CHAPTER 12

Mission Creek

12.1 GENERAL DESCRIPTION

Reference is made to the key map shown on Figure 12.1 and the Schematic shown on Figure 12.2.

Mission Creek has the second largest watershed and the largest natural water yield of the eight tributaries under study. Its watershed area is 336 square miles and its natural water yield in an average year is 142,900 acre-feet.

In 1970 the area contained a population of 10,340 and served 10,135 irrigated areas. No truly urban areas are served.

The headwaters of Mission Creek are located about 27 miles east northeast of its mouth at a point which is the junction between the Shuswap, Kettle and Okanagan watersheds. The headwaters lake is called Mission Lake (CP1) and is situated at an elevation of 6,097 feet. The watershed ridge continues in an unusually high elevation and includes the highest mountain peak in the area. Little White Mountain, elevation 7,122 feet. It is because of this high mountain ridge that the water yield of Mission Creek is so much greater than the larger, but lower, watershed of Vernon Creek. Flow from Mission Creek (CP1) is soon joined by flow from Loch Katrine (MP1) which flows through Graystoke Lake (CP2) to reach Mission Creek. Next, flow from Fish Hawk Lake (CP3) joins the stream. This lake did not exist as a developed, controlled reservoir in 1970. Mission Creek is next joined by Loch Long (CP4) via an unnamed creek. Ideal Lake (CP5) flow follows a long independent course in Belgo Creek before joining Mission Creek.

The most important tributary to Mission Creek is Hydraulic Creek which, itself, contains seven reservoirs. In 1970, its headwaters comprised three reservoirs. Hydraulic *#9* (CP6), Haynes (CP7), and McCulloch (CP8). Subsequent to 1970, these three reservoirs were merged into a single expanded McCulloch (CP8). It is anticipated that Canhon Lake (CP12) will be developed as a reservoir before 1980 and will be tributary to McCulloch.

Outflow from McCulloch runs into Hydraulic Creek and is soon joined by a linked series of three small reservoirs. Long Meadow (CP9), Brown (CP10), and

Fish (CPU). Flow from this total grouping of reservoirs continues on Hydraulic Creek, serves the needs of the South East Kelowna Irrigation District (UP6) and finally joins Mission Creek.

Flow in Mission Creek proceeds without benefit of additional storage inflow, serves Black Mountain Irrigation District (UPS), Brent David Irrigation District (UP9), and Rutland Water Users Association (UP9), its residual flow eventually entering Okanagan Lake.

As shown on the area-elevation curves on Figure 14.2, the media elevation of Mission Creek is 4,600 feet. After Penticton Creek, this is the highest of the tributary basins. With minor exceptions, the land rises steeply to the 4,000 foot elevation. A rough upland plateau between elevations 4,000 and 5,000 feet occupies 40% of the total area of the basin. Above 5,000 feet, the land steepens again over 30% of the land area and finally reaches the mountain peaks at 7,000 feet.

Reference to Figure 14.3 will show that the course of Mission Creek itself is relatively flat over the first four miles from its mouth with an average gradient of 25 feet per mile. Over the next 24 miles, the gradient gradually increases to 92 feet per mile. Over the final 14 miles to headwaters at Mission Lake, the gradient increases sharply to 208 feet per mile.

There are a number of hydrometric, meteorological and snow course stations within the Mission Creek system and these are located on Figure 12.1 Many of the hydrometric records are of short duration and often cover only the summer months.

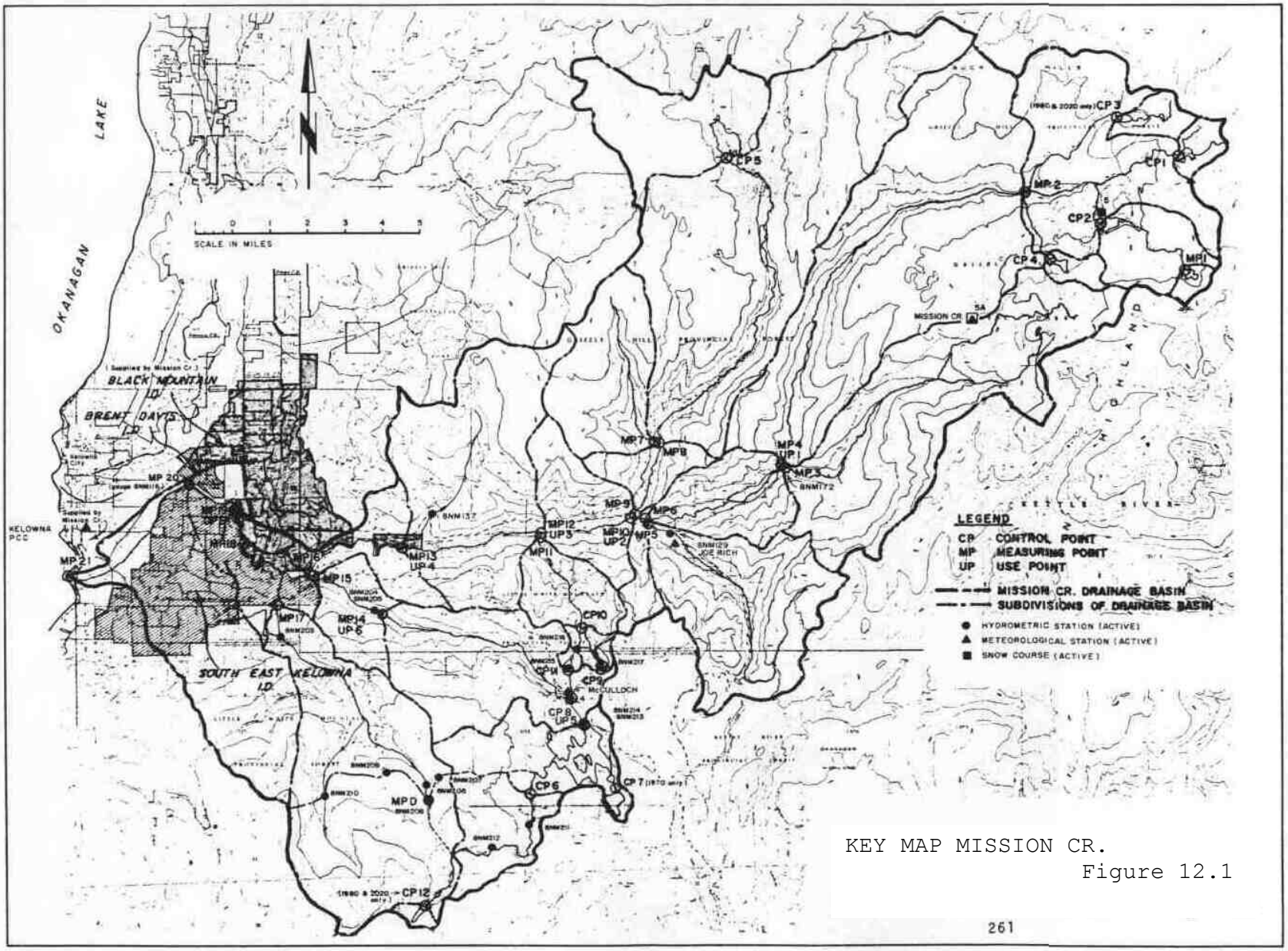
The most significant hydrometric station is 8NM116 located about five miles from the creek mouth. Hydrographs of mean monthly flows passing this station have been plotted on Figure 14.4.

12.2 HISTORICAL BACKGROUND

The following outlines the historical background of the major organized areas receiving water from Mission Creek.

a) Black Mountain Irrigation District

Prior to 1920 the irrigation interests in the area were controlled by the Kelowna Irrigation Company, the Black Mountain Water Company (subsidiary of Belgo-Canadian Fruit Land Company), and the Rutland Estates. These three systems were purchased by the Black Mountain Irrigation District after incorporation under the "Water Act" in November, 1920.



KEY MAP MISSION CR.
Figure 12.1

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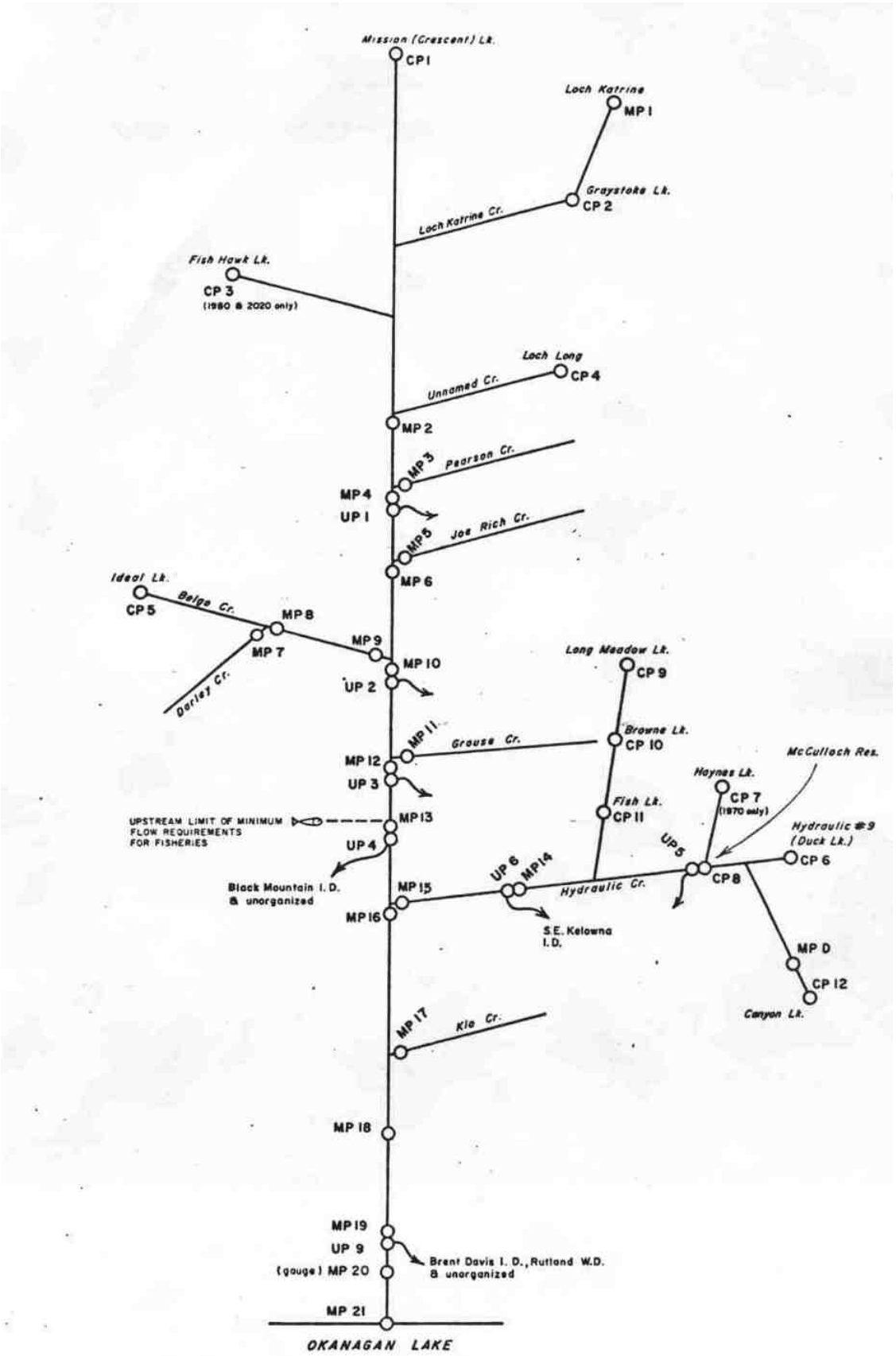

MISSION CR. SCHEMATIC Figure 12.2

The original works were constructed around 1910 and were laid out as an open-ditch gravity system. As component renewals became necessary, the District have pursued a policy of piecemeal conversion to pressurization. By 1956, it was reported that one-half of the system was under pressure and that one-third of the system was being used for sprinkler irrigation.

