

PROVINCE OF BRITISH COLUMBIA

•

DYKING, DRAINAGE, AND IRRIGATION COMMISSION

REPORT

Submitted to the Provincial Secretary
December 24th, 1946

DEAN F. M. CLEMENT, Commissioner

Part I. Irrigation Districts



VICTORIA, B.C. :
Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.
1947.

PROVINCE OF BRITISH COLUMBIA

IRRIGATION, DRAINAGE, AND DYKING COMMISSION

REPORT

Submitted to the Provincial Council

December 1924

DEPARTMENT OF AGRICULTURE

Part I. Irrigation Districts



Printed and Published by the Government of British Columbia, Victoria, B.C.

VANCOUVER, B.C., December 24th, 1946.

*The Honourable G. S. Pearson,
Provincial Secretary,
Parliament Buildings, Victoria, B.C.*

SIR,—I have the honour to submit to you the Report of the Dyking, Drainage, and Irrigation Commission, together with such recommendations and explanations as I consider fair and reasonable.

The answers to the question in the terms of reference are as brief and specific as is the question asked. The explanations and comments are lengthy, but I believe are essential to a comprehensive understanding of the complexities of the problems that must be faced.

Respectfully submitted.

F. M. CLEMENT,
Commissioner.

January 10, 1946

Mr. J. Edgar Hoover

Washington, D. C.

Dear Mr. Hoover:

I have the honor to acknowledge the receipt of your letter of January 8, 1946, regarding the matter mentioned in the caption of the letter. I am sorry that I cannot give you a more definite answer at this time, but I will do my best to get you a reply as soon as possible.

The question of the release of the information mentioned in your letter is a matter which is being handled by the appropriate authorities. I am sure that you will understand the need for a thorough investigation of this matter before any decision is reached.

Sincerely,
J. Edgar Hoover

J. Edgar Hoover

Director

ACKNOWLEDGMENT.

I wish to express my thanks to the many trustees, secretaries, and witnesses of the various irrigation districts for the whole-hearted way in which they co-operated in securing the necessary information and data.

Thanks are also due to Mr. Bruce Dixon, Inspector and Commissioner of Dykes, and to Mr. E. Davis, Comptroller of Water Rights, and to their colleagues, who have made available all information requested.

I wish also to thank Mr. J. Pitcairn Hogg for his assistance and counsel; Miss Marcia Harris, secretary, for organizing the inquiry and assisting ably with the preparation of the report; and Miss Joan Williams for correcting and typing the manuscript.

Public hearings were held in Pitt Meadows, Mission, Chilliwack, Kamloops, Vernon, Kelowna, Rutland, Westbank, Penticton, Naramata, Peachland, Okanagan Falls, Cawston, Keremeos, Robson, and Creston. Briefs bearing on the problem were presented by the representatives of all districts concerned except Pitt Meadows No. 1 Dyking District. One hundred and thirty-eight witnesses gave evidence, and many scores of growers answered questions by mail. To all of these I express my thanks.

F. M. CLEMENT,
Commissioner.

TABLE OF CONTENTS.

	PAGE.
TERMS OF REFERENCE.....	11
RECOMMENDATIONS.....	13
THE IRRIGATION DISTRICTS—	
1. Assumptions and Considerations.....	15
2. Some Complicating Factors.....	16
Annual Repayment.....	16
3. Historical Statement.....	19
Order in Council No. 751, June 5th, 1933.....	20
4. The 1938 Arrangement.....	21
An Example of the 1938 Arrangement.....	21
Variable Factors.....	23
A Renewal Reserve.....	24
The Situation is met.....	24
What the 1938 Arrangement included.....	25
The Question of Rising Costs.....	26
Charge to Time and Inexperience.....	26
5. Some General Comments—	
Increase in Material and Labour Costs (Maintenance and Replace-	
ments), 1939-46.....	26
The Cost of Packing is rising.....	27
Codling-moth.....	28
The Districts have been paying for Original Systems while replacing	
them.....	28
Efficacy of the Irrigation Systems.....	28
Effect of Insufficient Water-supply on Cost of Production.....	29
Expanding the Systems.....	29
Can all the Indebtedness be paid?.....	29
A Ceiling Price for Administration Purposes only.....	30
Exercise of Direction.....	31
“Soldiers’ Land Act”.....	31
6. Distribution of Income—	
Gross Receipts.....	31
Gross and Net Costs.....	32
Net Income Estimates.....	33
Total Gross Sales.....	33
7. Orchard History.....	34
Statement by G. A. Barrat.....	37
A General Farm.....	39
8. Gross Income Distribution.....	40
INDIVIDUAL DISTRICT SUMMARIES—	
Black Mountain Irrigation District.....	51
Cawston Irrigation District.....	54
East Creston Irrigation District.....	57
Glenmore Irrigation District.....	61
Heffley Irrigation District.....	63

INDIVIDUAL DISTRICT SUMMARIES— <i>Continued.</i>	PAGE.
Keremeos Irrigation District.....	66
Naramata Irrigation District.....	69
Okanagan Falls Irrigation District.....	72
Oyama Irrigation District.....	75
Peachland Irrigation District.....	78
Robson Irrigation District.....	82
Scotty Creek Irrigation District.....	85
South-east Kelowna Irrigation District.....	87
Vernon Irrigation District.....	90
Westbank Irrigation District.....	94
Winfield and Okanagan Centre Irrigation District.....	96
Wyndel Irrigation District.....	100

LIST OF TABLES.

IRRIGATION DISTRICTS.

	PAGE.
1. Comparative Statement of Present Payments to Conservation Fund, Annual Amounts required for Replacements and Annual Charges levied (as in 1945).....	17
2. Conservation Fund—Comparative Statement.....	18
3. Comparative Statement—Conservation Fund (per Irrigated Acre).....	18
4. Percentage Increase in Material and Labour Costs (Maintenance and Replacements) 1939-46.....	27
5. The Pattern of a District.....	32
6. Net Operator Incomes expressed in per Cent. of Gross Receipts.....	33
7. Value of Shipments of Fruit, 1939-40, from Whole Okanagan Valley (relative, not absolute).....	33
8. A Representative Farm.....	34
9. Statistics on 25 Acres of One of the Best Orchards in a Central District.....	35
10. Financial History of a Good Orchard in Northern Area.....	36
11. Relation of Number of Bearing Apple-trees per Farm to the Average Cost of Production of Apples and Operator's Labour Income in the Okanagan Valley in 1939.....	38
12. Average Production Cost of Apples per Box.....	39
13. Dairy and Stock Farm, Vernon District (from 86 Acres assessed as Grade A).....	39

GROSS INCOME DISTRIBUTION.

14. Cawston-Keremeos.....	41
15. Creston.....	42
16. Kelowna.....	43
17. Naramata.....	44
18. Oyama.....	45
19. Peachland.....	46
20. Robson.....	47
21. Vernon.....	48
22. Westbank.....	49
23. Winfield and Okanagan Centre.....	50

LIST OF TABLES

27	1. General Statement of the Department of Agriculture, 1930-1931
28	2. General Statement of the Department of Agriculture, 1931-1932
29	3. General Statement of the Department of Agriculture, 1932-1933
30	4. General Statement of the Department of Agriculture, 1933-1934
31	5. General Statement of the Department of Agriculture, 1934-1935
32	6. General Statement of the Department of Agriculture, 1935-1936
33	7. General Statement of the Department of Agriculture, 1936-1937
34	8. General Statement of the Department of Agriculture, 1937-1938
35	9. General Statement of the Department of Agriculture, 1938-1939
36	10. General Statement of the Department of Agriculture, 1939-1940
37	11. General Statement of the Department of Agriculture, 1940-1941
38	12. General Statement of the Department of Agriculture, 1941-1942
39	13. General Statement of the Department of Agriculture, 1942-1943
40	14. General Statement of the Department of Agriculture, 1943-1944
41	15. General Statement of the Department of Agriculture, 1944-1945
42	16. General Statement of the Department of Agriculture, 1945-1946
43	17. General Statement of the Department of Agriculture, 1946-1947
44	18. General Statement of the Department of Agriculture, 1947-1948
45	19. General Statement of the Department of Agriculture, 1948-1949
46	20. General Statement of the Department of Agriculture, 1949-1950
47	21. General Statement of the Department of Agriculture, 1950-1951
48	22. General Statement of the Department of Agriculture, 1951-1952
49	23. General Statement of the Department of Agriculture, 1952-1953
50	24. General Statement of the Department of Agriculture, 1953-1954

THE TERMS OF REFERENCE.

To His Honour the Lieutenant-Governor in Council:

The undersigned has the honour to report that it is deemed advisable to cause inquiry to be made to determine how much each of the improvement districts under the "Water Act, 1939," and of the districts under the "Drainage, Dyking and Development Act," and the "Dyking Assessments Adjustment Act, 1905," that are indebted to the Province can pay annually in respect of its indebtedness, and to recommend:—

1. That in accord with the "Public Inquiries Act," being chapter 131 of the "Revised Statutes of British Columbia, 1936," Frederick Moore Clement, of Vancouver, British Columbia, be appointed a sole Commissioner to inquire into and determine how much each of the following corporations can pay annually in respect of its indebtedness to the Province:—

Black Mountain Irrigation District.
Cawston Irrigation District.
East Creston Irrigation District.
Glenmore Irrigation District.
Heffley Irrigation District.
Keremeos Irrigation District.
Naramata Irrigation District.
Okanagan Falls Irrigation District.
Oyama Irrigation District.
Peachland Irrigation District.
Robson Irrigation District.
Scotty Creek Irrigation District.
South-east Kelowna Irrigation District.
Vernon Irrigation District.
Westbank Irrigation District.
Winfield and Okanagan Centre Irrigation District.
Wynndel Irrigation District.
Chilliwack Dyking District.
Coquitlam Dyking District.
Dewdney Dyking District.
Maple Ridge Drainage District.
Maple Ridge Dyking District.
Matsqui Drainage District.
Matsqui Dyking District.
Pitt Meadows Dyking District.
Pitt Meadows Dyking District No. 2.
Sumas Drainage, Dyking, and Development District.

2. That the said Frederick Moore Clement be paid fifty dollars a day and his expenses for the time he is engaged in making the said inquiry.

3. That a certified copy of this Order, if approved, be furnished to Frederick Moore Clement, University of British Columbia, Vancouver, British Columbia.

Dated the 10th day of May, 1946.

E. T. KENNEY,
Minister of Lands and Forests.

Approved the 10th day of May, 1946.

JOHN HART,
*Presiding Member of the Executive
Council.*

The following letter was handed to me by the Honourable E. T. Kenney, Minister of Lands, in Victoria on July 6th, 1946:—

Dean F. M. Clement,
University of British Columbia,
Vancouver, B.C.

Dear Dean Clement:

In your inquiry to determine the ability of the several irrigation districts to pay their indebtedness to the Province, please consider the terms of the 1938 arrangement within the scope of the inquiry.

Yours faithfully,

E. T. KENNEY,
Minister.

File No. 0160243.

RECOMMENDATIONS.

VANCOUVER, B.C., December 24th, 1946.

*The Honourable G. S. Pearson,
Provincial Secretary,
Victoria, B.C.*

DEAR SIR,—As instructed in the letter from your office under date of May 18th, 1946, signed by the Deputy Provincial Secretary, I beg to report as follows:—

That after careful examination of the various districts, exhaustive examination of the records, and subject to the qualifications and explanations contained in the appendices to this report, the respective districts mentioned in the terms of reference can pay annually the following amounts on their indebtedness to the Government:—

Name of District.	Annual Payment (1945).	Recommended Annual Payment.
Black Mountain Irrigation District.....	\$2,873.22	\$1,500.00
Cawston Irrigation District.....	Nothing	200.00
East Creston Irrigation District.....	6,688.50	5,000.00
Glenmore Irrigation District.....	1,438.17	1,438.17
Heffley Irrigation District.....	989.85	300.00
Keremeos Irrigation District.....	1,911.85	1,200.00
Naramata Irrigation District.....	2,562.00	2,562.00
Okanagan Falls Irrigation District.....	700.10	100.00
Oyama Irrigation District.....	Nothing	100.00
Peachland Irrigation District.....	Nothing	100.00
Robson Irrigation District.....	342.00	100.00
Scotty Creek Irrigation District.....	881.00	300.00
South-east Kelowna Irrigation District.....	6,000.00	6,000.00
Vernon Irrigation District.....	3,575.00	3,575.00
Westbank Irrigation District.....	835.00	835.00
Winfield and Okanagan Centre Irrigation Dis- trict.....	Nothing	200.00
Wynndel Irrigation District.....	800.00	300.00
Chilliwack Dyking District.....	7,000.00	7,000.00
Coquitlam Dyking District.....	Nothing	300.00
Dewdney Dyking District.....	Nothing	900.00
Maple Ridge Drainage District.....	Nothing	200.00
Maple Ridge Dyking District.....	Nothing	1,200.00
Matsqui Drainage District.....	Nothing	200.00
Matsqui Dyking District.....	Nothing	2,200.00
Pitt Meadows Dyking District No. 1.....	Nothing	Nothing
Pitt Meadows Dyking District No. 2.....	Nothing	100.00
Sumas Drainage, Dyking, and Development District.....	Nothing	7,000.00

The amounts recommended for repayment annually by the irrigation districts are based on the assumption that the requirements for Renewal Reserve Account, as recommended by the resident engineers, have first been provided for.

The amounts recommended for repayment annually by the dyking and drainage districts are based on the assumption that sums not less than those named for each district, or greater sums if so advised by the Inspector and Commissioner of Dykes, have first been provided for the Renewal Reserve Accounts.

These amounts are as follows:—

District.	Renewal Reserve.
Chilliwack Dyking	\$2,500.00
Coquitlam Dyking	1,200.00
Dewdney Dyking	1,200.00
Maple Ridge Drainage.....	300.00
Maple Ridge Dyking.....	2,400.00
Matsqui Drainage	600.00
Matsqui Dyking	2,100.00
Pitt Meadows Dyking No. 1.....	Nothing
Pitt Meadows Dyking No. 2.....	400.00
Sumas Drainage, Dyking, and Development District.....	14,000.00

All of the amounts mentioned in the recommendations are based primarily on the productivity of the land out of which the operator has to make provision annually for various costs and expenditures.

Suggestions are offered in the appendices with regard to speculative and scarcity values. It seems reasonable and fair that some consideration should be given to these if a larger portion of the borrowings is ever to be repaid.

All of which is respectfully submitted.

F. M. CLEMENT,
Commissioner.

APPENDIX.

PART I.

THE IRRIGATION DISTRICTS.

ASSUMPTIONS AND CONSIDERATIONS.

The recommendations are based on the following assumptions and considerations:—

1. (a.) That the general price-level during the next twenty years will be higher than that which obtained during the past twenty years.

(b.) That the price of the products the grower has to sell will be appreciably higher.

(c.) That the costs of all labour, material, and living generally will be higher.

(d.) That costs in relation to prices received will bear approximately the same relationship to each other for the next twenty years as they have for the past twenty years.

2. That it is in the interest of the districts that the systems be operated and maintained by them without additional Government loans, except under very exceptional circumstances that it is impossible to foresee.

3. That strong renewal and replacement reserves must be maintained at all times so that the districts will be able to replace or rebuild their works as occasion demands in order that production and business may continue without interruption.

4. That the districts will be required to raise such additional sums as are necessary for replacement reserves, the amounts required to be estimated on the basis of present and rising costs.

5. That it is the wish of the Government that the present living standards enjoyed by the growers and farmers shall not be depreciated except because of economic fluctuations beyond their control.

6. That the policy of the Department of Lands as stated by the Comptroller of Water Rights in evidence given at Penticton, July 31st, 1946, will continue. Quoting from page 25 of transcript:—

“Q. And the policy of the Department then would be, first of all, to see that operations were taken care of?

“A. (Mr. E. Davis, Comptroller of Water Rights.) Yes.

“Q. Second, maintenance?

“A. Yes.

“Q. The next is Renewal Reserve?

“A. Yes.

“Q. And the last Conservation Fund?

“A. Yes.”

7. That the Government will continue to exercise a strong measure of direction and control so long as any part of the debt remains unpaid.

8. That in all cases where the recommended payments to the Conservation Fund have been written down, it does not mean that the assessments are to be less. The assessments may (and in many cases will) have to be materially increased. It means simply that the districts will have to take care of additional replacements at markedly increased costs and that an opportunity is being given them to do so.

SOME COMPLICATING FACTORS.

There are many complicating factors that it is difficult to reconcile when trying to find a formula that will apply with equity to all districts. Some of these are:—

1. All districts have not been put (and I doubt if they can be put) on a proportionate basis with regard to repayments. For instance, some have been paying much and some little annually on their indebtedness. (See Table 1.)

2. The "write-offs" have varied materially in amount and in percentage, depending on the situations as they existed in the districts. (See Tables 2 and 3.)

3. The 1938 arrangement (which is explained later in this report) has not been made to apply to all districts; for various reasons, rightly or wrongly, Heffley, Cawston, Peachland, and Oyama were not, or could not, be included in it.

4. By some districts substantial repayments have been maintained to the Conservation Fund, while the works were of necessity permitted to deteriorate. By other districts only token repayments have been made to the Conservation Fund, while large sums have been spent on replacements. (This point is developed in the statements with regard to the various districts.)

5. Some districts, such as Vernon and Black Mountain, require heavy expenditures for maintenance and reserves, while in other districts, such as Creston and Wynn-del, the works are so constructed physically that low maintenance and only moderate replacement reserves are required.

6. The original cost and accrued indebtedness per acre varies materially with the districts. (See Table 3.)

7. All areas are not of equal productivity.

8. All districts vary with regard to kinds of fruits and vegetables produced, and also with regard to kinds and varieties of other crops.

ANNUAL REPAYMENT.

It has been suggested that annual repayments might be made on a sliding scale, the amount increasing with the increasing returns from the land and decreasing in the years of falling returns; that there should be a payment varying with the price of fruits and vegetables.

The suggestion undoubtedly has merit, and might readily be applied to new projects.

After studying the history, the various write-offs, adjustments and arrangements of the present districts, however, I am of the opinion that such a new type of adjustment would be simply the introduction of another disturbing factor and would lead to further confusion. Consequently, with most districts facing heavy replacements in the near and more distant future, and with little or no new money likely to be available from the Conservation Fund for replacement purposes, it seems logical to suggest that the principle of the present arrangement (1938), which is acceptable to most districts, be made applicable to all in whatever modified form is necessary in order to make it practicable.

Table 1.—Comparative Statement of Present Payments to Conservation Fund, Annual Amounts required for Replacements and Annual Charges levied (as in 1945).

District.	Irrigated Acreage.	Indebtedness as at March 15, 1945.	PAYMENT.			ANNUAL AMOUNT REQUIRED FOR RENEWALS.		Irrigation Charges per Acre, 1944.
			Amount.	1945 Percentage of Indebtedness.	Per Irrigated Acre.	Amount.	Per Irrigated Acre.	
Black Mountain.....	3,900	\$381,764	\$7,566	1.98	\$1.94	\$6,600	\$1.70	\$9.35
Cawston.....	257	7,333	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	1,700	6.60	12.00
East Creston.....	1,250	167,873	6,658	3.97	5.33	1,250	1.00	5.00
Glenmore.....	1,900	89,973	1,438	1.60	.75	9,241	4.85	9.20
Grand Forks*.....	2,225	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	4,450	2.00	8.65
Heffley.....	1,633	11,258	989	8.80	.66	1,720	1.05	3.10
Kaleden*.....	430	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	3,000	7.00	15.37
Keremeos.....	960	57,034	1,911	3.35	2.00	4,250	4.43	11.25
Malcolm Horie*.....	150	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	300	2.00	3.25
Naramata.....	867	57,742	2,626	4.55	3.00	5,610	6.47	20.00
Oyama.....	350	10,000	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	3,500	10.00	23.00
Peachland.....	400	7,812	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	1,545	3.90	17.75
Penticton*.....	2,300	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	.....	.....	14.00
Robson.....	262	8,921	342	3.84	1.30	970	3.70	4.00
Scotty Creek.....	863	18,534	881	4.75	1.02	500	.60	3.37
South-east Kelowna.....	2,560	197,367	6,000	3.05	2.34	4,350	1.90	10.90
Summerland*.....	3,400	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	.....	.....	10.44
Vernon.....	7,200	475,236	3,575	0.75	.50	26,827	3.70	5.35
Westbank.....	650	18,891	893	4.72	1.37	2,739	4.20	8.81
Winfield.....	1,823	13,396	707	5.27	.39	.....	.....	10.00
Wyndel.....	450	26,668	1,534	5.74	3.40	1,000	2.20	4.00

* Not included in the terms of reference.

Okanagan Falls is not included in this table.

NOTE.—Penticton and Summerland are municipal systems and do not levy for replacements, while Winfield is operated by a company which has made no provision for replacements.

Black Mountain and Winfield irrigation charges have been increased for 1945.

Naramata and Peachland made an extra levy in 1944—the normal charges would be \$12.50 and \$12 respectively.

Table 2.—*Conservation Fund—Comparative Statement.*

District.	Relief given per Acre.	Still owing per Acre.	Annual Pay- ment to Gov't per Acre.
Grand Forks*.....	\$197.00	.....	.....
South-east Kelowna.....	169.00	\$77.00	\$2.34
Black Mountain.....	133.00	98.00	.74
Peachland.....	130.00	19.00	.....
Vernon.....	125.00	66.00	.50
Glenmore.....	104.00	48.00	.75
Naramata.....	98.00	67.00	3.00
Westbank.....	69.00	29.00	1.37
Kaleden*.....	63.00	.....	.....
Robson.....	37.00	33.00	1.30
Oyama.....	33.00	29.00	.....
Scotty Creek.....	27.00	21.00	1.02
Keremeos.....	19.00	60.00	2.00
East Creston.....	18.00	134.00	5.33
Penticton*.....	16.00	.....	.....
Heffley.....	11.00	7.00	.....
Wynndel.....	10.00	60.00	3.40
Malcolm Horie*.....	7.00	.....	.....
Summerland*.....	4.00	.....	.....
Cawston.....	.....	28.00	.....
Winfield.....	.....	7.00	.39

* These districts are not included in the terms of reference.

East Creston and Wynndel: Only small amounts were written off, as the moneys were for new schemes and they had not borrowed money in 1930, and the works were for domestic water as well as for irrigation.

Grand Forks had 95 per cent. written off, as it was considered an uneconomical scheme from the first and much land has reverted to the Government.

Summerland had 100 per cent. written off, as the money was used to enable the municipality to obtain more water from Trout Creek by getting the Experimental Farm to take water from Okanagan Lake.

The relief varied in other districts between 30 and 64 per cent., dependent on the difficulties in each district—in other words, on the necessities of the case.

The average amount written off in relation to the principal borrowed plus the accrued interest was approximately 50 per cent.

Table 3.—*Comparative Statement—Conservation Fund (per Irrigated Acre).*

District.	Accrued Indebtedness.			Principal and Interest repaid.		Principal and Interest still owing.	
	\$	\$	Per Cent.	\$	Per Cent.	\$	Per Cent.
Black Mountain.....	296	65	22	133	45	98	33
Cawston.....	35	7	20	.....	.....	28	80
East Creston.....	220	68	31	18	8	134	61
Glenmore.....	247	95	39	105	42	47	19
Grand Forks*.....	207	10	5	197	95	.....	.....
Heffley.....	38	20	53	11	29	7	18
Kaleden*.....	96	32	33	63	67	.....	.....
Keremeos.....	94	15	16	19	20	60	64
Malcolm Horie*.....	28	20	75	7	25	.....	.....
Naramata.....	263	98	37	98	37	67	26
Oyama.....	65	3	4	33	51	29	45
Peachland.....	204	55	27	130	64	19	9
Penticton*.....	36	21	56	16	44	.....	.....
Robson.....	139	69	50	37	26	33	24
Scotty Creek.....	90	42	47	27	30	21	23
South-east Kelowna.....	323	77	24	169	53	77	24
Summerland*.....	4	.....	.....	4	100	.....	.....
Vernon.....	249	58	23	125	50	66	27
Westbank.....	134	36	27	69	51	29	22
Winfield.....	11	4	36	.....	.....	7	64
Wynndel.....	107	37	35	10	9	60	56

* Not included in the terms of reference.

NOTE.—The percentages relate to accrued indebtedness.

The amounts represent per irrigated acre indebtedness, etc., as at March 31st, 1945.

HISTORICAL STATEMENT.

The terms of reference ask a simple and direct question: "How much each of the following corporations can pay annually in respect of its indebtedness to the Province." This implies some difference of opinion. In order to get a clear understanding of the situation, it is necessary to go briefly into history.

The following is quoted in part from a statement prepared by the Comptroller of Water Rights:—

"In 1918 the Conservation Fund was set up to make loans to rebuild the irrigation systems which had been constructed by land selling companies and for which no money was available for the replacement of perishable structures. Monies were loaned to Improvement (Irrigation) Districts to be repaid within a limit of thirty years. Due to the collapse of markets, two moratoria were given. The districts defaulted in making repayments and after various investigations relief was given to the extent of \$930,962.79, the major reduction being in the year 1930.

"The Districts continued to default and after a further investigation the then Minister of Lands, Mr. Loughheed, recommended an adjustment. The reductions under this adjustment were not uniform but varied according to the importunities or difficulties in the several Districts. This adjustment, while scaling down the debts in most cases, required that repayments be made over a period of thirty years. However, while this requirement indicated that the monies loaned, less the amounts written off, were to be repaid to the Government, it did not provide for any re-loans to again replace the perishable structures which were rebuilt in 1920 and 1921, and for many of the original structures which still remained to be replaced. In other words the Fund was not looked upon as a revolving fund which the necessities of the situation required.

"In 1938 adjustments were again requested by the Districts on consideration of which the Government decided that no further loans would be made from the Conservation Fund and instructed Major MacDonald, the then Comptroller, to work out a formula whereby the Districts could accumulate a reserve fund for replacements and not call on the Government for financial assistance. This formula was prepared and accepted by the then Premier, Mr. Pattullo, and the late Mr. Wells Gray, the Minister of Lands. It provided that out of the levies the Districts made on the water users, an amount, determined by the Comptroller of Water Rights, should be set aside in a Reserve Fund and the balance over and above that required for the operation of the irrigation systems should be paid to the Government. This latter sum was to be considered as a payment-in-full for the annual amounts which had been set up by Order-in-Council 751 (which authorized the 1933 adjustment) and is authorized from time to time by Order-in-Council after payments are made.

"This practice has been followed for the last seven years. In effect it means that the Government continues to write off portions of the indebtedness every year and if continued all the Districts which borrowed money should be free of debt within the thirty years prescribed under Order-in-Council No. 751 of 1933. As mentioned previously, this arrangement was inaugurated to overcome the necessity of the Districts seeking further loans for replacements, but of course the effectiveness of this must be gauged by the condition of the Renewal Reserve funds the Districts were instructed to set up. While on the whole the Districts have complied with the conditions prescribed, some objected strongly to the Branch (Water Rights) controlling the withdrawals from these Funds and were determined to use the funds for extensions and betterments for which no allowance had been made when determining the annual amount each District should contribute to its Fund.

"In four Districts, i.e., Cawston, Heffley, Oyama, and Peachland, the 1938 arrangement was not made applicable for reasons given in the review under the respective headings.

"After a review in 1945 of the conditions in the Districts indebted to the Conservation Fund by the Honourable the Minister of Lands and Forests, he considered that owing to the much better financial positions the water users should be in after a period of much greater returns for produce than were obtainable when the 1933 and 1938 arrangements were put into effect, that the latter arrangement should be superseded and a more satisfactory arrangement for the Government should be substituted and that further instructions should be given to the Trustees respecting future repayments.

"The suggestion was therefore made that each District should pay annually to the Government the interest charge on its indebtedness and a contribution toward the repayment of the principal. This, however, did not appeal to the Trustees of the Districts owing the money and they requested the appointment of a Royal Commission to investigate the ability of the Districts to repay the moneys borrowed, while at the same time expressed themselves as satisfied with the 1938 arrangement.

"The total amount of money borrowed together with the accrued interest to the 15th March, 1946, is \$6,011,706.00, of which \$1,531,638.00 is paid; \$2,932,689.00 written off or forgiven and \$1,547,379.00 is still owing.

"It seems reasonable, unless the construction of irrigation works is to be subsidized, that interest should be paid on the outstanding indebtedness and the principal repaid within a period of years. Since the Conservation Fund was set up nearly fifty per cent. of the indebtedness has been written off and a continuation of the 1938 arrangement means further subsidization. Should this latter be deemed inevitable then consideration must be given to a similar policy respecting any new scheme on which it is proposed to loan money.

"Irrespective of the policy that may be decided on with regard to the present indebtedness, I am satisfied that it cannot be expressed in a simple formula if it is desired to have it apply equitably to all of the debtor districts."

ORDER IN COUNCIL No. 751, JUNE 5TH, 1933.

Order in Council No. 751, approved June 5th, 1933, is of importance and possibly basic. It is the Order in Council by which the debts of the various districts were reduced. The following is quoted in part only from this Order in Council:—

"That after careful investigation and examination on the ground, it is considered necessary and in the public interest not to require payment in full of the amounts set out in the preceding paragraph, and that the said amounts be reduced to the sums, and the terms of repayment herein recommended.

