THE FISHERIES PROBLEM ASSOCIATED WITH THE RECONSTRUCTION AND EXPANSION OF THE DOMESTIC WATER SUPPLY FACILITIES OF THE SEYMOUR RIVER, NORTH VANCOUVER, B.C.

Technical Report No. 3

DEPARTMENT OF FISHERIES, CANADA

Vancouver, B. C.

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SUMMARY

The Department of Fisheries, Canada, and the Fish and Game Branch of the B.C. Department of Recreation and Conservation are concerned with the possibility that the reconstruction and expansion of the Seymour River domestic water diversion facilities might so reduce flows in the river that the salmon and trout populations of the system would seriously decline.

The Greater Vancouver Water District has offered to release a minimum flow of 20 cfs at the dam, but available evidence indicates that this flow release would not be sufficient to prevent serious losses to the fisheries resource.

Analyses of available discharge records have indicated that in most years, releases considerably larger than the suggested 20 cfs could be supplied without serious interference with the domestic supply. It has been recommended, therefore, that the magnitude of the future flow releases at the Seymour Falls Dam should be determined by the existing water supply situation; that is, when water is plentiful, releases through the dam should be relatively large, but during dry spells when natural runoff is augmented by draws from storage, the flow release could be curtailed correspondingly.

The recommendations set forth herein suggest a minimum release of approximately 48 cfs whenever the Seymour Falls reservoir is at full storage level, and that this release could be reduced proportionally to 30 cfs as the reservoir is drawn down. It is suggested further that at such times as the Seymour Falls storage is exhausted and all storage demands are being fulfilled by the mountain lake reservoirs, the minimum release could be reduced to 20 cfs.

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I SEYMOUR RIVER WATERSHED

1. Description

Seymour River, from its headwaters approximately 25 miles due north of the City of Vancouver, follows a southerly course through generally mountainous terrain to its mouth in Burrard Inlet, a short distance east of Second Narrows Bridge (Fig. 1). While its watershed is rather small, being only about 70 square miles, it experiences relatively heavy precipitation, as evidenced by Provincial Department of Agriculture records which indicate that the average annual rainfall at Seymour Falls is 147 inches, as compared with the City of Vancouver average of 59 inches. Runoff is, therefore, relatively high, averaging about 8.5 cfs per square mile. Unfortunately, however, the system has no natural storage basins which can provide regulation, so discharge tends to be extremely flashy depending upon existing climatic conditions.[1] Daily discharge records obtained over a period of more than 30 years show a maximum discharge of 22,000 cfs (November 26, 1949) and a minimum of 9 cfs (August 10, 1928). While there are many exceptions, the general runoff pattern shown by the discharge records indicates high flows in the winter months with low-flow periods occurring during the summer.

2. History of Domestic Diversion[2]

Seymour River has been a source of domestic water supply for the City of Vancouver and environs since 1909, when an intake works and 24-inch pipeline were placed in service to divert water from a site about four miles downstream from Seymour Falls (Fig. 2). In subsequent years, the capacity of these works was increased in accordance with the mounting demand, until

in 1926, when the demand occasionally began to exceed the natural supply, 17,800 acre-feet of storage was developed in the mountain lakes (Burwell and Loch Lomond) to supplement the low flows of the river.

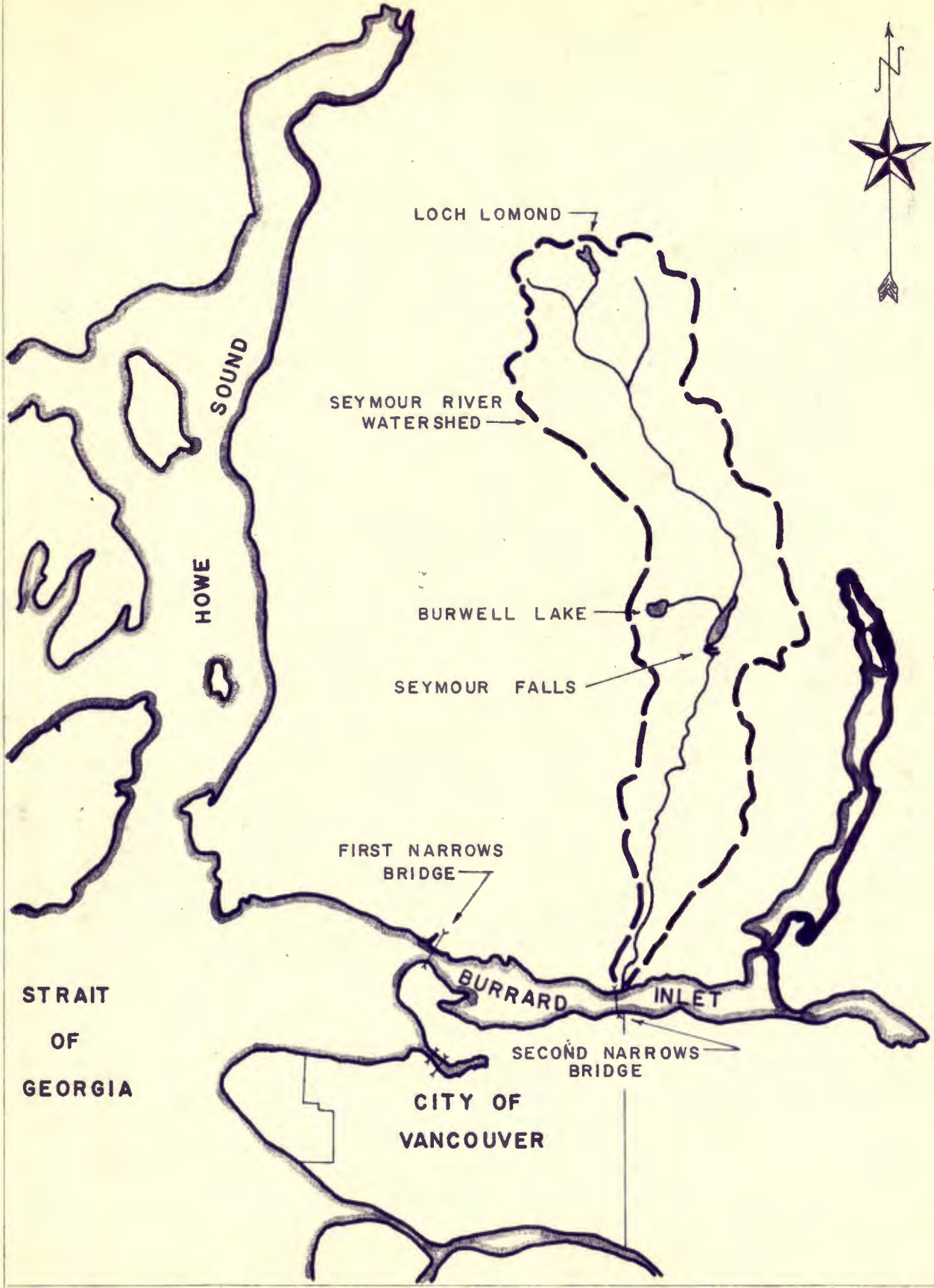
In 1928, an additional 1500 acre-feet of storage was created by construction of a 22-foot high dam and intake works at Seymour Falls. Diversion then took place at both intakes until 1948 when the lower site was abandoned in favour of all diversion taking place at Seymour Falls.

3. The Fisheries Resource

Seymour River supports important populations of Coho, Pink and Chum Salmon, and Steelhead Trout. The estimated spawning escapements of the various species during the years 1935 to 1958 inclusive are set forth in Table 1. While the estimated escapements in the years prior to 1942 were higher than those of recent years, the average annual escapements during the period 1949-58 have been 2000 Coho, 850 Pinks during the odd-numbered years, and 1100 Chum Salmon. The magnitude of the earlier runs to this system, however, suggests that it could support much larger numbers of fish. The Coho, Pink, and Chum Salmon runs contribute significantly to the commercial fishery of British Columbia. On their migration from the ocean, these fish are exploited by the troll, gill-net, and seine fisheries which operate throughout the coastal waters of the Province. The Coho Salmon and Steelhead Trout also contribute significantly to the ever-increasing salt and fresh water sports fishery of the Lower Mainland.

II PROPOSED DEVELOPMENT

1. Description



DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER	SCALE: 1" = 4 MI. (APPROX)
APPROVED:	LOCATION MAP	DWG. NO. FIGURE 1

SECOND NARROWS BRIDGE

STATION 8GA30

PINK & CHUM SALMON TO HERE

CANYON

LOWER INTAKE
(Abandoned 1948)

STATION 8GA28

BURWELL LAKE

BALANCING RESERVOIR

COHO & STEELHEAD SALMON TO HERE

SEYMOUR FALLS DAM & INTAKE

TO Loch Lomond

FLOW

BURRARD INLET

INDIAN ARM

DEPARTMENT OF FISHERIES, CANADA

SEYMOUR RIVER, NORTH VANCOUVER

SITE MAP

OF LOWER SEYMOUR RIVER

DRAWN:	DATE: JUNE 1, 1959
CHECK:	SCALE: 1"=1.25 MI. (approx)
APPROVED: DIVISION ENGINEER	DWG. NO. FIGURE 2

Req. 7673

Early in 1958, the fisheries agencies were advised that the Greater Vancouver Water District had made application to the Provincial Comptroller of Water Rights for permission to raise Seymour Falls Dam some 50 feet in order to increase the storage capacity of the reservoir to 20,500 acre-feet, 17,500 of which would be considered as "live". The Water District estimated that the proposed development would increase the diversion capabilities of the system to 143,000,000 gallons per day (270 cfs continuous) based on the average flow of the peak day, or 73,000,000 gallons per day (135 cfs continuous) based upon the mean annual flow [3].

2. Preliminary Assessment of Fisheries Requirements

Seymour Falls, the site of the existing dam, presently forms the upstream limit of the salmon and steelhead trout migration. A further increase in the height of the dam in itself, therefore, would not affect existing conditions. However, an increase in the diversion of water, particularly during low flow periods could reduce the spawning and rearing capacity of the available portion of the stream, affect the actual migration of salmon and steelhead, and alter the thermal structure of the stream. The latter is of course a vital factor in successful incubation and emergence of fry.

On the basis of the anticipated problems involved in maintaining the population level of the indigenous species under conditions of increased diversion, the fisheries agencies entered an objection to the issuance of a water licence. This was conditional, pending the results of a study to determine the actual requirements to maintain the salmon and trout populations at their present level of abundance.

The basic environmental requirements of the three indigenous species of salmon and of steelhead trout vary considerably. Pink and chum salmon enter the river during the fall, deposit eggs in the gravel, and the surviving fry emerge in the spring and move directly to sea. The entire freshwater period for those species then extends from approximately September 1 to May 1. During this period important environmental factors governing survival are volume and temperature of water.