Drainage plays an important part in the economy of the District, notably in the half-mile wide strip immediately east of the Rutland Ditch and extending from Rutland Road to the north boundary of the District. In this area the water table is high and the land is often waterlogged. Remedial drainage works were originally constructed and maintained by the Rutland Drainage District.

Under letters patent dated the 15th June 1925 the Black Mountain Irrigation District acquired all right, title and interest in the Drainage District. Subsequent drainage work as considered necessary for proper irrigation has been carried out by the Irrigation District.

Poor drainage conditions in the lower areas restrict agricultural activity to mixed farming. Elsewhere in the District production consists of fruit and some vegetables. The standard of productivity varies widely, being consistently high on some orchards and low in adjacent areas.

Being close to the city of Kelowna, the District has experienced considerable domestic subdivision, particularly in the area known as Rutland Flats. In this area orchards damaged by frost are not being replaced. Such land remaining under agriculture is being used for vegetable and hay production.

Problems resulting from overlapping boundaries with Rutland Waterworks District were resulved in 1969-70 by the establishment of a common boundary.

b) Rutland Waterworks District

The Rutland Waterworks District was originally incorporated under the Water Act by letters patent dated the 28th of December, 1949. At that time the domestic requirements of the area were being obtained from individual wells and the District itself embraced some fifteen houses supplied from one large well.

In 1956, the boundaries of the District were substantially extended to include some 200 additional consumers. It was estimated that approximately two-thirds of the individual well water supplies in the Rutland area were contaminated at that time. The District therefore extended its boundaries to in-

clude some 200 additional houses and installed new works to serve them. The system was completed in 1957 to designs by Associated Engineering Services Limited and cost approximately $185,000.

Subsequently, the District has extended its boundaries and pipelines to meet the demands of domestic subdivision.

Because Rutland Waterworks District's own source of water is unsuitable for domestic supply, they now seek to obtain a supply of higher quality from Black Mountain Irrigation District.

c) Brent-David Irrigation District

In 1891 Mr. F. Brend and Mr. J. David owned a large tract of land in the Rutland area. They irrigated it by taking water from Mission Creek and transporting it by flume across the flats to their land.

In the 1920's, the pressures of subdivision and increased demand for water indicated that storage facilities were necessary. On the advice of the Mater Rights Branch, a dam was built on Browne Lake using voluntary labour. This dam was later sold to South East Kelowna Irrigation District. The Brent-Davis system next purchased the dam on Loch Long from Black Mountain Irrigation District. The owners of the storage and distribution system became known as the Brent-David Water Users Community.

On February 23, 1950, following a continued increase in the number of water users due to subdivision and the need to raise funds for Improved services, the Brent-Davis Water Users Community became incorporated under the Water Act as Brent-David Irrigation District.

In 1970, overtures were made with a view to amalgamation with Rutland Waterworks District and for Black Mountain Irrigation District. This proposal, precipitated by increasing difficulties in providing irrigation water due to encroachment of subdivisions, did not result in any action. By 1973 it appears that an economical source of irrigation water is no longer available to the District.

d) South East Kelowna Irrigation District

Development of fruit lands in this district commenced with the activities of the Canyon Creek Irrigation Company, Limited, 1910-1911, and the South Kelowna Land Company, Limited, in 1912.

A system of main canals, concrete-lined ditches and wood pipe syphons

was installed, and water was conveyed from Hydraulic Creek, having a small flow but good storage, by the S.K.L. Company, and from Canyon Creek with heavy spring flow but poor storage facilities, by the Canyon Creek Irrigation Company.

Distribution works consisted in part of metal flumes, concrete pipes, wood pipe and wood flume, and in addition, there were domestic water systems installed by both companies to serve part of their areas. The irrigation charges were $5.00 and $6.00 per acre and special charges were made for the domestic water.

The District was incorporated by Letters Patent issued on November 2, 1920.

The original domestic system was installed in 1905. Since that time, there have been numerous renewals and extensions, and, in general, the existing distribution system is now considered to be in good condition.

12.3 LAND USE AND WATER REQUIREMENTS

General

The Mission Creek watershed serves a large agricultural area (10,135 acres in 1970) of which roughly half lies outside the natural watershed boundaries.

Land use is basically agricultural with a strong trend towards urbanization in some areas, such as Rutland.

The only industrial land use in the watershed is for a placer mining. operation on Mission Creek. Since its license permits diversion at the rate of 1.5 cfs (1,080 acre-feet/year), a false sense of importance tends to attach itself to industrial use. In fact, the use is totally non-consumptive and, further, the license may be cancelled on twelve months notice.

There are three major irrigation districts in the area. Black Mountain and Brent-Davis, which divert their water from Mission Creek and South East Kelowna which diverts its water from Hydraulic Creek and from KLO Creek. These groups also provide domestic water for residents within their boundaries.

The Rutland Waterworks District pumps its water directly from Mission Creek. Although not a particularly large water user, it serves roughly 600 domestic connections in a rapidly developing area. The supply are and service overlaps that of Black Mountain Irrigation District to a considerable extent.

a) Rutland Waterworks District

Rutland Waterworks District gets its water from the Brent-David Irrigations District's intake on Mission Creek near the southeast corner of Rutland Waterworks District. Rutland Waterworks District diverts water into an open sedimentation pond, thence through a gravel filter to a concrete sump. Water is pumped from the sump with a 30-HP, 300-US gpm, electric pump Into a six-inch force man, and with a 60-HP, 720 gpm, electric pump into an eight-inch force main. These mains discharge into an 180,000-US gallon high storage reservoir near the pumphouse. From this storage the water flows by gravity into the Rutland Waterworks District's distribution system through a ten inch main pipeline running northward along the east side to Rutland Airport to Belgo Road, then along Belgo Road to Highway 33. The supply is chlorinated at the pumphouse. A few consumers are served by a take-off from the eight-inch force main between the pumphouse and reservoir.

The distribution system is divided into two pressure zones, the lower zone being fed entirely by the six-inch laterial on Highway 33 through a pressure-reducing station at Hollywood Road.

The raw water in the creek at Rutland Waterworks District's point of diversion is subject to bacterial contamination, and the sedimentation pond and filter are not properly effective in removing sediment and vegetable matter. In addition, the temperature of the raw water during the summer is substantially higher than that considered acceptable for public water supply. Because of this, there is an increasing tendency to seek supply from the Black Mountain Irrigation District system.

b) Black Mountain Irrigation District

The Black Mountain Irrigation District diverts water from Mission Creek seven miles upstream from the Rutland Waterworks District's intake to a sedimentation pond, thence by gravity through a low-pressure, concrete conduit 5,900 feet long and through three tunnels of total length 3-880 feet to a surge tower. From here the water flows by gravity to Black Mountain Irrigation District through a trunk main, reducing from 48-inch diameter at the surge tower to 24-inch at Pressure Reducing Station No. 1 on Mugford Road. The water is chlorinated at the downstream end of 48-inch main.

There are two pressure-reducing stations on the main pipeline and five on the laterals. There are five separate pressure zones.

This system is designed to deliver, at frost-free times, up to 31,058 US gpm of irrigation and farm-domestic water to approximately 4,950 acres of

agricultural land approved for ARDA assistance within the Black Mountain Irrigation District. Farm-domestic water was obtained in winter (1970) by pumping from two wells in Black Mountain Irrigation District. The intake was winterized in 1971 so that the gravity supply from Mission Creek may be used all year. Wells previously used for winter supply are now retained as standby only.

c) South East Kelowna Irrigation District

This District encompasses an area of some 8,600 acres of which an estimated 4,478 acres were under irrigation in 1970.

Gravity water is supplied to the District by two irrigation systems of about equal size in area and one domestic system. The irrigation system to the north is commonly referred to as the KLO system with an intake on Canyon (KLO) Creek, while the irrigation system to the south is known as the SKL system with an intake on Hydraulic Creek. The domestic system, with an intake on Canyon Creek and serving about 200 farm connections, supplies the central area within the KLO irrigation system. The remaining areas are served by springs or cisterns.

Peak demand on the Canyon (KLO) Creek system is about 35 cfs and an estimated 2,140 acres were served in 1970.

After the spring runoff in Canyon Creek has dropped to below the irrigation demand, water from Hydraulic Creek is spilled from the SKL main diversion ditch into Canyon Creek about one-half mile upstream from the KLO diversion. A settling basin was built in 1969 to remove silts and sands from the Canyon Creek water. The water is brought to the settling basin in a metal flume, and presently is carried to the District in a concrete-lined ditch. After passing through screening tanks, the water is distributed by pipelines and flumes to the orchards. Most of the pipeline is coated (unlined) steel that was installed 15 years ago. Some of the short branch lines have been constructed of aluminum pipe.

Diversion from the KLO Creek system is not included in the computer programmes formulated for this study. Instead, all flow is assumed to come from Hydraulic Creek.

A diversion dam on Hydraulic Creek supplies water that is used in the SKL distribution system. The water is first carried in a wood-stave pipeline for 3,600 feet, then in a concrete-lined ditch for 13,400 feet to Canyon Creek where a portion of the water is fed into the KLO system. Crossing Canyon Creek through a steel syphon, the water supply is carried by a second ditch for about 5,700 feet at elevation 2,300 feet where it is dropped to elevation 1,950

feet by a 1,750-foot pipeline. A further section of open concrete-lined ditch delivers the water to the main branches of the SKL distribution system.

In 1970, the domestic water supply system of the South East Kelow Irrigation District was served in part by an intake on Canyon (KLO) Creek at elevation 2030 feet and in part by cisterns and wells. The original system was installed in 1905 and includes about 18 miles of small distribution mains serving an area of 2,600 acres.

d) Brent-Davis Irrigation District

In 1970, this small irrigation district served an estimated 107 acres. Gravity supply water is taken by flume from an intake on Mission Creek to its piped distribution system. The area is being transformed from an agricultural to a suburban community and may soon become absorbed within the Black Mountain Irrigation District.