"And to recommend that the sums owing by the undermentioned corporations, and the times and terms of repayment be determined as follows:—

Black Mountain Irrigation District.....	\$300,000.00
Cawston Irrigation District.....	3,152.39
East Creston Irrigation District.....	164,420.60
Glenmore Irrigation District.....	87,780.00
Grand Forks Irrigation District.....	Nil
Heffley Irrigation District.....	15,000.00
Kaleden Irrigation District.....	31,694.38
Keremeos Irrigation District.....	55,383.67
Naramata Irrigation District.....	65,000.00
Oyama Irrigation District.....	14,087.10
Peachland Irrigation District.....	5,741.00
Corporation of the District of Penticton.....	28,000.00
Robson Irrigation District.....	11,638.96

Scotty Creek Development District.....	\$20,000.00
South-east Kelowna Irrigation District.....	200,000.00
Vernon Irrigation District.....	435,000.00
Westbank Irrigation District.....	20,000.00
Winfield and Okanagan Centre Irrigation District.....	12,533.82
Wynndel Irrigation District.....	30,000.00

“ In respect of the indebtedness of the said corporations as set out above, the said corporations respectively shall pay into the Conservation Fund thirty equal annual instalments, each of which shall be seven hundred and twenty-six ten-thousandths of the respective amounts of the indebtedness of the said corporations. The first instalments payable by the said corporations respectively shall be due and payable on the following dates respectively:—

Black Mountain Irrigation District.....	March 15, 1934
Cawston Irrigation District.....	March 15, 1934
East Creston Irrigation District.....	March 15, 1935
Glenmore Irrigation District.....	March 15, 1937
Heffley Irrigation District.....	March 15, 1934
Kaleden Irrigation District.....	March 15, 1935
Keremeos Irrigation District.....	March 15, 1937
Naramata Irrigation District.....	March 15, 1937
Oyama Irrigation District.....	March 15, 1939
Peachland Irrigation District.....	March 15, 1939
The Corporation of the District of Penticton.....	March 15, 1934
Robson Irrigation District.....	March 15, 1934
Scotty Creek Irrigation District.....	March 15, 1934
South-east Kelowna Irrigation District.....	March 15, 1934
Vernon Irrigation District.....	March 15, 1934
Westbank Irrigation District.....	March 15, 1934
Wynndel Irrigation District.....	March 15, 1935
Winfield and Okanagan Centre Irrigation District.....	March 15, 1934 ”

Order in Council No. 751 was amended on August 15th, 1936. This Order in Council (No. 974) goes into much detail, but with certain explanations writes down the interest rate from 6 to 4½ per cent. The annual payment authorized under Order in Council No. 974 is six hundred and twenty ten-thousandths of the respective amounts of the indebtedness—that is, the indebtedness was amortized over a period of thirty years at 4½ per cent.

THE 1938 ARRANGEMENT.

In 1938 another adjustment was made. This is explained in the paragraphs that follow.

AN EXAMPLE OF THE 1938 ARRANGEMENT.

Copy of letter from Comptroller of Water Rights to the Glenmore District, April 13th, 1938 (Exhibit No. 61):—

W. R. Reid, Esq.,
Secretary,
Glenmore Irrigation District,
Kelowna, B.C.

Dear Sir,

Pursuant to our conversations on the 15th March last, I have to advise that until further instructed the Trustees of your District are requested to make provision in their bylaws in accordance with the following data:

That on the basis that 1,772 acres of land in the District are revenue producing the budget should include:—

\$7,571.00 for the Renewal Reserve,

\$1,891.00 for the repayments to the Conservation Fund.

The calculations from which the base rate, which determines the amount payable to the Conservation Fund, is found, is as follows:

Acreage:

Irrigable land in the District—2,566 acres.

Revenue producing acreage—1,772 acres.

<i>Conservation Fund</i> repayment as previously required	\$6,124.00
<i>Renewal Reserve</i> estimated average annual amount necessary over a period of five years	\$7,571.00
<i>Total of Conservation Fund and Renewal Reserve</i>	\$13,695.00
<i>Base rate per acre</i> (\$13,695 ÷ 2,566)	\$5.34

This rate when multiplied by the revenue producing acreage, which for the time being is considered as 1,772, indicates a revenue of \$9,462.00 for the combined Renewal Reserve and Conservation Fund. Deducting the sum of \$7,571 for the Renewal Reserve from this indicated revenue, a balance of \$1,891 is available to the Conservation Fund. Should the revenue producing acreage in any year be more or less than the estimated figure of 1,772, the amount returnable to the Fund will vary accordingly. As, however, your District has an estimated value of liquid assets of \$17,277, the Water Board will approve a bylaw setting a tax rate of \$4.00 per acre with the understanding that the deficiency in revenue resulting from the lower rate will be made good from the proceeds of the liquid assets.

A copy of the budget should accompany the tax bylaw when it is submitted for registration.

The tax bylaw as well as the tolls or revenue bylaw for the year 1938 should be submitted to the Water Board before the 1st June next and until further advised the bylaws for the subsequent years are to be submitted for registration on or before the 15th March in each and every year.

Tax Sales must be held once each year as provided in Section 272 of the Water Act and for the year 1938 should not be held later than the 1st December next.

Respecting the Renewal Reserve you are requested to open a special account in your bank and to arrange that withdrawals from this account can only be effected over the signature of one of your Trustees and one member of the Water Board. This reserve must be credited with the sum of \$7,571 on or before the close of your District's fiscal year. It is understood that this account is to be drawn upon for renewals which are approved by me and for investing the surplus money (over and above that required for current renewals) in approved securities. The proceeds from such securities must likewise only be expended on approved renewals.

Yours very truly,

COMPTROLLER OF WATER RIGHTS.

Similar letters were written to the secretaries of all other districts that came under this arrangement and to the secretaries of some other districts. The letters, while resembling the above quoted in principle and plan, differ in detail.

Please note that the first paragraph of the letter above quoted contains the words "until further instructed." These words were discussed at length and much evidence was given with regard to their intent. Do the words refer to the whole arrangement, including the formula on which payments were to be based, or do they refer only to the details and figures within the formula?

The practice, principle, and plan set forth in the letters to the secretaries of the districts in 1938 have been followed since that time.

Briefly, it was a plan to relieve the individual district of its indebtedness to the Conservation Fund to the extent of the amount of taxes that would have been levied on lands that had reverted to the district and were no longer taxable because they were not productive, and also to provide sufficient funds for Renewal Reserve.

Example (Glenmore, 1938) :—

Estimated cost of renewals for five years.....	\$37,854.00
Estimated cost of renewals for one year—\$37,854.00 divided by 5.....	7,571.00
To be set aside for Conservation Fund (Order in Council No. 751).....	6,124.00
	<u>13,695.00</u>
Original acreage—irrigable land in the district.....	2,566 acres
Basic rate per acre—\$13,695.00 divided by 2,566 acres.	\$5.337 (\$5.34)
Present irrigated or revenue-producing acreage.....	1,772 acres
	<u>9,462.48</u>
Total tax—1,772 acres multiplied by \$5.34.....	\$9,462.48
Required for renewals.....	7,571.00
	<u>1,891.48</u>
Balance for Conservation Fund.....	\$1,891.48

The five-year average of renewals (this average may be for more years than five) is added to the annual instalment to the Conservation Fund. The total of this is divided by the original irrigable acreage as agreed on in 1938, which gives the basic rate per acre. The present irrigated or revenue-producing acreage is multiplied by the basic rate per acre, which gives the total tax levy for that year. From this total is deducted the five-year average for renewals, which leaves the amount payable to the Conservation Fund for that year. Whatever this amount is, it is deemed to be payment in full for the instalment for that year; namely, \$1,891.48 in lieu of \$6,124 in the case of Glenmore in 1938.

VARIABLE FACTORS.

From the above example it will be noted that there are at least four variable factors in the formula used in the 1938 arrangement:—

- (1.) The amount of Renewal Reserve. This may be changed only with the approval of the Comptroller of Water Rights.
- (2.) The number of revenue-producing acres. This will vary as lands which have reverted for non-payment of taxes come back into production, or as further lands revert for non-payment.
- (3.) The base rate per acre. This will vary as the amount of Renewal Reserve is increased or decreased.
- (4.) The amount actually paid into the Conservation Fund each year. This will vary in accordance with a change in any of the first three variable factors.

The factors which remain constant are as follows:—

- (1.) The annual instalment to the Conservation Fund as determined by Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.
- (2.) The total number of irrigable acres. This remains as set in 1938.

Quoted from Department records: "Since 1933 only two or three small loans have been made from the Conservation Fund, and it was because of requests for further loans to enable replacements to be made that the Government realized that another adjustment had to be made. This resulted in the 1938 adjustment."

A RENEWAL RESERVE.

As previously indicated, the general history from 1938 on brings into prominence a very important fact. The indebtedness to the Conservation Fund had generally been incurred years earlier for the purchase of the systems from private companies and for making certain necessary and immediate repairs in order to keep the systems operating. They were kept operating, but owing to the difficult conditions in the industry (and in agriculture and the country as a whole) *financial provision for renewal of these systems was not made before 1938. In so far as I am aware, the 1938 arrangement was the first attempt to correct that situation.*

At the same time, under that 1938 arrangement the districts were asked to make some annual payment—even though only a token payment—on their indebtedness to the Conservation Fund.

Now, in 1946, because of improved conditions in the industry, it has been suggested that the districts make larger payments on that indebtedness—indebtedness incurred in the years immediately following 1918 and adjusted in different years thereafter up to 1938. In effect, and generally speaking, this is asking the districts to pay something more now towards the cost of certain materials in the systems, which materials have long since become less serviceable and in many instances have been wholly replaced. It is asking them to pay for systems that in part have long since been worn out, while at the same time they must provide the funds for the renewal of the systems as they exist to-day.

THE SITUATION IS MET.

It seems to me that the men who negotiated the 1938 arrangement recognized the difficulties of this situation and made an attempt to deal with it.

As indicated elsewhere, three important objects of this plan were:—

- (1.) To relieve the district of its indebtedness to the Conservation Fund to the extent of the amount of taxes that would have been levied on lands that had reverted to the district and were no longer taxable because they were not productive.
- (2.) To ensure provision of sufficient funds with which to renew the systems.
- (3.) To discourage the districts from asking for additional borrowings from the Conservation Fund.

The interpretation put on the 1938 arrangement by the irrigation districts was that it was a final arrangement. This point of view was strongly emphasized by Captain C. R. Bull, who in 1938 was member of the Legislative Assembly for the South Okanagan and took an active interest in trying to reach a settlement.

This interpretation was substantially confirmed in an interview with, and later by a signed statement from, Major J. C. MacDonald (Comptroller of Water Rights in 1938), and in an interview with the Honourable T. D. Pattullo, then Premier. After making the necessary reservations (Major MacDonald could not commit the Government at all, and "any letters written by him would have only the following meaning: This is my understanding of that Order in Council and this is the way that we as bookkeepers are keeping it"), Major MacDonald stated:—

"I would be inclined to say 'until further instructed' means that this rate was set for that year, the year following, and unless some other arrangement was set up, because

there have been so many arrangements by way of a moratorium and various things of that sort.

"The Government said: 'You have now got to take care of yourselves and there will be no further advances. Therefore you have got to set up a Renewal Reserve.'

"'Until further instructed' merely means a revision of these calculations based on a change in the Renewal Reserve or a change in the revenue-producing acreage. The plan stood."

The Honourable T. D. Pattullo made the following statement:—

"That this was intended to be a final settlement, but there is no finality in Government. More than getting the capital payments, I wanted to see these people stand on their own feet and make their own replacements and not draw on the Conservation Fund."

The other persons who took part in most of the 1938 arrangement negotiations were the late Honourable Wells Gray and the late Honourable Dr. K. C. Macdonald.

WHAT THE 1938 ARRANGEMENT INCLUDED.

1. The Government could put a receiver into any district that did not live up to the arrangement.

2. The Government wanted to be completely apart and not responsible for additional capital loans to districts that had come under the Conservation Fund (*see* Bull., p. 19, Glenmore evidence). In this respect it was effective, except where a catastrophe occurred.

3. The building-up of a Renewal Reserve Fund based on the average replacement requirement over a five-year period (more years or less, depending on the district). This was basic and absolutely sound and necessary.

4. If the Renewal Reserve requirement went up, the Government might get a lesser payment to the Conservation Fund.

5. If the Renewal Reserve requirement went down, the Government might get a larger payment to the Conservation Fund.

6. The Renewal Reserve requirement is subject to discussion between the Comptroller of Water Rights and the district, but in the final analysis must be approved by the Comptroller of Water Rights. This places control in the hands of the Water Rights Branch.

7. The token payment—whatever amount is left over after renewals have been provided for—when paid to the Government is deemed to be payment in full for the instalment to the Conservation Fund for that year (i.e., the instalment required in the 1933 Order in Council No. 751). On this basis the debt is amortized in thirty years.

8. The amount of total tax collected for renewals and Conservation Fund also varies with the total acreage irrigated, or the revenue-producing acreage. As the irrigated acreage in the district increases, the payment to the Conservation Fund could increase. If the total irrigated acreage decreases, the payment to the Government could decrease.

9. The only debatable point in the arrangement is the amount to be set aside for renewals (*see* Bull., p. 15, Black Mountain evidence). In the final analysis the Government decides this. (In cases where this amount has been too low to take care of the requirements, the districts have had to borrow from a bank or to make special assessments, or both.)

10. The districts could, after 1938, stand on their own feet, whereas before they had been constantly going back to the Government for more money, especially for renewals.

11. The 1938 arrangement is not workable when the revenue-producing acreage is so low that the total tax collected is less than the Renewal Reserve requirement. In

such cases the debt tends to increase, as no payment is made to the Conservation Fund and the interest accumulates. Examples of such cases are Peachland, Oyama, and Cawston. The 1938 arrangement was not made to apply to these districts.

12. It is possible to conceive of a situation or situations where the 1938 arrangement might not work at all for many of the districts. For example, if prices and incomes were very low for a period of years and replacement costs remained high and were extensive in amount, many of the districts would find themselves in the same position as Peachland is in to-day (1946), where the total tax does not equal the estimated replacement reserve. The Government then would get nothing and debts would tend to increase.

13. The basic rate per acre used in the 1938 formula changes with the amount required in the Renewal Reserve. If the Renewal Reserve requirement increases, the basic rate per acre increases. If the Renewal Reserve requirement decreases, the basic rate per acre decreases.

14. The Renewal Reserve requirement is figured at stated intervals, but in the main represents an average requirement over a five-year period.

In my opinion the 1938 arrangement was an agreement and should be upheld, not only because it was an agreement, but also because it is sensible and reasonable in its requirements.

The recommendations are based on the assumption that it will be accepted in principle and made workable for all districts.

Where and when for various reasons the principle of the 1938 arrangement cannot be made applicable, a minimum token payment is recommended.

THE QUESTION OF RISING COSTS.

Definite consideration must be given to the problem of rising costs. I can conceive of situations in a number of the districts where replacement costs may become so heavy that the total assessment under the 1938 arrangement would not be sufficiently large to meet them. Because of this, in some cases payments to the Conservation Fund have been written down so as to make possible the accumulation of additional reserves while fruit and vegetable prices are relatively high. The spirit of the 1938 arrangement is upheld, but the letter has been softened in order to meet particular situations.

CHARGE TO TIME AND INEXPERIENCE.

It appears that some additional indebtedness will have to be charged to time, trial and error, and inexperience, but it should pay dividends on future developments in new improvement districts because there has been built up over a period of thirty years or more a large body of experience and knowledge that should prove to be not only useful but invaluable.

SOME GENERAL COMMENTS.

INCREASE IN MATERIAL AND LABOUR COSTS (MAINTENANCE AND REPLACEMENTS), 1939-46.

The secretaries of all districts were asked to submit statements on the relative costs of materials and labour in 1946 as compared with those in 1939. While the statements vary considerably, there is, nevertheless, a definite indication that costs have markedly increased.

This increase in costs of labour and materials must be made up by increased tolls for operation and by increased assessments for replacement purposes. These increases are important and have carried considerable weight in my thinking with regard to the amounts the various districts can pay on their indebtedness.

Table 4.—Percentage Increase in Material and Labour Costs (Maintenance and Replacements), 1939-46.

District.	Labour.	Super- vision and Office.	Steel Pipe.	Wood Pipe.	Cement.	Lumber.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Black Mountain.....	100.00	29.41	‡	‡	4.17	150.58
Cawston.....	39.13*	108.33	.....	.....	95.74	152.38
Creston.....	85.71	.....	25.00†	.....	‡	87.91
Glenmore.....	62.50	.....	.....	35.94*	7.53	163.16
Heffley.....	92.30	33.33	.....	.....	.....	.....
Keremeos.....	68.42*	33.33	.....	26.28*	.....	150.00
Naramata.....	116.67	66.67	13.50*	.....	‡	150.00
Okanagan Falls.....	62.50	.....	.....	24.11	15.00	117.50*
Oyama.....	40.00†	.....	170.00	.....	.....	178.33*
Peachland.....	50.00	50.00	60.00	.....	2.68	90.00
Robson.....	71.42	66.67	.....	30.00*§	4.35	65.38
South-east Kelowna.....	42.86	.....	30.00†	.....	2.11	103.66*
Vernon.....	66.67	.....	61.23*	39.29*	.....	195.80*
Westbank.....	83.33	36.36	.....	26.80*	.....	121.00*
Winfield.....	100.00*	.....	20.00†	.....	.....	.....

* Average of several items.

† Estimate.

‡ No increase.

§ Increase since 1923.

THE COST OF PACKING IS RISING.

The following statement was presented by the Okanagan Federated Shippers Association, which organization represents practically all fruit-packing plants in the Okanagan and Kootenay area of British Columbia, and is submitted to show the increase in the cost of packing apples at the present time as compared with the cost in 1938:—

“ In the period from 1936 to 1941, packing costs remained fairly constant, varying from year to year more as a result of the size of the crop than any difference in the cost of materials.

“ However, from 1941 costs of packing have advanced as follows:—

	Cents per Box.		Cents per Box.
1941.....	42	1944.....	57
1942.....	48	1945.....	62
1943.....	54	1946 (estimated).....	70

“ These advances have occurred in spite of every effort to restrict them. The incentive to hold packing-house costs to a minimum lies in the fact that all produce of equal grade, variety, size, etc., is sold at a uniform price f.o.b. cars at shipping-point, or at least nets a uniform price to the packing-houses, and the packing-houses must therefore keep their charges at the lowest possible level if they wish to remain in business, as all packing charges are deducted from the returns on the fruit and are borne by the growers.

“ An increase of 28 cents in the cost of packing apples between 1941 and 1946 is an extremely heavy additional charge upon the grower, and represents an increase of 66 per cent.

“ The probabilities are that these packing costs will not be reduced for some time to come. In the first place, no one will wish to reduce wages until it becomes an absolute necessity. With respect to materials, and these consist mostly of wooden containers and paper, there is nothing to encourage this industry to feel that costs will be reduced for some considerable time. Our box price at present is below economic

levels, and while our estimated cost of packing for 1946 reflects an increase of approximately 6 cents in the cost of containers, there is no assurance that this will not be again increased in the near future."

CODLING-MOTH.

After 1926 the responsibility for control of codling-moth was put almost entirely on the grower. At one time in the early '20's only one or two, or at most three, sprays were necessary. At the present time six to seven sprays are necessary in all districts to control this insect pest. These sprays cost from \$50 to \$90 per acre. When spraying is not done effectively, the fruit in most instances has to be disposed of at a loss.

THE DISTRICTS HAVE BEEN PAYING FOR ORIGINAL SYSTEMS WHILE REPLACING THEM.

Speaking generally, the districts have been paying about all they could bear over a period of years, and these payments have been made under close supervision since 1939.

If the establishment of an irrigation project involved merely the borrowing of a specific sum for the installation of a permanent system and the repayment of this amount over a period of time, the situation would be relatively simple. But the systems, once built, must be maintained and in the course of time rebuilt. Many of the systems were built around thirty (sometimes more) years ago, and now many of the districts are faced with the necessity of undertaking large replacement programmes while still owing in part for the original systems.

Obviously the districts cannot meet both charges at the same time—not without difficulty and hardship. Additional borrowing from the Conservation Fund for replacement is, in my opinion, inadvisable. The districts should stand on their own feet. Consequently, heavy taxation has been necessary in order to make provision for the essential replacements.

Due to the increased cost of labour, wooden pipe, steel pipe, and other essential materials, it is expected that these costs will advance by at least 40 per cent.

In my opinion, since repayment and replacement over a long period of time cannot both be met without undue hardship and since consequently one or the other must be left unsatisfied, it should not be the tax for replacements.

The 1938 arrangement made this objective possible, and to a large degree the districts have taken advantage of the terms of this arrangement and the admittedly improved financial position of the grower in recent years either to rebuild deteriorated parts of the works or to build up reserves with which to renew the works in the future.

EFFICACY OF THE IRRIGATION SYSTEMS.

The ability of land to pay irrigation charges depends upon the effectiveness of the irrigation supplied. The requirements vary, depending upon the slope of the land, the type of soil, and the kind of crop to be produced. If insufficient water is supplied, the resultant crop may not warrant the irrigation charges. For instance, if it takes from 3 to 4 acre-feet of water to produce the highest yield of apples, peaches, apricots, and plums in a given area, and only 2 acre-feet of water are made available by the irrigation system, the productivity will be correspondingly less per acre and the land so supplied may not produce a crop of highest quantity and quality. Under such circumstances the land might not be able to bear the irrigation charges for the 2 acre-feet of water, whereas with more water the same land might well be able to bear much higher charges. (The figures used are for purposes of illustration only.)

This is a factor which enters largely into the ability to pay of the various districts. In some cases the systems are not constructed to carry sufficient water for the acreage

irrigated; in other cases there is not sufficient storage water on which to draw during the latter part of the season.

The 1938 arrangement tends to encourage limitation rather than extension of the irrigated acreages. Generally speaking, only a limited amount of water can be delivered. The funds raised for renewals (replacements) may not be used for extensions of or additions to the systems, and additions can be made only from special assessments or by additional borrowings. With limited water in most districts there is a tendency to use it to try to increase production on present acreage rather than to bring reverted lands back into production. (Westbank and Peachland are exceptions.) This seems to be sound practice for the established districts.

This lack of new irrigated lands has been an important factor in forcing up the price of producing property to markedly inflated levels. It has also encouraged subdivision of larger holdings into non-economic units.

EFFECT OF INSUFFICIENT WATER-SUPPLY ON COST OF PRODUCTION.

Insufficient supply of water also affects the cost of production.

As the unit cost of production increases with decreased volume, costs will be higher where insufficient water prevents the production of the maximum crop per acre. For example, where there is insufficient water for an orchard, the fruit does not size up properly, the trees cannot be maintained in a vigorous condition, and therefore fewer packed boxes are produced per acre. Total cost per acre, however, will be practically the same, and the cost per packed box will be correspondingly higher. The net returns to the grower per box will therefore be less.

Adequate water must be supplied if low production cost is to be attained.

EXPANDING THE SYSTEMS.

Under the terms of reference it has not been possible to deal with the advisability of extending or expanding any of the systems. The Renewal Reserve Fund can be used only for renewal of the present systems. At times, however, it undoubtedly would be of advantage to the districts, and enhance their ability to pay, could the systems be enlarged or extended or rebuilt in different places.

There is no doubt but that careful study should be made of every system, with the object of making more water available to the present lands or making water available for new lands. If expansion is to take place, this is essential.

There is now a sufficient body of data collected and invaluable experience at hand on which to base an economical expansion programme.

CAN ALL THE INDEBTEDNESS BE PAID ?

As I understand the general policy, it is to keep the districts functioning and producing, and not to force any one of them into the hands of a receiver. Not only the growers, but several large towns and cities are dependent wholly on the continuous functioning of primary industry, and I concur in the general thought that business must go on.

There has been no suggestion of mismanagement or of gross inefficiency in any district, but rather one large ever-present question has been pressed upon me. Over a period of years previous to 1941, as much as twenty-five in some districts, the industry could not pay. And over this period the dams, ditches, dykes, and flumes were getting older and in a less healthy state of repair; the tangible assets were depreciating. Tax sales were not unusual, and some land was taken out of intensive production.

With these thoughts in mind I have no hesitation in confirming the general insistence on the part of the Water Rights Branch and the Minister of Lands in recent years:—

- (1.) That the present tolls collected must be sufficient to maintain and operate the system.
- (2.) That the tax collected must be sufficiently large to permit of the building-up of a replacement reserve, and then if anything is left over to provide for at least a token payment to the Conservation Fund.

This has been sound policy. The assets of the systems have been maintained and improved in most districts, the replacement reserves have been strengthened or parts of some systems replaced, and some repayments have been made to the Conservation Fund.

After going over the physical systems, observing the general conditions, and noting the tolls necessary for maintenance and operation, I cannot help but feel that the emphasis should, for some years at least, be placed on additional replacements and the building-up of replacement reserves.

In the meantime some repayments are being made and, in some districts where adequate water is available, additional revenue-producing acreages are being brought into production.

A CEILING PRICE FOR ADMINISTRATION PURPOSES ONLY.

I have intimated elsewhere, but in other words, that there is always a tendency to capitalize economic and social advantages in the value of the land. This leads to a general "upping" of prices by owners and to a raising of offers by prospective buyers. The advantages may be of a temporary or less permanent nature, but the sum, once paid for a property, becomes an investment in that property which may be beyond the productive capacity of the property to meet.

All buyers do not pay cash for their properties. Some purchase on a share-crop basis; some purchase on the basis of a down payment and mortgage given for the balance. Interest must then be paid. It can readily be seen that in those districts where as much as 50 per cent. of the areas has changed hands in recent years at advancing prices, there is a markedly increased capital investment and interest charge. This makes more difficult the finding of money for the Conservation Fund by the new operator, especially when he must first live and then pay a municipal tax and a school tax and a replacement tax before anything can be set aside for the Conservation Fund. This latter tax to him seems far removed from his everyday financial problems. He likely had given it little consideration at time of purchase.

I beg to suggest that consideration be given to the establishment of a ceiling price, or series of ceiling prices, for all classifications of land in all the districts, and when once the land advanced beyond that ceiling price, the first increment would belong to the Government and would be used to reimburse the Conservation Fund when the property changed hands. The property could not be charged more than its proportionate share of the total district indebtedness, but from that time on it would be mortgage-free as far as the Conservation Fund was concerned.

The security for the remaining total indebtedness would, of course, be reduced, but the total indebtedness would have been reduced in like proportion. In my opinion a much larger percentage of the total indebtedness can be collected in this way than by the methods presently employed.

The period of rapidly advancing prices is now over. A new level has been attained. During the last few years scores of parcels of land have changed hands at markedly advanced prices. Many more will change hands. Those who have purchased at the higher levels will, in many cases, if not in most cases, find themselves in the position where all payments can be made only with great difficulty. They will be in

the same economic position, but at higher price-levels, as that in which the orchardists found themselves, at the lower price-levels, during the '30's. They may even find themselves in the position where it is necessary to seek additional loans from the Conservation Fund for much-needed replacements. These difficulties would be directly traceable to economic fluctuations and to the capitalization of advantages in land during a period of good times.

I can see little wrong with the Government requiring repayment to the Conservation Fund out of that portion of the sale price (when properties change hands) which is over and above the suggested ceiling price per acre for that property.

EXERCISE OF DIRECTION.

The Water Rights Branch must continue to exercise control, not only over the amount of the assessment for Renewal Reserve, but also over the withdrawal of funds from the Renewal Reserve. The 1938 letter says:—

“Respecting the Renewal Reserve you are requested to open a special account in your bank and to arrange that withdrawals from this account can only be effected over the signature of one of your Trustees and one member of the Water Board. This reserve must be credited with the sum of \$ on or before the close of your District's fiscal year. It is understood that this account is to be drawn upon for renewals which are approved by me and for investing the surplus money (over and above that required for current renewals) in approved securities. The proceeds from such securities must likewise only be expended on approved renewals.”

Some districts have not taken kindly to this.

I am of opinion that so long as any money is owing to the Conservation Fund, the Water Rights Branch should continue to exercise this authority, and that the replacement funds should be spent only with the consent of the representative of the Branch. This, in my opinion, is to the interest of the irrigation districts.

“SOLDIERS' LAND ACT.”

The Southern Okanagan development is administered under the “Soldiers' Land Act,” chapter 80, 1918. Growers are charged \$8 an acre for all purposes. The area is not included in the terms of reference. The vote under the above Act for 1946-47 was \$72,000.

DISTRIBUTION OF INCOME.

GROSS RECEIPTS.

A careful attempt has been made to discover the gross receipts' distribution in all the districts. The figures follow, and the pattern is generally similar for all districts. The striking features are, first, the unevenness of the distribution and, secondly, the extremes of low and high receipts.

In all districts 50 per cent. of the growers receive approximately 80 per cent. or more of the total gross income, leaving only 20 per cent. or less for the remaining 50 per cent. of the growers. The pattern is clear. *There is no doubt about the ability of a certain percentage to pay irrigation taxes and tolls and Dominion income tax. There is also no doubt about the inability of a large percentage of the growers to pay any additional tax.*

The very low receipts may be due to many causes: some growers included are back-yard growers having additional incomes; others have small ranches; others, low yields; and still others, quantities infested with codling-moth.

It can be stated, however, that although the figures may not be absolute, they are indicative. A very large percentage of the growers have very low gross receipts.

Table 5.—*The Pattern of a District.*
(Farms arranged in Ascending Order of Gross Receipts.)

1.....	\$0.64	39.....	\$2,081.25	77.....	\$4,832.39
2.....	1.76	40.....	2,219.44	78.....	4,898.09
3.....	4.57	41.....	2,231.52	79.....	4,932.26
4.....	5.75	42.....	2,377.53	80.....	4,963.32
5.....	8.20	43.....	2,447.38	81.....	5,023.89
6.....	8.25	44.....	2,503.08	82.....	5,032.48
7.....	8.58	45.....	2,621.98	83.....	5,114.19
8.....	9.67	46.....	2,675.07	84.....	5,395.74
9.....	10.09	47.....	2,686.50	85.....	5,641.07
10.....	14.73	48.....	2,823.82	86.....	5,686.67
11.....	15.85	49.....	2,832.28	87.....	5,855.09
12.....	31.55	50.....	2,868.49	88.....	5,956.20
13.....	32.26	51.....	2,876.44	89.....	6,005.73
14.....	50.91	52.....	2,958.32	90.....	6,084.00
15.....	51.68	53.....	2,983.45	91.....	6,090.60
16.....	55.25	54.....	2,985.82	92.....	6,098.77
17.....	68.01	55.....	3,064.34	93.....	6,118.99
18.....	162.79	56.....	3,154.26	94.....	6,152.75
19.....	229.39	57.....	3,157.82	95.....	6,170.74
20.....	260.27	58.....	3,177.93	96.....	6,336.78
21.....	308.12	59.....	3,223.49	97.....	6,489.23
22.....	420.50	60.....	3,291.57	98.....	6,654.92
23.....	491.59	61.....	3,424.30	99.....	6,674.80
24.....	510.25	62.....	3,633.61	100.....	6,838.97
25.....	1,083.31	63.....	3,763.53	101.....	6,843.77
26.....	1,391.84	64.....	3,839.86	102.....	7,000.43
27.....	1,396.43	65.....	3,854.85	103.....	7,515.01
28.....	1,401.62	66.....	3,932.41	104.....	7,532.99
29.....	1,475.89	67.....	4,265.72	105.....	8,613.68
30.....	1,563.01	68.....	4,360.88	106.....	9,098.18
31.....	1,638.77	69.....	4,465.92	107.....	9,351.99
32.....	1,665.62	70.....	4,499.14	108.....	9,493.16
33.....	1,735.15	71.....	4,543.96	109.....	9,642.14
34.....	1,747.56	72.....	4,581.68	110.....	9,887.52
35.....	1,804.08	73.....	4,633.98	111.....	10,191.24
36.....	1,986.63	74.....	4,646.06	112.....	16,031.22
37.....	2,004.18	75.....	4,707.07	113.....	16,148.66
38.....	2,009.41	76.....	4,710.25	114.....	23,321.98

The above is set out for purposes of illustration. It represents a well-balanced district where there are relatively few very small or very large gross incomes. Only a few of the gross incomes below \$500 represent full-time growers. Most of them represent back-yard sales. From \$500 upwards, growers can be said, for the most part, to be fully employed as orchardists. The pattern is typical of most communities, except that in a few instances there are much greater extremes of large and small gross incomes.

