08LE069	South Thompson River at Monte Creek	16,602	
08LE060	Spa Creek below Cowpersmith Diversion	13.0	R
08LE042	Spa Creek above Cowpersmith Diversion	13.0	
08LC041	Sugar Lake Reservoir at Outlet	-	R,*
08LE087	Tappen Creek at the Source	4.4	
08LE041	Tappen Creek near Tappen	27	
08LC040	Vance Creek below Deafies Creek	73.3	
08LC007	Vernon Irrigation District Diversion near Lavington	-	R
08LC030	Violet Creek near Grindrod (Lower)	-	
08LC020	Violet Creek near Grindrod (Upper)	13.0	
08LE023	Warren Creek near Salmon Arm	26.0	
08LE095	Weyman Creek near the Mouth	96.0	
08LE039	White Creek near Carlin	64.2	R
08LE073	White Creek at Tappen	125	R



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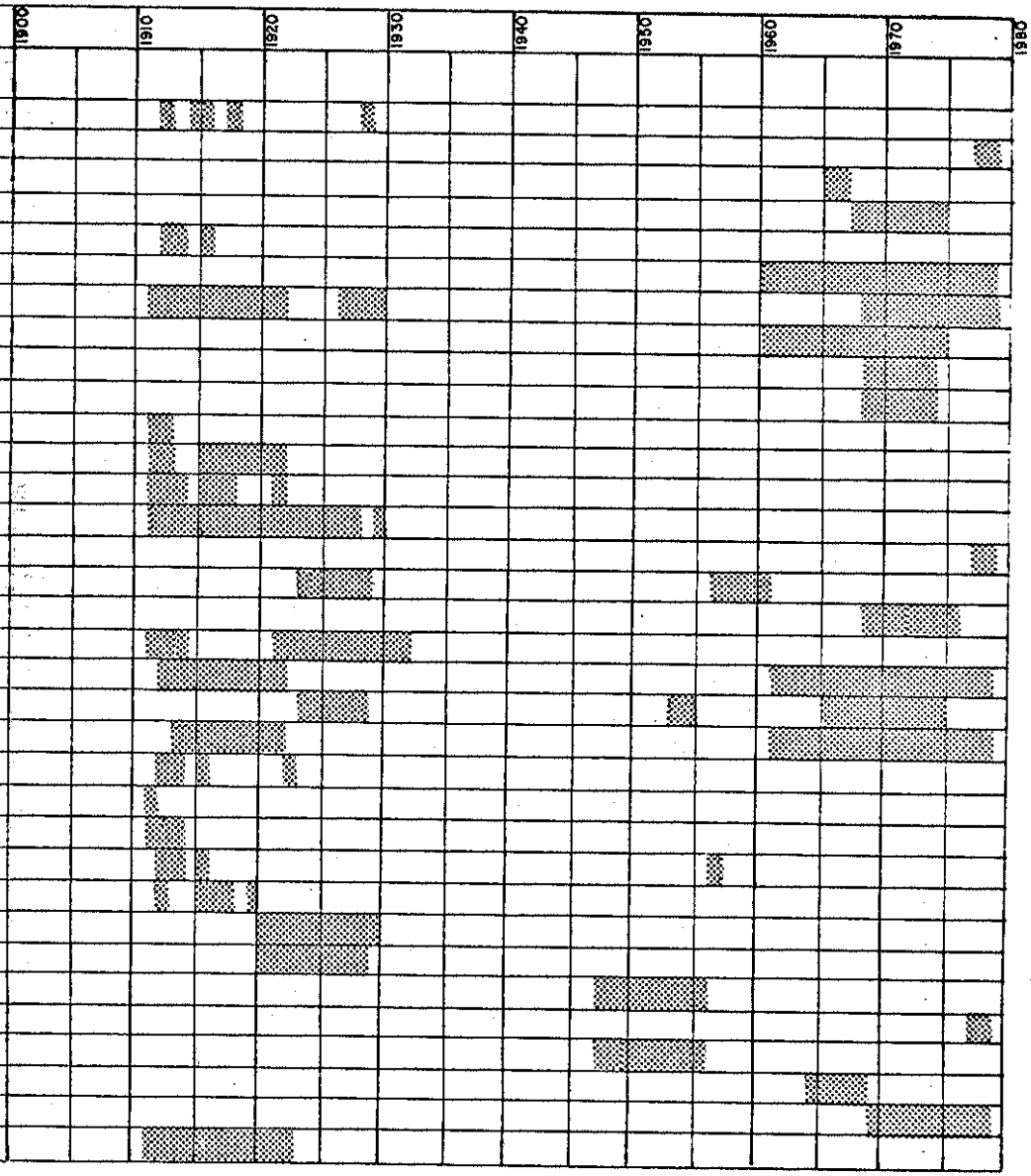
THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROMETRIC STATION RECORDS