Water users in terms of population and areas irrigated are shown on Table 12.1.

TABLE 12.1
WATER USERS IN THE MISSION CREEK WATERSHED (1970)

Area Served	Area Irrigated (acres)	Population (approx.) (persons)	Diversion		
			Irrigation (ac.-ft.)	Domestic (ac.-ft.)	Total (ac.-ft.)
Black Mountain Irrigation District	3,434	600	10,383	125	10,508
South East Kelowna Irrigation District	4,478	2,196	13,545	457	14,002
Brent-Davis Irrigation District	107	108	324	12	336
Rutland Waterworks District	0	4,569	0	522	522
Other	2,117	62	6,402	7	6,409
Total	10,135	7,535	30,654	1,123	31,777

Consumptive use diversions as listed above are assumed to result in no return flow within the Mission Creek sub-basin. However, consumptive use diversions are expected to provide a return flow to Okanagan Lake. The amount of return flow varies with the type of use and is estimated as follows:

a) For "Irrigation", return = 50% of diversion.

b) For "Domestic and Waterworks", return flow = 65% of diversion.

c) For "Industry", return flow = 902 of diversion.

From the above, water utilization in terms of the amounts of consumed water and return flow within the Okanagan Lake Basin may be tabulated as follows:
(Table 12.2).

TABLE 12.2

WATER UTILIZATION IN MISSION CREEK (1970)

Requirements	Diversion for Consumptive Use (acre-feet)	Consumed Water (acre-feet)	Return Flow to Okanagan Lake (acre-feet)
Irrigation	30,654	15,327	15,327
Domestic and Waterworks	1,160	406	754
Industry	0	0	0
Totals	31,814	15,733	16,081

A detailed breakdown of diversion requirements for the various organized areas at the 1970 stage of development is as shown on Table 12.3.

In order to acquire rights over the use of water, most users, acting either individually or collectively in an irrigation district, have maintained water licenses for storage and diversion granted by the Crown, in right of the Province. Licenses provide their holder with rights over the stated amount of water and, in cases of a shortage, the older license takes precedence over the newer.

Current water licences in 1970 for both storage and consumptive use are as listed on Table 12.4.

The industrial license listed is non-consumptive and hence does not affect the availability of water.

12.4 NATURAL WATER SUPPLY

Estimated natural water yields for the area are shown on computer printout sheets, reproduced on Figure 12.3 (Dry Year), Figure 12.4 (Average Year), and Figure 12.5 (Wet Year).

TABLE 12.3

DIVERSION REQUIREMENTS ON MISSION CREEK (1970)

GIVEN IN ACRE-FEET

Month	Type	Black Mtn. I.D.	South East Kelowna I.D.	Brent-Davis I.D.	Rutland Waterworks District	Other	Total
J	Agric.	0	0	0	0	0	0
	Dom.	6	23	1	27	1	58
	Ind.	0	0	0	0	0	0
F	Agric.	0	0	0	0	0	0
	Dom.	5	18	1	22	0	46
	Ind.	0	0	0	0	0	0
M	Agric.	0	0	0	0	0	0
	Dom.	6	23	1	27	1	58
	Ind.	0	0	0	0	0	0
A	Agric.	0	0	0	0	0	0
	Dom.	7	27	1	33	1	69
	Ind.	0	0	0	0	0	0
M	Agric.	1,557	2,031	50	0	960	4,598
	Dom.	12	46	1	56	1	116
	Ind.	0	0	0	0	0	0
J	Agric.	2,595	3,386	82	0	1,600	7,663
	Dom.	17	59	2	72	1	151
	Ind.	0	0	0	0	0	0
J	Agric.	2,595	3,386	82	0	1,600	7,663
	Dom.	20	73	2	89	2	186
	Ind.	0	0	0	0	0	0
A	Agric.	2,595	3,386	82	0	1,600	7,663
	Dom.	20	73	2	89	2	186
	Ind.	0	0	0	0	0	0
S	Agric.	1,037	1,355	33	0	640	3,065
	Dom.	10	37	1	46	1	95
	Ind.	0	0	0	0	0	0
O	Agric.	0	0	0	0	0	0
	Dom.	8	32	1	39	1	81
	Ind.	0	0	0	0	0	0
N	Agric.	0	0	0	0	0	0
	Dom.	6	23	1	27	1	58
	Ind.	0	0	0	0	0	0
D	Agric.	0	0	0	0	0	0
	Dom.	6	23	1	27	1	58
	Ind.	0	0	0	0	0	0
Total		10,502	14,001	344	554	6,413	31,814

Date Of Print-out:
Dec. 7, 1972

FLOWS IN AC. FT.

LOCATION	AREA IN K.AC.	J	F	M	A	M	J	J	A	S	O	N	D	YEAR
CPOA 1	1.9	0.	0.	0.	6.	659.	550.	6.	6.	6.	6.	0.	0.	1250.
MPOA 1	0.5	0.	0.	0.	1.	398.	335.	1.	1.	1.	1.	0.	0.	740.
CPOA 2	4.0	2.	2.	2.	24.	2730.	2241.	26.	24.	22.	22.	2.	2.	5100.
CPOA 3	1.2	1.	1.	1.	9.	766.	620.	10.	9.	8.	8.	1.	1.	1435.
CPOA 4	0.8	0.	0.	0.	5.	535.	440.	5.	5.	5.	5.	0.	0.	1000.
MPOA 2	18.9	36.	38.	38.	173.	11299.	8935.	209.	171.	137.	137.	38.	38.	21267.
MPOA 3	16.0	75.	92.	106.	240.	5975.	4183.	273.	152.	124.	124.	90.	90.	11525.
MPOA 4	63.9	232.	279.	311.	784.	26146.	19199.	923.	578.	462.	462.	275.	275.	49926.
MPOA 5	9.8	39.	47.	61.	129.	1078.	532.	123.	45.	45.	45.	45.	45.	2232.
MPOA 6	78.3	281.	338.	388.	954.	27474.	19847.	1081.	633.	517.	517.	330.	330.	52692.
CPOA 5	7.7	49.	68.	78.	127.	1939.	1097.	155.	77.	66.	66.	66.	66.	3861.
MPOA 7	7.0	40.	54.	62.	109.	1576.	894.	130.	63.	54.	54.	54.	54.	3143.
MPOA 8	43.0	230.	302.	358.	656.	10270.	6181.	754.	366.	321.	321.	300.	300.	20340.
MPOA 9	45.2	237.	310.	368.	681.	10447.	6246.	775.	373.	328.	328.	307.	307.	20711.
MPOA 10	125.1	524.	654.	765.	1653.	38072.	26168.	1874.	1013.	852.	852.	644.	644.	73714.
MPOA 11	3.2	10.	12.	16.	39.	252.	117.	34.	11.	11.	11.	11.	11.	533.
MPOA 12	133.1	547.	682.	802.	1737.	38687.	28465.	1951.	1038.	877.	877.	670.	670.	75004.
MPOA 13	147.7	596.	741.	877.	1902.	40056.	27149.	2107.	1095.	933.	933.	725.	725.	77838.
CPOA 6	9.1	55.	73.	85.	148.	2130.	1205.	176.	85.	73.	73.	73.	73.	4247.
CPOA 7	0.4	2.	2.	3.	6.	96.	22.	6.	2.	2.	2.	2.	2.	100.
CPOA 8	13.7	78.	97.	121.	223.	2725.	1490.	247.	110.	97.	97.	97.	97.	5480.
CPOA 9	0.2	1.	1.	1.	3.	24.	11.	3.	1.	1.	1.	1.	1.	50.
CPOA 10	0.7	3.	3.	5.	11.	84.	39.	10.	3.	3.	3.	3.	3.	175.
CPOA 11	0.9	4.	4.	7.	15.	198.	51.	13.	4.	4.	4.	4.	4.	725.
MPOA 14	22.4	113.	134.	173.	346.	3552.	1874.	386.	144.	132.	132.	132.	132.	7221.
MPOA 15	25.1	116.	137.	177.	358.	3615.	1901.	388.	147.	135.	135.	135.	135.	7357.
MPOA 16	176.3	714.	881.	1058.	2271.	43722.	29073.	2483.	1245.	1070.	1070.	862.	862.	85310.
CPOA 12	0.4	1.	1.	1.	5.	213.	160.	6.	5.	3.	3.	1.	1.	402.
MPOA 17	19.4	88.	114.	131.	256.	5226.	3471.	301.	161.	134.	134.	112.	112.	10189.
MPOA 18	197.8	801.	995.	1188.	2527.	48948.	32494.	2784.	1405.	1204.	1204.	975.	975.	95500.
MPOA 19	198.0	801.	998.	1188.	2527.	48948.	32494.	2784.	1405.	1204.	1204.	975.	975.	95500.
MPOA 20	199.5	801.	995.	1188.	2527.	48948.	32494.	2784.	1405.	1204.	1204.	975.	975.	95500.
MPOA 21	214.0	820.	1020.	1217.	2588.	49641.	32881.	2948.	1433.	1228.	1228.	999.	999.	96902.

MISSION CR. DRY YEAR (NATURAL FLOW)

Figure 12.3

Date Of Print-out:
Dec. 7, 1972

FLOWS IN AC. FT.