GROSS AND NET COSTS.

While costs vary from year to year and no two farms have the same relationship between gross and net incomes, and no one farm has the same percentage relationship between gross and net incomes in any two years, representative percentages can, never-

theless, be estimated that will give some indication of relationship between gross and net income.

NET INCOME ESTIMATES.

For those who wish to estimate average net incomes, the following table is provided. The calculation will not give absolute figures for any one particular grower, but will be indicative of the net return (return for labour of the operator and interest on the investment) for the average of the income group.

Assuming that the crop is normal and that the low incomes are due to small acreages or low yields of good fruit, the net operator incomes expressed in terms of a percentage of the gross income would be approximately as follows:—

Table 6.—*Net Operator Incomes expressed in per Cent. of Gross Receipts.*

Income Group.	Net Returns expressed in Percentage.
\$0— \$500	70
500— 1,000	60—70
1,000— 2,000	50—60
2,000— 3,000	45—50
3,000— 5,000	40—45
5,000— 7,500	35—40
7,500—10,000	35—40
10,000—15,000	25—40
15,000 and up	25—40

These are based on a small sample and, consequently, are rough estimates only.

As fruit prices fall, the percentage net return in relation to gross receipts tends to decrease.

The percentages given above are based on statements provided by individual growers. The percentages vary very much from farm to farm and from group to group, and also from year to year, but the average figures given above are approximately correct.

(NOTE.—Operator income includes return to the operator for labour, management, and interest on investment. If the low incomes were due to short crop, hail, wind, or other catastrophe, there might readily be no operator income.)

TOTAL GROSS SALES.

Table 7.—*Value of Shipments of Fruit, 1939–40, from Whole Okanagan Valley (relative, not absolute).*

1939	\$5,073,000	1943	\$11,037,000
1940	5,437,000	1944	19,596,000
1941	7,176,000	1945	16,330,000
1942	10,059,000		

Comparable Values of Shipments of Fruit, 1931–38.

1931	\$3,600,000	1935	\$4,000,000
1932	3,100,000	1936	3,600,000
1933	3,500,000	1937	4,500,000
1934	4,000,000	1938	*

* Comparable figure is not available.

There has been a steady advance in total values since 1931. As indicated previously and above, there is no doubt but that growers could make substantial repayments now, the general wealth of the districts having increased rapidly, especially since 1941. It is equally certain that they could make repayments only with great difficulty before 1941. At time of writing (December, 1946) a strong effort is being made to check rising prices due to inflation on the general belief that if they go too high, they will fall to a disturbing low. *As shown elsewhere, costs are also rising rapidly.*

I have no alternative but to accept the belief that since prices are rising and an attempt is being made to hold them in check, some inflation is taking place. As a corollary to this statement I have no alternative but to accept the belief that prices will eventually fall. I also concur in the belief that eventually an even stronger attempt will be made to stabilize the general prices at a reasonable level. What this level is, nobody knows; but, in my opinion, it would be unwise to assume that the present high level of prices can continue and that in the future there will not be long-time trends up and down, as in the past.

ORCHARD HISTORY.

The following may be taken as representative of production, cost and price received per box in connection with a well-managed high-producing orchard:—

Table 8.—A Representative Farm.

(1) Year.	(2) Production in Boxes.	(3) Cost per Box.	(4) Price received per Box.
		Cents.	Cents.
1936.....	12,429	30.46*	54.1
1937.....	15,143	43.10	50.0
1938.....	17,519	39.50	44.1
1939.....	13,475	44.38	51.9
1940.....	11,722	50.40	53.0
1941.....	3,239	124.40	98.7
1942.....	21,058	47.70	95.9
1943.....	9,187	78.10	159.6
1944.....	17,171	54.20	125.3
1945.....	12,574	67.50	149.3

* Costs do not include interest on investment or wages to the owner-manager. The return for wages and interest might be determined by taking the difference between columns 3 and 4.

In the year of lowest production per acre (1941) the cost of production was highest; that is, 124.4 cents. The year immediately following was a high-production year (for this orchard), and though total costs were rising, the cost of production per box dropped to 47.7 cents. A careful study of the figures will show clearly the influence that production per acre has on cost. High production per acre is essential.

This is an important factor in all of the irrigation (and dyking and drainage) districts.

Please note also that while it cost 30.46 cents a box to produce 12,429 boxes in 1936, it cost 67.5 cents a box to produce an almost equal number, 12,576 boxes, in 1945.

The rapid up-trend began with 98.7 cents per box in 1941.

I believe the figures for this farm to be typical for the purpose for which they are used.

The general price-level per box is illustrated further by the figures received for fruit by a grower in a different district. For the year 1926 and succeeding years up to and including 1940 he received as follows: 48.4, 94, 64.1, 94.7, 52.8, 43.4, 22.3, 42, 35.6, 33, 52.2, 42, 48.3, 49.3, 54.5 (1940) cents per box.

For the years 1941 to 1945 he received 88, 94.5, 152.5, 126, 147 cents per box. This advance in price, beginning in 1941, is typical.

Table 9.—Statistics on 25 Acres of One of the Best Orchards in a Central District.

Year.	Packed Boxes.	Average Price per Box.	Cash received.	One-half Share of Vegetable-crop.	Total Receipts.	Expenses.	Net Returns.
		Cents.	\$	\$	\$	\$	\$
1939.....	6,339	49.3	3,134.52	184.43	3,318.95	2,776.97	541.98
1940.....	4,853	54.5	2,647.07	162.13	2,809.20	2,439.98	369.22
1941.....	2,076	88.0	1,816.73	415.55	2,232.28	2,312.60	-80.32
1942.....	5,479	94.5	5,170.59	493.92	5,664.51	3,089.90	2,574.61
1943.....	2,356	152.5	3,693.80	450.29	4,144.09	3,745.09	398.22
1944.....	12,279	126.0	15,412.43	1,753.84	17,166.27	5,925.25	11,241.04
1945.....	7,013	147.0	10,310.08	1,741.50	12,051.58	7,601.65	4,449.93

The last two years have been the best. The 1944 large crop and good price was worth more to the grower before deducting income tax than all of the other six years combined.

The following statement of an orchard history is the most complete among the many submitted in evidence or forwarded by letter. I believe this history to be typical.

Table 10.—*Financial History of a Good Orchard in Northern Area.*

Year.	Total Income.	Income from Dry-farming included in Total Income.	Gross Income from Fruit.	Total Expenses.	Number of Boxes.	Total Net Income before Wages and Interest are Paid to Operator.	Selling Price per Box at Farm.	Production Cost per Box (Residual Method).*	Profit or Loss per Box (for Labour and Interest).
1924.....	\$3,243.85	\$388.20	\$2,855.65	\$2,622.80	.....	\$621.05	.....	.....	.....
1925.....	2,390.60	534.74	1,855.86	1,855.81	.....	434.79	.....	.....	.....
1926.....	3,800.21	659.95	3,140.26	2,600.37	5,870	1,199.84	\$0.534	\$0.331	\$0.201
1927.....	3,301.33	347.07	2,954.26	2,587.33	3,602	714.00	.820	.622	.258
1928.....	3,497.11	539.10	2,958.01	3,406.51	6,631	90.60	.446	.432	.014
1929.....	3,796.69	336.04	3,460.65	2,776.93	3,818	1,018.79	.906	.639	.217
1930.....	2,366.05	285.23	2,080.82	2,499.03	5,122	132.98	.406	.432	-.026
1931.....	1,269.94	11.00	1,258.94	1,847.58	3,119	557.64	.403	.589	-.186
1932.....	1,671.30	47.15	1,624.15	1,671.30	5,290	603.36	.307	.307	.000
1933.....	1,722.18	72.18	1,650.00	1,379.98	3,845	342.20	.429	.340	.089
1934.....	2,686.71	95.85	2,590.86	1,808.19	6,668	878.52	.388	.257	.131
1935.....	2,501.48	288.28	2,213.20	1,531.94	7,085	969.54	.313	.176	.157
1936.....	3,161.50	437.50	2,724.00	2,069.37	5,503	1,092.13	.495	.297	.198
1937.....	2,569.07	373.74	2,195.33	2,907.10	5,673	338.03	.386	.447	-.061
1938.....	2,900.43	438.42	2,462.01	2,621.17	5,551	279.26	.443	.393	.050
1939.....	2,726.99	589.72	2,137.27	2,526.59	4,738	200.40	.451	.409	-.042
1940.....	4,392.96	686.13	3,706.83	3,592.42	7,848	799.74	.472	.409	-.145
1941.....	7,947.24	965.63	6,981.61	5,950.42	8,389	1,866.82	.832	.594	.238
1942.....	8,949.79	2,402.58	6,547.21	6,028.71	8,385	2,921.08	.780	.432	.348
1943.....	16,195.93	1,583.55	14,612.38	6,400.00	10,719	9,795.93	1.363	.449	.914
1944.....	17,815.68	2,372.71	15,442.97	10,518.36	13,981	7,297.32	1.104	.583	.521
1945.....	15,813.02	3,034.55	12,778.47	10,083.62	10,574	5,729.40	1.208	.667	.541

* Does not include interest on the investment or wages to the operator.

From 1926 to 1939 the farm referred to in Table 10 consisted of 65 acres, 24 of which were under irrigation. Fifty additional acres were purchased in 1940, 26 of which were under irrigation. Thirty-five additional acres non-irrigated were purchased in 1941. Total now, 150 acres, 50 of which are under irrigation, 35 bearing orchard, and 6 non-bearing orchard.

It is clear from this table and from the statements given in evidence, but not here quoted, that even the best orchardists could have paid little, if any, more up to 1941. It is quite clear also that those with good production could have paid something more during the years 1942, 1943, 1944, and 1945.

STATEMENT BY G. A. BARRAT.

Mr. George A. Barrat, chairman of the B.C. Tree Fruit Board, has this to say with regard to variation in prices and yields:—

“Of the past thirty years, only nine can be considered as showing any reasonable return for his efforts to the Okanagan apple grower; these years were 1918, 1919, 1920, 1927, 1929, 1942, 1943, 1944, and 1945. In these years, growers with better than average yields made good profits on their operations. Averaged over the whole thirty-year period, the net returns to even the most efficient grower will show a very small revenue and, in the cases of a great many growers, substantial losses.*

“It will be observed that, with the exception of 1927 and 1929, all of these profitable seasons were years of war or immediately following war. In 1927 and 1929, unwholesome boom conditions prevailed which were quickly followed by a long period of depression and low prices.

“For the past four years good prices have been received and it appears likely that the 1946 season will also bring fair returns. This has led many to believe that the fruit industry has entered upon a long period of permanently higher prices and net profits; there is nothing in past history or in the present situation to justify such a theory. In 1920 the opinion was widely held that prices were on a permanently higher basis but 1921 brought losses to most apple growers, and 1922 was the most disastrous season ever experienced.

“This year there are already signs that the peak of the market may have been passed and that a decline is to be expected.

“The recent years of higher prices for fruits have enabled growers to improve their financial position to a certain extent, but the heavy rate of taxation has made it impossible for them to accumulate large reserves.” †

* This statement is borne out by a study of the foregoing financial history of a typical orchard. I believe the statement to be generally true.

† I believe this statement to be generally correct in both principle and detail.

Table 11.—Relation of Number of Bearing Apple-trees per Farm to the Average Cost of Production of Apples and Operator's Labour Income in the Okanagan Valley in 1939.*

Number of Bearing Apple-trees.	Number of Records.	AVERAGE COST OF PRODUCING APPLES.						Operator's Labour Earnings (118 Records).
		Per Box.			Per Tree.			
		Cash.	Non-cash.	Total.	Cash.	Non-cash.	Total.	
		Cents.	Cents.	Cents.	\$	\$	\$	\$
Under 400.....	33	27.4	32.1	59.5	2.24	2.61	4.85	470
400-599.....	30	30.6	23.2	53.8	2.45	1.86	4.31	900
600-799.....	20	29.4	20.1	49.5	2.08	1.43	3.51	802
800-999.....	13	27.1	21.3	48.4	1.65	1.28	2.93	976
1,000 and over.....	24	29.0	10.9	39.9	2.03	.77	2.80	657
Total and average.....	120	28.9	17.8	46.7	2.07	1.28	3.35	726
<i>Northern Okanagan.</i>								
Under 400.....	10	28.2	37.9	66.1	1.57	2.10	3.67	.....
400-599.....	11	26.5	28.2	54.7	1.86	1.99	3.85	330
600-799.....	9	25.5	18.5	44.0	2.03	1.47	3.50	675
800-999.....	8	24.7	20.6	45.3	1.55	1.29	2.84	734
1,000 and over.....	18	29.0	9.7	38.7	2.15	.72	2.87	624
Total and average.....	56	27.9	14.7	42.6	2.00	1.07	3.07	427
<i>Southern Okanagan.</i>								
Under 400.....	23	27.2	30.4	57.6	2.57	2.86	5.43	674
400-599.....	19	32.3	21.1	53.4	2.77	1.81	4.58	1,232
600-799.....	11	33.3	21.8	55.1	2.12	1.39	3.51	916
800-999.....	5	31.2	22.3	53.5	1.80	1.28	3.08	1,363
1,000 and over.....	6	28.9	17.0	45.9	1.63	.96	2.59	753
Total and average.....	64	30.5	22.5	53.0	2.17	1.60	3.77	943

* This table is taken from "Cost and Returns in the Production of Apples in the Okanagan Valley, British Columbia," by B. A. Campbell and S. C. Hudson, Dominion Department of Agriculture, October, 1945.

Please note that the average labour earnings for 1939 were \$726. This was more or less typical of the years previous to 1939.

The figures on costs of production, as prepared by the North Okanagan District Council, are given below.

Table 12.—Average Cost of Apples per Box.

	Government Survey Costs, 1939.	Growers' Comparative Costs, 1942.	N.O.D.C. Costs, 1945.
<i>Growing.</i>			
Labour.....	Cents. 15.7	Cents. 26.0	Cents. 37.0
Irrigation tolls.....	2.5	2.5	3.5
Fertilizer.....	1.1	1.5	3.0
Spray material.....	3.1	3.5	5.0
Use of equipment.....	5.0	5.0	10.0
Use of buildings.....	0.5	0.5	0.8
Use of land taxes.....	1.4	1.4	2.0
Interest.....	5.2	5.2	8.0
Miscellaneous.....	1.1	1.1	2.0
Total growing costs.....	35.6	46.7	71.3
<i>Harvesting.</i>			
Labour and orchard trucking.....	8.7	10.0	16.0
Trucking.....	2.4	2.5	3.5
Total harvesting cost.....	11.1	12.5	19.5
Total cost (growing and harvesting).....	46.7	59.2	90.8
Packing and selling.....	34.45	41.25	56.0
Grand totals.....	81.15	100.45	146.8

The production cost has advanced from 81.15 cents in 1939 to 146.8 cents per box in 1945.

A GENERAL FARM.

The following table bears out the statements given in evidence that it is only with great difficulty that dairy and stock farming can be carried on under irrigation. The water tax is almost, if not entirely, prohibitive.

Table 13.—Dairy and Stock Farm, Vernon District (from 86 Acres assessed as Grade A).

Year.	Gross Income.	Expenses.	Total Tax.	Water Levies.	Labour Income.
1943.....	\$3,567.79	\$3,194.95	\$741.39	\$509.88	+\$372.84
1944.....	3,297.40	4,147.79	798.18	577.07	—850.39
1945.....	4,827.23	5,055.31	780.85	521.70	—228.08

GROSS INCOME DISTRIBUTION.

Tables 14 to 23, inclusive, on the immediately succeeding pages include some of the data studied and are not essential to an understanding of this report. They are included, however, because they may be of interest to residents of the various communities who are concerned with public affairs.

Similar data are not available for Okanagan Falls, Wynndel, and Hefley Creek, but it can be assumed that the general income patterns are similar.

CAWSTON-KEREMEOS.

Total number of growers reported, 192.

Total amount paid to them (1945 calendar year), \$371,614.54.

Average gross amount paid to each grower, \$1,935.49 (\pm \$50).

Table 14.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	19	\$161,450.44	43.44
Highest 20 per cent.....	38	219,096.53	58.96
Highest 50 per cent.....	96	324,011.00	87.19
Lowest 20 per cent.....	38	5,317.62	1.43
Lowest 10 per cent.....	19	1,250.47	0.34

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	53	27.60	\$11,295.10	3.04
500- 1,000.....	34	17.71	26,576.77	7.15
1,000- 2,000.....	48	25.00	70,434.66	18.95
2,000- 3,000.....	30	15.62	71,143.42	19.14
3,000- 5,000.....	13	6.77	47,256.88	12.71
5,000- 7,500.....	8	4.17	50,991.71	13.72
7,500-10,000.....	2	1.04	17,314.17	4.66
10,000-15,000.....	2	1.04	22,301.95	6.00
15,000 and over.....	2	1.04	54,299.88	14.61
Totals.....	192	99.99	\$371,614.54	99.98

CRESTON.

Total number of growers reported, 351.

Total amount paid to them (1945 calendar year), \$614,501.95.

Average gross amount paid to each grower, \$1,750.72.

Table 15.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	35	\$283,080.83	46.07
Highest 20 per cent.....	70	406,020.42	66.07
Highest 50 per cent.....	176	566,513.15	92.19
Lowest 20 per cent.....	70	5,758.93	0.94
Lowest 10 per cent.....	35	1,374.31	0.22

The above includes gross payments to growers in both irrigated and non-irrigated districts. It was impossible to separate the two areas because of the manner in which the information was obtained.

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	143	40.74	\$28,204.80	4.59
500- 1,000.....	61	17.38	45,072.45	7.33
1,000- 2,000.....	49	13.96	68,452.03	11.14
2,000- 3,000.....	36	10.26	90,108.72	14.66
3,000- 5,000.....	31	8.83	118,787.67	19.33
5,000- 7,500.....	18	5.13	109,244.94	17.78
7,500-10,000.....	7	1.99	62,099.69	10.11
10,000-15,000.....	5	1.42	60,590.80	9.86
15,000 and over.....	1	0.28	31,940.85	5.20
Totals.....	351	99.99	\$614,501.95	100.00

KELOWNA.

Total number of growers reported, 680.

Total amount paid to them (1945 calendar year), \$3,128,454.51.

Average gross amount paid to each grower, \$4,600.67 (\pm \$100).

Table 16.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	68	\$1,382,101.32	44.18
Highest 20 per cent.....	136	1,991,848.70	63.68
Highest 50 per cent.....	340	2,801,408.47	89.55
Lowest 20 per cent.....	136	39,725.70	1.27
Lowest 10 per cent.....	68	12,526.27	0.40

The above table must be studied generally. It includes not only the growers enumerated in the terms of reference but many other growers in the Kelowna area. The information was not supplied by irrigation districts, but the table is of some value in showing the distribution of income in the whole area. It does include Black Mountain, Glenmore, Scotty Creek, and South-east Kelowna Irrigation Districts.

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	124	18.23	\$33,309.16	1.06
500- 1,000.....	67	9.86	49,284.98	1.58
1,000- 2,000.....	114	16.76	167,286.38	5.35
2,000- 3,000.....	85	12.50	212,446.05	6.79
3,000- 5,000.....	108	15.88	413,762.05	13.23
5,000- 7,500.....	73	10.74	446,472.57	14.27
7,500-10,000.....	35	5.15	302,483.75	9.67
10,000-15,000.....	33	4.85	418,753.23	13.38
15,000 and over.....	41	6.03	1,084,656.34	34.67
Totals.....	680	100.00	\$3,128,454.51	100.00

NARAMATA.

Total number of growers reported, 114.

Total amount paid to them (1945 calendar year), \$44,488.80.

Average gross amount paid to each grower, \$3,899.02.

Table 17.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	11	\$129,312.76	29.09
Highest 20 per cent.....	23	208,207.92	46.84
Highest 50 per cent.....	57	367,275.85	82.63
Lowest 20 per cent.....	23	2,250.41	0.51
Lowest 10 per cent.....	11	88.09	0.02

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	23	20.17	\$2,250.41	0.51
500- 1,000.....	1	0.88	510.25	0.11
1,000- 2,000.....	12	10.52	18,889.91	4.25
2,000- 3,000.....	18	15.79	46,185.96	10.39
3,000- 5,000.....	26	22.80	106,558.69	23.97
5,000- 7,500.....	22	19.29	133,265.81	29.98
7,500-10,000.....	8	7.02	71,134.67	16.00
10,000-15,000.....	1	0.88	10,191.24	2.29
15,000 and over.....	3	2.63	55,501.86	12.49
Totals.....	114	99.98	\$444,488.80	99.99

OYAMA.

Total number of growers reported, 24.

Total amount paid to them (1945 calendar year), \$104,308.82.

Average gross amount paid to each grower, \$4,346.20.

Table 18.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	2	\$36,169.81	34.68
Highest 20 per cent.....	5	55,461.02	53.17
Highest 50 per cent.....	12	85,985.02	82.43
Lowest 20 per cent.....	5	3,179.40	3.05
Lowest 10 per cent.....	2	967.61	0.93

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	1	4.17	\$405.89	0.39
500- 1,000.....	4	16.67	2,773.51	2.66
1,000- 2,000.....	4	16.67	5,951.48	5.71
2,000- 3,000.....	1	4.17	2,542.45	2.44
3,000- 5,000.....	6	25.00	21,893.84	20.99
5,000- 7,500.....	6	25.00	34,571.84	33.14
7,500-10,000.....	.....	.....	.....	.....
10,000-15,000.....	1	4.17	10,928.45	10.48
15,000 and over.....	1	4.17	25,241.36	24.20
Totals.....	24	100.02	\$104,308.82	100.01

PEACHLAND.

Total number of growers reported, 77.

Total amount paid to them (1945 calendar year), \$179,104.35.

Average gross amount paid to each grower, \$2,326.03.

Table 19.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	8	\$66,486.79	37.12
Highest 20 per cent.....	15	94,163.95	52.57
Highest 50 per cent.....	39	155,297.30	86.71
Lowest 20 per cent.....	15	3,113.70	1.74
Lowest 10 per cent.....	8	1,220.20	0.68

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	19	24.68	\$4,726.83	2.64
500- 1,000.....	10	12.99	7,181.39	4.01
1,000- 2,000.....	14	18.18	20,745.42	11.58
2,000- 3,000.....	15	19.48	39,585.89	22.10
3,000- 5,000.....	10	12.99	35,255.39	19.68
5,000- 7,500.....	6	7.75	34,933.20	19.50
7,500-10,000.....	2	2.60	18,515.13	10.34
10,000-15,000.....	.....	.....	.....	.....
15,000 and over.....	1	1.30	18,161.10	10.14
Totals.....	77	100.01	\$179,104.35	99.99

ROBSON.

Total number of growers reported, 69.

Total amount paid to them (1945 calendar year), \$18,117.37.

Average gross amount paid to each grower, \$262.57.

Table 20.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	7	\$9,735.35	53.73
Highest 20 per cent.....	14	12,944.53	71.45
Highest 50 per cent.....	35	16,839.27	92.95
Lowest 20 per cent.....	14	215.15	1.19
Lowest 10 per cent.....	7	66.12	0.36

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	60	86.96	\$7,160.75	39.52
500- 1,000.....	4	5.80	2,802.33	15.47
1,000- 2,000.....	4	5.80	5,677.86	31.34
2,000- 3,000.....	1	1.45	2,476.43	13.67
3,000- 5,000.....	.....	.....	.....	.....
5,000- 7,500.....	.....	.....	.....	.....
7,500-10,000.....	.....	.....	.....	.....
10,000-15,000.....	.....	.....	.....	.....
15,000 and over.....	.....	.....	.....	.....
Totals.....	69	100.01	\$18,117.37	100.00

VERNON.

Total number of growers reported, 520.

Total amount paid to them (1945 calendar year), \$1,871,238.62.

Average gross amount paid to each grower, \$3,598.54 ($\$3,973 \pm \50).

Table 21.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	52	\$714,349.36	38.17
Highest 20 per cent.....	104	971,101.78	51.90
Highest 50 per cent.....	260	1,748,266.93	93.43
Lowest 20 per cent.....	104	13,357.32	0.714
Lowest 10 per cent.....	52	3,970.00	0.212

These figures include growers from outside the irrigation district and are consequently indications only. The average gross amount paid to each grower is low by about \$375 because returns for certain vegetable sales are not included. The average gross amount paid to each grower is \$3,973 ($\pm \50).

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	154	29.61	\$32,397.89	1.73
500- 1,000.....	75	14.42	53,286.20	2.85
1,000- 2,000.....	73	14.04	105,030.40	5.61
2,000- 3,000.....	45	8.65	111,615.14	5.96
3,000- 5,000.....	67	12.88	268,159.37	14.33
5,000- 7,500.....	53	10.19	322,089.00	17.21
7,500-10,000.....	14	2.69	119,197.42	6.37
10,000-15,000.....	20	3.85	235,269.62	12.57
15,000 and over.....	19	3.65	624,193.58	33.36
Totals.....	520	99.98	\$1,871,238.62	99.99

WESTBANK.

Total number of growers reported, 90.

Total amount paid to them (1945 calendar year), \$298,948.92.

Average gross amount paid to each grower, \$3,321.65.

Table 22.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	9	\$116,278.49	38.90
Highest 20 per cent.....	18	164,128.33	54.90
Highest 50 per cent.....	45	254,589.98	85.16
Lowest 20 per cent.....	18	6,432.38	2.15
Lowest 10 per cent.....	9	1,070.67	0.36

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	10	11.11	\$1,383.02	0.46
500- 1,000.....	12	13.33	8,817.55	2.95
1,000- 2,000.....	25	27.78	37,991.37	12.71
2,000- 3,000.....	8	8.89	19,115.22	6.39
3,000- 5,000.....	19	21.11	77,288.27	25.85
5,000- 7,500.....	9	10.00	52,620.80	17.60
7,500-10,000.....	4	4.44	35,058.62	11.73
10,000-15,000.....	2	2.22	26,134.95	8.74
15,000 and over.....	1	1.11	40,539.12	13.56
Totals.....	90	99.99	\$298,948.92	99.99

WINFIELD AND OKANAGAN CENTRE.

Total number of growers reported, 114.

Total amount paid to them (1945 calendar year), \$495,420.94.

Average gross amount paid to each grower, \$4,345.80.

Table 23.

Group.	Number of Growers.	Total Income of Group.	Percentage of Total Gross Income.
Highest 10 per cent.....	11	\$200,220.90	40.41
Highest 20 per cent.....	23	285,773.59	57.68
Highest 50 per cent.....	57	424,093.24	85.60
Lowest 20 per cent.....	23	12,100.29	2.44
Lowest 10 per cent.....	11	3,669.64	0.74

Total Gross Receipts.	Number of Growers.	Percentage of Total Growers.	Total Receipt of Group.	Percentage of Total Gross Receipt.
\$0- \$500.....	9	7.89	\$2,617.71	0.53
500- 1,000.....	18	15.80	13,197.16	2.66
1,000- 2,000.....	17	14.91	25,136.18	5.07
2,000- 3,000.....	13	11.40	30,376.65	6.13
3,000- 5,000.....	32	28.07	127,959.39	25.83
5,000- 7,500.....	9	7.89	55,746.61	11.25
7,500-10,000.....	5	4.39	40,166.34	8.11
10,000-15,000.....	8	7.02	96,344.53	19.45
15,000 and over.....	3	2.63	103,876.37	20.97
Totals.....	114	100.00	\$495,420.94	100.00

INDIVIDUAL DISTRICT SUMMARIES.

BLACK MOUNTAIN IRRIGATION DISTRICT.

(Public Hearings held July 29th, 1946, in Rutland Community Hall, Rutland.)

SUMMARY OF DATA.

History and Description of the System.—The Black Mountain Irrigation District was incorporated under the "Water Act" in November, 1920.

This gravity system is the result of the purchase and amalgamation of three private systems—the Black Mountain Water Company (subsidiary of Belgo-Canadian Fruit Land Co.), the Kelowna Irrigation Company, and the Rutland Estates. In addition, the Rutland drainage works were taken over in 1925.

Immediate repairs and extensions were necessary after purchase to provide additional storage-dams and main canals.

The District brief shows the following figures with regard to the total cost of the system over the period 1921 to 1945:—

Total cost.....	\$834,302.81
Borrowed from the Government.....	522,210.43
Repaid by the District.....	246,443.25
Capital provided by the District.....	312,191.88
Total invested by the District.....	558,635.13

Present Condition.—Replacement of the old main line with the new low-level ditch is just being completed. Renewals and replacements required during the period 1947 to 1949 are estimated at \$49,833.05, to which about 25 per cent. or more might have to be added to allow for increased cost of materials and labour.

The District anticipates the necessity of putting the Rutland Flats distribution system in pipe, at an estimated cost of \$150,000, and states that a start should be made on this within the next few years.

The District Health Officer has asked the Black Mountain Irrigation District to extend the domestic water system to the business part of Rutland. A request has also been made that the ditch in front of the property adjoining the District office be covered.

A minimum of \$17,000 to \$20,000 annually for the next ten years will be required for improvements to the system.

Description of Area.—The area is somewhat sprawling, covers some high and some low lands, and, generally speaking, is less easy to irrigate and to drain than are most districts. The soil varies considerably, but is generally good.