Coho salmon and steelhead trout both have a longer period of freshwater residence than the above-mentioned species. Coho enter the river during the summer and fall, deposit eggs, and the fry emerge in the following spring. These fry, unlike those of pink and chum salmon, remain and rear in the river until the following spring. The life cycle of steelhead trout is quite similar. The adult migration is continuous throughout the year, with small peaks in the spring and fall. Egg deposition occurs in the spring, emergence in early summer and rearing generally continues until the late spring two years following. With the latter two species therefore, continuous consideration must be given to the fresh water environment.

Adequate flows with which to maintain the salmon and steelhead stocks will include transportation, spawning, incubation and rearing flows. The latter is of particular importance in that rearing is almost directly related to the discharge. In general the flows required for rearing are considered sufficient for the other requirements mentioned. The optimum rearing flow required for maintaining a maximum level of abundance cannot be computed but extensive research is currently being directed to the study of this

problem. Nevertheless, there is substantial biological evidence available from other streams to indicate that a rearing flow equal to the lowest mean monthly flow will support populations of salmon and trout at approximately their lowest levels of abundance. There is further data to suggest that the minimum flow requirement for the optimum rearing of juvenile salmon and trout in any period of years is probably equivalent to the average of the low mean monthly flows over this period.[3, 4, 5 & 6].

For the Seymour River the lowest mean monthly flow at Station 8 GA_{28} for 19 years of record is zero, and that at Station 8 GA_{30} for 26 years of record is 21 cfs; whereas the average of the low mean monthly flows for the corresponding periods are 65 and 92 cfs respectively (Tables 2 and 3).

From a fisheries viewpoint, therefore, it would be desirable to regulate future runoff to provide minimum flows as close as possible to 65 and 92 cfs at Stations 8 GA_{28} and 8 GA_{30} respectively. Comparison of these flow requirements with the 20 cfs minimum release through the dam as offered by the Water District indicated that even with due allowance for inflow below the dam, the population level of the Seymour River Salmon and Trout would be substantially reduced.

Representatives of the Water District, the Fish and Game Branch of the Provincial Department of Recreation and Conservation, and the Department of Fisheries, Canada, met in October, 1958, to discuss future releases, but no suitable solution was achieved. In an effort to develop a solution to the problem, the fisheries agencies agreed to undertake certain additional flow

studies based upon available discharge records and data to be supplied by the Water District. Representatives of the latter agency, however, expressed concern that the time required to complete the proposed studies might delay the imminent construction of the dam, tenders for which had already been called. After due consideration of the fact that the proposed dam will incorporate a by-pass arrangement which would be capable of meeting the expected fisheries flow requirements at any reservoir level, fisheries agencies agreed to withdraw their objections to the issuance of a water license on the understanding that the Comptroller of Water Rights would issue an Order on or before October 1st, 1959, setting forth the times and amounts of water releases through the dam for purposes of fish propagation.

3. Investigation

A. Assumed Conditions

Since the future natural runoff from the Seymour system cannot be estimated with reasonable confidence, the effects which the proposed development and increased demands might have on future river discharges cannot be computed directly. Nevertheless, an indication of the magnitude of these effects can be obtained by comparing recorded river discharges with those computed for the same period, assuming that future operating conditions were actually in existence at the time. The proposed comparison study is complicated, however, by the fact that most discharge records of the Seymour have been influenced by previous domestic diversions and storage manipulations. For this reason, only the water years 1932-33 to 1939-40 inclusive were studied because basic data is incomplete in all other years of record; but it was felt that the selected period was sufficiently long to permit a reasonable assessment as

to whether or not future river discharges, and consequently the salmon and steelhead production of the river, would be seriously curtailed by the proposed development.

Before the study could begin, however, it was necessary to establish certain basic relationships and assume future operating conditions as outlined in the following:

a) Runoff to Mountain Lake Reservoirs

The Water District has been able to supply records of monthly storage draws from these reservoirs (Table 4), but no data are available in connection with the rate at which the reservoirs were replenished. Nevertheless, Water District estimates based upon a comparison study of the relative drainage areas and precipitation records have indicated that the annual combined runoff to these reservoirs constitutes approximately 6.2 percent of the natural runoff at Seymour Falls.[2] This relationship has therefore been assumed herein, although the validity of so doing is open to criticism inasmuch as the relationship was derived from an annual comparison only, whereas it is employed in the following analyses on a monthly basis. Furthermore, it seems probable that a higher percentage of precipitation would occur as snowfall in the reservoir watersheds in view of their relatively higher average elevation. Consequently, much of the winter precipitation might not enter the reservoirs until the spring or early summer. As will be seen in the detailed analyses, however, these apparent inconsistencies are not of especial significance, although it is to be noted that while the monthly flows to storage may not be strictly correct, the dates when the reservoirs re-attain full storage level are probably fairly accurate. It

should be noted also that no allowance has been made for storage at the existing Seymour Falls balancing reservoir since this was used primarily for heavy short-term demands, which will no doubt also occur in future.

b) Natural Runoff at Stations 8 GA_{28} and 8 GA_{30}

Since most discharge records for the Seymour River have been influenced by previous domestic demands and storage manipulations, due allowance for these variables must be entered in the analyses. Thus, it was necessary to compute the probable natural discharges by modifying the recorded discharges in accordance with the domestic diversions and storage changes which actually occurred. In this connection the recorded discharges were adjusted for draws from storage but flows to storage have been neglected inasmuch as these were quentities which probably could not be accurately estimated. In view of the relatively small runoff contribution from the mountain lakes, however, it was thought that this omission would not seriously impair the accuracy of this study. Natural discharges which probably would have occurred at the two stations were therefore calculated from the following relationships:

Station 8 GA_{28}

Natural Discharge = Recorded discharge + Domestic Demand (Seymour Falls) - mean draw from storage.

Station 8 GA_{30}

Natural discharge = Recorded discharge + Domestic Demand (Total) - mean draw from storage.

Tables 4 and 5 set forth the recorded Storage Draws and Domestic Diversions

respectively, and Table 6 outlines the computed natural river discharges for the water years 1932-33 to 1939-40 inclusive.

c) Future Domestic Demands

Water District estimates of the capabilities of the proposed development indicate a maximum mean annual diversion of 135 cfs. It is expected, however, that as in the past the future demands of individual months will probably vary considerably from the mean annual demand; and in order to proceed with the comparison study to determine what effects the proposed development might have had on river discharges in the past it was necessary to adjust the recorded domestic demands of the individual months for the period under study. Obviously, there is no way of knowing what the revised demands would have been if the proposed development and increased demands had been in effect from 1932 to 1940, but for the purpose of this assessment it was assumed that the maximum expected mean annual demand of 135 cfs would have occurred in each year; and that the revised mean monthly demands would have been in the same proportion to the recorded monthly demands as the revised annual demand would have been to the recorded annual demand. For example, the mean diversion in May, 1937, was 40 cfs while the mean annual diversion in 1937 was 45 cfs, so the revised demand for May, 1937, was computed to be $\frac{40}{45} \times 135 = 112$ cfs.

The revised monthly domestic demands for the period were calculated in accordance with the foregoing and these are set forth in Table 7.

d) Future Operation of Reservoirs

It has been assumed that the mountain lake reservoirs would not have been

drawn upon until the storage at Seymour Falls had been exhausted; and that the upper reservoirs would have been replenished as quickly as possible, taking precedence over the Seymour Falls reservoir.

B. Flow Analyses

With establishment of the general criteria outlined in the foregoing sections, the first analysis undertaken was that of calculating what effects the proposed development might have had during the water years 1932-33 to 1939-40 inclusive, if, as suggested, by the Water District, only 20 cfs had been released through the dam whenever Seymour Falls reservoir was less than full storage level. Table 8 sets forth the pertinent items of this analysis and columns 6, 9, 10 and 12 are of particular significance.

Referring to the Table it will be noted that the revised domestic demands could have been supplied during each month of the eight years studied. For convenience, the revised average annual minimum mean monthly flows at Stations 8 GA_{28} and 8 GA_{30} have been transferred to Table 10 where they appear alongside the flows which were actually recorded for the same periods. Comparison of the recorded and revised flows indicates that over the eight-year period the average minimum mean monthly flows at Station 8 GA_{28} would have been reduced from 65 cfs to 20 cfs, while that at Station 8 GA_{30} would have been decreased from 89 cfs to 69 cfs; or reduction of approximately 69 and 22 percent respectively. The percent reduction at Seymour Falls is relatively larger because the discharges recorded at this site during the period studied included flows which were later diverted at the lower intake, which was upstream from Station 8 GA_{30}. Since corresponding declines in fish production would probably have accompanied these

flow reductions, a fixed release of only 20 cfs could not have maintained the fish populations at present levels of abundance.

Inspection of Table 8 disclosed, however, that the mountain storage probably would have been required in only two years of the eight studied, and that this storage was depleted in 1938 only. Furthermore, there is reasonable doubt that the extreme drawdown computed for 1938 actually would have materialized inasmuch as there appears to be a very serious inconsistency in the basic data leading to this conclusion. In this connection, it is to be noted on Sheet 3 of Table 6 that the mean natural discharge at Station 8 GA_{28} for the month of August, 1938, was computed to be - 2 cfs (assumed zero in the computations), but the inflow between this site and Station 8 GA_{30} was found to be 107 cfs. If these runoff figures were reasonably accurate - and this is extremely doubtful - it would be a most unusual condition to have no runoff from the upper 47 square miles of the drainage area, whereas the succeeding 21 square miles contributes 107 cfs. In view of this apparent discrepancy, therefore, it was concluded that the storage drawdown computed for 1938 probably would not have been as severe as indicated. While it is not possible to verify this conclusion, it has been assumed that at no time during the period would all available storage have been required under the imposed conditions.

It appeared therefore that in at least six years of the eight studied, and possibly in all eight, the minimum discharge through the dam probably could be substantially increased without requiring a corresponding reduction in the domestic supply. It is realized, however, that water shortages more critical

than those studied might arise in future, but the analysis has indicated that in most years discharges in excess of 20 cfs could be supplied without sacrifice. It would appear therefore that both interests could be served on a more equitable basis if releases through the dam were related directly to the current availability of the water; that is, when the reservoirs are falling or rising, water releases through the dam would be reduced or increased correspondingly.

It is believed that the requirements of the fisheries and water supply interests could probably be fulfilled without serious conflict if the following general operating conditions were observed.

Condition I - When the Seymour Falls Storage is exhausted and natural runoff is being supplemented by withdrawals from the mountain lake reservoirs, water releases through the Seymour Falls Dam should be not less than 20 cfs.