LOCATION	AREA IN K. AC.	J	F	M	A	M	J	J	A	S	O	N	D	YEAR
CPDA 1	1.0	0.	0.	0.	8.	656.	704.	8.	8.	8.	5.	0.	0.	1600.
MPDA 1	0.3	0.	0.	0.	2.	492.	414.	2.	2.	2.	2.	0.	0.	915.
CPDA 2	4.0	3.	3.	3.	32.	3475.	2851.	34.	32.	29.	29.	3.	3.	6493.
CPDA 3	1.2	1.	1.	1.	12.	988.	800.	13.	12.	11.	11.	1.	1.	1852.
CPDA 4	0.8	0.	0.	0.	6.	685.	563.	6.	6.	6.	6.	0.	0.	1280.
MPDA 2	18.9	49.	52.	52.	231.	14734.	11825.	709.	226.	182.	182.	52.	52.	27719.
MPDA 3	18.0	118.	144.	169.	381.	3410.	5773.	423.	225.	186.	186.	141.	141.	16297.
MPDA 4	63.9	354.	426.	482.	1190.	35727.	25891.	1374.	820.	664.	664.	418.	418.	68435.
MPDA 5	9.8	69.	82.	107.	235.	1863.	912.	221.	78.	78.	78.	78.	78.	3877.
MPDA 6	78.3	443.	534.	621.	1511.	38981.	27029.	1668.	924.	703.	703.	517.	517.	73371.
CPDA 5	7.7	75.	104.	120.	195.	2957.	1868.	238.	118.	104.	104.	104.	104.	5891.
MPDA 7	7.0	62.	85.	98.	175.	2428.	1368.	204.	97.	84.	84.	84.	84.	4850.
MPDA 8	43.0	365.	477.	568.	1055.	15520.	9167.	1199.	563.	499.	499.	471.	471.	30846.
MPDA 9	45.3	377.	491.	587.	1100.	15840.	9321.	1231.	577.	512.	512.	484.	484.	31519.
MPDA 10	125.1	830.	1036.	1223.	2645.	54183.	36478.	2930.	1512.	1266.	1266.	1013.	1013.	105436.
MPDA 11	3.2	20.	22.	30.	78.	472.	218.	68.	20.	20.	20.	20.	20.	1009.
MPDA 12	133.1	875.	1089.	1291.	2819.	55308.	37814.	3078.	1560.	1334.	1334.	1060.	1060.	107813.
MPDA 13	147.7	963.	1196.	1427.	3125.	57716.	38282.	3370.	1660.	1433.	1433.	1159.	1159.	112841.
CPDA 6	9.1	85.	113.	133.	233.	3269.	1840.	274.	131.	113.	113.	113.	113.	6527.
CPDA 7	0.4	3.	3.	5.	11.	83.	39.	10.	3.	3.	3.	3.	3.	173.
CPDA 8	13.7	126.	155.	194.	362.	4285.	2325.	395.	173.	155.	155.	155.	155.	8633.
CPDA 9	0.2	2.	2.	3.	6.	42.	19.	5.	2.	2.	2.	2.	2.	87.
CPDA 10	0.7	6.	8.	9.	20.	146.	68.	18.	8.	8.	8.	8.	8.	303.
CPDA 11	0.9	8.	8.	12.	25.	187.	88.	23.	8.	8.	8.	8.	8.	390.
MPDA 14	22.4	189.	222.	269.	589.	5784.	3019.	596.	236.	218.	218.	218.	218.	11797.
MPDA 15	25.1	196.	231.	299.	623.	5939.	3087.	623.	243.	225.	225.	225.	225.	12140.
MPDA 16	176.3	1165.	1436.	1736.	3781.	63795.	41350.	4020.	1909.	1664.	1884.	1390.	1393.	125309.
CPDA 12	0.4	2.	2.	2.	8.	284.	214.	8.	8.	5.	5.	2.	2.	537.
MPDA 17	19.4	138.	178.	206.	408.	7587.	4876.	479.	242.	203.	203.	175.	175.	14681.
MPDA 18	197.0	1304.	1615.	1943.	4194.	71399.	46234.	4495.	2157.	1868.	1868.	1566.	1566.	140704.
MPDA 19	198.0	1305.	1616.	1944.	4199.	71473.	46279.	4498.	2159.	1869.	1869.	1567.	1567.	140790.
MPDA 20	199.5	1306.	1617.	1946.	4205.	71533.	46248.	4504.	2154.	1870.	1870.	1568.	1568.	140788.
MPDA 21	214.0	1347.	1669.	2005.	4334.	72680.	48917.	4648.	2205.	1928.	1928.	1614.	1614.	142891.

MISSION CR. AVERAGE YEAR (NATURAL FLOW)

Figure 12.4

Date Of Print - out:
Dec. 7, 1972

FLOWS IN AC. FT.

LOCATION	AREA IN K. AC.	J	F	M	A	M	J	J	A	S	O	N	D	YEAR
CPDA 1	1.0	0.	0.	0.	12.	1248.	1027.	12.	12.	12.	12.	0.	0.	2333.
MPDA 1	0.5	0.	0.	0.	2.	703.	592.	2.	2.	2.	2.	0.	0.	1307.
CPDA 2	4.0	4.	4.	4.	46.	5051.	4142.	50.	46.	43.	43.	4.	4.	9440.
CPDA 3	1.2	2.	2.	2.	17.	1448.	1171.	19.	17.	15.	15.	2.	2.	2713.
CPDA 4	0.8	0.	0.	0.	9.	999.	821.	9.	9.	9.	9.	0.	0.	1867.
MPDA 2	18.9	75.	79.	79.	345.	21733.	17123.	420.	341.	271.	271.	79.	79.	40895.
MPDA 3	18.0	206.	250.	297.	668.	13305.	8970.	727.	370.	310.	310.	243.	243.	25899.
MPDA 4	63.9	508.	723.	826.	2017.	54989.	39363.	2282.	1317.	1069.	1069.	705.	705.	105663.
MPDA 5	9.8	134.	161.	208.	474.	3557.	1728.	439.	149.	149.	149.	149.	149.	7446.
MPDA 6	78.3	779.	941.	1104.	2695.	59621.	41581.	2892.	1513.	1265.	1265.	901.	901.	115457.
CPDA 5	7.7	127.	176.	204.	330.	4963.	2791.	401.	198.	176.	176.	176.	176.	9896.
MPDA 7	7.0	108.	146.	169.	309.	4111.	2301.	353.	165.	144.	144.	144.	144.	8237.
MPDA 8	63.0	638.	829.	995.	1869.	26035.	15165.	2074.	950.	857.	857.	816.	815.	51912.
MPDA 9	45.3	665.	861.	1035.	1970.	26687.	15476.	2164.	987.	885.	885.	844.	844.	53302.
MPDA 10	125.1	1463.	1825.	2169.	4736.	86817.	57302.	5121.	2522.	2172.	2172.	1766.	1766.	169830.
MPDA 11	3.2	40.	46.	61.	160.	953.	438.	138.	41.	41.	41.	41.	41.	2040.
MPDA 12	133.1	1556.	1936.	2309.	5101.	89104.	58380.	5442.	2619.	2270.	2270.	1864.	1864.	174715.
MPDA 13	147.7	1735.	2155.	2581.	5770.	93804.	60667.	6050.	2818.	2465.	2465.	2059.	2059.	184627.
CPDA 6	9.1	147.	192.	229.	405.	5524.	3089.	469.	221.	192.	192.	192.	192.	11047.
CPDA 7	0.4	7.	7.	10.	21.	158.	74.	20.	7.	7.	7.	7.	7.	330.
CPDA 8	13.7	223.	271.	345.	648.	7433.	4000.	698.	360.	271.	271.	271.	271.	15004.
CPDA 9	0.2	3.	3.	5.	11.	79.	37.	10.	3.	3.	3.	3.	3.	165.
CPDA 10	0.7	12.	12.	17.	38.	277.	130.	35.	12.	12.	12.	12.	12.	577.
CPDA 11	0.9	15.	15.	22.	48.	356.	167.	45.	15.	15.	15.	15.	15.	742.
MPDA 14	22.4	348.	405.	531.	1102.	10375.	5359.	1098.	425.	396.	396.	398.	398.	21227.
MPDA 15	25.1	388.	430.	560.	1201.	10790.	5541.	1179.	443.	415.	415.	415.	415.	22171.
MPDA 16	176.3	2126.	2614.	3172.	7089.	105044.	66403.	7325.	3282.	2901.	2901.	2495.	2495.	207846.
CPDA 12	0.4	3.	3.	3.	10.	424.	319.	13.	10.	7.	7.	3.	3.	803.
MPDA 17	19.4	243.	314.	364.	743.	12384.	7811.	832.	406.	347.	347.	304.	304.	24400.
MPDA 18	197.0	2377.	2936.	3545.	7866.	117538.	74261.	8185.	3694.	3253.	3253.	2804.	2804.	232517.
MPDA 19	198.0	2382.	2942.	3551.	7892.	117623.	74298.	8207.	3698.	3257.	3257.	2809.	2809.	232725.
MPDA 20	199.5	2390.	2952.	3560.	7931.	117752.	74351.	8240.	3704.	3263.	3263.	2815.	2815.	233037.
MPDA 21	214.0	2581.	3093.	3715.	8403.	120596.	75747.	4615.	3826.	3378.	3378.	2928.	2928.	239199.

MISSION CR. WET YEAR (NATURAL FLOW) Figure 12.5

In summary, the annual precipitation and resulting natural runoff of the Mission Creek Basin under the three types of year is as shown on Table 12.5.

TABLE 12.4
WATER LICENSES ON MISSION CREEK (1970)

Area Served	Total Licensed Storage (ac.-ft.)	Agriculture (ac.-ft.)	Domestic (ac.-ft.)	Industry (ac.-ft.)	Total (ac.-ft.)	Computed Diversion Requirement (ac.-ft.)
Black Mountain Irrigation District	9,300	14,575	522	0	15,097	14,002
South East Kelowna Irrigation District	14,375	23,300	268	0	23,568	10,508
Brent-Davis Irrigation District	1,300	1,015	0	0	1,015	336
Rutland Waterworks District	100	0	536	0	536	522
Other	650	5,603	134	1,080	6,817	6,409
Total	25,725	44,493	1,460	1,080	47,033	31,777

TABLE 12.5
ESTIMATED NATURAL WATER YIELDS FOR MISSION CREEK SUB-BASIN

Type of Year	Annual Runoff		Average Precipitation (Inches)	Remarks
	Kilo Acre-Feet	Inches Over Basin		
Dry	96.9	5.4	-	Area = 334 square miles. Runoff is abstracted from computer print-out data.
Average	142.9	8.0	27.9	
Wet	239.2	13.1	-	

12.5 STORAGE (Reference Figure 12.2)

In a climate of spring floods and summer droughts. It is necessary to store a high proportion of total available water so that it may be used when needed. To this end, the Mission Creek water users have developed a system of ten active reservoirs with a total live storage of 17,981 acre-feet in 1970. The reservoirs are operated either independently or in small groupings as required by their owners.

a) Mission (Crescent) Lake

This is a relatively small dam of 600 acre-feet capacity owned and operated by Black Mountain Irrigation District. Built in 1937 of earth and rock fill, the dam is understood to be stable, although the control gate is in poor condition. Control is through a 30-inch culvert set with an invert elevation of approximately 6,090 feet. The spillway elevation is 7.3 feet higher.

b) Graystoke Lake

The small and uncontrolled Lake Katrine drains directly into Graystoke Lake. Graystoke dam was built originally in 1931 of earth fill. Its control works consisted of a 26-inch horseshoe culvert at an elevation of roughly 6,000 feet and a spillway some 39.1 feet higher. In 1970 the live storage capacity was estimated at 2,107 acre-feet. In 1973 the dam was in the process of being rebuilt with a greatly increased storage to 5,000 acre-feet. Together with Ideal Lake and Fish Hawk Lake (not built in 1970), Graystoke provides the backbone of storage for Mission Creek Irrigation District.

c) Loch long

Built of earth fill in 1966, Loch Long provides 400 acre-feet of storage for Black Mountain Irrigation District. Control works consist of a 12-inch culvert at an estimated elevation of 6,050 feet. The spillway elevation is ten feet above the outlet control culvert.