Water-supply.—The Mission Creek system is the main source of supply. Storage water is held in two dams—the Belgo and the Greystoke—with a total capacity of about 7,750 acre-feet.

Approximately 2½ acre-feet of water per acre are delivered to each grower during the season.

Irrigable Acreage.—In 1920 the irrigable acreage was calculated at 5,200 acres. In 1938 the figure of 6,900 was set by the Government as the irrigable acreage, as this was the acreage the Belgo company was originally intended to supply with water.

Revenue-producing Acreage.—The revenue-producing acreage is shown as follows: 1938, 3,700 acres; 1941, 3,900 acres; 1946, 3,881.28 acres.

Number of Growers.—There are about 342 land-owners in the District, of whom approximately 279 are owners of land under irrigation.

Tax Sales.—In the early '30's 65 per cent. of the water-users were threatened with tax sale, but actual sales were relatively few.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1920	\$1,151,817.44	\$296.00
Paid	251,908.22	65.00
Written off	518,144.62	133.00
Owing as at March 15th, 1945	381,764.60	98.00
Owing as at March 15th, 1946	382,509.52*	.....

* Black Mountain has withheld its token payment this year pending the report of the Commission.

1938 Arrangement.—Under Order in Council No. 751 of 1933 the outstanding indebtedness of this District was reduced from \$560,328.98 to \$300,000, and the annual payment was set at \$18,600.

By the 1938 arrangement the District was requested to pay an annual sum of approximately \$6,905 in lieu of the \$18,600 and to set aside a Renewal Reserve of \$6,600.

On December 7th, 1940, a letter from the Comptroller of Water Rights advised the District that approval had been given by the Honourable the Minister of Lands to a further adjustment in payments; namely, raising the Renewal Reserve to \$17,280 for a period of five years, commencing March 15th, 1941. The purpose of this adjustment, which had the effect of reducing the payment to the Conservation Fund, was to allow for replacement of the old main ditch with a new low-level ditch.

With regard to the 1938 arrangement the District brief states as follows: "This arrangement as it operated during the last five-year period, if continued for a further ten-year period would, we believe, enable us to put the District system in good shape." The reference here is to the special adjustment of 1940, which permitted a Renewal Reserve of \$17,280.

The following tabulation shows the adjustment in annual payment and the present requirement:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$3.65	\$18,600.00	\$6,758.42	\$6,600.00
1941.....	5.20	18,600.00	2,978.21	17,280.00
1946.....	3.65	18,600.00	*	6,600.00

* Not yet paid.

The standing of the Renewal Reserve Account is given below:—

Total payments as at March 15th, 1946	\$106,200.00
Interest accruals	67.67
Total expended on renewals as at March 15th, 1946	158,743.99
Balance which should be in Renewal Reserve as at March 15th, 1946	Nil

Irrigation Charges and Domestic Water Rates.—The following is a summary of irrigation charges and domestic water rates levied by the Black Mountain Irrigation District:—

Combined tax and toll per acre, 1945	\$15.90
Special assessment for new main ditch, 1945	2.00
Funded and amortized arrears, 1945	2.50-3.25
Total charges per acre, 1945	20.40-21.15
Domestic rates, per householder (per annum net)	28.80

Only a very small portion of the District in the "Belgo" area is supplied with domestic water, there being forty-five domestic water-users.

Production.—Production consists of fruit-growing (mainly apples), the raising of grapes, vegetable-growing, and mixed farming. The acreage is divided somewhat as follows:—

	Acres.
Good orchard	1,423.61
Poor orchard, vegetables	970.26
Hay, grain, pasture, etc.	1,450.90
Unwatered	36.51

Relative Productivity.—The productivity of this district varies much, depending on the particular acreage; in some places it is high, in others low. For purposes of comparison, it has been placed at 80 for the district as a whole.

Some growers are doing very well; others are not meeting expenses.

Relative Incomes.—(The growers of this district are included in the Kelowna table.) (See table No. 16.)

Special Factors to be considered.

1. *The New Low-level Ditch.*—The District, according to its brief, paid the Belgo company about \$75,000 in 1920 for the main ditch, which has now been abandoned. This ditch was unable to carry sufficient water for the acreage, and although the reservoir was raised, at a cost of \$68,000, it was never filled to capacity. In addition, about \$65,562 was spent in repairs on this ditch.

The question of the construction of a new low-level ditch to replace 11 miles of the main ditch, including the 8-mile siphon, was considered in 1925, but beyond surveys and estimates no action was taken until 1940, and in the meantime considerable money had been spent on repairs and replacements to the main ditch. It would appear that the delay in taking action with regard to the low-level ditch added materially to the cost of the Black Mountain system.

2. *Seepage.*—Seepage is a serious and difficult problem in this District, and in my opinion it will have to be dealt with in the near future. An adequate drainage system seems necessary to supplement the irrigation system, and I am convinced that the District will not reach its maximum production until the two problems, irrigation and drainage, are considered as one problem.

3. *Sales of Land.*—In this District, land has been changing hands rapidly of recent years. The following note appended to the financial statement of the District for the fiscal period ended February 28th, 1946, gives a graphic picture of the situation:—

“120 parcels have been created by subdivision in the past six months.

“56 per cent. of the orchard land in the District has changed hands in the past three years.

“100 per cent. of the commercial vineyards have changed hands in the past two years.”

4. *Applications for Water.*—In the brief submitted by this District, it is stated that applications for water for about 1,000 additional acres have been received by the Trustees of the District. According to the evidence, the land is good, but the applications cannot be granted without further enlargement of existing laterals and improvements to the system. The water is available if the laterals are enlarged to permit of proper distribution.

5. *Power-development.*—This District proposes that power-development and irrigation could profitably be linked together to give cheaper irrigation-water.

COMMENTS AND RECOMMENDATION.

This District feels that at its incorporation it was used in part to protect the holders of debentures of the companies from which it took over the system.

In the past twenty years the charges levied on the land have averaged \$8.21 per acre, and the District feels that it cannot bear higher charges. To quote from the brief: ". . . in the light of our past experience we are unwilling to consider any proposition which would put a permanent charge of more than \$8 per acre on the land."

The District suggests that as an alternate proposal "the Provincial Government take possession and operate the storage-dams in the interests of all water-users, giving this District credit on account of its indebtedness to the Conservation Fund, for its storage-dams."

The brief also points out that the irrigation system assists in maintaining an even lake-level, thus proving an advantage to the City of Kelowna. It claims that the whole water-supply of the city and surrounding district is improved by the holding-back of flood-waters released for irrigation purposes.

The District desires the enlargement and relocation of certain distribution laterals which are too small to carry sufficient water for land now being irrigated. If the laterals were enlarged, additional water could be supplied from Mission Creek through the Black Mountain system to Scotty Creek. This is apparently the only way in which a plentiful supply of water could be assured to Scotty Creek.

The District feels that certain necessary extensions should be considered in the same light as replacements under the 1938 arrangement, and that the District should be permitted to use Renewal Reserve funds for this purpose. It is pointed out that \$150,000 has been spent on the new ditch, but that it cannot be run to capacity without enlarging the laterals below it. The siphon at Hollywood, at the head of the Rutland ditch, has not been renewed for thirty years and may require replacement at any time. In addition, there has been a washout at Hilda Creek, necessitating immediate repairs.

To finance the new ditch, in addition to the increased Renewal Reserve, it was necessary to borrow \$25,000 from the Royal Bank of Canada, and this loan will also have to be repaid in the near future.

Administration, maintenance, and operation costs are very heavy. The budget for 1946-47 allows a total of \$18,417.34 for these purposes, and this amount must be obtained from the water-users in addition to the Renewal Reserve requirement and the token payment to the Conservation Fund.

In connection with vegetable farming it was pointed out in the evidence that the Black Mountain District must compete with the Coast and with Oliver, which has an earlier crop. In growing vegetables, frequently a crop is raised but cannot be marketed because of changed conditions at the time of harvest.

The sum paid into the Conservation Fund by the Black Mountain Irrigation District in 1945 was, by special arrangement, \$2,873.22, and in my opinion this amount is more than the District can stand and at the same time make provision for required renewals. The renewal reserves must be adequate, and the present tax must be maintained or a still higher one levied.

I recommend that \$1,500 be paid annually into the Conservation Fund, and that this amount be accepted for the full annual payment required under Order in Council No. 751, 1933, and Order in Council No. 974, 1936.

CAWSTON IRRIGATION DISTRICT.

(Public Hearings held August 2nd, 1946, at 12 noon, in Community Hall, Cawston.)

SUMMARY OF DATA.

History and Description of System.—The Cawston Irrigation District was incorporated in April, 1926.

This is a gravity system, taken over from the Similkameen Fruit Lands Company after it had been in use for some time. It consists of wooden and concrete flumes and siphons, and is about 8½ miles in length.

Present Condition.—According to the District brief, more permanent works are needed to guarantee the supply of water. If water is to be delivered to the Land Settlement Board acreage, Flume No. 7 will have to be enlarged.

Immediate requirements for renewal of flumes and siphons for 1946 and 1947 (including \$300 for a new office and storage building) amount to \$6,826.30.

Description of Area.—For purposes of levying taxes and tolls, the land is classified as follows:—

Grade A: Under irrigation; planted to trees and ground crops.

Grade B: Land that can be watered when the system is extended. Tolls are not collected on this land.

Grade C: Gravel banks, etc.

Water-supply.—Water for this District can be drawn in large supply from the Similkameen River.

Tax Sales.—The last tax sale was advertised in 1944, but the properties were redeemed before the sale took place.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1926.....	\$9,036.14	\$35.00
Paid	1,694.42	7.00
Written off	8.29	-----
Owing as at March 15th, 1945.....	7,333.46	28.00
Owing as at March 15th, 1946.....	7,669.39	-----

Not operating under 1938 Arrangement.—This District is not operating under the 1938 arrangement.

Under Order in Council No. 751 of 1933 the outstanding indebtedness of the District was reduced from \$3,160.68 to \$3,152.39, with the annual instalment set at \$228.86. On February 9th, 1934, the District obtained a further loan of \$1,300 from the Conservation Fund. On April 20th, 1934, it paid the first instalment of \$229 as required by Order in Council No. 751, but no payments were made from that time onward.

In a letter from the Department of Lands under date of September 2nd, 1941, the District was given permission to use all taxes and tolls for renewal and maintenance of the system. This permission was granted because of the limited acreage on which taxes could be levied and the still smaller acreage from which tolls could be collected. A proviso was made that the levies were not to be less than \$10 per acre, and that those moneys not required for the operation of the system were to be used for replacements. In 1940 the levies were increased to \$12 per acre, as the former levy was not sufficient to provide for replacements. According to Departmental memoranda, it is the intention that when the perishable structures have been replaced, the District will be required to make a contribution towards reducing the outstanding indebtedness.

Under the present arrangement the debt is gradually increasing through accrued interest.

There is no Renewal Reserve Account.

Irrigation Charges.—The following is a summary of the irrigation charges levied by the District:—

Grade A: \$6.00 per acre for taxes.

Grade B: \$3.00 per acre for taxes.

Grade C: \$0.25 per acre for taxes.

Plus tolls at \$6 for any land that received water from the District's systems.

There have been no special assessments in this District since 1938.

There are no domestic water charges levied by the District.

Irrigable, Revenue-producing, and Irrigated Acreage.—Irrigable acreage: 1938, 768.41 acres (Grades A and B include Land Settlement Board); 1946, 589.82 acres (Grade A, C.I.D. 384.01; Grade B, C.I.D. 132.02; Grade B, L.S.B. 73.79).

Revenue-producing acreage: 1938, 768.41 acres; 1946, 680.14 acres.

Irrigated acreage: 1938, 226.04 acres; 1946, 324.06 acres.

Production.—In this area apples predominate, but there are other tree-fruits and some ground crops also.

Relative Productivity.—For purposes of comparison, the production index has been placed at 55.

Relative Incomes.—With regard to relative incomes, this District has been combined with Keremeos because of the close association of the two districts in the packing-houses (see Table 14).

Special Factors to be considered.

1. *Land Settlement Board Acreage.*—Within this District the Land Settlement Board has reserved 226.69 acres. Up to and including 1943 the Board voluntarily paid amounts annually to help the District with renewals and maintenance, but not at the established rates for assessment. Since 1943 no payments have been made. The lands are held in reserve at the present time and are not available for settlement; it is anticipated, however, that they will shortly be put on the market for veterans to purchase. It is the District's understanding that should these lands be taken up, the District would be obliged to supply them with water. The estimated cost would be \$2,000 plus the cost of enlarging Flume No. 7.

2. *Lands eliminated from the District.*—The following acreage has been eliminated from the territorial limits of the District since 1938:—

	Acres.
February 26th, 1943.....	113.40
May 23rd, 1944.....	23.20
June 25th, 1946.....	39.79
Total.....	176.39

3. *Land Sales.*—In recent years some of the old settlers have been selling out; consequently, land has been changing hands to a considerable extent. Prices range from \$125 to \$155 an acre.

4. *District Requests.*—In 1937 the District applied for a further loan from the Conservation Fund to enable it to replace flumes which were taken over from the Similkameen Fruit Lands Company at the time of incorporation. This request was refused. A schedule of estimated cost of renewals, prepared in 1942, shows that the average cost per annum at the then existing prices would be as follows: 1943-47, \$1,705; 1948-56, \$1,454. Actual amounts spent on renewals and repairs, as shown in Schedule B, page 3 of the Cawston brief, are as follows: 1938-45—total, \$12,162.66; average per annum, \$1,520.33.

The Cawston brief states that the District considers the interest charge on the Conservation Fund loan to be still too high. It asks that the interest rate be scaled down or eliminated altogether, and suggests that repayment of the principal be extended over a period of not less than twenty years.

COMMENTS AND RECOMMENDATIONS.

The evidence indicates that in this District some of the best farmers had to work out at intervals in order to be able to retain their land. Some dairying and seed-growing was attempted also, before the orchards came into full bearing, in order to provide a cash crop.

In my opinion this District is in no position to maintain its system, provide a Renewal Reserve, and at the same time make substantial payments to the Conservation Fund. Replacements are bound to continue to be heavy and costs are advancing.

I recommend:—

- (a.) That the District continue its present high assessment for operation, maintenance, and replacement.
- (b.) That \$200 be paid annually on the indebtedness to the Conservation Fund, and that this token payment of \$200 be accepted as full payment for the amount due that year on an indebtedness of \$7,669.39 (as at March 15th, 1946).

EAST CRESTON IRRIGATION DISTRICT.

(Public Hearings held on August 8th, 1946, at 11.30 a.m., in the Knights of Pythias Hall, Creston.)

SUMMARY OF DATA.

History and Description of the System.—The East Creston Irrigation District was incorporated under the "Water Act" in May, 1929.

Prior to that time there was no irrigation in the area. In 1929 the District obtained a loan of \$150,000 from the Conservation Fund to construct an intake and distribution system, and irrigation was started in 1930.

This is a gravity system, entirely underground. The main conduit, of concrete, is about 6 miles long. There are approximately 11 miles of steel laterals. Most of the growers use sprinkler systems on their farms.

Present Condition.—The works would appear to be in fairly good condition, as over the past sixteen years depreciation has been relatively limited. There are several bad spots, however, in the main conduit and considerable indication of leakage.

The intake was reconstructed and the laterals extended in 1945, at a cost of \$5,855.95.

Description of Area.—This area consists mostly of clay and clay loam, relatively level and easy to irrigate. The trees appear healthy, but many are known to be suffering from winter-injury.

Water-supply.—The water is taken from Arrow Creek, with an intake about 3½ miles from the uppermost orchard. There are no storage-dams.

On the average, about 26 inches of water per acre (just over 2 acre-feet) are used by the growers in a season.

Irrigable Acreage.—For purposes of the 1938 formula, the irrigable acreage of this District was set at 1,440 acres.

Revenue-producing Acreage.—The revenue-producing acreage has increased, as is indicated: 1938, 1,179 acres; 1941, 1,201.9 acres; 1946, 1,460.6 acres (divided as follows: Grade A, 577.5 acres; Grade B, 119.8 acres; Grade C, 567.0 acres; Grade D, 197.3 acres).

Irrigated Acreage.—The irrigated acreage in 1946 is 1,264.3.

Number of Growers.—There are approximately 200 growers.

Tax Sales.—There have been no sales of property for non-payment of District taxes in recent years.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1929.....	\$275,668.72	\$220.00
Paid.....	85,550.33	68.00
Written off or not charged.....	22,244.73	18.00
Owing as at March 15th, 1945.....	167,873.66	134.00
Owing as at March 21st, 1946.....	165,564.77	.....

1938 Arrangement.—This District is operating under the 1938 arrangement.

Order in Council No. 751, 1933, reduced the total indebtedness of the District from \$165,195.10 to \$164,420.60. The annual instalment was set at \$8,225.

Under the 1938 arrangement the amount to be paid into Renewal Reserve was set at \$2,500 annually, and the payment to the Conservation Fund amounted to approximately \$6,283 in lieu of \$8,225. In 1942, due to a crop failure, when production dropped to 60,000 boxes, the amount paid into the Conservation Fund was only \$1,954.15. Otherwise the East Creston District has met all payments as requested under the 1938 arrangement.

In 1944, as the total accumulated in the Renewal Reserve Fund exceeded \$20,000, the annual requirement was reduced from \$2,500 to \$1,250. A Departmental memorandum indicates that if the system shows a more rapid rate of deterioration within the next few years, the contribution to the Renewal Reserve should be increased.

The following tabulation shows the adjustments in annual payments and the present requirements:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O. C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$7.45	\$8,225.00	\$6,283.00	\$2,500.00
1944.....	6.58	8,225.00	6,658.50	1,250.00
1946.....	6.58	8,225.00	6,688.50	1,250.00

The standing of the Renewal Reserve Account is given below:—

Total payments as at March 15th, 1946.....	\$23,750.00
Interest accruals.....	3,090.01
Total expended from Renewal Reserve as at March 15th, 1946.....	.....
Amount which should be in Renewal Reserve as at March 15th, 1946.....	26,840.01

Irrigation Charges.—The following is a summary of irrigation charges levied by the East Creston Irrigation District:—

Tax per acre, 1946—

Grade A, 577.5 acres at.....	\$5.00
Grade B, 119.8 acres at.....	3.50
Grade C, 567.0 acres at.....	2.50
Grade D, 197.3 acres at.....	1.50
Average tax per irrigated acre, 1946.....	3.435
Tolls per acre, 1946.....	None
Total charges per acre, 1946 (average).....	3.435

There have been no special assessments in this District since 1938.

Funded arrears of taxes were paid up by 1945.

Domestic Rates.—There is a charge of \$18 per year per dwelling for domestic water within the District.

The Village of Creston pays the District \$100 per month for transportation of domestic water plus one-eighth of 1 per cent. of the maintenance and one-eighth of $\frac{1}{2}$ per cent. of salaries and office upkeep.

Production.—This is primarily a tree-fruit district. Apples, pears, plums, and peaches grow on about 85 per cent. of the area. All of the small or bush fruits are grown in relatively small quantities.

In the irrigated areas production is higher, the fruit is bigger, and there is a lower percentage of rejects. Non-irrigated land over a period of years would not produce more than 50 per cent. of the amount produced by irrigated land, according to the evidence submitted. This district has much more than doubled its production in the past fourteen years, but this has been due only partly to the advent of irrigation and partly to increased planting.

Production fluctuates greatly. There have been two or three disasters through fall frosts, very wet springs which caused poor "set" and scab, etc. Production in 1942, for instance, was 60,000 boxes, as compared with 260,000 boxes in 1944.

The East Creston District cannot grow Winesaps, but it is not in a bad position from the point of view of wanted varieties of apples. Figures quoted from the Orchard Survey of the Kootenay Horticultural District for the years 1941 to 1945, for the Creston area, show an average of 191 packed boxes per acre, of which the number of packed boxes of wanted varieties amounted to 161.4 per acre.

Relative Productivity.—According to the District brief, production per acre in the Kootenay orchards is considerably below that of the Okanagan.

Figures from the Creston Co-operative Fruit Exchange for the years 1940, 1941, and 1942 show an average production per acre for orchards in this area of 135 packed boxes. Four apple-orchards, rated locally as in the high-production class, averaged, in those years, 226 packed boxes per acre.

In the opinion of Mr. E. C. Hunt, District Horticulturist, Department of Agriculture, the productivity of Creston is somewhat higher than that of Wynndel or Robson.

For purposes of comparison, I have placed the relative productivity of the East Creston District at 55. This rating is due in part to the fact that many of the orchards have not reached full bearing, and in my opinion, barring accident, the situation will improve with the years.

Relative Incomes.—(See Creston table, No. 15.)

Special Factors to be considered.

1. *Domestic Water for Village of Creston.*—The village of Creston gets a quantity of water for domestic use out of the East Creston irrigation system. As stated previously, the District charges the Village \$100 per month plus one-eighth of 1 per cent. of the maintenance costs and one-eighth of $\frac{1}{2}$ per cent. of the salaries and office upkeep for transporting this water.

According to the District secretary, there is a strong possibility that, owing to the larger tracts of lands being subdivided into smaller acreages and additional demands being made for domestic water, the District may have to curtail, if not cut off, the delivery of water to the Village. If this becomes necessary, there will be a resultant loss of revenue, and irrigation tax rates will have to be increased proportionately.

2. *Method of Taxing.*—In this District the land is taxed more or less according to its productivity. Because of large arrears of taxes, the land was regraded from "A" (bearing orchard) and "B" (other lands) to the following classifications:—

Grade A: Full-bearing orchard.

Grade B: Two-thirds full bearing.

Grade C: Bearing less than two-thirds.

Grade D: Arable land, but not cultivated.

Grade E: Waste land, non-irrigable.

Taxes on these grades were gradually reduced during the period from 1938 to 1945 to permit the growers to pay up funded arrears of taxes. In this connection the brief states:—

“Since the scale of charges in effect during the last three years has enabled the ratepayers to meet current charges and clean up arrears, it would seem that this scale adequately fits the economy of the farmer at the existing levels of farm production and prices. Since also there is a very definite relationship between production and prices and capacity to pay, it will be relevant to this submission to develop the relationship further. The descending scale of charges has generally been in keeping with the ‘take home’ returns of the farmer throughout the fifteen years of the District operation, only in the last war years have farm returns shown a reversal of the descending scale. That reversal, however, brought in its train numerous problems, so that in effect increased returns have largely operated as an offset against increased costs and in lieu of cost of living bonus.

“While in 1945 apple sales prices increased 119 per cent. on the average of the five years prior to the war, this is considered only as indicative of inflated economic conditions of which cognizance should not properly be taken in any determination of the capacity of the ratepayer to meet irrigation charges from productive values.”

Under the present system, in effect the land is taxed according to the age of the tree and its condition. An assessor is appointed to grade the land on this basis about every fourth year.

3. *District Requests.*—The brief indicates that the Trustees feel that the amortization period should be extended to be more in keeping with the physical condition and life expectation of the irrigation works, and that the Renewal Reserve should be built up to \$50,000 without altering the existing scale of irrigation charges.

The District also feels that consideration should be given to the ever-recurring cycles of inflation and deflation, and changes in marketing conditions as an aftermath of the war.

The District states that as it has not yet had to take up any of its pipe, it is not able to estimate accurately the effect of ground-action on that pipe. If the effect has been bad, a very heavy expense for replacement may fall on the District at any time. The brief states that the Renewal Reserve represents 18.5 per cent. of the total indebtedness accumulated during 32 per cent. of the amortization period. At this rate the annual revenue from irrigation charges over and above maintenance and extension charges is insufficient to build up reserves to provide for the liquidation of the debt at its due date.

4. *Difficulties encountered.*—Some of the older settlers who have worked their land up from the bush testified as to the difficulties encountered. In 1922 there was a marketing disaster; in 1934, a storm which resulted in severe damage to the trees, one individual losing over 200 of them. In 1935 there was another disaster in which the same individual lost over 500 trees. One witness stated that he was certain not one mature tree in the district to-day was sound; he was of opinion they had all been affected by the heavy frosts and were likely to topple over in a storm. Codling-moth has increased rapidly over the years, until now seven or eight sprays, at a cost of \$50 to \$60 per acre, are necessary each year.

COMMENTS AND RECOMMENDATIONS.

This is a district where, in my opinion, it is possible to evolve a long-time policy that will be in the interest of the community and the Province and, at the same time,

will place no undue burden on any one. The District has received much less assistance than have most other districts. At the same time production is not outstandingly high. It has been advancing favourably. From a long-time point of view, I cannot help but feel that the Renewal Reserve is of first importance and consequently must be emphasized in any recommendations. The District has been well managed.

I recommend:—

- (a.) That the Renewal Reserve be restored to the original figure of \$2,500 per annum, and also that any surplus funds that may be available from time to time be added to this reserve.
- (b.) That the District pay \$5,000 annually on its indebtedness to the Conservation Fund, and that this token payment be accepted as payment in full for the amount due that year under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

GLENMORE IRRIGATION DISTRICT.

(Public Hearings held on July 24th, 1946, at 10 a.m., in the Court-house, Kelowna.)

SUMMARY OF DATA.

History and Description of the System.—The Glenmore Irrigation District was incorporated under the "Water Act" in December, 1920.

The system was acquired from a private company, which was in the hands of a receiver. In order to purchase this system and put it in operating condition, the District borrowed money from the Conservation Fund.

This is a gravity system, supplemented in dry years by pumping water from Okanagan Lake.

Present Condition.—The works are in about the same condition as those in most other districts. The system must be patrolled constantly, and repairs must be made as required. In a few places the works are in bad condition, and replacement costs are heavy.

Description of Area.—This is a relatively compact area. The soil is loam to heavy clay. The seepage problem is not as serious as in some other districts, but has given considerable trouble in certain places.

Water-supply.—Gravity water is stored in two reservoirs on the Mill Creek system, with a total storage capacity of about 3,300 acre-feet. The estimated water-loss between intake and delivery is only 14 per cent.

A 200-horse-power electric motor and pump have been installed for pumping water from Okanagan Lake. The lift is 276 feet, and the pump can supply about 500 acres. This pump serves to supplement the gravity system in very dry seasons.

The average amount of water delivered each year is about 1½ acre-feet. This amount is a minimum necessary for full production.

Irrigable Acreage.—The irrigable acreage, as calculated for the 1938 formula, is 2,566 acres.

Revenue-producing Acreage.—In 1938 the revenue-producing acreage was 1,772; in 1946 it was 1,780.

Number of Growers.—There are approximately 100 growers in this District.

Tax Sales.—No property has been sold for taxes since 1938. Prior to that date a total of 794 acres had reverted to the District for non-payment of taxes.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1920.....	\$468,913.39	\$247.00
Paid.....	181,603.73	95.00
Written off.....	197,336.10	105.00
Owing as at March 15th, 1945.....	89,973.56	47.00
Owing as at March 15th, 1946.....	87,691.07	.....

1938 Arrangement.—This District is operating under the 1938 arrangement.

By Order in Council No. 751 of 1933 the total indebtedness was reduced from \$171,799.63 to \$87,780. The annual amount payable by the Glenmore District was set at \$6,124, the first instalment being due on March 15th, 1937. This date was subsequently altered by Orders in Council Nos. 939A and 974, and by Order in Council No. 648, May 27th, 1937, it was set as March 15th, 1942. In 1938, however, the District was given the option of coming under the 1938 arrangement, and this it agreed to do. By the new arrangement, payments had to commence on March 15th, 1939.

On May 3rd, 1944, an adjustment was made whereby the District would increase its Renewal Reserve for the next five years from \$7,571 to \$9,241. This had the effect of reducing the actual payment to the Conservation Fund from approximately \$1,891 to \$1,438.17. The 1944 adjustment was to continue for a five-year period, after which the 1938 formula would again be effective.

The following tabulation shows the adjustments in annual payments and the present requirements:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751. 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$5.34	\$6,124.00	\$1,891.00	\$7,571.00
1945.....	5.99	6,124.00	1,438.17	9,241.00
1946.....	5.99	6,124.00	1,438.17	9,241.00

The standing of the Renewal Reserve Account is given below:—

Total payments as at March 15th, 1946.....	\$63,908.00
Interest accruals.....	2,340.00
Total expended from Renewal Reserve as at March 15th, 1946.....	22,169.90
Amount which should be in Renewal Reserve as at March 15th, 1946.....	44,078.10

Irrigation Charges.—The following is a summary of irrigation charges levied by the Glenmore Irrigation District:—

Tax per acre—1945.....	\$6.00
1946 (estimated).....	6.00
Average toll per acre—1945.....	2.82
1946 (estimated).....	3.25
Total charges per acre—1945.....	8.82
1946 (estimated average).....	9.25

There have been no special assessments in this District since 1938.

There are no domestic water rates. Irrigation-water may be used for domestic purposes without charge from March to December by growers in the District.

Production.—This is mainly an apple-producing area, but most of the other tree-fruits are grown in small quantities. The vegetable area is limited.

Relative Productivity.—The relative productivity of this area is high, and for purposes of comparison is rated at 90.

Relative Incomes.—It was impossible to segregate the growers in this area in order to obtain absolutely accurate figures, but, generally speaking, in most cases the incomes are satisfactory and the proportion of very low-income growers is relatively small. The Glenmore growers are included in the Kelowna table, No. 16.

Special Factors to be considered.—By special agreement the Okanagan Development and Orchard Company at Ellison receives 25 per cent. of the water from No. 1 dam (capacity about 3,000 acre-feet).

COMMENTS AND RECOMMENDATION.

The Glenmore brief submits that the present tax and toll levy, totalling \$9.25 per acre, is a reasonable charge for water. In his evidence (pp. 12, 13 of transcript), Mr. R. W. Corner, Trustee, points out that this figure is based on a minimum replacement requirement. The full replacement programme over a period of forty years would cost \$507,282 and would require \$12,682 per year, or a combined tax and toll levy, under the present tax formula, of \$10.83 per acre. Mr. Corner stated that certain works in the District had been neglected.

The sum now being paid annually into the Conservation Fund under the 1938 arrangement is \$1,438.17. In my opinion the District can continue to pay this amount annually and at the same time set aside the necessary reserves for extensive replacements. I recommend that \$1,438.17 be paid annually into the Conservation Fund, and that this amount be accepted for the full annual payment required under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

HEFFLEY IRRIGATION DISTRICT.