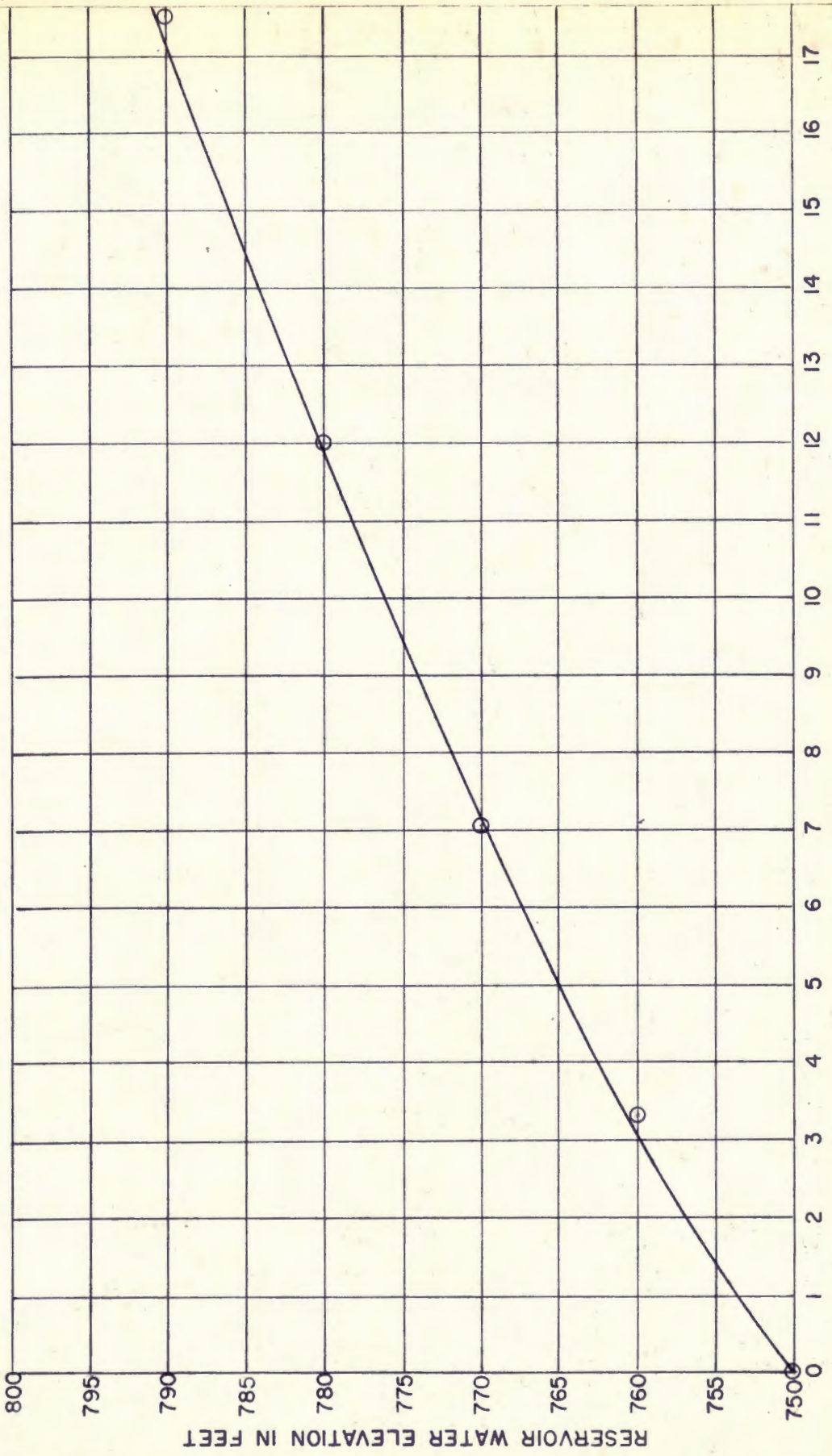
Condition II - at all times other than those defined in Condition I, the bypass through Seymour Falls Dam should be set to pass at least 30 cfs at minimum reservoir level, and this setting should not be reduced until Condition I applies.

Condition I is, of course, identical with the Water District proposal for the storage range specified above, but Condition II contemplates greater releases with increasing storage. It is foreseen that the latter condition would be fulfilled automatically with the fixed setting for at least 30 cfs at minimum reservoir, inasmuch as any changes in storage level would be reflected in the bypass discharge by increasing or decreasing the delivery head. In

this connection, the Water District has advised that the Seymour Falls reservoir will be operated between elevations 750 and 790, and since the bypass will be located at approximate elevation 723, available gross head will vary between 27 and 67 feet. Under the terms of Condition II the bypass would be set to deliver 30 cfs under the minimum head of 27 feet and as the gross head increases with the rising reservoir, the discharge through the bypass would also increase. The storage capacity curve is shown in Figure 3 and a computed storage-discharge curve is set out in Figure 4, where it will be seen that a fixed setting of 30 cfs at maximum drawdown would probably deliver 48 cfs at full storage level.

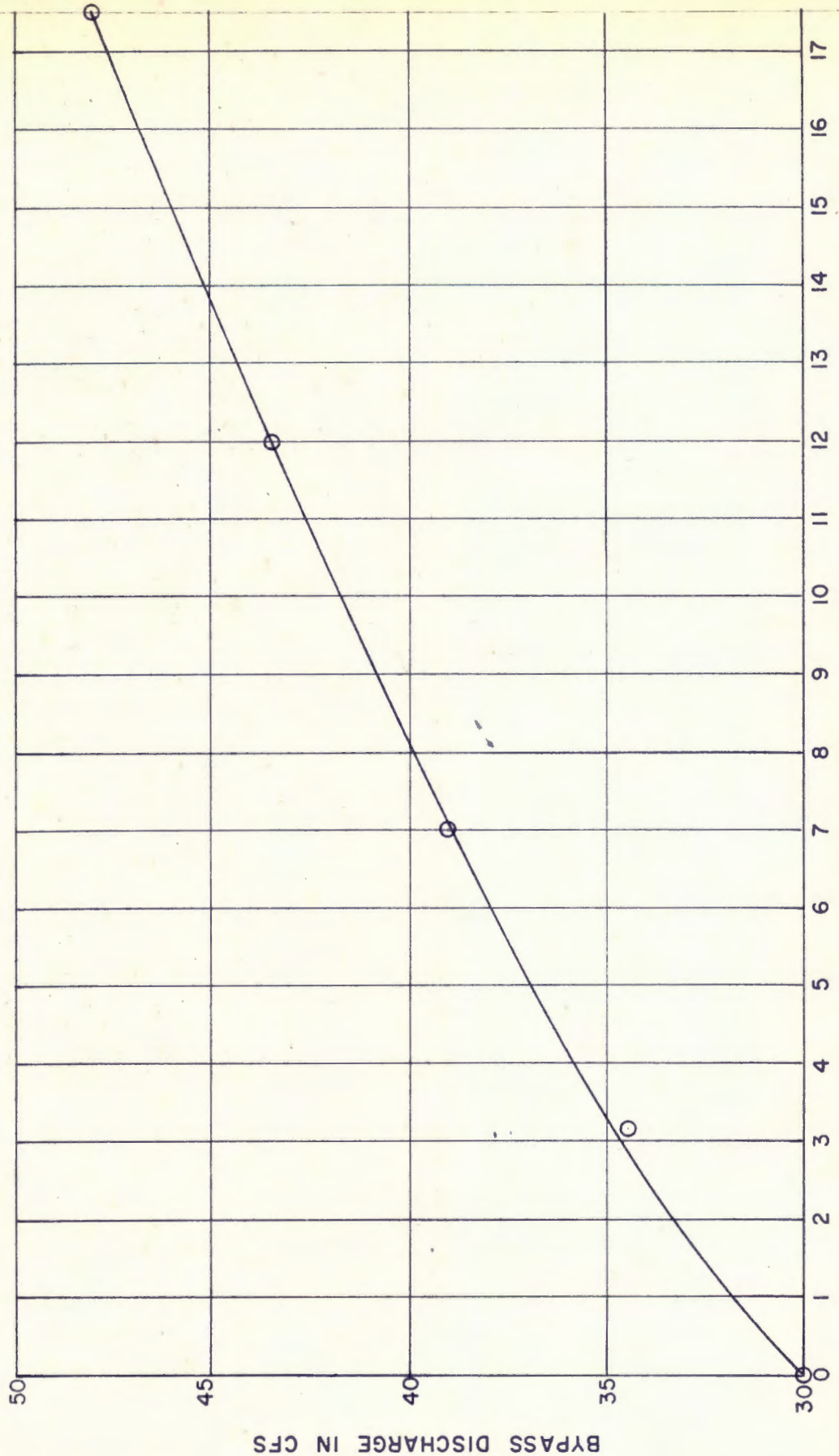
The water years 1932-33 to 1939-40 inclusive were re-analyzed to determine what effects these operating conditions might have had if the proposed development and increased demands had actually existed during those years. This analysis is set forth in Table 9, where it will be noted that the revised domestic demands and proposed minimum releases through the dam could have been maintained by natural runoff and available storage in all months except September, 1938, when an additional 2200 acre-feet of storage would have been required. This computed storage deficit would have been created in part by the apparent heavy drawdown of the preceding month, but for the same reasons as outlined in the earlier analysis, there is some doubt that this indicated deficiency would have actually materialized.

The revised annual minimum mean monthly flows computed in this analysis are set forth in Table 10 together with the flows which were recorded for the same periods. Comparing the averages of the computed and recorded flows



DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER	SCALE:
APPROVED:	SEYMOUR FALLS RESERVOIR FUTURE STORAGE CARACITY CURVE	DWG. NO. FIGURE 3

Req. 7673



DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER NEW SEYMOUR FALLS DAM	SCALE:
APPROVED:	RATING CURVE FOR BYPASS IF OPENING FIXED TO PASS 30 C.F.S. AT MINIMUM RESERVOIR LEVEL	DWG. NO. FIGURE 4

for the entire period 1932-33 to 1939-40 inclusive discloses that if the proposed development and increased domestic demands had existed during those years, the average annual minimum mean monthly flows at Station 8 GA_{28} would have been decreased from 65 cfs to 35 cfs while that at Station 8 GA_{30} would have declined from 89 cfs to 84 cfs; or reduction of approximately 46 and 5 percent respectively.

C. Discussion

While the foregoing analyses were prepared from what was considered to be the best available data and, where such data was lacking, from reasonably reliable estimates, it is submitted that the comparisons should be considered as indicative only in view of the following general observations:

a) Only eight years of records were subjected to analysis so all future flow conditions hardly could be inferred therefrom.

b) The analyses were conducted on a mean monthly basis only, which in effect assumes that the average flows, storage changes, and demands occurred at a constant rate during each month. This assumption is, of course, not true, and while it would have been desirable to investigate the daily flows, at least during apparent critical periods, the required data was incomplete.

c) Natural discharges computed for Stations 8 GA_{28} and 8 GA_{30} have been adjusted for actual draws from storage, but no allowance has been made for replenishment of the reservoirs.

d) There is no assurance that the revised domestic demands would have materialized as computed.

e) Computations of natural flows disclosed inconsistencies in the basic data (e.g. negative inflows between Stations 8 GA_{28} and 8 GA_{30}) and it may well be that there are others which cannot be detected.