d) Ideal Lake

This is the largest storage operated by Black Mountain Irrigation District, and the second largest in the Mission Creek watershed. Active storage is 5,475 acre-feet. The original earth-fill dam with concrete core was built in 1910. Later, in 1922, concrete cut-off dams were built. Control works consist of a 30-inch culvert set at an invert elevation of roughly 4,300 feet. The spillway is at an elevation 17 feet above this point.

e) Hydraulic #9 (Duck Lake)

This is a small reservoir which contained 231 acre-feet of active storage in 1970. It was an earthfill dam with a 24-inch outlet pipe set at elevation 4,221.1 feet and a spillway set at elevation 4,236.1 feet. In 1973 the dam was breached and the area is now part of an enlarge McCulloch Reservoir. The reservoir was operated by the South East Kelowna Irrigation District.

f) Haynes Lake

The dam on Haynes Lake is of earth fill with a 48-inch outlet control culvert set at elevation 4,118.5 feet. The spillway is at elevation 4,127.6 feet. In 1970, the reservoir contained 881 acre-feet of active storage. In 1972 this reservoir was absorbed into an expanded McCulloch Reservoir.

g) McCulloch Reservoir

This is by far the largest and most important reservoir in the Mission Creek watershed. In 1970, it had an active storage capacity of 7,555 acre-feet. In 1972 the dam was rebuilt to provide a greatly enhanced capacity of an estimated 11,950 acre-feet. The new dam is of earth fill and is operated through a 35-inch culvert set in the North Dam at an invert elevation of 4,095.5 feet. There are also two cutoff dams called East Dam and South Dam. The spillway elevation is set at 4,132.3 feet which effectively drowns both Haynes Lake and Hydraulic #9, described above.

h) Long Meadow Lake

Long Meadow is the highest in a chain of three small lakes (Browne and Fish) draining into Hydraulic Creek. Built of earth fill in 1960, its 153 acre-feet of storage is controlled by a 24-inch square culvert set at an invert elevation of 4,288.7 feet. Spillway elevation is at 4,298.0 feet. As with other lakes In the chain, operation is by South East Kelowna Irrigation District.

1) Browne Lake

Like its sisters, Long Meadow and Fish Lakes, this reservoir was built in 1960 of earth fill. Control of its 454 acre-feet of storage is by means of an 18-inch culvert set at elevation 4,270.5 feet. The spillway lip is at 4,279.8 feet elevation.

j) Fish Hawk Lake

Last in the series of earthfill dams built in 1960, Fish Lake impounds

only 125 acre-feet of active storage. The spillway overflows at elevation 4,222.5 feet and outflow is adjusted by an 18-inch culvert set in a timber structure with its invert at elevation 4,217.5 feet.

k) Canyon Lake

By nature, water from this lake flows into the Kettle Valley watershed via Stirling Creek. However, two diversion points have been created. The lower diversion directs water towards the McCulloch Reservoir. The upper diversion is a small dam (Canyon 'A') and reservoir which is in a poor state of repair and is only partially successful in directing water to Canyon Creek. The purpose of this diversion is to serve the local domestic water supply system. Mater which is successfully diverted into Canyon Creek may again be diverted, at a point some three miles downstream, into Myra Ditch which flows into the headwaters of Hydraulic Creek and McCulloch Reservoir. It is understood that in 1970 Canyon (KLO) Reservoir 'B' was kept at its full capacity of 304 acre-feet except for releases for domestic water purposes. Since it was, in effect, non-operational in 1970, it is not recognized in the computer programming of flows for that year. Estimated elevations for the outlet and spillway are 5.505 and 5.518 feet respectively.

Hydrologic information on the active ten of the eleven reservoirs described above is given on. Table 12.6.

Storages are currently operated in a manner which seems best to the owners for the purposes of irrigation or other consumptive use.

When comparing 1970 storages with estimated available runoff. It will be remembered that the apparent surpluses of water are being exploited already at such sites as Fish Hawk (CP3), Graystoke (CP2), and McCulloch (CP8). In the case of the latter it appears its live storage is already greater than the dry year inflow.

Methods of operation of storage are by no means rigid, but are assumed to follow the estimated pattern outlined on Table 12.7.

TABLE 12.6

1970 STORAGES IN THE MISSION CREEK SYSTEM

Reservoir	Drainage Area (acres)	Live Storage (ac.-ft.)	Surface Area (acres)	Annual Natural Runoff (ac.-ft.)		
				Dry Year	Average Year	Wet Year
Mission Lake	1,000	600	30	1,250	1,600	2,333
Graystoke	4,000	2,107	89	5,100	6,493	9,440
Loch Long	800	400	45	1,000	1,280	1,867
Ideal	7,700	5,475	362	3,861	5,891	9,894
Hydraulic	9,100	231	287	4,247	6,527	11,047
Haynes	400	881	137	100	173	330
McCulloch Res.	13,700	7,555	645	5,480	8,633	15,005
Long Meadow	200	153	-	50	87	165
Browne	700	454	-	175	303	577
Fish Hawk	900	125	-	225	390	742
Total	38,500	17,981		21,488	31,377	51,400

TABLE 12.7

RULE CURVE VALUES FOR MISSION CREEK RESERVOIRS

Reservoir	Reservoir Capacity	Rule Curve Values Expressed as a Percentage of Reservoir Capacity											
		J	F	M	A	M	J	J	A	S	O	N	D
Mission	600	0	0	0	0	0	100	67	33	0	0	0	0
Graystoke	2,107	0	0	0	0	0	100	67	33	0	0	0	0
Loch Long	400	0	0	0	0	0	100	67	33	0	0	0	0
Ideal	5,475	50	50	50	50	100	100	83	67	50	50	50	50
Hydraulic #9	231	0	0	0	0	30	100	67	33	0	0	0	0
Haynes	881	0	0	0	0	100	100	67	33	0	0	0	0
McCulloch	7,555	30	30	30	50	100	100	77	30	30	30	30	30
Long Meadow	153	0	0	0	0	100	100	67	33	0	0	0	0
Browne	454	0	0	0	0	100	100	67	33	0	0	0	0
Fish Hawk	125	0	0	0	0	100	100	67	33	0	0	0	0
Total	17,981												

EXPLANATION: For any given month -

1) Percentages shown refer to active storage occupied by water at end of month, e.g., *30%* storage occupied by water at end of March.
2) When rule curve value is exceeded, all excess water is released.
3) When rule curve value is not achieved, only stated water requirements are released.
4) Information based on local records of water users.

The above rule curve values have been used in computer programming for the production of print-outs showing regulated flows.

At the 1970 stage of development little or no consideration is given to the operation of storage for Fisheries or other non-consumptive use.

12.6 RESIDUAL FLOWS

When natural flow is affected by storage changes, diversions to or from the area and withdrawals for irrigation, domestic or industrial purposes, the resulting creek flow is called the "residual flow". These residual flows, for various selected points and three types of weather year at 1970 development, are shown on computer print-outs. They are reproduced as Figure 12.6 (Dry Year), Figure 12.7 (Average Year), and Figure 12.8 (Met Year).

Reference to these figures will show that residual flows immediately upstream and immediately downstream from the selected point are given. The difference is the amount diverted at the point for consumptive use. It will be noted that there are no "demand deficiencies" at the 1970 stage of development, even in a "dry" year.

Reference to Figure 12.9 and 12.6 will show that, based on Department of Fisheries estimates of need, there would be a considerable shortage of water for non-consumptive use in the latter part of the year, particularly August and September.

Figure 12.9 also shows that the crude "modified" method of operation actually creates a consumptive use deficiency in August and September of a dry year. Refinement of the method of operation before its application in practice would remove this obvious problem.

The fact that non-consumptive deficiencies appear in winter of even an "average" year suggests that Fisheries requirements for water exceed estimates of the creek's natural ability to generate flow. Detailed reference

Date of Printout:
Sept. 11, 1973 (revision)