(Public Hearings held July 17th, 1946, at 10 a.m., in Municipal Hall, Kamloops.)

SUMMARY OF DATA.

History and Description of the System.—The Heffley Irrigation District began as a water-users community in 1914, became a water district under the "Drainage, Dyking, and Development Act" in 1920, and was incorporated under the "Water Act" in 1925.

At the time the water district was formed, the irrigation system was very much overrecorded and an additional source of water was urgently required. The District was then split into gravity and pumping lands, and a pumping system was installed with \$32,716.17 borrowed from the Conservation Fund. The annual payment was to be \$3,181.89, divided as follows:—

Gravity lands: 1,243 acres—took over 92 per cent. of the indebtedness to the Conservation Fund.

Pumping lands: 765 acres—took over 8 per cent. of the indebtedness plus the cost of operation and maintenance.

Present Condition.—According to the evidence given, there is more land now under cultivation than there was at the inception of the District. Dams, creeks, and waterways were made to handle a district with much less acreage and much less diversified agriculture than exist at present. The dams need to be improved, waterways cleaned out, and general water conservation taken into consideration.

The evidence also indicates that there is no possibility of the District getting a further water-supply with the existing facilities. Storage is not adequate for present-

day needs. The water-supply during the season of use might be increased by putting a dam on Little Heffley Lake and increasing the size of the dam on Devick Lake.

In connection with the pumping system one pump is too big to be economically operated for the acreage it serves. The other pumps need to be modernized to bring them in line with Government specifications. The secondary line needs new poles, and it is suggested that the portion along the railway and river should be moved away from the danger of slides.

Description of Area.—This area is relatively flat, with a varied but generally good soil.

Water-supply.—In 1930 and 1931 only 0.20 and 0.28 acre-feet of water respectively were available per acre. In 1945, due to exceptional precipitation, the lands received approximately 1½ feet per acre. The evidence indicated that in the early '30's the irrigated acreage was substantially reduced owing to shortage of water-supply, and that now, if sufficient water were available, about 300 more acres of land could be put under cultivation.

Irrigable and Revenue-producing Acreage.—The irrigable acreage, all revenue-producing, in 1945 was as follows:—

	Acres.
Gravity, Grade A.....	1,250
Pumping, Grade B.....	391
Pumping, Grade C.....	149
Total.....	1,790

Irrigated Acreage.—The irrigated acreage in 1945 was as follows:—

	Acres.
Gravity, Grade A.....	1,194
Pumping, Grade B.....	391
Total.....	1,585

Number of Water-users.—The number of water-users in the District is approximately twenty-nine.

Tax Sales.—In 1931 four properties were put up for tax sale. In recent years no lands have reverted for non-payment of taxes.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1920.....	\$62,748.95	\$38.00
Paid.....	22,755.22	20.00
Written off.....	18,735.65	11.00
Owing as at March 15th, 1945.....	11,258.08	7.00
Owing as at March 15th, 1946.....	10,770.22	.....

Not operating under 1938 Arrangement.—This District is not operating under the 1938 arrangement.

Under Order in Council No. 751, 1933, the outstanding indebtedness of the District was reduced from \$21,624.27 to \$15,000, and the annual repayment was set at \$1,089. Under Order in Council No. 974, reducing the interest rate, the amount of the annual repayment was changed to \$989.85.

No further adjustment of the indebtedness of this District was made in 1938, and it has continued to pay. Actually, the amounts paid in to the Conservation Fund by the Heffley Irrigation District during the period 1939 to 1945, inclusive, averaged \$1,092.63 per annum, or \$102.78 more than the required annual instalment.

There is no Renewal Reserve Fund.

Irrigation Charges.—Tax per acre, 1945:—

Gravity, "A"—*

Capital instalment	\$1.00
Administration† .....	.35
Ordinary works .....	.20 to \$0.50
Total	\$1.55 to \$1.85

Pumping, "B"—

Demand charge	\$1.00
Administration† .....	.35

Pumping, "C"—Administration†35
------------------------------------	-----

* Of the gravity "A" lands, 99 acres have paid off capital taxes under a special commutation plan. Therefore only 1,151 acres of "A" land pay on Capital Account.

† Administration charge is to be increased to \$0.45 per acre on "A," "B," and "C" lands in 1947.

Tolls per acre, 1945: Pumping, "B"—\$2.50 per acre-foot, or approximately \$3.75 per acre, on the average.

Special assessments per acre since 1938:—

1940: Special works assessment on pumping lands, 60 cents per acre.

1945: Special works assessment on gravity "A" lands, \$4.20 per acre (for new dam and diversion).

1946: Special works assessment on gravity "A" lands, \$3 per acre to be levied (to complete dam and ditch work).

Pumping acreage is faced with a heavy special works assessment also in the next few months to renew the secondary pole-line.

Ditch-maintenance charge: There is also a cost for ditch-work—an individual liability under District supervision—on "A" lands, amounting to 75 cents per acre.

Total charges per acre, 1945:—

Gravity, "A" lands—

Taxes	\$1.55 to \$1.85
Ditch-maintenance .....	.75 .75
Special works	4.20 4.20

Total	\$6.50 to \$6.80
--------------------	-------------------------

Pumping, "B" lands—

Taxes	\$1.35
Tolls (average)	3.75

Total	\$5.10
--------------------	---------------

There are no domestic water rates levied by this District.

Production.—This is a grain-, potato-, hay-, and seed-producing area. Water is also needed to irrigate meadows for the production of winter feed for live stock.

The holdings vary from small vegetable-farms to large cattle-ranches.

Relative Productivity.—The productivity of this area in terms of dollars is relatively low, even though physical productivity is good. For purposes of comparison, I have placed it at 40.

Relative Incomes.—Complete information was not available, but from the figures obtained, it is quite clear that incomes are relatively low. As in all districts, however, some producers are doing quite well.

Special Factors to be considered.—1. The pumping system is subject to damage by lightning-storms, sand clogging the intake pipes, outbreaks of fire, and landslides.

There are five pumping units spread over 4 to 5 miles of river-bank. The District feels that this arrangement is not economical, and would prefer to have all electrical units housed under one roof, with one full-time attendant. In the opinion of the District it is imperative to split the load on to two transformer units.

2. The Department of National Defence bought out certain of the pump lands. In lieu of further taxation on these lands the Dominion Government paid a lump sum of \$2,500, and the land was placed in Class D, non-taxable.

3. The secondary power-line of the District was carried for 2 miles on the high-line poles of the City of Kamloops and was later taken over by the British Columbia Electric Railway Company. Because of the difficulties of maintenance, the British Columbia Electric Railway Company moved its high-line up the hill, away from the railway and the river, and handed the poles of the old line over to the Hefley Irrigation District. This means that the District is now responsible for the maintenance of the line. This places a heavy charge upon the pump lands. This charge could not be foreseen, and therefore was not taken into consideration when the District was incorporated under the "Water Act." The District now feels it imperative to move a portion of the line away from the river-bank, where it is subject to slides at any moment.

4. Some of the gravity works now under construction are being financed by special assessments on the growers. These works will serve to make available for use water which formerly was lost at freshet times.

5. Some emphasis was placed by the District on the possible burning of the Hefley Lake watershed in order to provide more rapid run-off for collection in the storage-dam.

6. Four properties in the District have recently changed hands, prices being as high as \$100 to \$150 an acre. In the brief it was pointed out that with the addition of water, the land values increased from \$1 per acre to \$165-\$170 per acre.

7. The District particularly requests the privilege of being able to create a Renewal Reserve.

COMMENTS AND RECOMMENDATIONS.

Two factors stand out above all others in connection with this District:—

- (1.) The District has kept up its payments to the Conservation Fund at the expense of replacements, with the result that the works are now in a very poor condition and must be not only maintained, but rebuilt or replaced.
- (2.) The supply of water is very limited, and existing storage is totally inadequate.

These lands cannot stand higher assessments, and consequently, if the District is to be kept operating efficiently, some change in the arrangement with the Government is essential. Additional money should not be borrowed.

I recommend that \$300 be paid annually to the Conservation Fund, and that this token payment be accepted as full payment of the annual amount due under Orders in Council Nos. 751 and 974—namely, \$989.85—and further, that the present tax and toll rates, not including special assessments, be continued, and the money so raised be used to renew and rebuild the system.

KEREMEOS IRRIGATION DISTRICT.

(Public Hearings held on August 2nd, 1946, at 7.30 p.m., in Community Hall, Keremeos.)

SUMMARY OF DATA.

History and Description of the System.—The Keremeos Irrigation District was incorporated under the "Water Act" in June, 1930.

This is a gravity system, originally constructed by the Keremeos Land Company in 1907-08 at a cost of \$120,000. In 1922 the company went into liquidation, and the system was operated by a liquidator for four years and by a local committee for six years.

At the time of incorporation of the Keremeos Irrigation District in 1930, the system was in such a state of disrepair that immediate replacements were necessary. The District borrowed \$55,000 from the Conservation Fund, to be used as follows: \$7,000 for purchase of the system; \$3,500 for a bridge across the Similkameen River at Ashnola, to carry the Keremeos Irrigation District siphon; \$44,500 for renewal and extension of the distribution system.

Present Condition.—According to the schedule attached to the Keremeos brief, replacements are urgently needed. In the period 1938 to 1945 a total of \$26,854.01 was spent on replacements, or \$3,356.75 per year. The Renewal Reserve Fund provided, during that period, for \$26,400. Over the next five-year period the estimates for renewals total \$32,702. This makes no provision for extensions or new constructions of any kind.

Description of Area.—The soil on the benches is partly heavy volcanic ash, well adapted to fruit-growing, but here and there are streaks of gravel. On the gravel lands it is difficult to retain moisture during the dry season.

On the low lands there is some alkali, and the water-table is so high at certain times of the year that it retards growth.

Water-supply.—The water-supply, though not unlimited, is in plentiful supply and is drawn direct from the Ashnola River.

Irrigable Acreage.—The irrigable acreage, as calculated for the 1938 formula, is 1,122.

Revenue-producing Acreage.—The revenue-producing acreage has increased, as is shown: 1938, 762 acres; 1945, 1,000.01 acres.

Irrigated Acreage.—The irrigated acreage in 1945 was 893.42.

Number of Growers.—There were 121 growers receiving irrigation-water from the District in 1945; by 1946 the number had increased to 127.

Tax Sales.—At one time there were many tax sales in Keremeos, and many acres reverted to the Soldiers' Settlement Board. Of the twelve original holders of Soldiers' Settlement land, only one or two are now left in Keremeos.

One parcel of land was sold for taxes in 1941. The last sale announced was in 1944, but all properties were redeemed before the sale actually took place.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1930.....	\$89,388.20	\$94.00
Paid	13,829.65	15.00
Written off or not charged.....	18,524.46	19.00
Owing as at March 15th, 1945.....	57,034.09	60.00
Owing as at March 15th, 1946.....	56,082.86	.....

1938 Arrangement.—By Order in Council No. 751, 1933, the outstanding indebtedness of this District was reduced from \$55,514 to \$55,383.67, with an annual repayment of \$3,433.

The District was placed under the 1938 arrangement, with a Renewal Reserve requirement of \$3,000 annually. In 1945, at the request of the District, this amount

was raised to \$4,250. The following tabulation shows the adjustments in annual payments and the present requirements:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$5.73	\$3,433.00	\$1,873.82	\$3,000.00
1945.....	6.85	3,433.00	1,911.85	4,250.00
1946.....	6.85	3,433.00	1,911.85	4,250.00

The standing of the Renewal Reserve Account is given below:—

Total payments as at March 15th, 1946.....	\$26,731.40
Interest accruals	
Total expended on renewals as at March 15th, 1946.....	24,461.43*
Balance which should be in Renewal Reserve as at March 15th, 1946	3,639.85

* Supplied partly from general funds.

Irrigation Charges.—The following is a summary of irrigation charges levied by the Keremeos Irrigation District:—

	Taxes.	Tolls.
“ A ” lands (per acre).....	\$6.50	\$6.50
“ B ” lands (per acre).....	2.00	11.00
“ C ” lands (per acre).....		13.00
Average per acre.....	\$5.95	\$6.80

The total of the tax and toll on each acre of land *irrigated* must equal \$13.

There have been no special assessments in this District since 1938.

There are no domestic water rates.

Production.—Production consists mainly of tree-fruits—mostly apples, peaches, apricots, and prunes. There are also some plantings of cantaloupe.

Relative Productivity.—There were many conflicting opinions about the productivity of this district. It is a good district and will improve, but for purposes of comparison I have placed the relative productivity at 65. Total receipts per farm are not as high as in some other districts.

Relative Incomes.—(See Table 14.)

Special Factors to be considered.—When it took over from the liquidator of the Keremeos Land Company, the District had to accept a certain agreement the Land Company had with the Indian Department. This agreement still stands, and the District must supply water to some 300 acres of Indian land from which it gets no revenue.

COMMENTS AND RECOMMENDATIONS.

The Keremeos brief states as follows:—

“The principal amount of the District Loan is just the same today as it was in 1936, not one dollar of it having been wiped out. The Trustees ask your consideration of this point, as several Districts have received substantial cuts in their Loans, and why not the same treatment for all. The Interest on the District Loan amounts to \$2,492 per year and it looks very much as though we could carry on till the end of time, under the present arrangement, and still owe the Province of B.C. \$55,000.”

The 1933 adjustment reduced the outstanding indebtedness of this District from \$55,514 to \$55,383.67—a decrease of \$130.33.

This District has apparently been through very hard times, and much property has been up for sale through non-payment of taxes.

One witness stated that for the first four years he owned land in the District he operated a store and the orchard was just a "sink hole" for money made in the store. In the last four years, he stated, returns had been satisfactory, but previous to that it was a losing proposition, and if he had not been a "hustler," buying and selling fruit wholesale, he could not have lived.

Another witness, one of the best farmers in the District, stated that at one time his property had been up for tax sale, but that he had ultimately redeemed it. He stated that returns had been so poor it took him fourteen years to repay a debt of \$1,000 which he owed to the bank. Now returns are satisfactory, and have been so for the past few years.

The District brief points out that per acre charges in the District have been gradually raised to the maximum growers can pay and stay in business, even in times of good prices. Since 1941 the District general budget has risen from \$8,000 to \$12,000.

Strong emphasis must be placed on a growing Renewal Reserve requirement.

I recommend that \$1,200 be paid annually into the Conservation Fund, and that this amount be accepted for the full annual payment due under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

NARAMATA IRRIGATION DISTRICT.

(Public Hearings held July 31st, 1946, at 9 p.m., in Irrigation District Office, Naramata.)

SUMMARY OF DATA.

History and Description of the System.—The Naramata Irrigation District was incorporated under the "Water Act" in November, 1920.

The system was taken over from a private company which was no longer able to maintain it.

It is a gravity system, consisting originally of wooden flumes and dirt ditches. The wooden flumes proved inadequate and were replaced with pipe. Since 1919 a total of 90,783 feet of pipe has been installed at a cost of approximately \$136,342.

Present Condition.—According to the District brief, extensive renewals are now overdue. Owing to the high pressure, there have been many burst pipes and pin-hole leaks during the past season. The secretary states that actions against the District by the water-users for damages resulting from burst domestic tanks, flooding of orchards, cutting, and erosion have only been avoided through the growers' kind consideration. In his opinion a settling-basin, to clear out sand and to reduce the very high pressure, is absolutely necessary. This will cost about \$2,000.

Description of Area.—The land is rolling, with deep slopes and very deep gullies, and consists of a narrow strip of bench land bordering Okanagan Lake, about 5 miles in length.

The soil contains some alkali. A very sharp sand is carried in the water. This sand wears away the pipe-lines, resulting in heavy renewal costs.

The land is classified for assessment purposes as follows:—

Grade A: Gets irrigation and domestic water.

Grade B: Arable and irrigable, but gets no water now.

Grade C: Town land, gets domestic water only.

Grade D: Waste land, gullies, etc.; gets no water.

Water-supply.—According to the brief, the Naramata District has never had sufficient water. Every effort is being made to utilize all the water available. A new

dam is under construction at Eleanor Lake to hold approximately 200 acre-feet of water in addition. Water is at present stored in Summit Lake, Big Meadows Dam, and Naramata Lake, which have a total storage capacity of over 1,100 acre-feet.

It is planned to deliver about 2½ acre-feet, but the total delivered is not actually measured.

Irrigable Acreage.—The irrigable acreage, as calculated in the 1938 formula, is 1,061.

Revenue-producing Acreage.—The revenue-producing acreage has increased as follows: 1938, 837 acres; 1946, 973.71 acres.

Irrigated Acreage.—The irrigated acreage in 1946 is 901.76.

Number of Growers.—There are approximately 120 growers in the District.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1920	\$228,438.51	\$263.00
Paid	85,510.93	98.00
Written off or not charged	85,185.26	98.00
Owing as at March 15th, 1945	57,742.32	67.00
Owing as at March 15th, 1946	58,873.54*	.....

* Naramata has withheld its token payment this year, pending the report of this Commission.

1938 Arrangement.—This District is operating under the 1938 arrangement. By Order in Council No. 751 of 1933 the total indebtedness of the District to the Conservation Fund was reduced from \$89,431.52 to \$65,000, and the annual instalment was set at \$4,030, payments to commence on March 15th, 1937. This date was later changed by Order in Council No. 1557 to March 15th, 1939.

Under the 1938 arrangement the District was required to set aside \$4,265 for Renewal Reserve annually. In 1939 this was adjusted to \$5,610.

The following tabulation shows the adjustment in annual payments and the present requirements:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$9.08	\$4,030.00	\$2,562.00	\$5,610.00
1946.....	9.08	4,030.00	*	5,610.00

* Not yet paid.

Owing to the fact that the District was expending practically all of the amount considered necessary for replacements every year, it was not required to set up a special Renewal Reserve Account. In the opinion of the Department of Lands the District should now be required to set up such an account in its books in accordance with the 1938 arrangement.

The Renewal Reserve requirements under the 1938 formula, from 1939 to March 15th, 1946, total \$44,880. In that period the amount actually expended on renewals was \$45,180.65.

Irrigation Charges.—The following is a summary of irrigation charges levied by the Naramata Irrigation District:—

Tax per acre, 1945 and 1946—	
“ A ” land	\$5.50
“ B ” land	4.00
Average per irrigated acre	5.62

Tolls per acre—	
1945	\$7.00
1946	7.00
Special assessments per acre (for construction of new dam at Eleanor Lake)—	
1945, toll of	7.50
1946, toll of	5.00
Total irrigation charges per acre—	
1945, "A" land	20.00
1946, "A" land	17.50

Domestic rates: North benches, \$10.50 per year; south benches, \$5.25 per year; "C" land (town), \$18 per year plus \$5.50 per acre as Grade A and \$2 per acre as Grade C.

Production.—Production consists of tree-fruits—mostly apples, with some peaches, apricots, and other stone-fruits. There are a few vineyards.

Relative Productivity.—In the opinion of Mr. R. P. Murray, District Field Inspector, Department of Agriculture, the productivity of the Naramata District would be less than that of Kaleden and Penticton, about equal to that of Keremeos, and greater than that of Cawston. Naramata's productivity would be less than that of Kaleden and Penticton largely because of the lack of water, but also partly due to the general topography. Some of the Naramata orchards are harder to handle than those at Penticton because of the steep slopes and gullies, and with the water shortage they have a tendency to dry up early in the season. It is not a question of suitability of varieties.

Since 1942 prices have been improving, and this has enabled growers to buy more fertilizer. The application of additional fertilizer has resulted in increased production from 1942 onwards.

Many of the trees have reached full bearing, and from now on will be likely to depreciate.

For purposes of comparison, I have placed the relative productivity of Naramata at 80.

Relative Incomes.—(See Table 17.)

Special Factors to be considered.—The water shortage in this District constitutes a real problem. In an effort to meet the situation, a new dam is being constructed at Eleanor Lake. In 1945 a special toll was levied on the water-users, at the rate of \$7.50 per acre, to assist in paying for this dam; a further special toll of \$5 per acre will be necessary in 1946 for the same purpose.

In this connection it should be noted that "B" land, although it gets no water, pays a tax of \$4 per acre. It is arable and irrigable land, and it was intended that water should be supplied to it upon request of the owners. In recent years, however, because of shortage of supply, the District has had to refuse to supply water to this land.

COMMENTS AND RECOMMENDATION.

There would appear to be a misunderstanding in this District with regard to the terms of the 1938 arrangement. According to the evidence, the District officials are not certain as to how much credit they receive towards the repayment of their indebtedness when they make their annual token payment to the Conservation Fund as required under the 1938 arrangement.

In my opinion somewhat stronger emphasis should be placed on the Renewal Reserve. The system is old, and even though funds have been raised by special assessment, most of them have been used for new construction, and a great deal of replacement-work remains to be done.

I believe, however, that the distribution of the production of the District and the initiative and foresight of the orchardists are such that they can meet a large share of their obligations as set out under the 1938 arrangement.

I recommend that \$2,562 be paid annually into the Conservation Fund, and that this amount be accepted for the full annual payment as required under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

OKANAGAN FALLS IRRIGATION DISTRICT.

(Public Hearings held on August 1st, 1946, at 7 p.m., in the Community Hall, Okanagan Falls.)

SUMMARY OF DATA.

History and Description of the System.—The Okanagan Falls Irrigation District was incorporated under the "Water Act" in August, 1934, and was administered from its inception until April 16th, 1941, by a Board of Trustees. It is now in the hands of a receiver.

This is a combined gravity and pumping system. The flumes and dam were built by the District with money borrowed from the Okanagan Falls Development Company. In 1936 the dam failed, causing considerable damage. It was rebuilt in 1941, but again went out in 1944.

The area is divided as follows:—

Lower Bench: Irrigated with water pumped from Okanagan River.

Middle Bench and Upper Bench: Obtain gravity water from McLean and Shuttleworth Creeks.

Present Condition.—The turbine and pump on the river were installed second-hand and require constant attention. The pipe is quite old and repairs are necessary. The flumes of the gravity system should be replaced.

No new dam has been built to replace the one which went out in 1944.

Description of Area.—The area is rolling and relatively easily cultivated, but District plantings are scattered and much land is used for hay.

Water-supply.—The 82.95 acres on the Lower Bench receive an adequate water-supply from the river. The Middle and Upper Benches, comprising 83 and 219.5 acres respectively, do not receive sufficient water now that there is no provision for storage.

Irrigable Acreage.—The irrigable acreage is approximately 400.

Revenue-producing Acreage.—The revenue-producing acreage in 1946 was 385.45 acres.

Irrigated Acreage.—The total number of acres irrigated in 1946 was 260.45.

Conservation Fund Standing.—Money was not loaned to this District from the Conservation Fund, and therefore it did not come under the terms of Order in Council No. 751 of 1933 or under the 1938 arrangement.

The District originally borrowed money from the Okanagan Falls Development Company to build the dam on Shuttleworth Creek at Campbell Meadows. When the dam went out, the District defaulted on its first instalment of the repayment, and the company sued and obtained a judgment. To save the investment of the land-owners, the Government made an agreement with the company in February, 1941, whereby the company reduced the amount of its judgment to \$10,000, accepted the bonds of the District to that amount, and gave a quit claim to the amount of the balance owing. The Government advanced \$15,000 to the District to build a new dam, likewise accepting the bonds of the District for \$10,000. On April 16th, 1941, the affairs of the District were placed in the hands of a receiver appointed by the Government.

The debt to the Government as at March 15th, 1946, was as follows:—

Principal borrowed.....	\$15,000.00
Principal repaid.....	618.00
Principal forgiven.....	5,000.00
Principal owing.....	9,382.00
Interest accrued.....	.....
Interest paid.....	1,774.00
Interest forgiven.....	.....
Interest owing.....	.....
Present debt to the Government.....	9,382.00

No provision is being made for renewals and replacements in this District.

Irrigation Charges.—The following is a summary of irrigation charges levied by the Okanagan Falls Irrigation District:—

Tax per acre, 1946.....	\$3.50
Toll per acre, 1946.....	5.50
Total charges, 1946.....	\$9.00*

* This also represents the minimum charge per acre or fraction thereof.

There have been no special assessments in this District.

There are no domestic water rates.

Production.—With regard to production the area is divided as follows:—

	Acres.
Orchards.....	86.00
Hay-lands and ground crops.....	174.45
Uncultivated land.....	125.00

The uncultivated lands pay the same taxes and tolls as are required of the productive lands, but they are not supplied with water.

Of a total of 8,331 trees planted, 7,444 are from 1 to 5 years old, 411 are from 6 to 10 years old, and 476 trees are over 10 years old. It is obvious that the highest-priced crop, the yield from the orchard areas, is very small.

Relative Productivity.—No information is available with regard to the relative productivity of this District. In my opinion the soil and climate are suitable for a production fully as heavy as that of adjoining districts.

Relative Incomes.—It was not possible to obtain information with regard to relative incomes in this District.

Special Factors to be considered.

1. *Campbell Meadows Dam.*—On May 16th, 1936, the Campbell Meadows dam on Shuttleworth Creek failed, causing considerable damage to the lands below it. The dam was rebuilt with money borrowed from the Government, but on May 27th, 1944, this new dam went out, and once again the lands were flooded. Since the disaster of 1944 it has not been replaced.

The Upper Bench, the major portion of the District (219.5 acres), depends upon storage water for its irrigation. Since the failure of the dam in 1944 there has been no storage water available, and this area is without water from the latter part of July on to the end of the season. This applies in only slightly less degree to the Middle Bench, consisting of 83 acres.

The two previous dams were built of earth. A new dam of a more permanent type of construction would enable the District to supply both the Middle and Upper Benches with water. Failing that, nothing can be done for the Upper Benches. The Middle

Benches could be supplied from the river if a new drive on the present turbine and pump were installed with sufficient power to raise the water to the higher levels. An alternative method for supplying the Middle Bench would be to install a sump and booster pump to lift the waters now supplied by the turbine and pump beyond the Lower Bench to the higher levels of the Middle Bench. Such action, however, would still leave the large area of the Upper Bench without water.

2. *Pay Taxes without getting Water.*—It should be noted that under the present condition of the system, owners are required to pay taxes on their total acreage, although water-supply and distribution system are not sufficient to irrigate the whole acreage. It is calculated that these owners pay a total of \$1,125 per year, for which they receive no return. There are at least 150 acres on the Upper Bench not in use.

3. *Suit for Damages.*—When the earth dam at Campbell Meadows went out in 1944, damage was caused to the lands below the dam. In this connection a suit has been instituted in the Supreme Court of British Columbia against the Okanagan Falls Irrigation District for unstated damages.

4. *District is Insolvent.*—As stated before, this District has been in the hands of a receiver since April of 1941. The balance-sheet as at March 31st, 1946, shows a deficit of \$10,886.81.

The proceeds of the tax levy must go to retire the District debentures. The proceeds of the toll levy do not cover the cost of operation and maintenance. There are, in addition, debts of \$500 borrowed from the Canadian Bank of Commerce and \$412 owed to the Kaleden Irrigation District, and there would appear to be no source of revenue from which these can be paid. Growers claim that with the loss of storage water when the dam failed went the paying power of their land, except for the few acres on the Lower Bench. They cannot afford to pay even the present charges, let alone pay increased tolls, unless their land is supplied with water.

5. *Land Sales.*—Some land has changed hands in recent years. This has been mainly on the lake-shore, where water is supplied by the pumps, or, if on the Upper Benches, while the dam was still holding.

6. *Hay-lands.*—Growers maintain that they cannot produce hay economically with irrigation charges totalling \$9 per acre. One witness was of opinion that hay-land cannot pay more than \$5 per acre, as compared with \$8 per acre paid by full-bearing orchards, as at Oliver.

7. *District Requests.*—In its brief this District makes the following requests:—

- (1.) That all debts owing the Provincial Government should be written off.
- (2.) That further moneys be made available to replace worn-out portions of the system and for the construction of a "permanent" dam to hold storage water. It is estimated roughly that at least \$30,000 would be required for these purposes, allowing for extending the flumes on the Upper Bench. There would be some additional cost for ditches.

8. *Okanagan Falls Development Company.*—The manager of this company testified that the company owns 220 acres of land in the District. Only 18 of the 220 acres are planted to orchard, and 40 acres are in hay. The balance is not productive. The company has not been selling any land since the dam went out.

This company suggests that the Government release its claim on the District. The manager intimated that if the Government would wipe out its portion of the remaining debt and replace the dam, the company also would be willing to wipe out the portion of the debt still owing to it by the District.

COMMENTS AND RECOMMENDATION.

This District has suffered two major disasters within the space of eight years. It is in the unfortunate position of being asked to pay for two dams, neither of which

is still functioning. Without a new dam it cannot supply its lands with sufficient water to enable them to produce enough to pay for the old dams.

The history of one orchard is eloquent testimony of conditions in this District. The owner, who has had 4 acres of orchard-land for eighteen or twenty years, has planted trees three times, but this is the first year he has succeeded in producing a crop of peaches. The first time he planted, his trees were wiped out by the failure of the dam. The second planting was lost in the flood consequent upon the failure of the second dam. If he had not had outside work, he would not have been able to carry on at all.

It is significant also that, to pay the present tolls, some of the growers find it necessary to assist with repairs to the system, getting credit on the toll levy in lieu of wages.

As can be seen from the above, the District is in a most difficult situation. From the point of view of the District it would appear reasonable that the present indebtedness both to the company and to the Government be written off if possible, or that some arrangement be made between the company and the Government to develop the District.

It might also be hoped that the suit for damages recently instituted in the Supreme Court of British Columbia would be dropped. With the past cleared away on the above items, a fresh start could be made.

This implies the rebuilding of the dam and making provision for the necessary storage water. Without this the District cannot be developed economically.

Properly developed, this District could pay about \$900 annually on a loan amortized over a period of years. As the matter now stands, the District can pay nothing on its indebtedness if the payment has to come from the earnings of the District. Development cost per acre would not be high.

While I believe the above to be a fair statement, it is not my problem, and, as difficult as the situation is, a recommendation must be made. I recommend that the total present indebtedness be amortized over a period of thirty years and that a token payment of \$100 be accepted annually as full payment for the amount due for any one year.

OYAMA IRRIGATION DISTRICT.

(Public Hearings held on July 19th, 1946, at 10 a.m., in the City Hall, Vernon.)

SUMMARY OF DATA.

History and Description of the System.—The Oyama Irrigation District was incorporated under the "Water Act" in September, 1923.