In spite of these apparent shortcomings, however, it is believed that insofar as available data will permit, the foregoing investigation provides a reasonable indication of possible flow distribution in future years. Furthermore, the investigation has indicated that in most years the fish stocks of the Seymour River can be provided with more water than the 20 cfs proposed by the Water District without endangering the domestic supply. While water shortages more serious than those encountered during the period studied will undoubtedly occur in some future years it is apparent that the fisheries resource of this system is a valuable asset which cannot be maintained by uncontrolled flows from the domestic diversion. Since, as the investigation has indicated, flow releases in excess of 20 cfs could be maintained in most years without interference with the domestic supply, it is felt that such measures should be employed. It is to be noted that recent press releases have stated that domestic water will not be diverted from the Seymour system during the summer of 1959 while the dam reconstruction is in progress. It would appear therefore that the Water District commitments for 1959 can be met from sources other than the Seymour (notably the Capilano system). It is suggested, therefore, that fisheries flow requirements during future water shortages in the Seymour system might be met, at least in part, by increasing the normal diversion from the Capilano system.

III RECOMMENDATIONS

If the Seymour River fisheries resource is to be maintained at its existing average level of production, the average of the annual minimum mean monthly flows at Stations 8 GA_{28} and 8 GA_{30} must remain near 65 and 92 cfs respectively.

Since a minimum release of 20 cfs through the dam, as suggested by the Water District, would not meet these requirements, and since releases in excess of 20 cfs probably could be undertaken in most years without apparent interference with the domestic supply, it is recommended that in future the minimum water release through the dam be related directly to available storage, and that the magnitude of such releases be determined by the following conditions:

Condition I - when the Seymour Falls storage is exhausted and natural runoff is being supplemented by withdrawals from the mountain lake reservoirs, water releases through the Seymour Falls Dam should be not less than 20 cfs.

Condition II - at all times other than those defined in Condition I, the controls for the bypass through the Seymour Falls Dam should be set to pass at least 30 cfs at minimum reservoir level, and this setting should not be reduced until Condition I applies.

LIST OF REFERENCES

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2. Scott, T.J., 1957, A Study of the Hydrology of Seymour Creek, Greater Vancouver Water District.

3. Unpublished correspondence, Department of Fisheries, Canada, Vancouver, B.C.

4. Smoker, W.A., 1954, A Preliminary Review of Salmon Fishing Trends on Inner Puget Sound. Res. Bull. No. 2, 3 - 11.

5. Smoker, W.A., 1955, Doctorate Thesis, Univ. of Washington.

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YEAR	COHO	PINK	STEELHEAD	CHUM
1958	300-500	NIL	100-300	100-300
1957	2000-5000	50-100	500-1000	100-300
1956	1000-2000	NIL	300-500	100-300
1955	2000-5000	300-500	500-1000	100-300
1954	1000-2000	1-50	500-1000	2000-5000
1953	1000-2000	1000-2000	500-1000	500-1000
1952	2000-5000	1-50	500-1000	1000-2000
1951	1000-2000	500-1000	500-1000	1000-2000
1950	1000-2000	NIL	500-1000	1000-2000
1949	1000-2000	1000-2000	500-1000	1000-2000
1948	2000-5000	NIL	300-500	1000-2000
1947	1000-2000	1000-2000	500-1000	500-1000
1946	2000-5000	1-50	500-1000	2000-5000
1945	2000-5000	500-1000	1000-2000	2000-5000
1944	500-1000	1-50	1000-2000	1-300
1943	2000-5000	100-300	1000-2000	2000-5000
1942	5000-10,000	1-50	1000-2000	5000-10,000
1941	10,000-20,000	50,000-100,000	1000-2000	50,000-100,000
1940	1000-2000	50-100	1000-2000	1000-2000
1939	5000-10,000	20,000-50,000	1000-2000	500-1000
1937	1000-2000	20,000-50,000	500-1000	5000-10,000
1936	10,000-20,000	300-500	2000-5000	2000-5000
1935	2000-5000	5000-10,000	1000-2000	2000-5000

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CHECK:	SEYMOUR RIVER, NORTH VANCOUVER THE ESTIMATED ESCAPEMENT OF SALMON AND STEELHEAD TO THE SEYMOUR RIVER 1935-58	SCALE:
APPROVED:		DWG. NO. — TABLE 1

WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	MEAN	LOW MONTHLY MEAN
1921-22	1310	589	579	123	152	111	299	815	1030	320	133	381	487	111
1922-23	317	246	638	411	186	192	483	675	559	178	55	77	335	55
1923-24	177	365	607	509	1070	179	296	649	401	121	55	395	402	55
1924-25	808	498	569	400	575	259	519	880	410	189	142	60	442	60
1925-26	46	518	1190	204	636	392	428	486	169	52	233	133	372	46
1926-27	661	646	536	440	344	252	431	773	869	365	135	349	486	135
1927-28	869	647	307	714	267	574	318	415	216	120	–	–	471	120
1928-29	554	518	306	85	nil	221	261	615	530	140	67	8	277	nil
1929-30	274	47	400	72	616	280	620	411	322	76	106	116	276	47
1930-31	184	259	252	642	295	554	610	592	573	105	27	293	365	27
1931-32	649	661	538	223	545	579	562	996	1030	663	124	61	579	61
1932-33	365	1060	370	323	98	305	584	948	1300	990	208	675	603	98
1933-34	665	433	942	926	766	635	707	665	124	282	139	142	535	124
1934-35	665	1330	528	893	822	433	338	807	866	458	140	250	627	140
1935-36	428	342	799	395	33	229	672	1000	693	243	41	140	420	33
1936-37	191	93	586	14	45	432	652	1150	1230	192	179	83	435	14
1937-38	840	901	724	292	158	502	597	887	601	90	19	43	478	19
1938-39	523	410	778	748	66	318	667	892	655	412	53	91	471	53
1939-40	470	1210	1260	640	562	688	472	705	179	42	74	66	531	42
MEAN	528	567	627	424	381	377	518	756	619	274	107	187	447	65

NOTE: DATA FROM WATER RESOURCES DIVISION OF THE DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES, CANADA

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER STATION 8GA28	SCALE:
APPROVED:	RECORDED MEAN MONTHLY DISCHARGES 1921-22 TO 1939-40	DWG. NO. TABLE 2

WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	MEAN	LOW MONTHLY MEAN
1930-31	351	401	412	1210	389	770	773	487	640	100	37	418	508	37
1931-32	751	897	817	428	653	712	862	831	952	612	145	94	645	94
1932-33	358	1120	467	463	216	458	497	842	1150	922	218	298	627	216
1933-34	847	523	1300	1120	866	704	620	632	132	276	131	172	611	131
1934-35	775	1700	679	1300	814	595	400	801	812	430	131	260	723	131
1935-36	551	399	855	632	81	418	914	1030	693	266	51	194	501	51
1936-37	277	123	776	68	138	609	856	1170	1310	189	168	101	484	68
1937-38	1020	1040	849	421	263	629	655	867	582	97	29	45	543	29
1938-39	626	536	947	1100	149	381	717	945	669	388	50	106	555	50
1939-40	505	1460	1540	767	811	844	513	710	177	35	63	79	635	35
1940-41	1240	478	1230	730	709	583	429	828	281	54	56	495	593	54
1941-42	1110	812	1040	302	314	256	483	509	618	226	63	45	483	45
1942-43	225	730	693	203	382	417	1090	530	559	208	89	60	431	60
1943-44	597	303	899	864	266	370	500	498	253	49	52	189	405	49
1944-45	680	1310	424	848	789	404	344	1190	506	184	52	164	572	52
1945-46	221	782	808	647	704	599	846	1250	1100	700	200	108	664	108
1946-47	332	429	1010	583	1220	469	876	754	388	256	35	83	582	35
1947-48	970	312	1000	427	305	276	594	1390	1080	286	235	480	616	235
1948-49	551	688	263	204	385	618	735	1210	655	366	148	160	507	160
1949-50	412	1500	824	284	329	581	663	877	1310	594	240	126	694	126
1950-51	1220	714	1860	704	871	268	731	840	502	79	21	211	668	21
1951-52	696	690	305	363	656	180	720	1080	961	349	115	91	516	91
1952-53	89	405	639	1760	595	415	599	1070	649	491	114	295	595	89
1953-54	976	1440	890	423	1130	347	400	736	979	751	213	338	725	213
1954-55	631	2150	773	299	258	141	656	818	1130	656	198	171	656	141
1955-56	951	1200	451	496	105	449	868	1320	1560	668	78	327	635	78
MEAN	649	851	836	641	535	481	663	897	756	356	117	212	581	92

NOTE: DATA FROM WATER RESOURCES DIVISION OF THE DEPARTMENT OF NORTHERN AFFAIR AND NATIONAL RESOURCES, CANADA

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER STATION 8GA30	SCALE:
APPROVED:	RECORDED MEAN MONTHLY DISCHARGES 1930-31 TO 1955-56	DWG. NO. TABLE 3

YEAR	UNITS	JAN	FEB	MAR	JULY	AUG	SEPT.	OCT	NOV	DEC	THE YEAR TOTAL
1932	ACRE-FEET						1816	1101			2917
	EQUIVALENT CFS						31	18			4
1933	ACRE-FEET		1138	220							1358
	EQUIVALENT CFS		21	4							2
1934	ACRE-FEET				2042	702	551	418			3713
	EQUIVALENT CFS				33	11	9	7			5
1935	ACRE FEET	754				1005	2499	1642			5900
	EQUIVALENT CFS	12				16	42	27			8
1936	ACRE-FEET		1578	220	1398	2816	512				6524
	EQUIVALENT CFS		29	4	23	46	9				9
1937	ACRE-FEET	139	2219				1547				3905
	EQUIVALENT CFS	2	40				26				5
1938	ACRE-FEET				214	2284	1753	809			5060
	EQUIVALENT CFS				3	37	30	13			7
1939	ACRE-FEET					1656	579	832			3072
	EQUIVALENT CFS					27	10	13			4
1940	ACRE-FEET				1045	2499	1715	2015			7274
	EQUIVALENT CFS				17	41	29	33			10
1941	ACRE-FEET				650	3113	143				3906
	EQUIVALENT CFS				11	50	2				5
1942	ACRE-FEET					4158	3351	293			7802
	EQUIVALENT CFS					68	56	5			11
1943	ACRE-FEET					1388	2499	349			4236
	EQUIVALENT CFS					23	42	6			6
1944	ACRE FEET				1541	4555	1348				7444
	EQUIVALENT CFS				25	74	23				10
1945	ACRE FEET					4323	3167	1402			8892
	EQUIVALENT CFS					70	53	23			12
1946	ACRE-FEET					117	3155	718			3990
	EQUIVALENT CFS					2	53	12			6
1947	ACRE-FEET	642				1836	944	184			3606
	EQUIVALENT CFS	10				30	16	3			5
1948	ACRE-FEET										—
	EQUIVALENT CFS										—
1949	ACRE-FEET	1983	4125	698							6806
	EQUIVALENT CFS	32	75	11							9
1950	ACRE-FEET	1323	660								1983
	EQUIVALENT CFS	22	12								3
1951	ACRE-FEET				1402	2976	3817			2221	10416
	EQUIVALENT CFS				23	48	64			36	14
1952	ACRE-FEET	7793				999	1598	1598	399		12387
	EQUIVALENT CFS	127				16	27	26	7		17
1953	ACRE-FEET					1567	999				2566
	EQUIVALENT CFS					25	17				4
1954	ACRE-FEET	635	248								883
	EQUIVALENT CFS	10	4								12
1955	ACRE-FEET			2875	1429	1939	1408				7710
	EQUIVALENT CFS			47	23	32	24				11
1956	ACRE-FEET		2062	2062	73	3728	1646	853			10424
	EQUIVALENT CFS		37	34	1	60	28	14			14
1957	ACRE-FEET	1685	4105								5793
	EQUIVALENT CFS	27	74								8