STORAGES GIVEN ARE FOR THE END OF THE MONTH
UNITS FOR DEMANDS, STORAGES, FLOWS, AND DEFICIENCIES ARE ACRE FEET

		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL
CONTROL POINT	1													
STORAGE		J.	0.	0.	0.	0.	550.	402.	198.	0.	0.	0.	0.	
CONTROL POINT	2													
STORAGE		J.	0.	0.	0.	0.	2107.	1412.	695.	0.	0.	0.	0.	
CONTROL POINT	3													
STORAGE		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
CONTROL POINT	4													
STORAGE		J.	0.	0.	0.	0.	400.	269.	132.	0.	0.	0.	0.	
CONTROL POINT	5													
STORAGE		2737.	2737.	2737.	2737.	4676.	5475.	3495.	1826.	1735.	1803.	1871.	1939.	
CONTROL POINT	6													
STORAGE		J.	0.	0.	0.	69.	231.	155.	76.	0.	0.	0.	0.	
CONTROL POINT	8													
STORAGE		2531.	2531.	2531.	2939.	8436.	8436.	6385.	2531.	1938.	2130.	2300.	2470.	
CONTROL POINT	9													
STORAGE		J.	0.	0.	0.	24.	35.	36.	39.	0.	0.	0.	0.	
CONTROL POINT	10													
STORAGE		J.	0.	0.	0.	60.	88.	95.	97.	0.	0.	0.	0.	
CONTROL POINT	11													
STORAGE		J.	0.	0.	0.	24.	35.	38.	39.	0.	0.	0.	0.	
CONTROL POINT	12													
STORAGE		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	2													
FLOW		36.	38.	38.	172.	11299.	5878.	1183.	1226.	1161.	136.	63.	63.	21294.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	6													
FLOW		291.	338.	389.	954.	27376.	16543.	1805.	1442.	1442.	516.	356.	156.	51751.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	8													
FLOW		231.	302.	358.	658.	8331.	5363.	2734.	2036.	412.	253.	232.	232.	21140.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	9													
FLOW		236.	310.	368.	661.	6589.	5450.	2755.	2043.	419.	260.	239.	239.	21509.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	15													
FLOW		184.	204.	247.	127.	637.	2008.	18.	1527.	3.	29.	31.	31.	5018.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	16													
FLOW		739.	930.	1104.	2213.	36511.	21518.	1259.	1529.	514.	862.	692.	692.	68362.
DEFICIENCY (FISH)		1061.	870.	696.	0.	0.	0.	541.	271.	1886.	1538.	1108.	1108.	9079.
MEASURING POINT	18													
FLOW		771.	769.	1155.	2112.	37444.	21988.	1255.	1567.	552.	900.	730.	730.	70275.
DEFICIENCY (FISH)		1029.	831.	645.	0.	0.	0.	442.	233.	1848.	1500.	1070.	1070.	8668.
MEASURING POINT	20													
FLOW		743.	946.	1126.	2077.	36627.	20648.	3.	209.	0.	859.	701.	701.	64635.
DEFICIENCY (FISH)		1058.	854.	674.	0.	0.	0.	1800.	1591.	2400.	1541.	1099.	1099.	12116.
MEASURING POINT	21													
FLOW		761.	971.	1155.	2138.	37321.	21034.	64.	237.	24.	883.	725.	725.	66037.
DEFICIENCY (FISH)		1039.	829.	645.	0.	0.	0.	1736.	1563.	2376.	1517.	1075.	1075.	11855.
USE POINT	1													
DEMAND, IRRIGATION		J.	0.	0.	0.	148.	247.	247.	247.	99.	0.	0.	0.	988.
DEMAND, DOMESTIC		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		J.	0.	0.	0.	148.	247.	247.	247.	99.	0.	0.	0.	988.
FLOW, UPSTREAM		252.	279.	311.	784.	26146.	16142.	1897.	1633.	1485.	460.	300.	300.	49970.
FLOW, DOWNSTREAM		252.	279.	311.	784.	25998.	15895.	1650.	1386.	1386.	460.	300.	300.	48982.
DEMAND, DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	2													
DEMAND, IRRIGATION		J.	0.	0.	0.	22.	36.	36.	36.	15.	0.	0.	0.	145.
DEMAND, DOMESTIC		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		J.	0.	0.	0.	22.	36.	36.	36.	15.	0.	0.	0.	145.
FLOW, UPSTREAM		525.	654.	765.	1653.	35985.	22056.	4581.	3491.	1867.	782.	601.	601.	73571.
FLOW, DOWNSTREAM		525.	654.	765.	1653.	35951.	22020.	4545.	3455.	1852.	782.	601.	601.	73426.
DEMAND, DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	3													
DEMAND, IRRIGATION		J.	0.	0.	0.	42.	70.	70.	70.	28.	0.	0.	0.	280.
DEMAND, DOMESTIC		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		J.	0.	0.	0.	42.	70.	70.	70.	28.	0.	0.	0.	280.
FLOW, UPSTREAM		548.	582.	802.	1737.	36579.	22327.	4621.	3481.	1878.	808.	627.	627.	74717.
FLOW, DOWNSTREAM		548.	582.	802.	1737.	36537.	22257.	4551.	3411.	1850.	808.	627.	627.	74437.
DEMAND, DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	4													
DEMAND, IRRIGATION		J.	0.	0.	0.	2037.	3395.	3395.	3395.	1359.	0.	0.	0.	13581.
DEMAND, DOMESTIC		23.	18.	23.	27.	46.	59.	73.	73.	37.	32.	23.	23.	457.
DEMAND, INDUSTRIAL		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		23.	18.	23.	27.	2083.	3454.	3468.	3468.	1396.	32.	23.	23.	14038.
FLOW, UPSTREAM		596.	741.	877.	1903.	37905.	22341.	4708.	3468.	1905.	863.	682.	682.	77270.
FLOW, DOWNSTREAM		575.	723.	854.	1875.	35822.	19487.	1240.	0.	509.	831.	659.	659.	53232.
DEMAND, DEFICIENCY		J.	0.	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.
DEFICIENCY (FISH)		1227.	1077.	946.	0.	0.	0.	560.	1800.	1891.	1569.	1141.	1141.	11352.
USE POINT	5													
DEMAND, IRRIGATION		0.	0.	0.	0.	33.	54.	54.	54.	22.	0.	0.	0.	217.
DEMAND, DOMESTIC		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		J.	0.	0.	0.	33.	54.	54.	54.	22.	0.	0.	0.	217.
FLOW, UPSTREAM		133.	170.	198.	0.	1457.	4314.	2574.	4164.	861.	0.	0.	0.	13871.
FLOW, DOWNSTREAM		133.	170.	198.	0.	1424.	4269.	2520.	4110.	839.	0.	0.	0.	13654.
DEMAND, DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	6													
DEMAND, IRRIGATION		J.	0.	0.	0.	1557.	2596.	2596.	2596.	1038.	0.	0.	0.	10383.
DEMAND, DOMESTIC		6.	5.	6.	7.	12.	17.	23.	20.	10.	8.	6.	6.	123.
DEMAND, INDUSTRIAL		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		6.	5.	6.	7.	1569.	2613.	2618.	2615.	1048.	8.	6.	6.	10506.
FLOW, UPSTREAM		167.	206.	249.	122.	2143.	4593.	2618.	4140.	1048.	34.	34.	34.	15389.
FLOW, DOWNSTREAM		151.	201.	241.	115.	574.	1980.	0.	1526.	0.	28.	28.	28.	4880.
DEMAND, DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	9													
DEMAND, IRRIGATION		J.	0.	0.	0.	759.	1265.	1265.	1265.	506.	0.	0.	0.	5060.
DEMAND, DOMESTIC		29.	23.	29.	35.	58.	75.	93.	93.	46.	41.	29.	29.	580.
DEMAND, INDUSTRIAL		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		29.	23.	29.	35.	817.	1340.	1358.	1358.	552.	41.	29.	29.	5640.
FLOW, UPSTREAM		771.	959.	1155.	2112.	37444.	21988.	1358.	1567.	552.	900.	730.	730.	70275.
FLOW, DOWNSTREAM		743.	946.	1126.	2077.	36627.	20648.	3.	209.	0.	859.	701.	701.	64635.
DEMAND, DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY (FISH)		1058.	854.	674.	0.	0.	0.	1800.	1591.	2400.	1541.	1099.	1099.	12116.
GRAND TOTALS FOR ALL THE USE POINTS!														
DEMAND, IRRIGATION		J.	0.	0.	0.	4598.	7883.	7883.	7883.	3067.	0.	0.	0.	30884.
DEMAND, DOMESTIC		58.	46.	58.	69.	116.	151.	188.	186.	93.	81.	58.	58.	1160.
DEMAND, INDUSTRIAL		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		58.	46.	58.	69.	4714.	7816.	7843.	7849.	3160.	81.	58.	58.	31814.
DEMAND, DEFICIENCY		J.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

MISSION CR. DRY YEAR (1970) Figure 12.6

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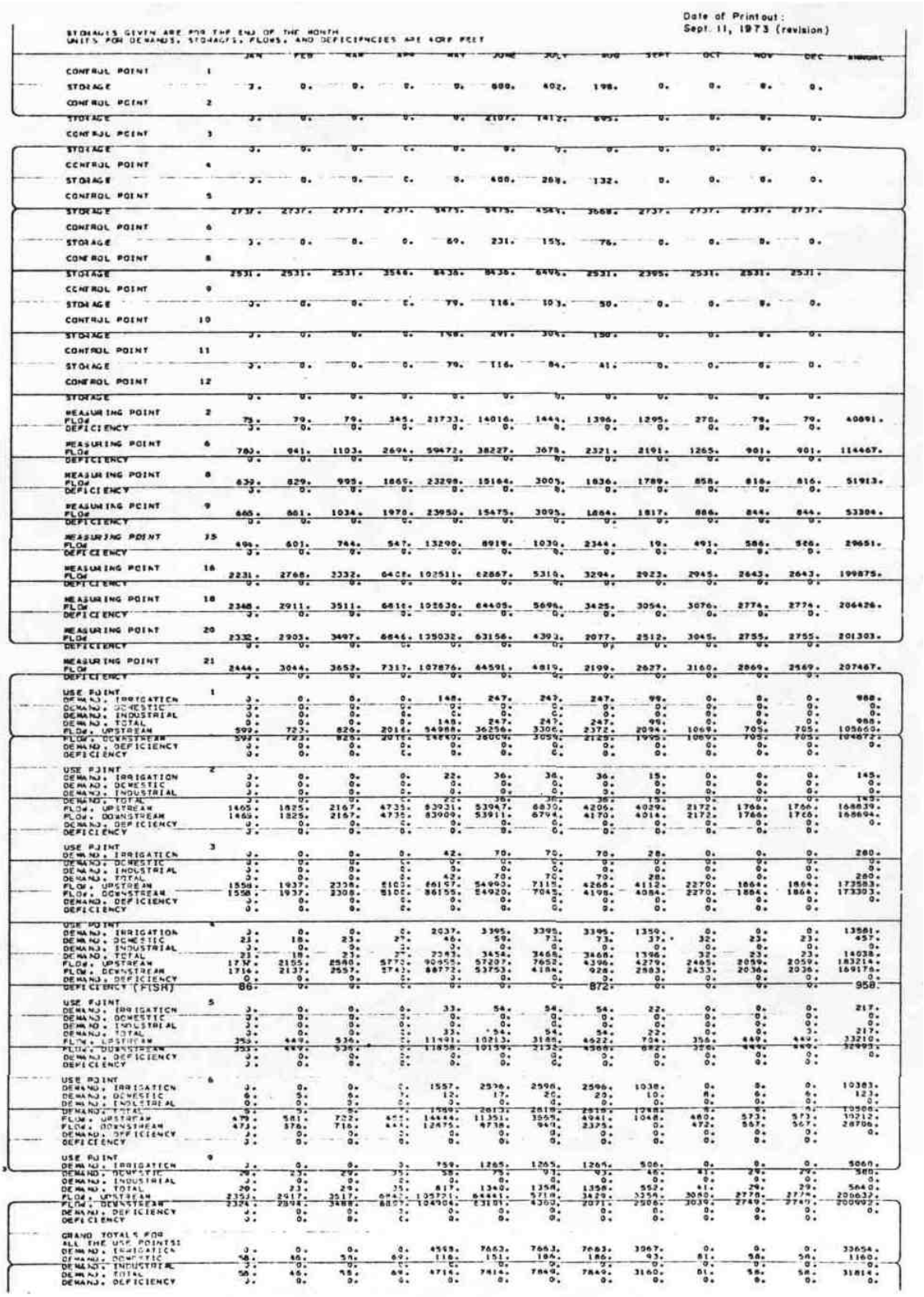
STORAGES GIVEN ARE FOR THE END OF THE MONTH
UNITS FOR DEMANDS, STORAGES, FLOWS, AND DEFICIENCIES ARE ACRE FEET