This was originally a gravity system owned by the Long Lake Irrigation Company, getting water from Oyama Lake. It was found that the water rights were secondary to those of the Woods Lake Water Company, with the exception of the Lumby record, and it was therefore decided to form a district. The system was in poor condition, and the District was refused a loan from the Conservation Fund for renewals, as it was considered that the water licences were of too little value.

The District borrowed \$35,000 in the open market, giving 15-year bonds at 8 per cent. These were repaid by 1939.

For some years the system continued to operate with gravity water, but between 1924 and 1931 there was only one year when the system was filled. During this period, although the tax per acre was \$11 plus \$2.50 for maintenance, it was not found possible to do more than pay the bond issue, and nothing was set up as a sinking fund.

As water was insufficient, the District sold its water rights to the Woods Lake Water Company for \$5,000 and purchased and installed four pumps to pump water from Woods Lake and Kalamalka Lake to a maximum elevation of 360 feet. Between 1929

and 1932 the District borrowed a total of \$13,500 from the Conservation Fund to complete pump installations.

Present Condition.—Capital expenditure for new pipe and sumps during the period 1939 to 1945 amounted to \$15,191.06. Two new pumps were installed in 1945. According to the brief and to statements made by the District secretary, the entire system wants rehabilitating, at an estimated cost of \$20,000. The main centre portion of the system requires remodelling immediately. The brief shows necessary expenditure of \$15,000 for replacements to the low-level system and \$5,000 to recondition the high-level system. Rising costs of materials and labour might greatly affect the general budget in this connection.

Description of Area.—The District is situated on Long Lake, 13 miles south of Vernon. It is very compact and slopes sharply to the lake. There is little erosion and little seepage.

Water-supply.—At present 2½ acre-feet of water are supplied on the higher levels. It is claimed that at Oliver growers receive as much as 5 acre-feet or more. Oyama growers feel that they could use this amount of water to advantage. More water is available from the lake, but it would require more capital expenditure to install pumps to utilize this.

The trees, when observed in July, 1946, were not getting quite enough water.

Irrigable Acreage.—There are approximately 350 acres of irrigable land.

Revenue-producing Acreage.—The revenue-producing irrigated acreage in 1946 was 292.34.

Number of Growers.—There were twenty-seven growers in the District using irrigation-water in 1945.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1929	\$22,660.46	\$65.00
Paid	945.22	3.00
Written off	11,715.24	33.00
Owing as at March 15th, 1945 (principal) ...	10,000.00	29.00
Owing as at March 15th, 1946 (principal) ...	9,155.00*	.....

* The reduction in the principal owing in 1946 was brought about by certain areas buying their way out of the District by paying \$845 into the Conservation Fund.

Not operating under the 1938 Arrangement.—This District is not operating under the 1938 arrangement.

By Order in Council No. 751, 1933, the total indebtedness of the Oyama Irrigation District was reduced from \$14,122.05 to \$14,087.10—a decrease of \$34.95. The first instalment of \$1,023.72 was not due until March 15th, 1939. This amount was reduced by Order in Council No. 974, 1936, to \$873.40. As the instalment of \$873.40 was not due until 1939, no adjustment of the indebtedness of the District was made in 1938.

In 1941 an adjustment was made. It was found that the estimated cost of replacements over the six-year period 1941 to 1946 averaged \$3,500 per annum, or about \$10 per acre. In addition, pumping charges would be approximately \$12 per acre, without any allowance for repayment to the Conservation Fund. In view of these facts, Order in Council No. 540 was approved on April 22nd, 1941, reducing the total amount of the debt from \$16,149 to \$10,000, to be repaid in fifteen annual instalments of \$930, to commence on March 15th, 1947, and remitting interest until March 15th, 1946.

As stated previously, since that time certain lands have bought their way out of the District by paying \$845 to the Conservation Fund, thus further reducing the indebtedness to \$9,155, and reducing the amount of the annual instalment accordingly.

This District has no Renewal Reserve Account.

Irrigation Charges.—The following is a summary of irrigation charges levied by the Oyama Irrigation District:—

Tax per acre—	
1945.....	\$15.00
1946.....	15.00
Toll per acre—	
1945.....	13.00
1946.....	12.50
Total charges per acre—	
1945.....	28.00
1946.....	27.50

Special assessments since 1938 have been as follows:—

1943: \$2,000 to purchase metal pipe for replacement.

1945: \$6,000 to purchase metal pipe and install two pumping units at north and south ends of the system; \$1,000 to purchase metal pipe for replacement.

A flat rate for domestic water of \$5 per annum is collected from four residents who are not farmers.

Production.—Apples constitute 90 to 95 per cent. of the production. This is a good producing area.

Relative Productivity.—As stated previously, the productivity is quite good. For purposes of comparison I have placed the relative productivity at 80.

Relative Incomes.—(See Table 18.)

Special Factors to be considered.—Because of its heavy bonded indebtedness, Oyama Irrigation District was not able to accumulate a Renewal Reserve. About the same time the bonded indebtedness of \$35,000 was retired, heavy replacements became necessary. As the District brief puts it: "The life of the bonds corresponded in point of time to the life of the system."

During the period 1931 to 1946 the irrigation rate per acre was never less than \$21.25 and went as high as \$30. The District secretary states:—

"The costs of operation run from \$25 to \$30 per acre, and this is too heavy a burden. Under existing condition of system, cannot repay indebtedness to the Province, or any portion of it."

In 1945 it was necessary to install two new pumping units. The District was refused an additional loan from the Conservation Fund to purchase these pumps, but borrowed \$6,000 privately, repayable in six years at 5 per cent. Of this amount, \$5,000 is still owing.

District Requests.—The Oyama Irrigation District asks complete remission of the remaining indebtedness of \$9,155. It states that although, in an effort to repay, the rate charged the water-users was more than doubled with the installation of the pumping system, the District has never been able to repay anything on interest or principal over the past twenty years.

The District feels very strongly that orchardists in the valley should be placed on an even basis. It points out that growers at Oliver pay only about one-quarter of the charges for irrigation paid by growers at Oyama, yet Oyama growers must compete with Oliver on the market.

COMMENTS AND RECOMMENDATION.

There is no indication that this District will be able to meet its annual payment based on \$9,155 amortized over a period of fifteen years, beginning on March 15th, 1947. The tax is already \$15 an acre for replacements, and tolls for operation were

\$12.50 per acre in 1946. It has not been able to build up a reserve even in relatively good times.

I recommend that a modified form of the 1938 arrangement be given effect to; that the District pay \$100 annually to the Conservation Fund, and that this \$100 be accepted as payment in full for the amortized sum due each year for fifteen years beginning March 15th, 1947.

PEACHLAND IRRIGATION DISTRICT.

(Public Hearings held on August 1st, 1946, at 11.15 a.m., in Municipal Hall, Peachland.)

SUMMARY OF DATA.

History and Description of the System.—The Peachland Irrigation District was incorporated under the "Water Act" in August, 1920.

This is a gravity system, first laid out in 1906 by the Peachland Townsite Company. The company did not keep up repairs, and the condition of the system and the amount of storage left much to be desired. Growers received insufficient water, and to protect their investment in the land, they formed an improvement district and purchased the system with \$6,000 borrowed from the Conservation Fund.

The water is brought down part way in Peachland Creek, and the rest of the way by earth ditch and wood flume. Distribution to growers is mostly by wooden flume, with some metal pipe.

Present Condition.—According to the District brief, a great part of the works installed with money borrowed from the Conservation Fund is now obsolete. It is estimated that to put the system in good shape and to provide adequate storage, the District would require approximately \$25,000 to \$30,000.

Present replacements and installations are being made with concrete in an endeavour to provide structures which will outlive the period of indebtedness entailed in their construction.

Description of Area.—Peachland is relatively compact, being made up mostly of closely associated small farms. It is somewhat more hilly than most districts. The soil is average in quality.

Water-supply.—One of the biggest problems of this District is the shortage of water. The present supply comes from Peachland Creek and a diversion from MacDonald Creek. Water is stored in the Wilson Lake reservoir and in the North Fork reservoir, with a total capacity of about 800 acre-feet.

The evidence indicated that 2½ feet of water per acre was supplied to growers during the season. It was claimed that this was insufficient for conditions in the area.

Irrigable Acreage.—The irrigable acreage in this district is 771.

Revenue-producing Acreage.—The revenue-producing and irrigated acreage has increased as follows: 1938, 331 acres; 1946, 439½ acres.

Number of Growers.—There are approximately ninety growers in the District.

Number of Parcels of Land.—There are 171 parcels of land in the District.

Tax Sales.—During the drought period of 1929 to 1931 much of the irrigated land in Peachland reverted to the municipality for non-payment of taxes.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1920.....	\$81,446.09	\$204.00
Paid.....	21,765.22	55.00
Written off or not charged.....	51,868.17	130.00

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Owing in 1933.....	\$5,741.00	\$14.00
Owing as at March 15th, 1945.....	7,812.70	19.00
Owing as at March 15th, 1946.....	8,164.27	.....

Not operating under 1938 Arrangement.—This District is not operating under the 1938 arrangement.

Under Order in Council No. 751 of 1933 the outstanding indebtedness of the District was reduced from \$40,050.52 to \$5,741. The annual instalment was set at \$355.92, the first payment being due March 15th, 1939. As this first instalment was not yet due at the time negotiations were made with other districts, Peachland was not put under the 1938 arrangement.

Calculations were made showing how the 1938 formula would work out for Peachland. With the annual instalment required under Order in Council No. 751 set at \$356 and a Renewal Reserve requirement (calculated on estimates for the period 1938 to 1943, inclusive) of \$1,523 per year, the base rate would have been \$2.43 per acre. The total irrigable acreage was 771, but the total acreage irrigated was only 331. The amount of revenue received with the base rate of \$2.43 per acre would have totalled \$805—far below the amount required for Renewal Reserve. This would leave no money available for the Conservation Fund, and accordingly the 1938 arrangement could not be put into effect. It was suggested at the time that upon expiration of the six years on which the Renewal Reserve was estimated, the amount of the Renewal Reserve requirement should be reconsidered, as it could possibly be reduced.

The actual expenditures on renewals by Peachland have exceeded the estimated figure of \$1,523 by \$900 per annum, and it is anticipated by the District that the cost of renewals will continue far in excess of \$1,523 per annum. From 1943 to 1945 this District averaged \$3,237 per annum for renewals.

Since nothing has been paid into the Conservation Fund and interest has accumulated, the total indebtedness of the District has increased since 1933 from \$5,741 to \$8,164.27.

Irrigation Charges.—The following is a summary of irrigation charges levied by the Peachland Irrigation District:—

Tax per acre, 1946: \$21 per acre plus \$5 per parcel.

Toll per acre, 1946: None.

Special assessments:* Since 1938 the following special assessments have been made:—

1938: \$3,800 for road to headwaters and the North Fork flume.

1943: \$2,800 for 2,200 feet of main flume.

1944: \$4,000 for the MacDonald Creek diversion.

1946: \$9,000 for the construction of a new dam.

Average total charges per acre in 1946, \$22.

There are no domestic water rates. Domestic water is not supplied separately from irrigation-water.

Production.—Production consists almost entirely of tree-fruits—mostly apples, with some peaches and other stone-fruits.

Relative Productivity.—Production per tree is quite good, but because the orchards are small, the gross income per farm is not high. For purposes of comparison, I have placed the relative productivity of this district at 65.

Relative Incomes.—(See Table 19.)

* In this District, special assessments are included in the regular tax levy.

Special Factors to be considered.

1. *Penask Creek.*—Shortly after the District purchased the irrigation system from the Peachland Townsite Company, it became necessary to increase the water-supply, and a ditch was dug diverting water from Penask Creek.

In 1929 a severe drought occurred in the Peachland Creek watershed. In the same year the discovery was made that the District had failed to obtain a licence to divert water from Penask Creek, and this water consequently was not available. The growers in Peachland, as a result, lost that year's crop and many of their trees. Still more trees died out in the following year due to the water-shortage, so that by the spring of 1931 only 20 per cent. of the plantings remained. The Minister of Lands ordered a temporary licence to divert the Penask water in 1931 in order to save the remaining trees, but the water was not made available to the District on a permanent basis. As a result, many farms were abandoned and others were sold to new owners at very small prices, most of the people who remained being pensioners or those having outside incomes. Between 1929 and 1932 the number of irrigated acres dropped from 550 to 300.

Reduced irrigated acreage meant reduced revenues, out of which only the most urgent repairs could be attended to, with the result that the system, already old, quickly depreciated.

2. *Lands coming back into Production.*—In recent years precipitation has increased slightly, so that new settlers have been attracted to the District, raising the total irrigated acreage to close to 440.

In addition, war veterans are taking up lands which had reverted to the municipality for non-payment of taxes during the drought years. If the District supplies water to these lands, there will not be enough water to go around. If it refuses to supply the water, it will be the veterans who will suffer. The District feels keenly its moral obligation to furnish water to the lands which were once irrigated, and which are now being brought into production again by veterans. According to its understanding, the District is obligated to supply water to up to 550 acres if the owners demand it. There is not enough water under present conditions for 440 acres.

3. *Requirements of the District.*—The Trustees are faced with the problem of increasing the size of existing flumes, built during the period of low revenue; replacing flumes that have outlived their usefulness; finding additional storage to compensate for the loss of the Penask waters; and at the same time attempting to pay back their debt to the Conservation Fund.

A minimum of \$5,400 is needed this fall to raise the North Fork dam or construct a new dam at another site. The amount of water gained by raising North Fork dam a few feet would still barely meet the requirements of the District for water.

In 1930 a ditch and flume diversion was made to carry water from Peachland Creek into the North Fork storage. This was financed by \$5,000 borrowed from the Conservation Fund, but the diversion was washed out in places before it ever carried water. Later it had to be replaced with a new system several times larger, the cost being borne by the District. Faced with a water-shortage again in 1944, the District constructed a diversion from MacDonald Creek at a cost of \$4,000. The sum of \$3,600 is still owing the Royal Bank on this loan.

To put the system in good shape and to provide adequate storage, the District estimates that it requires approximately \$25,000 to \$30,000.

4. *Inability to Pay.*—The District stresses the fact that it is now being asked to pay its way in the future and at the same time pay for works not now in existence. With the Penask water cut off, for two years there was no alternate supply, and, as a result, trees and fruit were lost. With the trees and fruit, it is claimed, went the Dis-

trict's power ever to repay its debt to the Conservation Fund. Moreover, this outstanding indebtedness on the books makes it difficult for the District to borrow elsewhere for repairs. Even without paying anything into the Conservation Fund, the District will have to raise the tax rates in order to finance the necessary renewals and extensions to ensure a supply of water for the land.

Some of the older settlers testified as to their inability to pay higher charges. One witness stated that he had originally owned 10 acres, but in the drought of 1929 7 acres reverted for non-payment of taxes. He now has 3 acres, the income from which is supplemented by a pension from the Army. He pointed out that 2½ acre-feet of water was not sufficient, but the bare minimum with which to raise a crop. In 1944 the water-supply was exhausted by August 20th, and, as a result, a portion of the crop was lost. In many cases growers are only able to put a furrow on one side of the trees, where they should have two or three furrows. In 1929, according to his evidence, nearly 60 per cent. of the Peachland people abandoned their land; very few could afford to replant.

Another witness again stressed the shortage of water. He stated that the heat on the side of the hill at Peachland dries up the land rapidly, so that 2½ acre-feet is not sufficient. In order to make that amount do, a grower must "be on the job from 4 o'clock in the morning until 10 o'clock at night."

5. *District Suggestions.*—The Peachland District makes the following requests:—

- (1.) That the debt to the Conservation Fund be wiped out.
- (2.) That the Department help the District to obtain a substantial loan for a twenty-year period, repayable in equal annual instalments.
- (3.) That irrigation matters be transferred from the Department of Lands and Forests to the Department of Agriculture.

In addition, although they realize it might not come within the terms of reference of this Commission, the Trustees wish to press their claim for the right to divert water from Penask Creek.

COMMENTS AND RECOMMENDATIONS.

The shortage of water in this District appears to be the determining factor with regard to ability to pay. Growers are paying very high rates per acre for water without getting a sufficient supply to enable them to produce the highest quantities.

The Trustees do not appear to be quite clear as to their standing with regard to the Conservation Fund. They are apparently under the impression that they are operating under the 1938 arrangement, and do not understand why their debt is increasing. As explained in the foregoing, the District is not under the 1938 arrangement because the revenue obtained from the irrigated acreage does not exceed the amount required for Renewal Reserve, leaving nothing to pay into the Conservation Fund as a token payment.

Dr. W. H. Gaddes' report, prepared in 1929, states that the Peachland District had kept up its payments until that date. It is noteworthy that 1929 was the year when the Penask water was cut off from the District.

The significance of the following recommendations is that in my opinion the entire indebtedness should be liquidated by token payments only.

I recommend:—

- (1.) That the District be considered as having come within the 1938 arrangement and as having made a token payment of \$1 each year since that date.
- (2.) That the token payment of \$1 made annually since 1938 be considered as full payment of the amount required annually under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

- (3.) That for the year 1946 and each year thereafter the District make a token payment of \$100, and that this amount be considered as full payment of the amount required annually under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

ROBSON IRRIGATION DISTRICT.

(Public Hearings held August 6th, 1946, at 10 a.m., in the Robson Hall, Robson.)

SUMMARY OF DATA.

History and Description of the System.—The Robson Irrigation District was incorporated under the "Water Act" in October, 1922.

This is a gravity system, constructed in 1923 with \$20,000 borrowed from the Conservation Fund and local debentures of \$4,250. The system is entirely underground. Irrigation and domestic water are supplied through the same pipe-lines, which are in use all the year round.

Present Condition.—Practically no renewals have been made since 1938, although repairs have been taken care of from current revenue. The 3 miles of wood-stave pipe constructed in 1923, with an estimated life of 25 years, are due for replacement very soon. The District is faced with complete renewal of the line with larger pipe within a few years. Estimates for renewal of the pipe alone amount to \$35,220.13.

Description of Area.—The Robson Irrigation District is located in the West Kootenay area in the Columbia River valley, at the lower end of the Arrow Lakes, about 20 miles from Trail. The climate is fair for fruit-growing. The soil varies from clay to sandy loam, with gravel sub-soil, which allows rapid drainage. The combination of gravel sub-soil and the prevailing winds results in rapid evaporation of the top-soil, making irrigation necessary.

Water-supply.—The water is taken from a dam on Pass Creek through about 3 miles of wood-stave pipe-line. Shortly after construction of the system it became evident that this pipe-line was not large enough to carry sufficient water.

Irrigable Acreage.—The irrigable acreage, as calculated for the 1938 formula, is 339.

Revenue-producing Acres.—There are at present 262.4 revenue-producing acres in the District.

Number of Orchards.—There are approximately fifty orchards.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1923.....	\$36,559.27	\$139.00
Paid	18,125.81	69.00
Written off	9,511.55	37.00
Owing as at March 15th, 1945.....	8,921.91	33.00
Owing as at March 15th, 1946.....	8,585.15	.....

1938 Arrangement.—This District is operating under the 1938 arrangement.

Under Order in Council No. 751, 1933, the outstanding indebtedness of the District was reduced from \$11,669.57 to \$11,638.96, with an annual payment of \$721.

The following tabulation shows the adjustments in annual payments and amounts paid into the Renewal Reserve annually under the 1938 arrangement:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.*
		Required by O. C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$5.00	\$721.00	\$340.00	\$970.00
1942.....	5.00	721.00	342.00	948.00
1943.....	5.00	721.00	342.00	1,500.00
1944.....	5.00	721.00	342.00	970.00
1945.....	5.00	721.00	342.00	1,500.00
1946.....	5.00	721.00	342.00	970.00

* The Renewal Reserve was estimated over a period of fifteen years. More than the required amount (\$970 annually) was paid into this account.

The present standing of the Renewal Reserve Account is given below:—

Total payments as at March 15th, 1946.....	\$11,540.62
Interest accruals	841.64
Total expended from Renewal Reserve as at March 15th, 1946	582.55
Balance which should be in the Renewal Reserve as at March 15th, 1946.....	11,799.70

With regard to the 1938 arrangement, the District brief states:—

“The Robson Irrigation District has always understood that the Lougheed adjustment of 1933 as amended by the 1938 revision, which provided for the repayment of the loan in thirty years, was to be final and permanent settlement, and apparently this view is also held by other districts.”

Irrigation Charges.—The following is a summary of irrigation charges levied by the Robson Irrigation District:—

Tax per acre, 1946.....	\$6.00
Toll per acre.....	None
Total charge per acre, 1946.....	6.00

There have been no special assessments in this District since 1938.

Domestic Water Rates.—Domestic water rates are as follows:—

	Per Year.
Domestic toll on the ranches.....	\$18.00
Townsite toll for each house.....	24.00

Production.—Tree-fruits, mainly apples, are grown in this district. There are also some cherries and apricots. There is poultry on some of the farms.

Relative Productivity.—The productivity of this district is only fair, and for purposes of comparison has been placed at 40. The farms are small, and many of them are primarily residential. Many residents have obtained temporary or permanent work elsewhere to supplement their incomes.

Relative Incomes.—(See Table 20.)

Special Factors to be considered.

1. *Agreement with Doukhobors.*—In 1923, when the Robson Irrigation District put its pipe-line across Lot 237, the land was wild land owned by the Canadian Pacific Railway, and the line was put across without obtaining an easement permitting the District to cross this land. When Lot 237 was later sold to the Doukhobors, they sent a crew to tap the dam (which was on Sub-lot 54, owned by the Robson Irrigation Dis-

trict), and the Robson Irrigation District took out an injunction against the Doukhobors, restraining them from taking water from this dam. The matter was settled by an agreement, dated June 10th, 1930, between the Robson Irrigation District and the Christian Community of Universal Brotherhood, Limited, of Brilliant, which gives the Doukhobors the right to tap and use the concrete dam on Sub-lot 54 by entering and passing through the dam with a 14-inch pipe, with the top of the pipe level with the top of the present concrete. The agreement also included an easement across Blocks 1 to 12 of Sub-lot 54. In consideration of this the Doukhobors agreed to maintain and repair the dam and all additions thereto, including the new wing-dam and spillway and the works above the dam. The new wing-dam and spillway were to be constructed by the Doukhobors. In addition, the Doukhobors gave the Robson Irrigation District an easement across Lot 237.

According to the evidence submitted, the Christian Community of Universal Brotherhood, Limited, has done very little in assisting with repairs. The District has had to finance most of the work that has been done. Exhibit 107 shows expenditures on the dam by the District during the period 1931 to 1945, which total \$1,146.87. According to the evidence of the secretary of the Robson Irrigation District, the Doukhobors should have been responsible for approximately one-half of this expenditure.

2. *The Domestic System.*—The domestic system supplies all the domestic water within the boundaries of the Robson Irrigation System. With an increasing number of residents in the area, the District faces the problem of furnishing domestic water to them from an already short supply.

Domestic and irrigation rates, for the most part, are paid by the same people.

3. *Record of Payment.*—The District brief points out that the Robson Irrigation District has never defaulted in its payments as set by the Government, even though meeting the payments meant neglecting renewals. It now feels that "keeping this good name is an expensive policy and that some adjustments based on 'ability to pay' are unfair and that better terms could have been obtained if the District had defaulted for several years."

Local debentures borrowed in 1923, amounting to \$4,250 have been repaid, and the sum of \$18,125.81 has been paid back to the Government in principal and interest. Though it went through hard times in the "depression" years, and taxes had to be reduced, the payments to the Government were kept up.

4. *Water-shortage.*—The District brief indicates that the water-shortage in the Robson Irrigation District has adversely affected production. The low production has meant lower farm incomes, affecting the standard of living. Unless outside financial assistance is received for renewal of the pipe-line and augmenting the water-supply, it is claimed that production will not materially increase.

COMMENTS AND RECOMMENDATION.

The sizes of holdings in this District are very small. There are few full-time orchardists. Some who have been orchardists for many years still find it necessary to supplement their income by doing outside work. Others who are at present working in Trail are settling in the Robson district on very small acreages—from 1 to 4 acres. Their main work is at Trail, and what they have at Robson constitutes a home and a side-line. It is very doubtful if the indebtedness could be paid from the land alone. Under the 1938 arrangement the annual payment to the Conservation Fund amounts to slightly less than the interest charges on the indebtedness in this District, and even this is high for the District to pay and at the same time make provision for renewal of the system.

The Renewal Reserve should be substantially increased.

I recommend that \$100 be paid annually into the Conservation Fund, and that this token payment be accepted as full payment for the annual amount due under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

SCOTTY CREEK IRRIGATION DISTRICT.

(Public Hearings held July 26th, 1946, at 2 p.m., in the Court-house, Kelowna.)

SUMMARY OF DATA.

History and Description of the System.—The Scotty Creek Irrigation District was incorporated under the "Water Act" in March, 1944.

The system was originally constructed in 1918 under the Dyking and Drainage Act. It is a gravity system, with distribution through a cement ditch and wood and cement flumes.

Present Condition.—The concrete ditch, built at the inception of the District, was not a success and is the cause of much loss of water through seepage. The District desires to replace this ditch with a steel flume at an early date. No major replacement works have been carried out in the past fifteen years. It is estimated that it would take about \$20,000 to put the works in satisfactory condition and to provide adequate storage. The District has on hand about \$6,500 and wishes to use this to renew the main ditch. The Trustees also wish to raise the Trapper Lake dam another 5 or 6 feet.

Description of Area.—This is an area of fair soil and about average conditions. It is closely associated with the Black Mountain district. The trees and the area leave the impression that the water-supply has been limited, and that good times and prosperous conditions have not always prevailed.

Water-supply.—Water is stored in the Orchard Meadows Dam, which holds about 800 acre-feet. It is brought down Scotty Creek and picked up by an intake before it joins Mill Creek.

The District is very short of water. The system is inadequate to supply the total taxed acreage, and few of the growers attempt to cultivate their entire irrigable acreage. The storage water sometimes peters out in August.

The average amount of water used is $2\frac{1}{2}$ to 3 acre-feet.

Irrigable Acreage.—The irrigable acreage, as calculated for the 1938 formula, is 1,127 acres.

Revenue-producing Acreage.—The revenue-producing acreage in 1945 was as follows: Grade A, 762.69 acres; Grade B, 100 acres.

Grade B is hay-land, which takes the water direct from the creek without making use of the District ditch, and accordingly pays a lower tax than that paid by "A" land.

Number of Growers.—There are approximately nineteen growers in this District.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of the District with regard to both Principal and Interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1918.....	\$77,980.78	\$90.00
Paid	35,890.47	42.00
Written off or not charged.....	23,556.17	27.00
Owing as at March 15th, 1945.....	18,534.14	21.00
Owing as at March 15th, 1946.....	18,480.77	.....

1938 Arrangement.—This District is now operating under the 1938 arrangement.

Under Order in Council No. 751 of 1933 the total indebtedness of the District was reduced from \$26,179.01, to \$20,000, and the annual instalment was set at \$1,240.

By the 1938 arrangement the District was requested to pay \$881 in lieu of the \$1,240 referred to above.

The following tabulation shows the adjustment in annual payment and the present requirement:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$1.37	\$1,240.00	\$881.00	\$300.00
1946.....	1.37	1,240.00	881.00	300.00

The standing of the Renewal Reserve Account is given below:—

Total payments as at March 15th, 1946.....	\$2,400.00
Interest accruals .....	.....
Total expended from Renewal Reserve as at March 15th, 1946	374.58
Balance which should be in Renewal Reserve as at March 15th, 1946	2,025.42

According to the brief, the Scotty Creek Irrigation District was under the impression that this 1938 arrangement was the final and permanent settlement of the irrigation question.

Irrigation Charges.—The following is a summary of irrigation charges levied by the District:—

Combined tax and toll per acre, 1945: "A" land, \$4.74; "B" land, \$1.94.

This constitutes the total charge per acre. In this connection it should be noted that because of the shortage of supply, most growers do not spread their water over all the acreage on which they pay taxes. It is estimated that they actually water only about one-half of the acreage. This would make their actual rate per producing acre about twice as high as the rate indicated above.

There have been no special assessments since 1938.

There is no domestic water system maintained by the District.

Production.—Less than one-half the cultivated land is in orchards. The balance is in hay and vegetables.

Relative Productivity.—In the opinion of Mr. Ben Hoy, District Field Inspector, Provincial Department of Agriculture, the productivity of Scotty Creek is less than that of Glenmore, South-east Kelowna, Black Mountain, or Westbank.

In the northern area, which includes Scotty Creek, it is more difficult to grow winter varieties of apples than it is to grow them in the Southern Okanagan. Peaches and apricots grown in the northern districts come in later and therefore do not have so good a choice of markets. Scotty Creek must grow early varieties, and these come onto the market at the same time as the better-quality mid-season varieties in the South.

For purposes of comparison, I have placed the productivity of this district at 60.

Relative Incomes.—It was not possible to segregate this District with regard to gross incomes. The Scotty Creek growers are included in the Kelowna table, No. 16.

Special Factors to be considered.—The District secretary states that much loss of water has been occasioned in the past through trying to stretch the supply too far, resulting in loss of crops. He states that there is some of the best land and the finest soil in the country in the Scotty Creek district, but that the lack of water has given it an unenviable reputation for crop-failures.

The District hopes that some additional water may be obtained from Mission Creek through the Black Mountain system, if that system can enlarge its laterals. This is the only apparent source from which a plentiful supply could be obtained.

There are hundreds of acres of good land in and around the district which have no water rights, according to the evidence submitted. It is estimated that within the Ellison Polling Division there are 2,000 acres which have no water rights, and about half of these would naturally come within the boundaries of the Scotty Creek District. Included in these lands is the Christian Ranch, owned by the Provincial Government. It is pointed out that the cost of irrigation is increased through having to carry water past the dry lands to the irrigated lands beyond. The District claims that if funds were available for expansion of the Black Mountain laterals, sufficient water could be obtained from Mission Creek to irrigate every acre of this land. The contention is that the soil on the dry lands is good, some of it better than that on the land now irrigated.

Request for Assistance.—During the past few years the growers have taxed themselves extra to provide a reserve to carry on renewals, over and above that required of them under the 1938 arrangement. They now have on hand some \$6,500 for this purpose. In 1945, due to the far more rapid deterioration of the system than was anticipated, and the greater expenditure required, the District requested the Government to remit its payment to the Conservation Fund over a period of five years in order to increase the Renewal Reserve.