Water Survey of Canada

Table 3-F

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)	
THOMPSON			
08LF041	Alkali Creek near Kamloops	6.5	R
08LF081	Ambusten Creek near the Mouth	33.0	
08LF067	Barnard Creek near Ashcroft	29.0	
08LF070	Barnes Creek above Pense Lake Diversion	32.4	
08LF008	Beaton Creek near Kamloops	34.0	R
08LF062	Bonaparte River near Bridge Lake	666	R
08LF002	Bonaparte River below Cache Creek	5,025	R
08LF060	Bonaparte River near Cache Creek	4,092	R
08LF065	Bonaparte River above Clinton Creek	3,212	R
08LF066	Bonaparte River above Loon Creek	2,564	R
08LF003	Botanie Creek near Lytton	98.4	R
08LF004	Cache Creek near Cache Creek	90.7	R
08LF029	Cache Creek (McAbee Diversion) near Cache Creek	-	R
08LF005	Cherry Creek near Kamloops	53.1	
08LF079	Cherry Creek near the Mouth	190	R
08LF038	Clinton Creek at Clinton	78.0	
08LF064	Clinton Creek near the Mouth	252	R
08LF006	Cornwall Creek near Ashcroft	91.0	R
08LF007	Criss Creek near Savona	490	R
08LF037	Cutoff Valley Creek near Clinton	58.0	R
08LF027	Deadman River above Criss Creek	863	R
08LF010	Deadman River (Walhachin Flume)	-	R
08LF011	Deadman River below Walhachin Flume	-	R
08LF009	Deadman River above Walhachin Flume	1,165	
08LE012	Duffy Creek near Cherry Creek	40.1	
08LF028	Durrand Creek below Guichon Diversion	130	R
08LF032	Durrand Creek near Savona	130	R
08LF030	Durrand Creek (Ferguson Diversion) near Savona	-	R
08LF048	Fiftynine Creek near Chasm	203	
08LF080	Fiftynine Creek near Clinton	-	
08LF047	Fiftyseven Creek near Clinton	80.5	
08LF063	Gladwin Creek near Lytton	6.0	
08LF075	Green Lake near 70 Mile House	-	*
08LF013	Hat Creek near Ashcroft	74.1	



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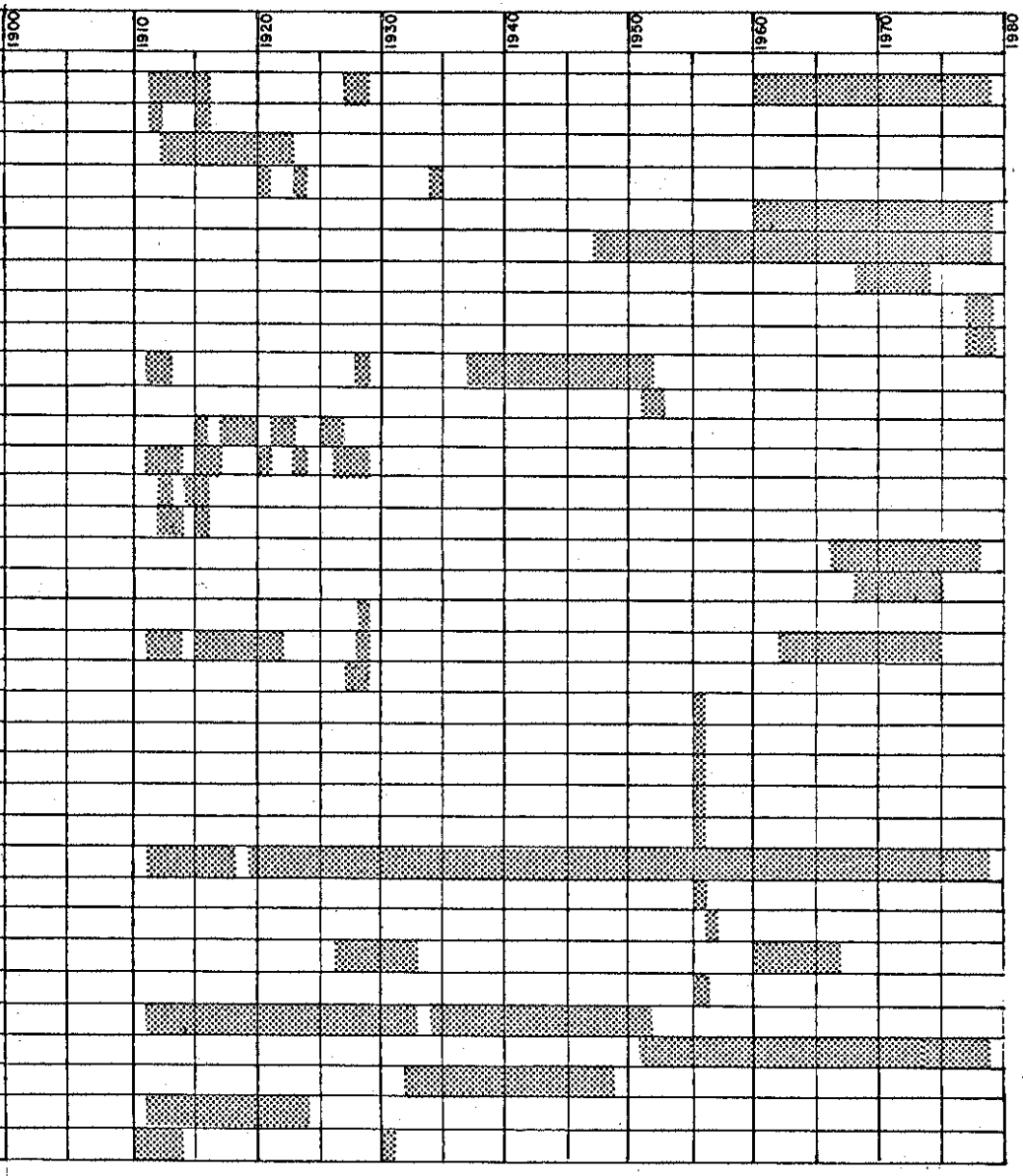
THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROMETRIC STATION RECORDS