		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL
CONTROL POINT	1													
STORAGE		3.	0.	0.	0.	0.	890.	403.	198.	0.	0.	0.	0.	
CONTROL POINT	2													
STORAGE		3.	0.	0.	0.	0.	2197.	1412.	695.	0.	0.	0.	0.	
CONTROL POINT	3													
STORAGE		3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
CONTROL POINT	4													
STORAGE		3.	0.	0.	0.	0.	400.	268.	132.	0.	0.	0.	0.	
CONTROL POINT	5													
STORAGE		2737.	2737.	2737.	2737.	5475.	5475.	4544.	3441.	2737.	2737.	2737.	2737.	
CONTROL POINT	6													
STORAGE		3.	0.	0.	0.	69.	231.	155.	76.	0.	0.	0.	0.	
CONTROL POINT	8													
STORAGE		2531.	2531.	2531.	3120.	8436.	8436.	6498.	2531.	2136.	2426.	2531.	2531.	
CONTROL POINT	9													
STORAGE		4.	0.	0.	0.	42.	61.	66.	50.	0.	0.	0.	0.	
CONTROL POINT	10													
STORAGE		0.	0.	0.	0.	104.	253.	186.	150.	0.	0.	0.	0.	
CONTROL POINT	11													
STORAGE		0.	0.	0.	0.	42.	61.	66.	41.	0.	0.	0.	0.	
CONTROL POINT	12													
STORAGE		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	2													
FLOW		44.	52.	52.	231.	14733.	8518.	1304.	1284.	1207.	182.	52.	52.	27717.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	6													
FLOW		448.	533.	620.	1512.	37932.	23675.	2445.	1734.	1690.	764.	518.	518.	72385.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	8													
FLOW		385.	476.	569.	1056.	12783.	9167.	2121.	1468.	1202.	499.	471.	471.	30847.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	9													
FLOW		377.	491.	588.	1101.	13103.	9323.	2162.	1681.	1215.	512.	484.	484.	31518.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	15													
FLOW		273.	313.	410.	254.	4809.	4298.	235.	1947.	7.	62.	221.	326.	13074.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	16													
FLOW		1216.	1519.	3826.	3308.	57631.	35647.	1770.	1853.	1636.	1469.	1363.	1468.	110784.
DEFICIENCY (FISH)		584.	281.	0.	0.	0.	0.	30.	0.	784.	931.	437.	332.	3359.
MEASURING POINT	18													
FLOW		1271.	1588.	1913.	3572.	59229.	36445.	1951.	1919.	1702.	1535.	1429.	1534.	114090.
DEFICIENCY (FISH)		527.	212.	0.	0.	0.	0.	0.	0.	698.	865.	371.	266.	2939.
MEASURING POINT	20													
FLOW		1246.	1567.	3886.	3547.	58446.	35120.	601.	363.	1152.	1498.	1402.	1507.	108533.
DEFICIENCY (FISH)		564.	233.	0.	0.	0.	0.	1199.	1237.	1248.	904.	398.	293.	6066.
MEASURING POINT	21													
FLOW		1206.	1619.	3965.	3696.	59699.	35789.	745.	674.	1289.	1543.	1448.	1553.	111136.
DEFICIENCY (FISH)		514.	181.	0.	0.	0.	0.	1055.	1186.	1201.	857.	352.	247.	5593.
USE POINT	1													
DEMAND, IRRIGATION		0.	0.	0.	0.	148.	247.	247.	247.	99.	0.	0.	0.	988.
DEMAND, DOMESTIC		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		0.	0.	0.	0.	148.	247.	247.	247.	99.	0.	0.	0.	988.
FLOW, UPSTREAM		353.	426.	482.	1191.	35726.	22784.	2398.	1882.	1690.	665.	419.	419.	68436.
FLOW, DOWNSTREAM		353.	426.	482.	1191.	35578.	22537.	2151.	1635.	1591.	665.	419.	419.	67448.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	2													
DEMAND, IRRIGATION		0.	0.	0.	0.	22.	36.	36.	36.	15.	0.	0.	0.	145.
DEMAND, DOMESTIC		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		0.	0.	0.	0.	22.	36.	36.	36.	15.	0.	0.	0.	145.
FLOW, UPSTREAM		830.	1038.	1223.	2647.	51277.	33182.	4579.	3490.	2901.	1267.	1013.	1013.	104457.
FLOW, DOWNSTREAM		830.	1036.	1223.	2647.	51275.	33087.	4603.	3390.	2901.	1267.	1013.	1013.	104305.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	3													
DEMAND, IRRIGATION		0.	0.	0.	0.	42.	70.	70.	70.	28.	0.	0.	0.	280.
DEMAND, DOMESTIC		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		0.	0.	0.	0.	42.	70.	70.	70.	28.	0.	0.	0.	280.
FLOW, UPSTREAM		876.	1088.	1291.	2812.	52400.	33624.	4751.	3637.	2948.	1334.	1060.	1060.	106679.
FLOW, DOWNSTREAM		876.	1088.	1291.	2812.	52358.	33554.	4681.	3567.	2920.	1334.	1060.	1060.	106399.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	4													
DEMAND, IRRIGATION		0.	0.	0.	0.	2027.	3395.	3395.	3395.	1359.	0.	0.	0.	13581.
DEMAND, DOMESTIC		23.	18.	23.	27.	46.	54.	73.	73.	37.	32.	23.	23.	457.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		23.	18.	23.	27.	2073.	3449.	3468.	3468.	1396.	32.	23.	23.	14038.
FLOW, UPSTREAM		982.	1195.	1427.	3127.	54766.	36742.	4973.	3468.	3019.	1433.	1159.	1159.	111430.
FLOW, DOWNSTREAM		930.	1177.	1404.	3100.	52683.	31288.	1505.	0.	1623.	1401.	1136.	1136.	97292.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY (FISH)		801.	623.	395.	0.	0.	0.	295.	1800.	777.	999.	664.	664.	7079.
USE POINT	5													
DEMAND, IRRIGATION		0.	0.	0.	0.	33.	54.	54.	54.	22.	0.	0.	0.	217.
DEMAND, DOMESTIC		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		0.	0.	0.	0.	33.	54.	54.	54.	22.	0.	0.	0.	217.
FLOW, UPSTREAM		206.	262.	311.	0.	4945.	6291.	2703.	4390.	765.	0.	157.	262.	20292.
FLOW, DOWNSTREAM		206.	262.	311.	0.	4912.	6237.	2649.	4336.	743.	0.	157.	262.	20075.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	6													
DEMAND, IRRIGATION		3.	0.	0.	0.	1957.	2598.	2598.	2598.	1038.	0.	0.	0.	10383.
DEMAND, DOMESTIC		3.	3.	6.	7.	12.	17.	20.	20.	10.	8.	6.	6.	123.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		6.	3.	6.	7.	1969.	2615.	2618.	2618.	1048.	8.	6.	6.	10506.
FLOW, UPSTREAM		249.	324.	400.	229.	6224.	8843.	2927.	4988.	1948.	93.	220.	319.	27231.
FLOW, DOWNSTREAM		243.	324.	400.	229.	4855.	6230.	211.	1840.	0.	55.	214.	319.	12731.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	9													
DEMAND, IRRIGATION		3.	0.	0.	0.	759.	1265.	1265.	1265.	506.	0.	0.	0.	5060.
DEMAND, DOMESTIC		29.	23.	29.	35.	58.	75.	93.	93.	46.	41.	29.	29.	580.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		32.	23.	29.	35.	817.	1340.	1358.	1358.	552.	41.	29.	29.	5640.
FLOW, UPSTREAM		1276.	1588.	1914.	3576.	59243.	36451.	1954.	1920.	1703.	1536.	1436.	1535.	114125.
FLOW, DOWNSTREAM		1245.	1566.	1885.	3541.	58426.	35111.	596.	562.	1151.	1495.	1401.	1506.	108485.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY (FISH)		505.	234.	0.	0.	0.	0.	1204.	1238.	1249.	905.	395.	294.	6079.
GRAND TOTALS FOR ALL THE USE POINTS														
DEMAND, IRRIGATION		3.	0.	0.	0.	4998.	7663.	7663.	7663.	3067.	0.	0.	0.	30454.
DEMAND, DOMESTIC		54.	44.	58.	69.	116.	151.	186.	186.	93.	81.	58.	58.	1160.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		58.	44.	58.	69.	5114.	7814.	7849.	7849.	3160.	81.	58.	58.	31614.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

MISSION CR. AVERAGE YEAR (1970) Figure 12.7



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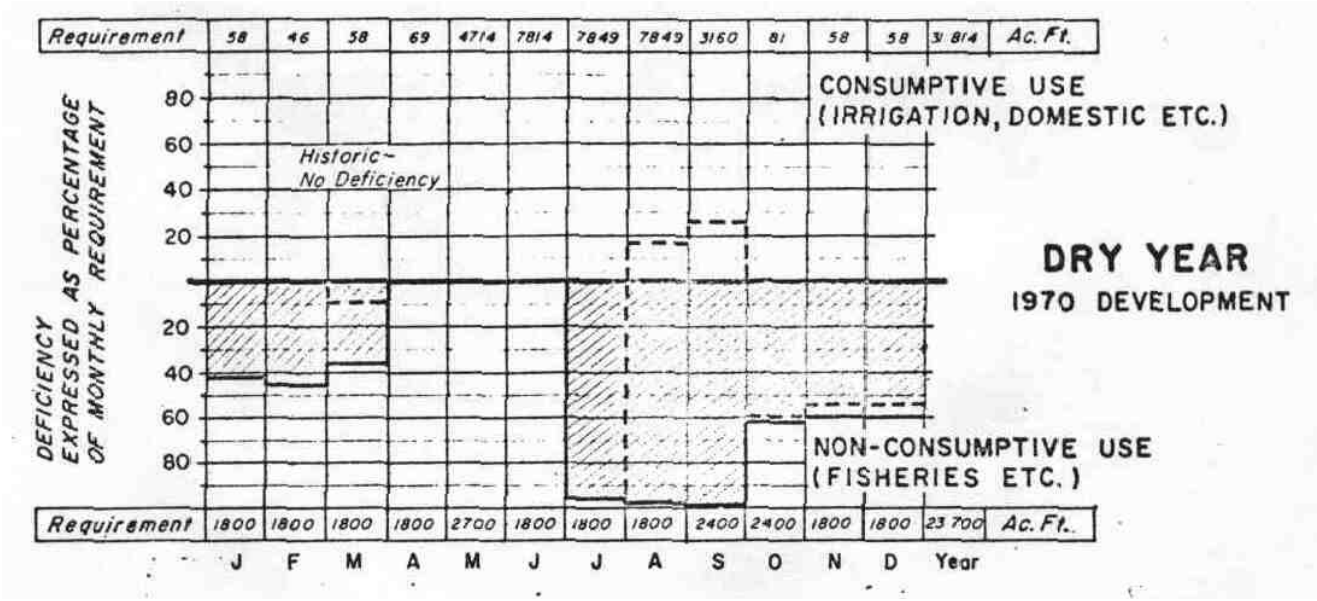
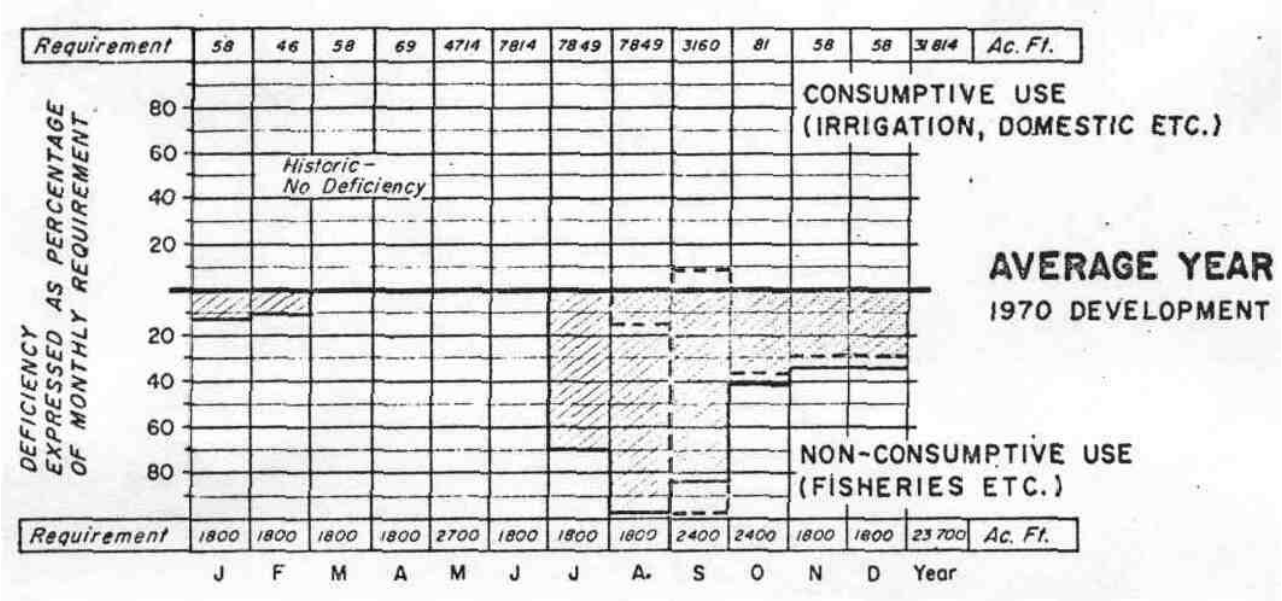
STORAGES GIVEN ARE FOR THE END OF THE MONTH
UNITS FOR DEMANDS, STORAGES, FLOWS, AND DEFICIENCIES ARE ACRE FEET