NOTE: DATA FROM THE GREATER VANCOUVER WATER DISTRICT

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER	SCALE:
APPROVED:	RECORDED STORAGE DRAWS FROM MOUNTAIN LAKES 1932 TO 1957	DWG. NO. TABLE 4

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1930	53	40	35	36	48	43	65	52	43	46	38	36	44.6
1931	44	43	42	43	51	54	64	64	47	46	46	45	49.1
1932	46	45	43	42	37	58	49	49	41	43	41	45	44.3
1933	43	46	39	42	41	45	55	63	43	42	41	41	45.1
1934	41	41	41	44	45	60	56	57	44	41	41	41	46.0
1935	44	41	39	40	49	53	51	53	47	41	39	39	44.7
1936	59	61	59	52	56	58	72	81	55	52	51	56	59.3
1937	47	44	40	40	40	49	61	51	46	41	40	41	45.0
1938	43	43	42	41	50	65	69	115	92	42	44	45	57.6
1939	40	41	40	40	45	45	53	73	45	41	39	40	45.2
1940	37	37	37	37	44	65	70	57	45	40	40	40	45.8
1941	38	39	39	40	38	45	68	60	43	43	43	42	44.8
1942	41	40	39	39	40	41	52	57	46	40	40	38	42.8
1943	40	38	36	35	36	40	57	45	41	37	37	37	39.9
1944	40	40	40	40	42	50	63	49	49	42	42	42	44.9
1945	43	42	42	42	43	54	65	61	44	39	41	42	46.4
1946	40	40	40	40	48	46	51	57	46	42	42	41	44.4
1947	43	40	40	41	46	52	59	61	45	42	42	41	46.0
1948	37	37	36	36	36	36	51	46	40	39	39	40	39.4
1949	47	47	43	41	50	58	56	49	62	46	42	45	48.8
1950	61	56	49	48	50	70	77	69	60	51	52	51	57.8
1951	55	57	56	60	57	87	104	93	68	58	56	58	67.4
1952	66	62	60	60	65	66	95	99	68	62	61	60	68.7
1953	59	59	57	54	60	63	88	83	71	61	60	59	64.5
1954	69	63	60	61	70	65	78	80	62	60	63	62	66.1
1955	62	66	69	66	67	75	81	92	80	66	81	86	74.3
1956	82	77	73	85	108	82	119	108	81	76	72	82	87.1
MEAN	48.9	47.6	45.8	46.1	50.4	56.5	67.7	67.6	53.9	47.3	47.1	48.0	52.2

NOTE: 1) DATA FROM THE GREATER VANCOUVER WATER DISTRICT.
2) UP TO AND INCLUDING 1948, 16 C.F.S. DRAWN FROM SEYMOUR FALLS WITH REMAINDER FROM LOWER INTAKE. ALL DIVERSION FROM SEYMOUR FALLS AFTER 1948.

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER	SCALE:
APPROVED:	RECORDED MEAN MONTHLY DOMESTIC DIVERSIONS 1930 TO 1956	DWG. NO. TABLE 5

Req. 7673

MONTH	① RECORDED $8GA_{28}$ CFS	② DOMESTIC DRAW SEYMOUR FALLS CFS	③ TOTAL FLOW SEYMOUR FALLS ① + ② CFS	④ DRAW FROM MOUNTAIN STORAGE CFS	⑤ COMPUTED NATURAL $8GA_{28}$ ③ - ④ CFS	⑥ RECORDED $8GA_{30}$ CFS	⑦ TOTAL DOMESTIC DRAW SEYMOUR RIVER CFS	⑧ TOTAL FLOW $8GA_{30}$ ⑥ + ⑦ CFS	⑨ DRAW FROM MOUNTAIN STORAGE CFS	⑩ COMPUTED NATURAL $8GA_{30}$ ⑧ - ⑨ CFS	⑪ COMPUTED INFLOW $8GA_{30}$ & $8GA_{28}$ ⑩ - ⑤ CFS
1932-33											
OCT	365	16	381	18	363	358	43	401	18	383	20
NOV	1060	"	1076	-	1076	1120	41	1161	-	1161	85
DEC	370	"	386	-	386	567	45	612	-	612	226
JAN	323	"	339	-	339	463	43	506	-	506	167
FEB	98	"	114	21	93	216	46	262	21	241	148
MAR	305	"	321	4	317	458	39	497	4	493	176
APR	584	"	600	-	600	497	42	539	-	539	-61
MAY	948	"	964	-	964	842	41	883	-	883	-81
JUN	1300	"	1316	-	1316	1150	45	1195	-	1195	-121
JUL	990	"	1006	-	1006	922	55	977	-	977	-29
AUG	208		224	-	224	218	63	281	-	281	57
SEP	675	"	691	-	691	698	43	741	-	741	50
1933-34											
OCT	665	16	681	-	681	847	42	889	-	889	208
NOV	433	"	449	-	449	523	41	564	-	564	115
DEC	942	"	958	-	958	1300	41	1341	-	1341	383
JAN	926	"	942	-	942	1120	41	1161	-	1161	219
FEB	766	"	782	-	782	866	41	907	-	907	125
MAR	635	"	651	-	651	704	41	745	-	745	94
APR	707	"	723	-	723	620	44	664	-	664	-59
MAY	665	"	681	-	681	632	45	677	-	677	-4
JUN	124	"	140	-	140	132	60	192	-	192	52
JUL	282	"	298	33	265	276	56	332	33	299	34
AUG	139	"	155	11	144	131	57	188	11	177	33
SEP	142	"	158	9	149	172	44	216	9	207	58

NOTE: NO DATA AVAILABLE REGARDING RATE AND TIMING OF RESERVOIR REPLENISHMENT, SO NO ALLOWANCE THEREFORE HAS BEEN ENTERED IN TABLE.

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER STATIONS $8GA_{28}$ & $8GA_{30}$ COMPUTED NATURAL DISCHARGES & INFLOWS 1932-33 TO 1939-40	SCALE:
APPROVED:		DWG. NO. TABLE 6 (SHEET 1 OF 4)

MONTH	① RECORDED $8GA_{28}$ CFS	② DOMESTIC DRAW SEYMOUR FALLS CFS	③ TOTAL FLOW SEYMOUR FALLS ①+② CFS	④ DRAW FROM MOUNTAIN STORAGE CFS	⑤ COMPUTED NATURAL $8GA_{28}$ ③-④ CFS	⑥ RECORDED $8GA_{30}$ CFS	⑦ TOTAL DOMESTIC DRAW SEYMOUR RIVER CFS	⑧ TOTAL FLOW $8GA_{30}$ ⑥+⑦ CFS	⑨ DRAW FROM MOUNTAIN STORAGE CFS	⑩ COMPUTED NATURAL $8GA_{30}$ ⑧-⑨ CFS	⑪ COMPUTED INFLOW $8GA_{28}$ TO $8SA_{30}$ ⑩-⑤ CFS
1934-35											
OCT	685	16	701	7	694	775	41	816	7	809	115
NOV	1330	"	1346	–	1346	1700	41	1741	–	1741	395
DEC	528	"	544	–	544	679	41	720	–	720	176
JAN	893	"	909	12	897	1300	44	1344	12	1332	435
FEB	822	"	838	–	838	814	41	855	-	855	17
MAR	433	"	449	–	449	595	39	634	–	634	185
APR	338	"	354	–	354	400	40	440	–	440	86
MAY	807	"	823	-	823	807	49	856	–	856	33
JUN	866	"	882	-	882	812	53	865	–	865	-17
JUL	458	"	474	-	474	430	51	481	–	491	7
AUG	140	"	156	16	140	131	53	184	16	168	28
SEP	250	"	266	42	224	260	47	307	42	265	41
1935-36											
OCT	428	16	444	27	417	551	41	592	27	565	148
NOV	342	"	358	–	358	399	39	438	–	438	80
DEC	799	"	815	-	815	855	39	894	-	894	79
JAN	395	"	411	–	411	632	59	691	–	691	280
FEB	33	"	49	28	21	81	61	142	28	114	93
MAR	229	"	245	4	241	418	59	477	4	473	232
APR	672	"	688	–	688	814	52	866	–	866	178
MAY	1000	"	1016	-	1016	1030	56	1086	–	1086	70
JUN	693	"	709	-	709	693	58	751	-	751	42
JUL	243	"	259	23	236	266	72	338	23	315	79
AUG	41	"	57	46	11	51	81	132	46	86	75
SEP	140	"	156	9	147	194	55	249	9	240	93

NOTE: NO DATA AVAILABLE REGARDING RATE AND TIMING OF RESERVOIR REPLENISHMENT, SO NO ALLOWANCE THEREFORE HAS BEEN ENTERED IN TABLE.