Water Survey of Canada

Table 3-G

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)	
08LF015	Hat Creek near Cache Creek	658	R
08LF035	Hat Creek near Carquile	699	
08LF014	Hat Creek-Hammond Diversion to Oregon Jack Creek	-	
08LF034	Hat Creek above Marble Canyon	430	R
08LF061	Hat Creek near Upper Hat Creek	350	R
08LF046	Kamloops Lake at Savona	-	*
08LF071	Loon Creek near the Mouth	479	R
08LF082	Medicine Creek near the Mouth	64	R
08LF083	Medicine Creek Diversion near Ashcroft	-	R
08LF017	Murray Creek near Spences Bridge	119	
08LF050	Noiset Spring near Spences Bridge	-	
08LF019	Oregon Jack Creek near Ashcroft	65.0	R
08LF039	Oregon Jack Creek near Ashcroft (Lower)	82.1	R
08LF020	Pendleton Creek near Cherry Creek	10.4	
08LF018	Puckett Creek near Ashcroft	13.0	
08LF069	Pukaist Creek below Woods Creek	103	R
08LF074	Rayfield River above Pressy Lake	1,223	
08LF042	Rush Creek near Kamloops	1.3	
08LF021	Scottie Creek near Cache Creek	174	R
08LF040	Studhorse Creek near Ashcroft	30.0	
08LF054	Thompson River near Ashcroft	-	*
08LF055	Thompson River near Basque	-	*
08LF057	Thompson River below Deadman River	-	*
08LF053	Thompson River near Gladwin Court (below Rapids)		*
08LF052	Thompson River near Gladwin Court (above Rapids)		*
08LF023	Thompson River at Kamloops	37,814	*
08LF056	Thompson River near McAbee		*
08LF059	Thompson River near Martel	-	*
08LF033	Thompson River near Savona	39,109	
08LF058	Thompson River below Shaw Rapids	-	*
08LF022	Thompson River at Spences Bridge	54,649	
08LF051	Thompson River near Spences Bridge	54,908	
08LF043	Thompson River near Walhachin	40,922	
08LF024	Tranquille River near Kamloops	596	R
08LF025	Twaal Creek near Spences Bridge	85.0	



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THOMPSON RIVER BASIN PRE-PLANNING STUDY

HYDROMETRIC STATION RECORDS

Water Survey of Canada

Table 3-H

STN. NO.	STATION NAME	DRAINAGE AREA (km^2)		1909	1910	1920	1930	1940	1950	1960	1970	1980
08LF068	Venables Creek above Venables Lake	30.0										
08LF026	Venables Creek at Outlet of Venables Lake	15.5	R									
08LF049	Watching Creek near Kamloops	79.5										

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THOMPSON RIVER BASIN PRE-PLANNING STUDY
HYDROMETRIC STATION RECORDS
Water Survey of Canada

Table 3-1