		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL
CONTROL POINT	1													
STORAGE		3.	0.	0.	0.	0.	600.	402.	198.	0.	0.	0.	0.	
CONTROL POINT	2													
STORAGE		3.	0.	0.	0.	0.	2107.	1412.	695.	0.	0.	0.	0.	
CONTROL POINT	3													
STORAGE		3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
CONTROL POINT	4													
STORAGE		3.	0.	0.	0.	0.	400.	269.	132.	0.	0.	0.	0.	
CONTROL POINT	5													
STORAGE		2737.	2737.	2737.	2737.	5475.	5475.	4584.	3668.	2737.	2737.	2737.	2737.	
CONTROL POINT	6													
STORAGE		3.	0.	0.	0.	89.	231.	155.	76.	0.	0.	0.	0.	
CONTROL POINT	8													
STORAGE		2531.	2531.	2531.	3546.	8436.	8436.	6496.	2531.	2395.	2531.	2531.	2531.	
CONTROL POINT	9													
STORAGE		3.	0.	0.	0.	79.	116.	103.	50.	0.	0.	0.	0.	
CONTROL POINT	10													
STORAGE		3.	0.	0.	0.	148.	291.	304.	150.	0.	0.	0.	0.	
CONTROL POINT	11													
STORAGE		3.	0.	0.	0.	79.	116.	84.	41.	0.	0.	0.	0.	
CONTROL POINT	12													
STORAGE		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	2													
FLOW		79.	79.	79.	345.	21733.	14016.	1444.	1396.	1295.	270.	79.	79.	40091.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	6													
FLOW		780.	941.	1103.	2694.	59472.	38227.	3078.	2321.	2191.	1265.	901.	901.	114467.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	8													
FLOW		632.	829.	995.	1865.	23298.	15164.	3005.	1836.	1789.	858.	816.	816.	51913.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	9													
FLOW		668.	861.	1034.	1970.	23950.	15475.	3095.	1864.	1817.	888.	844.	844.	53304.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	15													
FLOW		496.	601.	744.	547.	13290.	8919.	1039.	2344.	19.	491.	586.	586.	29651.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	16													
FLOW		2231.	2768.	3332.	6408.	102511.	62867.	5310.	3294.	2923.	2945.	2643.	2643.	199875.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	18													
FLOW		2348.	2911.	3511.	6816.	105630.	64405.	5698.	3425.	3054.	3070.	2774.	2774.	206426.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	20													
FLOW		2332.	2903.	3497.	6846.	135032.	63156.	4393.	2077.	2512.	3045.	2755.	2755.	201303.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
MEASURING POINT	21													
FLOW		2444.	3044.	3652.	7317.	107876.	64591.	4819.	2199.	2627.	3160.	2869.	2569.	207467.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	1													
DEMAND, IRRIGATION		0.	0.	0.	0.	148.	247.	247.	247.	99.	0.	0.	0.	988.
DEMAND, DOMESTIC		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		0.	0.	0.	0.	148.	247.	247.	247.	99.	0.	0.	0.	988.
FLOW, UPSTREAM		599.	723.	826.	2016.	54988.	36256.	3306.	2372.	2094.	1069.	705.	705.	105660.
FLOW, DOWNSTREAM		599.	723.	826.	2016.	54840.	36009.	3059.	2125.	1995.	1069.	705.	705.	104672.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	2													
DEMAND, IRRIGATION		0.	0.	0.	0.	22.	36.	36.	36.	15.	0.	0.	0.	145.
DEMAND, DOMESTIC		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		0.	0.	0.	0.	22.	36.	36.	36.	15.	0.	0.	0.	145.
FLOW, UPSTREAM		1465.	1825.	2167.	4735.	83931.	53947.	6830.	4206.	4029.	2172.	1766.	1766.	168839.
FLOW, DOWNSTREAM		1465.	1825.	2167.	4735.	83909.	53911.	6794.	4170.	4014.	2172.	1766.	1760.	168694.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	3													
DEMAND, IRRIGATION		0.	0.	0.	0.	42.	70.	70.	70.	28.	0.	0.	0.	280.
DEMAND, DOMESTIC		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		0.	0.	0.	0.	42.	70.	70.	70.	28.	0.	0.	0.	280.
FLOW, UPSTREAM		1558.	1937.	2338.	5102.	88157.	56905.	7115.	4268.	4112.	2270.	1864.	1864.	173583.
FLOW, DOWNSTREAM		1558.	1937.	2308.	5102.	88155.	56920.	7045.	4198.	4084.	2270.	1864.	1864.	173303.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	4													
DEMAND, IRRIGATION		0.	0.	0.	0.	2037.	3395.	3395.	3395.	1359.	0.	0.	0.	13581.
DEMAND, DOMESTIC		23.	18.	23.	21.	46.	50.	73.	73.	37.	32.	23.	23.	457.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		23.	18.	23.	21.	2083.	3454.	3468.	3468.	1396.	32.	23.	23.	14038.
FLOW, UPSTREAM		1714.	2155.	2580.	5773.	90955.	57207.	7652.	4396.	4279.	2465.	2059.	2059.	183214.
FLOW, DOWNSTREAM		1716.	2137.	2557.	5741.	88772.	53753.	4184.	928.	2883.	2433.	2036.	2036.	169176.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY (FISH)		86.	0.	0.	0.	0.	0.	0.	872.	0.	0.	0.	0.	958.
USE POINT	5													
DEMAND, IRRIGATION		0.	0.	0.	0.	33.	54.	54.	54.	22.	0.	0.	0.	217.
DEMAND, DOMESTIC		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		0.	0.	0.	0.	33.	54.	54.	54.	22.	0.	0.	0.	217.
FLOW, UPSTREAM		353.	449.	536.	0.	11991.	10213.	3188.	4522.	704.	356.	449.	449.	33210.
FLOW, DOWNSTREAM		353.	449.	536.	0.	11838.	10159.	2132.	4568.	682.	356.	449.	449.	32993.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	6													
DEMAND, IRRIGATION		0.	0.	0.	0.	1557.	2596.	2596.	2596.	1038.	0.	0.	0.	10383.
DEMAND, DOMESTIC		6.	5.	6.	5.	12.	17.	20.	20.	10.	8.	6.	6.	123.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		6.	5.	6.	5.	1569.	2613.	2616.	2616.	1048.	8.	6.	6.	10506.
FLOW, UPSTREAM		479.	581.	722.	447.	14444.	11351.	3565.	4941.	1048.	480.	573.	573.	39212.
FLOW, DOWNSTREAM		473.	576.	716.	443.	12875.	4738.	949.	2375.	0.	472.	567.	567.	28706.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
USE POINT	9													
DEMAND, IRRIGATION		0.	0.	0.	0.	759.	1265.	1265.	1265.	506.	0.	0.	0.	5060.
DEMAND, DOMESTIC		20.	23.	29.	25.	58.	73.	93.	93.	46.	41.	29.	29.	580.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		20.	23.	29.	25.	817.	1338.	1358.	1358.	552.	41.	29.	29.	5640.
FLOW, UPSTREAM		2357.	2917.	3517.	6861.	135721.	84461.	5718.	3429.	3354.	3080.	2770.	2770.	206632.
FLOW, DOWNSTREAM		2324.	2894.	3488.	6807.	104904.	63181.	4360.	2071.	2508.	3039.	2740.	2740.	200992.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
GRAND TOTALS FOR ALL THE USE POINTS!														
DEMAND, IRRIGATION		0.	0.	0.	0.	4558.	7663.	7663.	7663.	3067.	0.	0.	0.	30614.
DEMAND, DOMESTIC		48.	46.	58.	60.	116.	151.	184.	186.	93.	81.	58.	58.	1160.
DEMAND, INDUSTRIAL		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEMAND, TOTAL		58.	46.	58.	60.	4714.	7814.	7849.	7849.	3160.	81.	58.	58.	31814.
DEMAND, DEFICIENCY		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

MISSION CR. WET YEAR (1970) Figure 12.8





LEGEND
Historic (Simulated) Operation
Modified (Simulated) Operation

NOTES: 1. Consumptive Use deficiencies are totals for whole basin.
2. Non-Consumptive deficiencies are those extant at creek mouth.
3. In a Wet Year, a fisheries deficiency of $^{1400\ (Hist)}/_{0\ (Mod)}$ ac. ft. exists at mouth in August.

MISSION CR. (1970) DEFICIENCY DIAGRAM Figure 12.9

to Figures 12.9 and 12.3 and 12.4 lend support to this contention.

In conclusion, the contribution which Mission Creek makes to the gross inflow to Okanagan Lake may be evaluated for various types of year as shown on Table 12.8.

TABLE 12.8

COMPARISON BETWEEN ESTIMATED INFLOWS TO MISSION CREEK AND OKANAGAN LAKE

Type of Year	Regulated Flows at 1970 Development		Percentage Contribution by Mission Creek to Okanagan Lake Inflow %
	Inflow to Okanagan Lake From Mission Creek (acre-feet)	Total Tributary Inflow to Okanagan Lake From All Sources (acre-feet)	
Dry	66,000	279,200	23.6
Average	107,300	516,000	20.8
Wet	202,000	796,700	25.4