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER STATIONS $8GA_{28}$ & $8GA_{30}$ COMPUTED NATURAL DISCHARGES & INFLOWS 1932-33 TO 1939-40	SCALE:
APPROVED:		DWG. NO. TABLE 6 (SHEET 2 OF 4)

MONTH	① RECORDED $8GA_{28}$ CFS	② DOMESTIC DRAW SEYMOUR FALLS CFS	③ TOTAL FLOW SEYMOUR FALLS ①+② CFS	④ DRAW FROM MOUNTAIN STORAGE CFS	⑤ COMPUTED NATURAL $8GA_{28}$ ③-④ CFS	⑥ RECORDED $8GA_{30}$ CFS	⑦ TOTAL DOMESTIC DRAW SEYMOUR RIVER CFS	⑧ TOTAL FLOW $8GA_{30}$ ⑥+⑦ CFS	⑨ DRAW FROM MOUNTAIN STORAGE CFS	⑩ COMPUTED NATURAL $8GA_{30}$ ⑧-⑨ CFS	⑪ COMPUTED INFLOW $8GA_{28}$ TO $8GA_{30}$ ⑩-⑤ CFS
1936-37											
OCT	191	16	207	-	207	277	52	329	-	329	122
NOV	93	"	109	-	109	123	51	174	-	174	65
DEC	586	"	602	-	602	776	56	832	-	832	230
JAN	14	"	30	2	28	68	47	115	2	113	85
FEB	45	"	61	40	21	138	44	182	40	142	121
MAR	432	"	448	-	448	609	40	649	-	649	201
APR	652	"	668	-	668	856	40	896	-	896	228
MAY	1150	"	1166	-	1166	1170	40	1210	-	1210	44
JUN	1230	"	1246	-	1246	1310	49	1359	-	1359	113
JUL	192	"	208	-	208	189	61	250	-	250	42
AUG	179	"	195	-	195	168	51	219	-	219	24
SEP	83	"	99	26	73	101	46	147	26	121	48
1937-38											
OCT	840	16	856	-	856	1020	41	1061	-	1061	205
NOV	901	"	917	-	917	1040	40	1080	-	1080	163
DEC	724	"	740	-	740	849	41	890	-	890	150
JAN	292	"	308	-	308	421	43	464	-	464	156
FEB	158	"	174	-	174	263	43	306	-	306	132
MAR	502	"	518	-	518	629	42	671	-	671	153
APR	597	"	613	-	613	655	41	696	-	696	83
MAY	887	"	903	-	903	867	50	917	-	917	14
JUN	601	"	617	-	617	582	65	647	-	647	30
JUL	90	"	106	3	103	97	69	166	3	163	60
AUG	19	"	35	37	-2	29	115	144	37	107	107
SEP	42	"	58	30	28	45	92	137	30	107	79

NOTE: NO DATA AVAILABLE REGARDING RATE AND TIMING OF RESERVOIR REPLENISHMENT, SO NO ALLOWANCE THEREFORE HAS BEEN ENTERED IN TABLE.

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER STATIONS $8GA_{28}$ & $8GA_{30}$ COMPUTED NATURAL DISCHARGES & INFLOWS 1932-33 TO 1939-40	SCALE:
APPROVED:		DWG. NO. TABLE 6 (SHEET 3 OF 4)

MONTH	① RECORDED $8GA_{28}$ CFS	② DOMESTIC DRAW SEYMOUR FALLS CFS	③ TOTAL FLOW SEYMOUR FALLS ①+② CFS	④ DRAW FROM MOUNTAIN STORAGE CFS	⑤ COMPUTED NATURAL $8GA_{28}$ ③-④ CFS	⑥ RECORDED $8GA_{30}$ CFS	⑦ TOTAL DOMESTIC DRAW SEYMOUR RIVER CFS	⑧ TOTAL FLOW $8GA_{30}$ ⑥+⑦ CFS	⑨ DRAW FROM MOUNTAIN STORAGE CFS	⑩ COMPUTED NATURAL $8GA_{30}$ ⑧-⑨ CFS	⑪ COMPUTED INFLOW $8GA_{28}$ TO $8GA_{30}$ ⑩-⑤ CFS
1938-39											
OCT	523	16	539	13	526	626	42	668	13	655	129
NOV	410	"	426	-	426	536	44	580	-	580	154
DEC	778	"	794	-	794	947	45	992	-	992	198
JAN	748	"	764	-	764	1100	40	1140	-	1140	376
FEB	66	"	82	-	82	149	41	190	-	190	108
MAR	318	"	334	-	334	381	40	421	-	421	87
APR	667	"	683	-	683	717	40	757	-	757	74
MAY	892	"	908	-	908	945	45	990	-	990	82
JUN	655	"	671	-	671	669	45	714	-	714	43
JUL	412	"	428	-	428	388	53	441	-	441	13
AUG	53	"	69	27	42	50	73	123	27	96	54
SEP	91	"	107	10	97	106	45	151	10	141	44
1939-40											
OCT	470	16	486	14	472	505	41	546	14	532	60
NOV	1210	"	1226	-	1226	1460	39	1499	-	1499	273
DEC	1260	"	1276	-	1276	1540	40	1580	-	1580	304
JAN	640	"	656	-	656	767	37	804	-	804	148
FEB	562	"	578	-	578	811	37	848	-	848	270
MAR	688	"	704	-	704	844	37	881	-	881	177
APR	472	"	488	-	488	513	37	550	-	550	62
MAY	705	"	721	-	721	710	44	754	-	754	33
JUN	179	"	195	-	195	177	65	242	-	242	47
JUL	42	"	58	17	41	35	70	105	17	88	47
AUG	74	"	90	49	41	63	57	120	49	71	30
SEP	66	"	82	29	53	79	45	124	29	95	42

NOTE: NO DATA AVAILABLE REGARDING RATE AND TIMING OF RESERVOIR REPLENISHMENT, SO NO ALLOWANCE THEREFORE HAS BEEN ENTERED IN TABLE.

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER STATIONS $8GA_{28}$ & $8GA_{30}$ COMPUTED NATURAL DISCHARGES & INFLOWS 1932-33 TO 1939-40	SCALE:
APPROVED:		DWG. NO. TABLE 6 (SHEET 4 OF 4)

Req. 7673

MONTH	RECORDED DOMESTIC DEMAND CFS	RECORDED DOMESTIC DEMAND AS PERCENT OF MEAN ANNUAL DEMAND	REVISED DOMESTIC DEMAND CFS
	1932-33		
OCT	43	94.5	128
NOV	41	90.1	122
DEC	45	98.9	134
JAN	43	94.5	128
FEB	46	101.1	137
MAR	39	85.7	116
APR	42	92.4	125
MAY	41	90.1	122
JUN	45	98.9	134
JUL	55	121.0	163
AUG	63	138.8	187
SEP	43	94.5	128
MEAN	45.5	100.0	135
	1933-34		
OCT	42	91.0	123
NOV	41	89.0	120
DEC	41	89.0	120
JAN	41	89.0	120
FEB	41	89.0	120
MAR	41	89.0	120
APR	44	95.5	129
MAY	45	97.6	132
JUN	60	130.2	176
JUL	56	121.5	164
AUG	57	123.7	167
SEP	44	95.5	129
MEAN	46.1	100.0	135
	1934-35		
OCT	41	91.1	123
NOV	41	91.1	123
DEC	41	91.1	123
JAN	44	97.8	132
FEB	41	91.1	123
MAR	39	86.7	117
APR	40	88.9	120
MAY	49	108.9	147
JUN	53	117.8	159
JUL	51	113.3	153
AUG	53	117.8	159
SEP	47	104.4	141
MEAN	45.2	100.0	135

RECORDED DOMESTIC DEMAND CFS	RECORDED DOMESTIC DEMAND AS PERCENT OF MEAN ANNUAL DEMAND	REVISED DOMESTIC DEMAND CFS
1935-36		
41	73.2	99
39	69.6	94
39	69.6	94
59	105.2	142
61	109.0	147
59	105.2	142
52	92.8	125
56	100.0	135
58	103.7	140
72	128.7	174
81	144.8	195
55	98.2	133
56.0	100.0	135
1936-37		
52	108.2	146
51	106.1	143
56	116.4	157
47	97.8	132
44	91.5	123
40	83.2	112
40	83.2	112
40	83.2	112
49	101.9	137
61	126.9	171
51	106.0	143
46	95.6	129
48.1	100.0	135
1937-38		
41	72.1	97
40	70.6	95
41	72.1	97
43	75.6	102
43	75.6	102
42	74.0	100
41	72.1	97
50	88.0	119
65	114.3	154
69	121.3	164
115	202.3	273
92	162.0	218
56.8	100.0	135

RECORDED DOMESTIC DEMAND CFS	RECORDED DOMESTIC DEMAND AS PERCENT OF MEAN ANNUAL DEMAND	REVISED DOMESTIC DEMAND CFS
1938-39		
42	91.2	123
44	95.5	129
45	97.7	132
40	86.8	117
41	89.0	120
40	86.8	117
40	86.8	117
45	97.6	132
45	97.6	132
53	115.0	155
73	158.3	214
45	97.7	132
46.1	100.0	135
1939-40		
41	89.5	121
39	85.2	115
40	87.5	118
37	81.0	109
37	81.0	109
37	81.0	109
37	81.0	109
44	96.1	130
65	142.0	192
70	152.9	206
57	124.5	168
45	98.3	133
45.8	100.0	135

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	SEYMOUR RIVER, NORTH VANCOUVER	SCALE:
APPROVED:	REVISED DOMESTIC DEMANDS FOR PROPOSED DEVELOPMENT IN EFFECT 1932-33 TO 1939-40	DWG. NO. TABLE 7

MONTH	(1) COMPUTED NATURAL RUNOFF BGA_{28} CFS	(2) ESTIMATED RUNOFF TO MOUNTAIN STORAGES CFS	(3) ESTIMATED DOMESTIC DEMAND CFS	SEYMOUR FALLS RESERVOIR MONTHLY CHANGE (4) CFS-MOS	(5) AC-FT	(6) STORAGE AT MONTH END AC-FT	MOUNTAIN RESERVOIRS MONTHLY CHANGE (7) CFS-MOS	(8) AC-FT	(9) STORAGE AT MONTH END AC-FT	(10) PROPOSED SPILL AT SEYMOUR FALLS CFS	(11) COMPUTED INFLOW BGA_{28} TO BGA_{30} CFS	(12) REVISED RUNOFF BGA_{30} CFS
	1932-33			SEPT. 30			(ASSUMED)					
OCT	363	22	128	+143	+8750	17500	–	–		92	20	112
NOV	1076	67	122	–	–		–	–		954	85	1039
DEC	386	24	134	–	–		–	–		252	226	478
JAN	339	21	128	–	–		–	–		211	167	378
FEB	93	6	137	-64	-3540	13960	–	–		* 20	148	168
MAR	317	20	116	+58	+3540	17500	–	–		143	176	319
APR	600	37	125	–	–		–	–		475	x 0	475
MAY	964	60	122	–	–		–	–		842	x 0	842
JUN	1316	81	134	–	–		–	–		1182	x 0	1182
JUL	1005	62	163	–	–		–	–		843	x 0	843
AUG	224	14	187	–	–		–	–		37	57	* 94
SEP	691	43	128	–	–		–	–		563	50	613
MEAN	615	38	135	+11			–			469	77	546
	1933-34											
OCT	681	42	123	–	–	17500	–	–	17800	558	208	766
NOV	449	28	120	–	–		–	–		329	115	444
DEC	958	59	120	–	–		–	–		838	383	1221
JAN	942	58	120	–	–		–	–		822	219	1041
FEB	782	48	120	–	–		–	–		662	125	787
MAR	651	40	120	–	–		–	–		531	94	625
APR	723	45	129	–	–		–	–		594	x 0	594
MAY	681	42	132	–	–		–	–		549	x 0	549
JUN	140	9	176	-56	-3320	14180	–	–		* 20	52	72
JUL	265	16	164	+54	+3320	17500	–	–		47	34	81
AUG	144	9	167	-43	-2630	14870	–	–		* 20	33	* 53
SEP	149	9	129	–	–	14870	–	–		* 20	58	78
MEAN	547	34	135	-4			–			416	110	526
	1934-35											
OCT	694	43	123	+43	+2630	17500	–	–	17800	528	115	643
NOV	1346	84	123	–	–		–	–		1223	395	1618
DEC	544	34	123	–	–		–	–		421	176	597
JAN	897	56	132	–	–		–	–		765	435	1200
FEB	838	52	123	–	–		–	–		715	17	732
MAR	449	28	117	–	–		–	–		332	185	517
APR	354	22	120	–	–		–	–		234	86	320
MAY	823	51	147	–	–		–	–		676	33	709
JUN	882	55	159	–	–		–	–		723	x 0	723
JUL	474	29	153	–	–		–	–		321	7	328
AUG	140	9	159	-39	-2390	15110	–	–		* 20	28	* 48
SEP	224	14	141	+40	+2390	17500	–	–		43	41	84
MEAN	639	40	135	+4			–			500	127	627