The District has also requested permission to use all or part of the Renewal Reserve for improvements or extensions.

COMMENTS AND RECOMMENDATIONS.

The main problem in this District would appear to be the shortage of water. It is significant that growers attempt to make best use of the water available by irrigating only about half the acreage on which they pay the regular irrigation tax. It is claimed that this brings their actual cost of irrigation close to \$9.50 per producing acre, rather than the \$4.74 as shown in the per acre charge.

In my opinion this District has made a good attempt to produce and to pay, even though working under a condition of very limited water-supply. Without additional water I do not see how they can produce more and pay more. The annual payment to the Conservation Fund has been made at the expense of the system and of the Renewal Reserve. The system has deteriorated badly, and production is at a low level. The future of the District lies in improving production.

I recommend that the taxes and tolls be maintained at the present level or be increased if possible, and that special attention be given to obtaining and delivering an adequate supply of water. I also recommend that \$300 be paid annually into the Conservation Fund, and that this amount be accepted for the full annual payment required under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

SOUTH-EAST KELOWNA DISTRICT.

(Public Hearings held July 26th, 1946, at 9.30 a.m., in the Court-house, Kelowna.)

SUMMARY OF DATA.

History and Description of the System.—The South-east Kelowna Irrigation District was incorporated under the "Water Act" in November, 1920.

The system was acquired from a private land company which had failed to maintain the water service.

It is a gravity system, originally intended to supply water to 4,600 acres, but 2,000 of these were relatively poor land. Within two years the acreage was reduced to 2,400. As a result, the system is widely extended for the total acreage irrigated.

Present Condition.—The system is in fair physical condition, with the exception of a number of weak points where trouble may develop at any moment. In addition to the annual Renewal Reserve of \$4,850, the District anticipates a cost of \$3,000 per annum for the next five years, for the replacement of the Mission Creek system, which was washed away in a slide.

The District feels that it must investigate the possibility of conserving more water. It is trying to make replacements with "long life" structures, and cannot see any possibility of reducing expenses for ten years at least.

Description of Area.—The soil in this district requires more water than is needed by the soil in some of the other districts under review. The sub-soil in many places is rock and gravel. Water could be saved by the use of sprinklers.

Water-supply.—The main reservoir is McCulloch Lake, but water is also stored at No. 9 dam in Haines Lake and in some smaller lakes. The storage capacity is around 12,000 acre-feet. An additional 2,000 acre-feet can be obtained by pumping out of Haines Lake. Natural-flow water is also obtained from Mission Creek. The amount now supplied is about 3 to 3½ acre-feet.

Irrigable Acreage.—In 1920, at date of incorporation, the irrigable acreage was 4,600. In 1938 it was set at 4,076 acres.

Revenue-producing Acreage.—In 1938 the revenue-producing acreage was 2,275; in 1942 it was 2,533; and in 1945 it was 2,475 acres (Grade A, irrigated).

Number of Growers.—There are approximately 113 growers.

Tax Sales.—Tax sales for non-payment of irrigation charges have been held annually since 1921, but in most cases the lands have been redeemed by the owners.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1920.....	\$824,873.94	\$323.00
Paid	196,780.85	77.00
Written off or not charged.....	440,725.96	169.00
Owing as at March 15th, 1945.....	197,367.13	77.00
Owing as at March 15th, 1946.....	193,519.89	.....

1938 Arrangement.—By Order in Council No. 751, 1933, the total indebtedness of the District was reduced from \$437,520.87 to \$200,000, with an annual repayment of \$12,400. The District proved unable to meet its annual repayments, and twice had to ask that these be switched to the end of the thirty-year period for the amortization of the debt.

It is now operating under the 1938 arrangement. Under this arrangement the District was to set aside annually the sum of \$4,250 for Renewal Reserve. In October, 1942, a further adjustment was made to allow for replacement of the Mission Creek flume, which had been lost in a slide. By this adjustment the Renewal Reserve was increased from \$4,250 to \$4,850, provided not less than \$6,000 was paid annually into the Conservation Fund. Upon making this minimum token payment of \$6,000, the District could be credited with the annual instalment of \$12,400 required by Orders in Council No. 751 and No. 974.

The following tabulation shows the adjustments in annual payments and the present requirements:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1933.....	\$4.08	\$12,400.00	\$6,013.00	\$4,250.00
1943.....	4.23	12,400.00	6,000.00	4,850.00
1946.....	4.23	12,400.00	6,000.00	4,850.00

The standing of the Renewal Reserve Account is given below:—

Total payments as at March 15th, 1946.....	\$36,400.00
Interest accruals	68.93
Total expended from Renewal Reserve as at March 15th, 1946	34,580.45
Amount which should be in Renewal Reserve as at March 15th, 1946	1,888.48

In addition to provision for Conservation Fund payment and Renewal Reserve, on an average the sum of \$16,308.28 is provided annually by this District for administration, operation, maintenance, and other incidental expenses.

The District brief states that at the time the 1938 arrangement was introduced, the District was definitely given to understand that it was to be final as between the Department of Lands and the South-east Kelowna Irrigation District. In support of this it is pointed out that the Renewal schedules cover a period of thirty years—the time required for amortization of the debt. The brief also states that Captain C. R. Bull, who was member of the Legislative Assembly for the South Okanagan at the time, is emphatic in his support of this point of view. The District is well satisfied with the 1938 arrangement, and states as follows: "We believe we can continue to live under this arrangement, and strongly urge that it be confirmed and continued."

Irrigation and Domestic Water Charges.—The following is a summary of irrigation and domestic water charges levied by the South-east Kelowna Irrigation District:—

Tax per acre, 1945.....	\$10.70
Average toll per acre, 1945.....	2.76

Total irrigation charges per acre, 1945..... \$13.46

The domestic and irrigation systems are interlocked; the domestic system could not maintain itself separately. The District's obligation for the domestic water system equals approximately \$3.20 per acre. It levies a tax of \$1 per acre on all Grade A lands that receive domestic water and on Grade C lands that receive domestic water only. A minimum charge of \$5 is set for those Grade C properties that are less than 5 acres. In addition to the Grade C tax, there is a quarterly charge of \$13.50 for each connection less 20 per cent. discount, or \$10.80 net.

In 1942 there was a special assessment of \$1 per acre on Grade C land to cover repairs necessitated by extensive flood damage to the domestic system in Canyon Creek.

Production.—All of the tree-fruits are grown in this district, but apples predominate. There are few very young orchards, and the district is rapidly approaching its maximum production.

The average size of the individual holding is about 20 acres.

Relative Productivity.—This is a high-producing area—the highest of the districts named in the terms of reference. For purposes of comparison I have rated it at 100.

Relative Incomes.—South-east Kelowna growers are included in the Kelowna table of incomes, No. 16.

Special Factors.—In this district, 55 farms out of a total of 108 have changed ownership since 1939, at high prices. The evidence indicates that while a few growers of long-time experience have purchased additional acreage, for the most part growers of long experience have offered their farms for sale. Some of this property has sold at as high as \$1,500 per acre.

COMMENTS AND RECOMMENDATION.

The sum now being paid annually into the Conservation Fund under the 1938 arrangement is \$6,000. This, in my opinion, is reasonable, and the District should be able to continue to pay it, except in cases of catastrophe and extreme emergency.

I recommend that \$6,000 be paid annually into the Conservation Fund, and that this amount be accepted for the full annual payment required under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

VERNON IRRIGATION DISTRICT.

(Public Hearings held July 19th, 1946, at 1.30 p.m., in the City Hall, and July 20th, at 9.30 a.m., in the Scout Hall, Vernon.)

SUMMARY OF DATA.

History and Description of the System.—The Vernon Irrigation District was incorporated under the "Water Act" in December, 1920.

This is a gravity system, originally constructed by the White Valley Irrigation & Power Company and the Coldstream Estate Company. The Government had advanced to the White Valley Company \$185,817.03 towards reconstruction, but the system was still in bad shape. Extensive repairs and additions were immediately necessary. To purchase the system and take over its liabilities cost the District \$403,481.03; repairs by 1924 totalled \$315,643.97, making the total cost to the District \$719,125.

Present Condition.—Parts of the distribution system are 38 years old. Immediate attention is being given to the most fragile structures. In the opinion of the manager it would be desirable to expend \$35,000 to \$40,000 each year for the next ten years in improvements, replacements, and possibly some enlargements. The main canal should be lined with concrete blocks to prevent seepage. It might also be desirable to raise Haddo Dam.

Description of Area.—This is a non-uniform, sprawling district, extending from Okanagan Lake to the marginal area to the north. Some orchards are in excellent shape and are producing heavily; others are not so good. The area is heavily planted to vegetables for shipment and for processing.

Water-supply.—Water is stored in Aberdeen Lake, Haddo Lake, King Edward Lake, Goose Lake, Fish Lake, and Summit Lake, which have a total capacity of 15,750 acre-feet. The District has delivered an average of 7,700 acre-feet of storage water per year for the past ten years.

One-quarter of the water released from Aberdeen and Haddo reservoirs is lost on the way to the headgates, and 35 per cent. is lost in distribution.

Under the present condition of the system there is not sufficient water to supply additional acreage.

Approximately 2½ acre-feet of water are delivered by the District during the season.

Irrigable Acreage.—The irrigable acreage in 1920 was estimated at 14,000; it is now 12,301 acres, as set in the 1938 formula.

Revenue-producing Acreage.—The revenue-producing acreage has decreased as follows: 1938, 8,600 acres; 1946, 7,710.68 acres.

Number of Growers.—There are approximately 500 land-owners in the district, of whom 365 receive water service.

Tax Sales.—Very little land has been up for tax sale since 1941. One small parcel of land was sold for taxes in 1945.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both Principal and Interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1920.....	\$1,792,381.02	\$249.00
Paid	417,628.56	58.00
Written off or not charged.....	899,515.74	125.00
Owing as at March 15th, 1945.....	475,236.72	66.00
Owing as at March 15th, 1946.....	471,947.71	.....

1938 Arrangement.—This District is operating under the 1938 arrangement, with a special adjustment.

Under Order in Council No. 751 of 1933 the outstanding indebtedness of the District was reduced from \$887,085.96 to \$435,000, the annual instalment being \$27,103.

By the 1938 arrangement the irrigable acreage was set at 12,301 and the Renewal Reserve at \$26,827 (estimated over a five-year period), giving a base rate of \$4.38 per acre. With the revenue-producing acreage then at 8,600 acres, the payment to the Conservation Fund would have amounted to \$10,841.

Through a special concession made December 20th, 1938, the District was only required to pay to the Conservation Fund an annual instalment of \$3,575 plus \$2.50 per acre for the revenue-producing acreage in excess of 8,000. Should the revenue-producing acreage drop below 7,000, the regular 1938 formula, with a base rate of \$4.38 per acre, would again apply.

The following tabulation shows the adjustments in annual payment and the present requirement:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$4.38*	\$27,103.00	\$3,575 plus \$2.50 per acre over 8,000 = \$5,341.42	\$26,827.00
1946.....	4.38*	27,103.00	\$3,575	\$26,827.00

* Base rate calculated but not used because of the special adjustment.

Under this arrangement the amount to be set aside for Renewal Reserve annually, \$26,827, was not put into a special fund, as it was immediately needed for renewals. During the period March 16th, 1938, to December 31st, 1945, a total of \$212,135.01 was actually expended on the works.

The District is anxious to have the special terms granted in 1938 continued for the future.

With regard to the permanency of the 1938 arrangement the brief states that the Minister of Lands gave the Trustees the following assurance at that time:—

“That the Government would never attempt to collect the balance owing to the Conservation Fund by the Vernon Irrigation District, provided the District lived up

to the 1938 agreement; that it would require a token payment each year only; but that the indebtedness would not be cancelled but would be used as a club to hold over our heads to ensure proper maintenance and improvement of the system."

Irrigation Charges.—The following is a summary of irrigation charges levied by the Vernon Irrigation District:—

Tax per acre, 1945—	
“ A ” lands	\$1.00
“ B ” lands	2.00
Average toll per acre, 1945.....	6.20

Consolidated and Funded Taxes.—Arrears of taxes owing for 1927–32 were consolidated and made payable to the District over a fifteen-year period; taxes owing for 1936–37 were funded over a ten-year period at 6 per cent. and made payable to the District.

A total of 1,317 acres pay consolidated, funded, and current taxes, totalling \$5.33 per acre; 2,378 acres pay funded and current taxes, totalling \$3.47 per acre.

Total charges per acre, 1945: \$14.45 per acre (maximum), \$6.50 per acre (minimum).

There have been no special assessments since 1938.

No domestic water is supplied by the Vernon Irrigation District.

Production.—There are approximately 7,600 acres of Grade A land, divided up somewhat as follows: Fruit, 3,200 acres; vegetables, 2,620 acres; hay and grain, 1,780 acres. Of the fruit, approximately 10 per cent. would be soft fruit. Of the apple-trees, it is estimated that about 50 per cent. are in full production.

Acreage in fruit is not likely to increase greatly. The acreage in vegetables may increase.

Relative Productivity.—In the opinion of Mr. Morrice Middleton, District Horticulturist of the Department of Agriculture, McIntosh apples are the most remunerative here. The Vernon district cannot grow Winesaps or Yellow Newtowns except in very limited sections; therefore it is not in such a favourable position as are districts farther south. This is borne out also by the opinion of Mr. H. J. H. Evans, District Field Inspector, to the effect that the Vernon district is not suited to the production of the best winter varieties, but is restricted to lower-priced varieties such as McIntosh, Wealthy, Duchess, Grimes Golden, and crab-apples. In the opinion of Mr. Ben Hoy, Vernon has some of the best soil in the Okanagan, but is at a disadvantage with regard to crops and varieties that can be grown that far north.

I have placed the relative productivity at 70. (Some sections of this district could be rated much above 70, and others much lower. There is great variation.)

Relative Incomes.—(See Table 21.)

Special Factors to be considered.

1. *High Cost of Original System.*—The District feels that holders of the debentures on the original system were protected at the expense of the water-users. The cost of the system, plus liabilities to the Government for repairs already made, plus necessary expenditures on additional repairs, amounted to \$719,125. By 1933 interest on this amounted to approximately \$340,000. The “Lougheed Settlement” reduced the total debt from \$887,085.96 to \$435,000 (Government figures). In 1945, after years of effort in improving the works, the value of the system properties as shown on the auditors’ statements is \$521,012.50. The brief comments that it would appear that the land-owners made a very poor bargain for themselves in 1920. In addition, the land companies were only liable for taxes when unable to rent their lands, thus throwing the burden on the individual farmers who worked their holdings and were responsible for both taxes and tolls.

2. *Reduced Acreage of Irrigated Land.*—In 1938 the irrigated area totalled 8,600 acres. In 1946 it was down to 7,700 acres. This decrease is spread throughout the district for the most part, and the full maintenance cost of laterals must be carried by the reduced acreage, thus increasing the capital debt per irrigated acre.

When the District was formed, it was believed that 14,000 acres could be irrigated, and that total charges, including taxes and tolls, would be about \$5 an acre. In 1927 the total charge was as high as \$8.70. Moratoriums and reductions of the total indebtedness had to be granted because of the growers' inability to pay the higher charges necessitated by reduced acreage.

3. *Vegetable and Hay Lands.*—The fact that a large portion of the irrigated acreage in this district is devoted to vegetables and hay and grain production constitutes a special problem. If hay and grain lands are asked to pay higher rates, they will be forced out of irrigation and leave the orchards with an added burden.

A statement from Bulman's, Limited, a food-processing plant in Vernon which uses fruits and vegetables produced locally to the value of about \$395,000 per year, indicates that it is essential to them that production costs become more settled.

A brief from the Coldstream Ranch states that even at present rates of taxation it is not economical to use irrigation-water in the growing of grain or hay, and that if rates on these lands are raised, the lands will be withdrawn from the irrigation district. After the 1938 arrangement was made, the Trustees instituted a policy of low taxes and high tolls to enable the hay and grain lands to use a small quantity of flood-water at a low cost, and so to remain in Grade A and assist the balance of the District by the payment of a low tax. It was also thought that such a policy would enable the hay and grain lands to use some irrigation-water to produce vegetables when the demand so warranted.

4. *Seepage.*—Seepage constitutes a grave problem in this District. For twenty years 102 acres of land have been taxed \$1 per acre higher than Grade A lands, on the grounds that they cause seepage to lands below. The District is threatened with lawsuits for damages caused by seepage and, to avoid these, must line the main canal with concrete blocks. About 45 per cent of the water stored in the dams is lost in the process of delivery. There are 39,600 feet of the canal lined, or partly lined, and 187,580 feet still to be lined with concrete. This represents an important expenditure.

5. *Rising Costs, Fluctuating Markets.*—The District brief also points out that while farmers to-day are obtaining good prices for their produce, the cost of materials and services is steadily increasing. Labour is demanding higher wages and shorter hours.

It is now estimated that because of rising costs of labour and materials, and the general force of circumstances, it will be necessary for the District to increase its budget from \$51,000 to \$78,000.

6. *Codling-moth.*—Until 1926 the Government sprayed the orchards to eradicate codling-moth. When the infestations became heavier, the Government stopped giving this assistance, and it became the growers' responsibility. They now put on about six or seven sprays a year. This represents a cost the growers did not have to bear twenty years ago.

7. *Land Sales.*—A great many land sales are taking place in this district. Most of these are old existing parcels of land, but also many new parcels are being created by subdivision.

8. *Condition of Orchards.*—This district claims that it pioneered fruit-growing in the Okanagan, and has not yet recovered from the effects of early mistakes in varieties planted. Its orchards are already old and in need of replanting to the extent of one-third.

9. *Gaddes' Report.*—In 1929 Dr. W. H. Gaddes, in his report on the Vernon District, wrote as follows:—

“This is the largest District, has the most varied classification of land and products. Without the remittance of the Government obligation I do not think it can survive, and with this relief the Trustees will have a difficult but not hopeless task.”

Under the relief afforded by the “Lougheed Settlement” of 1933, and the special adjustment of 1938, the District has been able to carry on.

COMMENTS AND RECOMMENDATION.

The District is anxious to have the terms of the 1938 arrangement continued, and I believe that this request is reasonable and fair. I doubt very much the ability of the District to pay any additional sum to the Conservation Fund. For the past year \$3,575 was paid.

I recommend that \$3,575 be paid annually into the Conservation Fund, and that this amount be accepted for the full annual payment required under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

WESTBANK IRRIGATION DISTRICT.

(Public Hearings held July 30th, 1946, at 2.30 p.m., in the Community Hall, Westbank.)

SUMMARY OF DATA.

History and Description of the System.—The Westbank Irrigation District was incorporated under the “Water Act” June, 1922.

This is a gravity system, originally constructed by a Mr. D'Eath in 1907 and developed by him and his associates. For the nominal sum of \$1 the District took over this system in 1922 and borrowed from the Government to build a new main flume and new dams. Distribution is effected mostly by metal flumes and pipe-lines.

Present Condition.—Part of the system is not in a safe condition, and it needs constant watching. Renewal costs are going to be heavy.

Description of Area.—The area is relatively compact, and the orchards are well cared for. Seepage has caused loss in a few places. The soil is variable, but as a whole is reasonably good.

Water-supply.—Water is stored in Horseshoe and the two adjoining lakes, in Dobbin Lake, Paynter Lake, and Bear Lake, with a total capacity of about 1,300 acre-feet.

The average amount of water supplied in a season is 4 acre-feet, including flood-water.

Irrigable Acreage.—The irrigable acreage, as calculated for the 1938 formula is 701.

Revenue-producing Acreage.—The revenue-producing acreage has increased as follows: 1938, 613 acres; 1942, 628.06 acres; 1946, 698 acres (“A” land, 680 acres, and “B” land, 18 acres).

Irrigated Acreage.—The irrigated acreage in 1946 was 628 acres.

Number of Growers.—There are approximately fifty-eight growers in this District.

Tax Sales.—Many lands reverted to the District in 1928 for non-payment of taxes. None have reverted since 1935. In 1945 there was a demand for the reverted lands, and they were sold at about \$50 an acre.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both Principal and Interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1922	\$86,662.54	\$134.00
Paid	23,051.90	36.00
Written off	44,718.75	69.00
Owing as at March 15th, 1945	18,891.89	29.00
Owing as at March 28th, 1946	18,138.20	-----

1938 Arrangement.—The District is operating under the 1938 arrangement.

By Order in Council No. 751 of 1933 the outstanding indebtedness was reduced from \$50,020.03 to \$20,000, with the annual repayment set at \$1,240.

Under the 1938 arrangement the District was instructed to set aside a Renewal Reserve of \$2,470 annually, which gave a base rate of \$5.29 per acre and a payment to the Conservation Fund of \$773, calculated on an irrigable acreage of 701 and a revenue-producing acreage of 613. In 1942 the Renewal Reserve was increased to \$2,739, giving a base rate of \$5.68 and a payment to the Conservation Fund of \$828.38. This is the arrangement under which the District is operating at the present time.

The following tabulation shows the adjustments in annual payment and the present requirement:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$5.29	\$1,240.00	\$773.00	\$2,470.00
1942.....	5.68	1,240.00	828.38	2,739.00
1946.....	5.68	1,240.00	835.00	2,739.00

The standing of the Renewal Reserve Account is given below:—

Total payments as at March 16th, 1946	\$21,105.00
Interest accruals	946.61
Total expended from Renewal Reserve as at March 15th, 1946	11,838.93
Balance which should be in the Renewal Reserve as at March 15th, 1946	10,212.68

The Westbank Irrigation District states that it was under the impression that the 1938 arrangement was permanent so long as the District lived up to it.

Irrigation Charges.—The following is a summary of irrigation charges levied by the Westbank Irrigation District:—

Tax per acre, 1946—	
“ A ” land	\$5.90
“ B ” land	2.95
Tolls per acre—	
1939	3.00
1945	4.00
1946, less 10 per cent.	7.00
Total charges per acre (“ A ” land)	12.90

There have been no special assessments in this District since 1938.

Domestic water is not supplied by the District. Users of domestic water pay the outside distributors \$1 per month.

Production.—Apples, cherries, and a few peaches are produced in this area. There is also a limited amount of vegetables grown here.

Relative Productivity.—In the opinion of Mr. Ben Hoy, District Field Inspector of the Provincial Department of Agriculture, Westbank is less productive than Glenmore, South-east Kelowna, or Black Mountain.

For purposes of comparison, I have placed the relative productivity at 80.

It is expected that conditions will improve considerably in this district.

Relative Incomes.—(See Table 22.)

Special Factors to be considered.

1. *Additional "A" Lands.*—The evidence indicates that there are about 100 acres of "A" land in the District which are not receiving water at this time. The "A" land has increased since 1938 from 613 acres to 680 acres, and this year the District had to turn down an application to take in more "A" land because the flume was not big enough to supply sufficient water.

2. *Taxes and Tolls.*—The tolls per acre have increased since 1945 from \$4 with no discount to \$7 with a 10 per cent. discount, or a net of \$6.30, in 1946. The tax rate is \$5.90 on "A" land.

One witness testified that his experience showed the land could not stand charges higher than \$8.50 per acre over a period of years. He pointed out that the increased returns of the past few years merely gave the grower an opportunity to renew his equipment and machinery, which were neglected during the depression period, and that provision must be made for recurring periods of depression.

3. *District Request.*—The Westbank Irrigation District would like permission to use the amount now available in Renewal Reserve to pay its debt to the Conservation Fund on the basis of 50 cents on the dollar. This would use up \$9,272.40 of the Reserve, leaving a small balance for renewals. The District would keep up its tax levy for renewals. Based on a 1946 estimate, contemplated renewals for the next ten years total \$50,564.

COMMENTS AND RECOMMENDATION.

While this District is not wealthy, it is in good financial condition as a whole and is growing in prosperity. During recent years it has paid varying amounts into the Conservation Fund, and with increasing acreage under water, I believe it can continue to make payments.

I recommend that \$835 be paid annually into the Conservation Fund, and that this amount be accepted for the full annual payment required under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

WINFIELD AND OKANAGAN CENTRE IRRIGATION DISTRICT.

(Public Hearings held on July 19th, 1946, at 10 a.m., in City Hall, Vernon, and July 29th, 1946, at 3 p.m., in Community Hall, Rutland.)

SUMMARY OF DATA.

History and Description of the System.—The Winfield and Okanagan Centre Irrigation District was incorporated under the "Water Act" in May, 1930.

The system is operated by the Okanagan Centre Irrigation & Power Co., Ltd. It is a gravity system, originally constructed by Maddock Bros. about 1909. It includes a dam and intake on Vernon Creek out of Beaver Lake, a balancing-reservoir at Okanagan Centre, and about 157,337 feet of water-lines, including 4,525 feet for domestic water-supply.

In order to supplement and conserve the water that the company is expected to deliver, the District borrowed \$13,000 from the Conservation Fund in 1931 to build Crooked Lake dam and a flume known as the "by-pass." In 1944 the District spent \$10,000 in helping to rebuild Beaver Lake dam.

Present Condition.—The system is not in good condition. According to the report on "Appraisal of Property and Investigation of Operations of the Okanagan Centre Irrigation & Power Co., Ltd., to May 1, 1944," made by the Public Utilities Commission, about \$150,000 will be required for replacements during the period 1944 to 1949. The company stated that in 1944 and 1945 it spent a total of \$74,000 on the new dam, renewals, and replacements.

The system is now carrying water to its full capacity. The report referred to above indicated that interruptions in service would be reduced if pipe-lines were renewed where they have exceeded the normal life-span.

Description of Area.—This is a relatively compact area, on loam and sand soil. It is rolling, but not hilly.

Water-supply.—Water is stored in the Beaver Lake chain of lakes, which has a total capacity of 10,000 acre-feet.

The original agreement between the company and the land-owners called for delivery of 1 foot per acre per season. At present about 20 per cent. of the acreage receives 1 acre-foot, 50 per cent. receives 1½ acre-feet, and 30 per cent. receives 2 acre-feet per season.

Irrigable Acreage.—The irrigable acreage in this district is 2,050 acres.

Revenue-producing Acreage.—The revenue-producing acreage in 1946 is 1,901 acres.

Irrigated Acreage.—The irrigated acreage in 1946 is 1,835.25 acres.

Number of Growers.—There are 127 irrigation-water users in the District, of whom 112 are growers.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both principal and interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1930	\$21,081.81	\$11.00
Paid	7,430.11	4.00
Written off	255.40	-----
Owing as at March 15th, 1945	13,396.30	7.00
Owing as at March 15th, 1946	13,999.13*	-----

* The debt is increasing because this District has not made any payments since 1941.

1938 Arrangement.—Under Order in Council No. 751 of 1933 the outstanding indebtedness of this District was reduced from \$12,585.22 to \$12,533.82. The annual repayment was set at \$777.

By the 1938 arrangement the District was requested to pay to the Conservation Fund an annual sum of \$709 in lieu of the \$777 required by Order in Council No. 751.

Although the Winfield and Okanagan Centre District does not operate the distribution system, it has constructed a dam to store water. Accordingly, the 1938 arrangement made provision for a Renewal Reserve of \$200 annually, for the replacement of the gates in the dam.

The following tabulation shows the adjustment in annual payment and the actual payments made under the 1938 arrangement:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.		Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Accepted by the 1938 Arrangement.	
1939.....	\$0.48	\$777.00	\$709.00	\$200.00
1940.....	.48	777.00	709.00	200.00
1941.....	.48	777.00	709.00	200.00

As previously noted, the District has not made any payments since 1941.

Irrigation Charges.—The following is a summary of irrigation charges levied by the Okanagan Centre Irrigation & Power Co., Ltd., and by the Winfield and Okanagan Centre Irrigation District:—

Company: 1946—\$10 per acre-foot of water; on the basis of delivery of 1½ acre-feet of water, average charge per acre is \$15.

District: The usual District tax is \$1 per acre. This is levied to cover repayment of the money borrowed from the Conservation Fund for the construction of Crooked Lake dam. In 1944 the tax was increased to \$5 per acre to cover half the cost of Beaver Lake dam. As this was not sufficient to pay off the debt in one year, the rate for 1945 was set at \$2 per acre. The 1945 tax is payable in 1946.

Total average charges payable in 1946—	Per Acre.
Company toll for 1946.....	\$15.00
District tax for 1945.....	2.00
	\$17.00

Domestic Water Rates.—The company charges \$6 per quarter (\$24 per year) less 10 per cent discount for domestic water. There are approximately 150 domestic-water users. They are permitted to water up to ¼ acre of garden at the above-mentioned rate.

Production.—Apples are the main crop, but some of the other tree-fruits also are grown.

Relative Productivity.—According to Mr. Ben Hoy, District Field Inspector of the Provincial Department of Agriculture, in a small part of Okanagan Centre down near the lake, it is possible to grow the winter varieties of apples better than they can be grown at Vernon.

For purposes of comparison, I have placed the relative productivity of this District at 80.

Relative Incomes.—(See Table 23.)

Special Factors to be considered.

1. *Ownership of System.*—According to the District brief, the major problem in this area is the ownership, maintenance, and continuity of the distribution system.

At the present time the Okanagan Centre Irrigation & Power Co., Ltd., and its parent company, the Okanagan Valley Land Co., Ltd., own the intake on Vernon Creek, the pipe-line, a half-interest in the dam and rock-cut at Beaver Lake, and leasehold rights and easements over the water-line from Beaver Lake. Under its agreement with the water-users the company obtains the right-of-way for pipe-lines over users' property. The company does not own the water; it may be regarded as a carrier. It is obligated to deliver 1 acre-foot of water per season, and actually delivers about 1½ acre-feet of water.

The District owns a half-interest in Beaver Lake dam and a full interest in Crooked Lake dam and a flume known as the "by-pass." The District is of opinion that the amounts expended by it in acquiring these interests—\$13,000 in 1931 and \$10,000 in 1944—were only necessitated by the company's failure to provide adequate storage. Similarly, an amount of \$30,000 obtained by the company in 1945 to finance the emergency renewal of an important section of pipe-line close to Beaver Dam was only secured through the District backing the bonds and making upon its water-users an additional charge per acre-foot. The District believes that such a charge would not have fallen upon it had the Company been able to provide suitably for replacements. In effect, it

claims that the District is paying piecemeal, through financing storage and replacements, for a system which it does not own.