MONTH	(1) COMPUTED NATURAL RUNOFF BGA_{28} CFS	(2) ESTIMATED RUNOFF TO MOUNTAIN STORAGES CFS	(3) ESTIMATED DOMESTIC DEMAND CFS	SEYMOUR FALLS RESERVOIR MONTHLY CHANGE (4) CFS-MOS	(5) AC-FT	(6) STORAGE AT MONTH END AC-FT	MOUNTAIN RESERVOIRS MONTHLY CHANGE (7) CFS-MOS	(8) AC-FT	(9) STORAGE AT MONTH END AC-FT	(10) PROPOSED SPILL AT SEYMOUR FALLS CFS	(11) COMPUTED INFLOW BGA_{28} TO BGA_{30} CFS	(12) REVISED RUNOFF BGA_{30} CFS
	1935-36											
OCT	417	26	99	–	–	17500	–	–	17800	318	148	466
NOV	355	22	94	–	–		–	–		264	80	344
DEC	815	50	94	–	–		–	–		721	79	800
JAN	411	25	142	–	–		–	–		269	280	549
FEB	21	1	147	-146	-8100	9400	–	–		* 20	93	113
MAR	241	15	142	+79	+4850	14250	–	–		* 20	232	252
APR	688	43	125	+55	+3250	17500	–	–		508	178	686
MAY	1016	63	135	–	–		–	–		881	70	951
JUN	709	44	140	–	–		–	–		569	42	611
JUL	236	15	174	–	–		–	–		62	79	141
AUG	11	1	195	-204	-12500	5000	–	–		* 20	75	* 95
SEP	147	9	133	-6	-350	4650	–	–		* 20	93	113
MEAN	423	26	135	-18			–			306	120	426
	1936-37											
OCT	207	13	146	+41	+2500	7150	–	–	17800	* 20	122	142
NOV	109	7	143	-54	-3200	3950	–	–		* 20	65	85
DEC	602	37	157	+221	+13550	17500	–	–		224	230	454
JAN	28	2	132	-124	-7600	9900	–	–		* 20	85	105
FEB	21	1	123	-122	-6750	3150	–	–		* 20	121	141
MAR	448	28	112	+234	+14350	17500	–	–		102	201	303
APR	668	41	112	–	–		–	–		556	228	784
MAY	1166	72	112	–	–		–	–		1054	44	1098
JUN	1246	77	137	–	–		–	–		1109	113	1222
JUL	208	13	171	–	–		–	–		37	42	79
AUG	195	12	143	–	–		–	–		52	24	76
SEP	73	5	129	-76	-4500	13000	–	–		* 20	48	* 68
MEAN	414	25	135	+10			–			270	110	380
	1937-38											
OCT	856	53	97	+74	+4500	17500	–	–	17800	685	205	890
NOV	917	57	95	–	–		–	–		822	163	985
DEC	740	46	97	–	–		–	–		643	150	793
JAN	308	19	102	–	–		–	–		206	156	362
FEB	174	11	102	–	–		–	–		72	132	204
MAR	518	32	100	–	–		–	–		418	153	571
APR	613	38	97	–	–		–	–		516	83	599
MAY	903	56	119	–	–		–	–		784	14	798
JUN	617	39	154	–	–		–	–		463	30	493
JUL	103	6	164	-81	-4950	12550	–	–		* 20	60	* 80
AUG	0	0	273	-205	-12550	0	-88	-5400	12400	* 20	107	127
SEP	28	2	218	–	–	0	-210	-12400	0	* 20	79	99
MEAN	481	30	135	-18			-25			389	111	500

MONTH	(1) COMPUTED NATURAL RUNOFF BGA_{28} CFS	(2) ESTIMATED RUNOFF TO MOUNTAIN STORAGES CFS	(3) ESTIMATED DOMESTIC DEMAND CFS	SEYMOUR FALLS RESERVOIR MONTHLY CHANGE (4) CFS-MOS	(5) AC-FT	(6) STORAGE AT MONTH END AC-FT	MOUNTAIN RESERVOIRS MONTHLY CHANGE (7) CFS-MOS	(8) AC-FT	(9) STORAGE AT MONTH END AC-FT	(10) PROPOSED SPILL AT SEYMOUR FALLS CFS	(11) COMPUTED INFLOW BGA_{28} TO BGA_{30} CFS	(12) REVISED RUNOFF BGA_{30} CFS
	1938-39											
OCT	526	33	123	+286	+17500	17500	+33	+2020	2020	84	129	213
NOV	426	26	129	–	–		+26	+1650	3670	271	154	425
DEC	794	49	132	–	–		+49	+3000	6670	613	198	811
JAN	764	47	117	–	–		+47	+2880	9550	600	376	976
FEB	82	5	120	-63	-3480	14020	+5	+280	9830	20	108	128
MAR	334	21	117	+57	+3480	17500	+21	+1290	11120	138	87	225
APR	683	42	117	–	–		+42	+2500	13620	524	74	598
MAY	908	56	132	–	–		+56	+3440	17060	720	82	802
JUN	671	42	132	–	–		+13	+740	17800	526	43	569
JUL	428	26	155	–	–		–	–		273	13	286
AUG	42	3	214	-192	-11800	5700	–	–		* 20	54	74
SEP	97	6	132	-55	-3480	2220	–	–		* 20	44	* 64
MEAN	480	30	135	+3			+24			317	114	431
	1939-40											
OCT	472	29	121	+249	+15280	17500	–	–	17800	102	60	162
NOV	1226	76	115	–	–		–	–		1111	273	1384
DEC	1276	79	118	–	–		–	–		1158	304	1462
JAN	656	41	109	–	–		–	–		547	148	695
FEB	578	36	109	–	–		–	–		469	270	739
MAR	704	44	109	–	–		–	–		595	177	772
APR	488	30	103	–	–		–	–		379	62	441
MAY	721	45	130	–	–		–	–		591	33	624
JUN	195	12	192	-17	-1000	16500	–	–		* 20	47	67
JUL	41	3	206	-185	-11400	5100	–	–		* 20	47	67
AUG	41	3	168	-83	-5100	0	-64	-3900	13900	* 20	30	* 50
SEP	53	3	133	–	–	0	-100	-5900	8000	* 20	42	62
MEAN	538	33	135	-3			-14			419	124	544

* ANNUAL LOW MEAN MONTHLY DISCHARGE

x NEGATIVE COMPUTED INFLOWS ASSUMED TO BE ZERO

COLUMN		COLUMN		COLUMN	
1	FROM TABLE	5,8	CONVERSION OF COLUMNS 4 & 7 TO ACRE-FEET	10	SUGGESTED DISCHARGE AT NEW DAM (SPILLWAY PLUS BYPASS PIPE)
2	6.2 PERCENT OF COLUMN 1		- 28 DAY CFS-MONTH = 55.4 ACRE-FEET		
3	FROM TABLE		- 30 " " " = 59.4 " "	11	FROM TABLE
4,7	STORAGE DRAWS REQUIRED TO SUPPLEMENT NATURAL RUNOFF		- 31 " " " = 61.4 " "	12	RELEASE AT NEW DAM PLUS INFLOW (COLUMN 10 + COLUMN 11)
		6,9	EFFECT OF COLUMNS 5 & 8 ON AVAILABLE STORAGE		

DEPARTMENT OF FISHERIES, CANADA

SEYMOUR RIVER, NORTH VANCOUVER
FLOW ANALYSIS OF PROPOSED DEVELOPMENT
WITH FIXED MINIMUM RELEASE OF 20 C.F.S.
THROUGH SEYMOUR FALLS DAM
1932-33 TO 1939-40

DRAWN:	DATE: JUNE 1, 1959
CHECK:	SCALE:
APPROVED: DIVISION ENGINEER	DWG. NO. TABLE 8

Req. 7673

MONTH	(1) COMPUTED NATURAL RUNOFF BGA_{28} CFS	(2) ESTIMATED RUNOFF TO MOUNTAIN STORAGES CFS	(3) ESTIMATED DOMESTIC DEMAND CFS	SEYMOUR FALLS RESERVOIR MONTHLY CHANGE (4) CFS-MOS.	(5) AC-FT	(6) STORAGE AT MONTH END AC-FT	MOUNTAIN RESERVOIRS MONTHLY CHANGE (7) CFS-MOS.	(8) AC-FT.	(9) STORAGE AT MONTH END AC-FT	(10) PROPOSED SPILL AT SEYMOUR FALLS CFS.	(11) COMPUTED INFLOW BGA_{28} TO BGA_{30} CFS	(12) REVISED RUNOFF BGA_{30} CFS
	1932	-33		SEPT	30	8750	(ASSUMED)		17800			
OCT	363	22	128	+143	+8750	17500	–	–		92	20	112
NOV	1076	67	122	–	–		–	–		954	85	1039
DEC	386	24	134	–	–		–	–		252	226	478
JAN	339	21	128	–	–		–	–		211	167	378
FEB	33	6	137	-90	-4980	12520	–	–		* 46	148	194
MAR	317	20	116	+81	+4980	17500	–	–		120	176	296
APR	600	37	125	–	–		–	–		475	× –	475
MAY	964	60	122	–	–		–	–		842	× –	842
JUN	1316	81	134	–	–		–	–		1182	× –	1182
JUL	1006	62	163	–	–		–	–		843	× –	843
AUG	224	14	187	-11	-670	16830	–	–		48	57	* 105
SEP	691	43	128	+11	+670	17500	–	–		552	50	602
MEAN	615	38	135	+11			–			468	77	545
	1933	-34										
OCT	681	42	123	–	–	17500	–	–	17800	558	208	766
NOV	449	28	120	–	–		–	–		329	115	444
DEC	958	59	120	–	–		–	–		838	383	1221
JAN	942	58	120	–	–		–	–		822	219	1041
FEB	782	48	120	–	–		–	–		662	125	787
MAR	651	40	120	–	–		–	–		531	94	625
APR	723	45	129	–	–		–	–		594	× –	594
MAY	681	42	132	–	–		–	–		549	× –	549
JUN	140	9	176	-82	-4860	12640	–	–		46	52	98
JUL	265	16	164	+55	+3370	16010	–	–		46	34	80
AUG	144	9	167	-68	-4160	11850	–	–		45	33	* 78
SEP	449	9	129	-23	-1360	10490	–	–		* 43	58	101
MEAN	547	34	135	-10			–			422	110	532
	1934	-35										
OCT	694	43	123	+114	+7010	17500	–	–	17800	457	115	572
NOV	1346	84	123	–	–		–	–		1223	395	1618
DEC	544	34	123	–	–		–	–		421	176	597
JAN	897	56	132	–	–		–	–		765	435	1200
FEB	838	52	123	–	–		–	–		715	17	732
MAR	449	28	117	–	–		–	–		332	185	517
APR	354	22	120	–	–		–	–		234	86	320
MAY	823	51	147	–	–		–	–		676	33	709
JUN	882	55	159	–	–		–	–		723	× –	723
JUL	474	29	153	–	–		–	–		321	7	328
AUG	140	9	159	-65	-3980	13520	–	–		* 46	28	* 74
SEP	224	14	141	+37	+2200	15720	–	–		* 46	41	87
MEAN	639	40	135	+7			–			497	126	623

MONTH	(1) COMPUTED NATURAL RUNOFF BGA_{28} CFS	(2) ESTIMATED RUNOFF TO MOUNTAIN STORAGES CFS	(3) ESTIMATED DOMESTIC DEMAND CFS	SEYMOUR FALLS RESERVOIR MONTHLY CHANGE (4) CFS-MOS.	(5) AC-FT	(6) STORAGE AT MONTH END AC-FT	MOUNTAIN RESERVOIRS MONTHLY CHANGE (7) CFS-MOS.	(8) AC-FT.	(9) STORAGE AT MONTH END AC-FT	(10) PROPOSED SPILL AT SEYMOUR FALLS CFS.	(11) COMPUTED INFLOW BGA_{28} TO BGA_{30} CFS	(12) REVISED RUNOFF BGA_{30} CFS
	1935	-36										
OCT	417	26	99	+29	+1780	17500	–	–	17800	289	148	437
NOV	358	22	94	–	–		–	–		264	80	344
DEC	815	50	94	–	–		–	–		721	79	800
JAN	411	25	142	–	–		–	–		269	280	549
FEB	21	1	147	-170	-9400	8100	–	–		44	93	137
MAR	241	15	142	+57	+3500	11600	–	–		42	232	274
APR	688	43	125	+99	+5900	17500	–	–		464	178	642
MAY	1016	63	135	–	–		–	–		881	70	951
JUN	709	44	140	–	–		–	–		569	42	611
JUL	236	15	174	–	–		–	–		62	79	141
AUG	11	1	195	-226	-13900	3600	–	–		42	75	* 117
SEP	147	9	133	-21	-1250	2350	–	–		* 35	93	128
MEAN	423	26	135	-19						307	120	427
	1936	-37										
OCT	207	13	146	+26	+1600	3950	–	–	17800	35	122	157
NOV	109	7	143	-67	-3950	0	–	–		* 33	65	98
DEC	602	37	157	+286	+17500	17500	–	–		159	230	389
JAN	28	2	132	-148	-9100	8400	–	–		44	85	129
FEB	21	1	123	-137	-7600	800	–	–		35	121	156
MAR	448	28	112	+272	+16700	17500	–	–		64	201	265
APR	668	41	112	–	–		–	–		556	228	784
MAY	1166	72	112	–	–		–	–		1054	44	1098
JUN	1246	77	137	–	–		–	–		1109	113	1222
JUL	208	13	171	-11	-670	16830	–	–		48	42	90
AUG	195	12	143	+4	+250	17080	–	–		48	24	* 72
SEP	73	5	129	-101	-6000	11080	–	–		45	48	93
MEAN	414	25	135	+10			–			269	110	379
	1937	-38										
OCT	856	53	97	+105	+6420	17500	–	–	17900	654	205	859
NOV	917	57	95	–	–		–	–		822	163	985
DEC	740	46	97	–	–		–	–		643	150	-793
JAN	308	19	102	–	–		–	–		206	156	362
FEB	174	11	102	–	–		–	–		72	132	204
MAR	518	32	100	–	–		–	–		418	153	571
APR	613	38	97	–	–		–	–		516	83	599
MAY	903	56	119	–	–		–	–		784	14	798
JUN	617	38	154	–	–		–	–		463	30	493
JUL	103	6	164	-106	-6500	11000	–	–		45	60	105
AUG	0	0	273	-179	-11000	0	-124	-7600	10200	30	107	137
SEP	28	2	** 218	–	–	0	-172	-10200	0	* 20	79	* 99
MEAN	481	30	135	-15			-25			389	111	500

MONTH	(1) COMPUTED NATURAL RUNOFF BGA_{28} CFS	(2) ESTIMATED RUNOFF TO MOUNTAIN STORAGES CFS	(3) ESTIMATED DOMESTIC DEMAND CFS	SEYMOUR FALLS RESERVOIR MONTHLY CHANGE (4) CFS-MOS.	(5) AC-FT	(6) STORAGE AT MONTH END AC-FT	MOUNTAIN RESERVOIRS MONTHLY CHANGE (7) CFS-MOS.	(8) AC-FT.	(9) STORAGE AT MONTH END AC-FT	(10) PROPOSED SPILL AT SEYMOUR FALLS CFS.	(11) COMPUTED INFLOW BGA_{28} TO BGA_{30} CFS	(12) REVISED RUNOFF BGA_{30} CFS
	1938	-39										
OCT	526	33	123	+296	+17500	17500	+33	+2000	2000	84	129	213
NOV	426	26	129	–	–		+26	+1500	3500	271	154	425
DEC	794	49	132	–	–		+49	+3000	6500	613	198	811
JAN	764	47	117	–	–		+47	+2900	9400	600	376	976
FEB	82	5	120	-89	-4900	12600	+5	+300	9700	46	108	154
MAR	334	21	117	+80	+4900	17500	+21	+1300	11000	116	87	203
APR	683	42	117	–	–		+42	+2500	13500	524	43	567
MAY	908	56	132	–	–		+56	+3400	16900	720	82	802
JUN	671	42	132	–	–		+15	+900	17800	524	43	567
JUL	428	26	155	–	–		–	–		273	13	286
AUG	42	3	214	-214	-13100	4400	–	–		42	54	96
SEP	97	6	132	-68	-4000	400	–	–		* 33	44	* 77
MEAN	480	30	135	–			+25			320	114	434
	1939	-40										
OCT	472	29	121	+279	+17100	17500	–	–	17800	72	60	132
NOV	1226	76	115	–	–		–	–		1111	273	1384
DEC	1276	79	118	–	–		–	–		1158	304	1462
JAN	656	41	109	–	–		–	–		547	148	695
FEB	578	36	109	–	–		–	–		469	270	739
MAR	704	44	109	–	–		–	–		595	177	772
APR	498	30	109	–	–		–	–		379	62	441
MAY	721	45	130	–	–		–	–		591	33	624
JUN	195	12	192	-44	-2600	14900	–	–		47	47	94
JUL	41	3	206	-205	-12200	2700	–	–		40	47	87
AUG	41	3	168	-44	-2700	0	-106	-6500	11300	23	30	* 53
SEP	53	3	133	–	–	0	-100	-6100	5200	* 20	42	62
MEAN	538	33	135	-1			-17			421	124	545

* ANNUAL LOW MEAN MONTHLY DISCHARGE

** IN SEPT./38 ESTIMATED MEAN DEMAND OF 218 CFS CAN NOT BE SUPPLIED. ADDITIONAL 2200 AC-FT REQUIRED.

× NEGATIVE COMPUTED INFLOWS ASSUMED TO BE ZERO

COLUMN	
1	FROM TABLE
2	6.2 PERCENT OF COLUMN 1
3	FROM TABLE
4,7	STORAGE DRAWS REQUIRED TO SUPPLEMENT NATURAL RUNOFF
5,8	CONVERSION OF COLUMNS 4 & 7 TO ACRE-FEET
	-28 DAY CFS-MONTH = 55.4 ACRE-FEET
	-30 " " " = 59.4 " "
	-31 " " " = 61.4 " "
6,9	EFFECT OF COLUMNS 5 & 8 ON AVAILABLE STORAGE
10	SUGGESTED DISCHARGE AT NEW DAM (SPILLWAY PLUS BYPASS PIPE)
11	FROM TABLE
12	RELEASE AT NEW DAM PLUS INFLOW (COLUMN 10 + COLUMN 11)

DEPARTMENT OF FISHERIES, CANADA

SEYMOUR RIVER, NORTH VANCOUVER
FLOW ANALYSIS OF PROPOSED DEVELOPMENT
WITH VARIABLE MINIMUM RELEASE AT
SEYMOUR FALLS DAM
1932-33 TO 1939-40

DRAWN:	DATE: JUNE 1, 1959
CHECK:	SCALE:
APPROVED: DIVISION ENGINEER	DWG. NO. TABLE 9

Req. 7673

STATION $8GA_{28}$

WATER YEAR	RECORDED MINIMUM MEAN MONTHLY DISCHARGE	COMPUTED MEAN MONTHLY DISCHARGE IF PROPOSED DEVELOPMENT & INCREASED DEMANDS HAD BEEN IN EFFECT	
		MINIMUM BYPASS DISCHARGE CONSTANT AT 20 CFS	MINIMUM BYPASS DISCHARGE VARIES BETWEEN 20 & 48 CFS
1932-33	98 CFS	20 CFS	46 CFS
1933-34	124	20	43
1934-35	140	20	46
1935-36	33	20	35
1936-37	14	20	33
1937-38	19	20	20
1938-39	53	20	33
1939-40	42	20	20
MEAN	65	20	35
PERCENT OF RECORDED MEAN	100	31	54

STATION $8GA_{30}$

WATER YEAR	RECORDED MINIMUM MEAN MONTHLY DISCHARGE	COMPUTED MEAN MONTHLY DISCHARGE IF PROPOSED DEVELOPMENT & INCREASED DEMANDS HAD BEEN IN EFFECT	
		MINIMUM BYPASS DISCHARGE CONSTANT AT 20 CFS	MINIMUM BYPASS DISCHARGE VARIES BETWEEN 20 & 48 CFS
1932-33	216 CFS	94 CFS	105 CFS
1933-34	131	53	78
1934-35	131	48	74
1935-36	51	95	117
1936-37	68	68	72
1937-38	29	80	99
1938-39	50	64	77
1939-40	35	50	53
MEAN	89	69	84
PERCENT OF RECORDED MEAN	100	78	95

DRAWN:	DEPARTMENT OF FISHERIES, CANADA	DATE: JUNE 1, 1959
CHECK:	**SEYMOUR FALLS, NORTH VANCOUVER** STATIONS $8GA_{28}$ & $8GA_{30}$	SCALE:
APPROVED:	COMPARISON OF RECORDED AND COMPUTED FLOWS WITH FIXED AND VARIABLE RELEASES AT SEYMOUR FALLS DAM, 1932-33 TO 1939-40	DWG. NO. TABLE 10