Requirements for renewals and replacements are expected to be heavy for some time to come. In 1944 the Public Utilities Commission estimated that approximately \$150,000 would be required for renewals and replacements over the next five years.

The company offered to sell all its rights in the system to the district in 1944 for the sum of \$75,000, but in view of the estimated \$150,000 required for repairs, the District did not find itself in a position to accept this offer. It was in that same year that the District spent \$10,000 in helping to rebuild the dam at Beaver Lake and was obliged to assess its members \$5 per acre to cover the cost.

2. *Okanagan Valley Land Co., Ltd.*—The Okanagan Valley Land Co., Ltd., the parent company of the Okanagan Centre Irrigation & Power Co., Ltd., owns 291 acres of orchard in the District and pays the same irrigation charges as are paid by the other water-users. According to the evidence, the Okanagan Valley Land Co. does not feel that the water charges are exorbitant at present, but thinks that they might be onerous in depression periods.

3. *Increase in Charges.*—In 1943 the Okanagan Centre Irrigation & Power Co., Ltd., applied to the Public Utilities Commission for the right to increase its water rate, and was granted permission to raise it from \$6 to \$8 per acre-foot. When it became necessary in 1945 to renovate a portion of the main line from the intake at a cost of approximately \$25,000, the company made further application to the Public Utilities Commission, and was granted permission to charge an extra \$2 per acre-foot for this purpose.

Since 1909 the rate charged by the company or its predecessors has increased from \$2.50 per acre-foot to \$10 per acre-foot. At the same time the company maintains that the revenue from water rates during the period 1929 to 1942 was not sufficient to take care of operating costs, fair return on investment, and provision for depreciation.

COMMENTS AND RECOMMENDATION.

The appraisal made by the Public Utilities Commission in 1944, since it was based on a fair return on total investment plus cost of services, may have resulted in fixing a rate which has no relation to the ability of the water users to pay.

The District brief states as follows: "Assistance from the Government only after the recipient has reached rock bottom is often of no avail. We would appreciate some action that could be used with advantage to-day. . . . Unless financial assistance is given to this area by the Government, it cannot definitely stay in business." The District desires financial assistance in order to purchase the system from the Okanagan Centre Irrigation & Power Co., Ltd.

The situation is confused and will require careful "give and take" consideration by all parties if the water-supply of the district is not to be interrupted. In my opinion the growers of this District have received less favourable consideration than the growers of other Okanagan districts. It would seem to be reasonable to try to buy out the interest of the company in the system. An offer to sell was made in 1944. If the purchase were made by the District, the situation would be somewhat clarified, but a distinct loss would be sustained by the Conservation Fund. Only during the past few years, 1941 to 1945, have the farms of the district been on a profitable basis, and with no assurance that the period of fair prices will continue, some losses over the next few years are almost certain.

- (a.) The company has a substantial investment in orchards and lands, and also in the system. The system might well be purchased by the District for an amount not exceeding the price for which it was offered in 1944.

(b.) If the system were owned by the District, provision would then have to be made for renewal reserves and replacements, as estimated by the District Engineer.

(c.) Since it is doubtful whether the District can pay both for the old system and for the renewal of a large part of it at the same time, it would be necessary to write off a part of the indebtedness by token payments in a manner similar to that being followed in other districts under the 1938 arrangement. A token payment of \$1,000 is possible, if and when an additional loan is made with which to purchase the system.

All the above is, however, only by way of suggestion for future development. The following has to do with the present indebtedness:—

I recommend that \$200 be paid annually into the Conservation Fund, and that this token payment be accepted as full payment for the annual amount due under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.

WYNNDEL IRRIGATION DISTRICT.

(Public Hearings held on August 8th, 1946, at 10 a.m., in the Knights of Pythias Hall, Creston.)

SUMMARY OF DATA.

History and Description of the System.—The Wynndel Irrigation District was incorporated under the "Water Act" in April, 1932.

This is a gravity system, financed with \$30,000 borrowed from the Conservation Fund. The main line is of wood-stave pipe; the laterals are of steel pipe. The entire system is underground, as the domestic water flows through the same pipes and must be supplied all year round. The growers use sprinklers.

Present Condition.—Very little has been spent on replacements since the system was constructed. Though it is not anticipated that many renewals will be required for some years to come, in the opinion of the Water Comptroller, complete replacement of perishable structures would cost over \$35,000, and provision should be made for this by increasing the Renewal Reserve.

Description of Area.—This is a rolling area, consisting mostly of sand and sand loam. It is cut up badly and gives every indication of being difficult to farm efficiently.

Water-supply.—This appears to be adequate.

Irrigable Acreage.—The irrigable acreage, as set in the 1938 formula, is 525.

Revenue-producing Acreage.—The revenue-producing acreage was 465 acres in 1938 and may have increased slightly by the present time.

Number of Parcels of Land.—There are 120 parcels of arable land in the District, but some growers cultivate more than one parcel.

Conservation Fund Standing.—The following statement gives the Conservation Fund standing of this District with regard to both Principal and Interest, as at March 15th, 1945:—

	Total Principal and Interest.	Per Irrigated Acre (approximately).
Borrowed and accrued since 1932	\$47,838.28	\$107.00
Paid	16,969.43	37.00
Written off or not charged	4,200.60	10.00
Owing as at March 15th, 1945	26,667.25	60.00
Owing as at March 15th, 1946	25,924.62	.....

1938 Arrangement.—This District is operating under the 1938 arrangement.

Under Order in Council No. 751 of 1933 the outstanding indebtedness of the District was reduced from \$30,839.90 to \$30,000, with the annual repayment set at \$1,860.

By the 1938 arrangement the amount of Renewal Reserve was set at \$1,000 and the irrigable acreage at 525, giving a base rate of \$5.45 per acre. On a revenue-producing acreage of 465 acres this resulted in an annual payment to the Conservation Fund under the 1938 formula of \$1,534. The record of the actual payments made by this District from 1939 to 1946, however, showed that no payment was made in 1940, but that in 1939, 1941, and 1942 payments in excess of the required amount were made. At date of preparing this report, only a portion of the 1946 token payment has been paid by the District.

The following tabulation shows the adjustments and actual amounts of the annual payments under the 1938 arrangement from 1939 to 1946, inclusive:—

Year of Adjustment and Present Year.	Base Rate per Acre.	PAYMENTS TO CONSERVATION FUND.			Renewal Reserve.
		Required by O.C. 751, 974 (1933, 1936).	Under 1938 Arrangement.		
			Acceptable.	Paid.	
1939.....	\$5.45	\$1,860.00	\$1,534.00	\$2,700.00	\$1,000.00
1940.....	5.45	1,860.00	1,534.00	.....	1,000.00
1941.....	5.45	1,860.00	1,534.00	3,400.00	1,000.00
1942.....	5.45	1,860.00	1,534.00	1,868.00	1,000.00
1943.....	5.45	1,860.00	1,534.00	1,534.00	1,000.00
1944.....	5.45	1,860.00	1,534.00	1,534.00	1,000.00
1945.....	5.45	1,860.00	1,534.00	1,534.00	1,000.00
1946.....	5.45	1,860.00	1,534.00	800.00	1,000.00

The present standing of the Renewal Reserve Account is given below:—

Total payments as at March 15th, 1946.....	\$7,000.00
Interest accruals	246.99
Total expended from Renewal Reserve as at March 15th, 1946	2,682.99
Balance which should be in Renewal Reserve as at March 15th, 1946	4,564.00

Production.—Production in this District consists mainly of the small fruits, with some tree-fruits and some flowers and bulbs.

Relative Productivity.—According to the evidence of the District secretary, productivity of this District is similar to that of East Creston, but different from that of the Okanagan. Wynndel growers do not obtain the premiums for their produce secured by Okanagan districts in the earlier pools. Markets are sometimes sated with a commodity before the later-maturing products at Wynndel are ready for shipping.

Mr. E. Uri stated that the raspberries grown at Wynndel do not ship so well as those grown at the Coast. They have a thinner wall and collapse on shipping. Another witness testified that Wynndel growers do not get such good prices for their small fruits as do growers at the Coast.

In the opinion of Mr. E. C. Hunt, District Horticulturist, the productivity at Wynndel is somewhat less than that at Creston.

Relative Incomes.—Detailed information is not available on this point. They are known to be relatively low.

Special Factors to be considered.

1. *Size of Holdings.*—The holdings on the average are very small. The following table gives an indication of the distribution of land:—

Arable land (120 parcels).....	Acres. 494.10
Waste land	350.60

Size of Holding (Acres).	Number of Parcels.	Number of Parcels belonging to Persons owning more than One Parcel.
2 or less.....	43	9
2 to 5.....	35	15
5 to 10.....	34	3
10 or more.....	6	1

2. *Variations in Productivity.*—Productivity within the District varies greatly, due to extreme differences in altitude and contour of lands, soil differences on the hill-side as compared with on the flats, and the advanced age of many growers.

3. *Change of Climate.*—Since 1932 the climate of the district has been much more severe than in previous years. In December of 1932 most of the strawberry plantations were destroyed by a blizzard, with the result that instead of a crop in excess of 30,000 crates in 1933, only 8,371 crates were harvested. Growers had to replant at considerable expense and wait for the plants to grow to producing age. Since then other blizzards and severe frosts have further damaged the plantations. Severe weather conditions such as this were not known in the district previous to 1932. Frost damage at blossom-time in 1942 resulted in a drop in production from 15,000 boxes to 787. Such conditions have prevented this district from benefiting greatly from the increased prices of recent years. In fact, a severe storm can practically extinguish the ability to pay of a large proportion of the growers who operate small holdings.

4. *Diseased Plants.*—Unfortunately, following the blizzard of 1932, new plantings of strawberries had to be made. These proved to be diseased, with the result that great difficulty has been experienced by the growers in combating strawberry root-rot and strawberry-weevil since that date. Production has declined accordingly.

The growers feel that if good supplies of strawberry plants, free from disease and of a fresh strain, could be brought in, there might be some recovery in this district.

5. *Difficulty of maintaining Production.*—The evidence indicated that the second crop of strawberries in this district has never been so good as that obtained from the virgin soil. Only one grower has been able to get steady production over a number of years on the same piece of ground. On the side-hills the soil wears down gradually to within a few inches of the sub-soil, so that it must be continually replenished to produce a good crop. When the top-soil is reduced, growers find that they must switch from strawberry culture to the growing of raspberries or tree-fruits.

6. *District Requests.*—The District brief points out that the products of the Wynndel Irrigation District provide work for the people of the towns and for the transportation systems, as well as supplying valuable food products, and it would seem desirable to assist the people to stay on the land. To this end the District makes the following requests:—

- (1.) That with regard to repayment it be considered separately from other districts because of its peculiar circumstances of production, climate, and size of holdings.
- (2.) That no additional financial obligations be imposed.
- (3.) That consideration be given towards easing the requirements during years of adversity.
- (4.) That consideration be given towards conversion of a considerable portion of the moneys repaid to apply as reduction of principal.

COMMENTS AND RECOMMENDATIONS.

In order to keep up its payments to the Conservation Fund, this District has curtailed expenditures on maintenance. Over a ten-year period the expenditure for

repairs, maintenance and operation, office and administration has been only \$466 per annum on the average.

As arrears of taxes have been collected, they have been paid into the Conservation Fund, even though this brought the total annual payment to a figure higher than that required by the 1938 arrangement. On the other hand, a portion of the sum to be set aside annually for Renewal Reserve is made up of uncollected tolls, to be paid into the fund upon collection. The Department of Lands does not favour this method of handling the Renewal Reserve Account. It is of opinion that the Renewal Reserve requirement should be increased, and that it will be necessary to increase the tax levies on this account.

In this connection it should be noted that the general ability of the District to meet its payments has been much less than was anticipated prior to incorporation, due to a combination of climatic changes, reduced yields of berries per acre, shorter life of plantations, and in many years unprofitable prices for the product.

The amount originally borrowed from the Conservation Fund was used with great economy. Through special arrangements with owners for right-of-way, and a policy of growers supplying labour at Government relief wage rates, the construction of the works was completed at a figure lower than the original estimate.

Generally speaking, the District has done a good job under very difficult circumstances. It has made its payments only by making personal sacrifices and by paying a relatively small amount into Renewal Reserve Account. In my opinion if the present policy continues, the District may be able to meet most of its obligations, but it will not have the necessary funds for renewals when required, and a new loan will be needed. Increased assessments at the present time are out of the question.

I therefore recommend:—

- (a.) That the annual payment to the Conservation Fund be \$300, and that this token payment be accepted as full payment of the amount required annually under Order in Council No. 751, 1933, and its amendment, Order in Council No. 974, 1936.
- (b.) That the Renewal Reserve be increased to at least \$1,500 annually.

VICTORIA, B.C.:

Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.
1947.

REPORT OF THE DISTRICT COURT, 11th JUDICIAL DISTRICT, FOR THE YEAR 1932.

The District Court, 11th Judicial District, for the year 1932, has the honor to report to the Honorable Board of Commissioners of the County of Dallas, Texas, that during the year 1932, the Court has held 1,234 sessions, and has rendered 1,234 judgments, and has received 1,234 dollars in fees.

The Court has also received 1,234 dollars in fines, and has collected 1,234 dollars in costs, and has paid 1,234 dollars in salaries to the clerks of the Court.

The Court has also received 1,234 dollars in interest, and has collected 1,234 dollars in taxes, and has paid 1,234 dollars in expenses.

The Court has also received 1,234 dollars in donations, and has collected 1,234 dollars in gifts, and has paid 1,234 dollars in honoraria.

The Court has also received 1,234 dollars in legacies, and has collected 1,234 dollars in bequests, and has paid 1,234 dollars in legacies.

The Court has also received 1,234 dollars in annuities, and has collected 1,234 dollars in pensions, and has paid 1,234 dollars in annuities.

The Court has also received 1,234 dollars in interest, and has collected 1,234 dollars in taxes, and has paid 1,234 dollars in expenses.

The Court has also received 1,234 dollars in donations, and has collected 1,234 dollars in gifts, and has paid 1,234 dollars in honoraria.

The Court has also received 1,234 dollars in legacies, and has collected 1,234 dollars in bequests, and has paid 1,234 dollars in legacies.

The Court has also received 1,234 dollars in annuities, and has collected 1,234 dollars in pensions, and has paid 1,234 dollars in annuities.

The Court has also received 1,234 dollars in interest, and has collected 1,234 dollars in taxes, and has paid 1,234 dollars in expenses.

The Court has also received 1,234 dollars in donations, and has collected 1,234 dollars in gifts, and has paid 1,234 dollars in honoraria.

PROVINCE OF BRITISH COLUMBIA



DYKING, DRAINAGE, AND IRRIGATION COMMISSION

REPORT

Submitted to the Provincial Secretary
December 24th, 1946

DEAN F. M. CLEMENT, *Commissioner*

Part II. Dyking and Drainage Districts



VICTORIA, B.C.:

Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.
1947.

PROVINCE OF BRITISH COLUMBIA

IRRIGATION, DRAINAGE AND DYKING COMMISSION

REPORT

Submitted to the Minister of Agriculture
and Fisheries, Victoria, B.C.

DEAN R. H. GIBSON

Part II. Diking and Drainage Districts



PRINTED AND BOUND BY THE GOVERNMENT OF BRITISH COLUMBIA
VICTORIA, B.C.

VANCOUVER, B.C., December 24th, 1946.

*The Honourable G. S. Pearson,
Provincial Secretary,
Parliament Buildings, Victoria, B.C.*

SIR,—I have the honour to submit to you the Report of the Dyking, Drainage, and Irrigation Commission, together with such recommendations and explanations as I consider fair and reasonable.

The answers to the question in the terms of reference are as brief and specific as is the question asked. The explanations and comments are lengthy, but I believe are essential to a comprehensive understanding of the complexities of the problems that must be faced.

Respectfully submitted.

F. M. CLEMENT,
Commissioner.

1950, December 11, 1950

The Honorable W. W. [Name]

[Address]

Washington, D. C.

I have the honor to acknowledge the receipt of your letter of the 10th instant regarding the [subject] and in reply to inform you that the [subject] is being handled by the [department]. The [subject] is being handled by the [department] and the [subject] is being handled by the [department].

Sincerely,
[Signature]

Very truly yours,
[Signature]

ACKNOWLEDGMENT.

I wish to express my thanks to the many trustees, secretaries, and witnesses of the various irrigation districts for the whole-hearted way in which they co-operated in securing the necessary information and data.

Thanks are also due to Mr. Bruce Dixon, Inspector and Commissioner of Dykes, and to Mr. E. Davis, Comptroller of Water Rights, and to their colleagues, who have made available all information requested.

I wish also to thank Mr. J. Pitcairn Hogg for his assistance and counsel; Miss Marcia Harris, secretary, for organizing the inquiry and assisting ably with the preparation of the report; and Miss Joan Williams for correcting and typing the manuscript.

Public hearings were held in Pitt Meadows, Mission, Chilliwack, Kamloops, Vernon, Kelowna, Rutland, Westbank, Penticton, Naramata, Peachland, Okanagan Falls, Cawston, Keremeos, Robson, and Creston. Briefs bearing on the problem were presented by the representatives of all districts concerned except Pitt Meadows No. 1 Dyking District. One hundred and thirty-eight witnesses gave evidence, and many scores of growers answered questions by mail. To all of these I express my thanks.

F. M. CLEMENT,
Commissioner.

TABLE OF CONTENTS.

	PAGE.
TERMS OF REFERENCE.....	113
RECOMMENDATIONS.....	115
THE DYKING AND DRAINAGE DISTRICTS—	
1. The Thoughts back of the Recommendations on Dyking and Drainage.....	117
2. A General Statement—Reserves are essential.....	117
A Good Job done on Maintenance.....	118
Renewal, Replacement, and Improvement and Additions.....	118
A Ceiling (or Base) Price.....	118
Price Fluctuations.....	119
Interest and Sinking Fund Payments postponed.....	119
Municipal Levies.....	120
Corporation of the District of Sumas (Statement of Arrears of Taxes).....	120
Corporation of the District of Pitt Meadows (Statement of Arrears of Taxes).....	121
Matsqui Municipality, Ward 4 (Statement of Arrears of Taxes).....	122
General Farms (Operator Incomes).....	122
Operator Incomes on some Specialized Farms, 1945.....	123
Some Important Facts.....	124
“Dyking Assessments Adjustment Act, 1905”.....	124
INDIVIDUAL DYKING AND DRAINAGE DISTRICT SUMMARIES—	
Chilliwack Dyking District.....	132
Coquitlam Dyking District.....	133
Dewdney Dyking District.....	135
Maple Ridge Drainage District.....	137
Maple Ridge Dyking District.....	138
Matsqui Drainage District.....	140
Matsqui Dyking District.....	141
Pitt Meadows Dyking District No. 1.....	143
Pitt Meadows Dyking District No. 2.....	144
Sumas Drainage, Dyking, and Development District.....	145
Ladner Municipality.....	149

LIST OF TABLES.

DYKING AND DRAINAGE DISTRICTS.

	PAGE.
24. General Farms—Lower Fraser Valley.....	122
25. Acreage and Indebtedness.....	125
26. Summary of Debt Analysis—Dyking Districts, 1945.....	126
27. Total Amount in Arrears on Assessments.....	126
28. Estimate of Number of Acres at Various Levels in the Districts.....	127
29. Replacement Schedule.....	128
30. Dyking and Drainage Assessments (1932 and 1946).....	130

THE TERMS OF REFERENCE.

To His Honour the Lieutenant-Governor in Council:

The undersigned has the honour to report that it is deemed advisable to cause inquiry to be made to determine how much each of the improvement districts under the "Water Act, 1939," and of the districts under the "Drainage, Dyking and Development Act," and the "Dyking Assessments Adjustment Act, 1905," that are indebted to the Province can pay annually in respect of its indebtedness, and to recommend:—

1. That in accord with the "Public Inquiries Act," being chapter 131 of the "Revised Statutes of British Columbia, 1936," Frederick Moore Clement, of Vancouver, British Columbia, be appointed a sole Commissioner to inquire into and determine how much each of the following corporations can pay annually in respect of its indebtedness to the Province:—

Black Mountain Irrigation District.
Cawston Irrigation District.
East Creston Irrigation District.
Glenmore Irrigation District.
Heffley Irrigation District.
Keremeos Irrigation District.
Naramata Irrigation District.
Okanagan Falls Irrigation District.
Oyama Irrigation District.
Peachland Irrigation District.
Robson Irrigation District.
Scotty Creek Irrigation District.
South-east Kelowna Irrigation District.
Vernon Irrigation District.
Westbank Irrigation District.
Winfield and Okanagan Centre Irrigation District.
Wynndel Irrigation District.
Chilliwack Dyking District.
Coquitlam Dyking District.
Dewdney Dyking District.
Maple Ridge Drainage District.
Maple Ridge Dyking District.
Matsqui Drainage District.
Matsqui Dyking District.
Pitt Meadows Dyking District.
Pitt Meadows Dyking District No. 2.
Sumas Drainage, Dyking, and Development District.

2. That the said Frederick Moore Clement be paid fifty dollars a day and his expenses for the time he is engaged in making the said inquiry.

3. That a certified copy of this Order, if approved, be furnished to Frederick Moore Clement, University of British Columbia, Vancouver, British Columbia.

Dated the 10th day of May, 1946.

E. T. KENNEY,
Minister of Lands and Forests.

Approved the 10th day of May, 1946.

JOHN HART,
*Presiding Member of the Executive
Council.*

RECOMMENDATIONS.

VANCOUVER, B.C., December 24th, 1946.

*The Honourable G. S. Pearson,
Provincial Secretary,
Victoria, B.C.*

DEAR SIR,—As instructed in the letter from your office under date of May 18th, 1946, signed by the Deputy Provincial Secretary, I beg to report as follows:—

That after careful examination of the various districts, exhaustive examination of the records, and subject to the qualifications and explanations contained in the appendices to this report, the respective districts mentioned in the terms of reference can pay annually the following amounts on their indebtedness to the Government:—

Name of District.	Annual Payment (1945).	Recommended Annual Payment.
Black Mountain Irrigation District.....	\$2,873.22	\$1,500.00
Cawston Irrigation District.....	Nothing	200.00
East Creston Irrigation District.....	6,688.50	5,000.00
Glenmore Irrigation District.....	1,438.17	1,438.17
Heffley Irrigation District.....	989.85	300.00
Keremeos Irrigation District.....	1,911.85	1,200.00
Naramata Irrigation District.....	2,562.00	2,562.00
Okanagan Falls Irrigation District.....	700.10	100.00
Oyama Irrigation District.....	Nothing	100.00
Peachland Irrigation District.....	Nothing	100.00
Robson Irrigation District.....	342.00	100.00
Scotty Creek Irrigation District.....	881.00	300.00
South-east Kelowna Irrigation District.....	6,000.00	6,000.00
Vernon Irrigation District.....	3,575.00	3,575.00
Westbank Irrigation District.....	835.00	835.00
Winfield and Okanagan Centre Irrigation Dis- trict.....	Nothing	200.00
Wynndel Irrigation District.....	800.00	300.00
Chilliwack Dyking District.....	7,000.00	7,000.00
Coquitlam Dyking District.....	Nothing	300.00
Dewdney Dyking District.....	Nothing	900.00
Maple Ridge Drainage District.....	Nothing	200.00
Maple Ridge Dyking District.....	Nothing	1,200.00
Matsqui Drainage District.....	Nothing	200.00
Matsqui Dyking District.....	Nothing	2,200.00
Pitt Meadows Dyking District No. 1.....	Nothing	Nothing
Pitt Meadows Dyking District No. 2.....	Nothing	100.00
Sumas Drainage, Dyking, and Development District.....	Nothing	7,000.00

The amounts recommended for repayment annually by the irrigation districts are based on the assumption that the requirements for Renewal Reserve Account, as recommended by the resident engineers, have first been provided for.

The amounts recommended for repayment annually by the dyking and drainage districts are based on the assumption that sums not less than those named for each district, or greater sums if so advised by the Inspector and Commissioner of Dykes, have first been provided for the Renewal Reserve Accounts.

These amounts are as follows:—

District.	Renewal Reserve.
Chilliwack Dyking.....	\$2,500.00
Coquitlam Dyking.....	1,200.00
Dewdney Dyking.....	1,200.00
Maple Ridge Drainage.....	300.00
Maple Ridge Dyking.....	2,400.00
Matsqui Drainage.....	600.00
Matsqui Dyking.....	2,100.00
Pitt Meadows Dyking No. 1.....	Nothing
Pitt Meadows Dyking No. 2.....	400.00
Sumas Drainage, Dyking, and Development District.....	14,000.00

All of the amounts mentioned in the recommendations are based primarily on the productivity of the land out of which the operator has to make provision annually for various costs and expenditures.

Suggestions are offered in the appendices with regard to speculative and scarcity values. It seems reasonable and fair that some consideration should be given to these if a larger portion of the borrowings is ever to be repaid.

All of which is respectfully submitted.

F. M. CLEMENT,
Commissioner.

APPENDIX.

PART II.

THE DYKING AND DRAINAGE DISTRICTS.

THE THOUGHTS BACK OF THE RECOMMENDATIONS ON DYKING AND DRAINAGE.

The general thoughts back of the recommendations on the dyking and drainage districts are:—

1. That we should begin anew from where we are at present and, if possible, make a fresh start. The past, though important, is largely a matter of financial history.

2. That the districts should be put on as sound a financial basis as possible, with the object of eventually making them financially independent.

3. That, should all debts be cancelled now, before provision has been made for substantial reserves, it would not be long before some districts would again have to seek additional loans.

4. That it is the desire of the Government and residents of the districts to keep as much as possible of the land in the districts producing abundantly.

5. That the land-owners shall not be pressed beyond their ability to pay.

6. That additional borrowings shall not be necessary, except in cases of catastrophe or incidents beyond human control.

7. That the districts shall continue under the direction and management of the Dyking and Drainage Commissioner, under a responsible minister of the Crown, so long as all or any part of the debt to the Government remains unpaid.

8. *That the principle of the present assessments (tolls), which vary from year to year, for management, operations, repairs, and maintenance is sound in practice and shall be continued, and shall not be influenced in any way by the additional practice of making provision for renewal reserves.*

9. That, in addition to 8, an amount shall be collected annually and placed in a Renewal Reserve Account. The money in this account shall be used only for renewals, replacements, improvements, and additions to dykes, motors, pumps, gates, and any such other permanent works and facilities. The account is to be drawn upon and the money used only on the recommendation of the Dyking and Drainage Commissioner, subject to the approval of the responsible minister of the Crown.

10. That the present indebtedness of each district shall be amortized (equal annual payments made up of principal and interest) over a period of years, and a rate of interest to be decided by the departments concerned. A period of forty years is mentioned in the recommendations, but no reference is made to a rate of interest.

11. That a token payment shall be made each year by each district, and that this token payment, not less in amount than the sum recommended, shall be accepted as payment in full for the principal and interest due that year.

12. That consideration will be given to the idea of a ceiling value or price per acre, based on relative productivity, for the different grades of land in the various districts, and that when lands change ownership or are disposed of above this price, the full indebtedness to the Government at that time will be met out of the sale price.

A GENERAL STATEMENT—RESERVES ARE ESSENTIAL.

The following general comments apply to a greater or lesser degree to Coquitlam, Pitt Meadows No. 1, Pitt Meadows No. 2, and Maple Ridge. They apply to some degree to all other districts or to some part of them.

These districts all contain some good lands, but they also all contain some very poor lands. For about one-half a century men have been trying to make farms and homes in these areas. A few have been quite successful, but, broadly speaking, the soil still remains untamed, and modern homes are few. Good crops have been grown on some of the lands for many years, but in many parts the returns are still well below the minimum for profitable production. Some are inclined to blame the farmers themselves; others blame the soil; and still others the heavy taxation. All these factors may play a part, but all are minor compared to one outstanding fact, and that is that in many parts of these districts the free water-table is too close to the surface, and consequently a relatively limited area in depth is available within which the root systems of crops can work.

Full production, and consequently profitable production, cannot be attained until the winter water and the spring-freshet water are brought under more rigid control. Decomposition of the peat which covers many sections cannot be hastened while it is water-saturated. Fertilizer alone will not solve the problem. Lime is of little value while the water problem dominates. The breakdown of the peat into a usable muck depends on humification, and this chemical-bacteriological process can take place only in the presence of air. Air and favourable bacteria cannot play their part in a water-saturated soil.

Whether or not the high level of water in the districts can be lowered is primarily an engineering problem, and is not answered here, but the above facts have been considered as they exist, and I do not see how substantial payments can be made on indebtedness until such time as production can be materially increased. High production annually cannot be attained under existing conditions.

The above points have been carefully considered and have influenced my recommendations.

A GOOD JOB DONE ON MAINTENANCE.

It can be stated with some marked degree of certainty that a good job has been done in management, operation, repairs, and maintenance. The amount of funds available must of necessity be the limiting factor in the amount of work accomplished, but, all things considered, there is little to complain about. The dykes, drains, pumps, and equipment are in good repair.

RENEWAL, REPLACEMENT, AND IMPROVEMENT AND ADDITIONS.

Time is always an important factor in the use of man-made goods. No matter how good the equipment and how well maintained and repaired, it must eventually wear out or become obsolete and have to be replaced. An attempt has been made to find out the cost of replacements, improvements, and additions over the next decade. Only in part can this be measured, but replacements must be provided for, and in considering what recommendations to make, this has played an important part.

In order to make certain areas more productive, certain improvements and additions are essential to dykes and pumps. These have been considered.

The long-time view is essential, and consequently a strong emphasis has been placed on the retention of certain funds in the districts and the building-up of reserves of capital so that it will not be necessary to resort to additional borrowings if this can be avoided.

I consider this absolutely essential.

A CEILING (OR BASE) PRICE.

This was dealt with at length in the section on irrigation. It is equally important in the dyking and drainage districts. In my opinion the only way that a larger part

of the investment can be regained is to take it when the land is sold or changes hands. Very often the sale price is at a speculative level, and some of this increase might readily be paid to the Government in order to relieve that particular parcel of land from the claim against it.

It is suggested that a ceiling price, based on productive values only, be established for each and every grade of land in each district, and when land changes hands above that price, all or part of the Government claim be satisfied.

If, as recommended, the debts of each district are amortized over a period of years at a selected rate of interest, and if these amortized sums are to be satisfied by the making of token payments only, it follows that the owner of any parcel of land can at any time meet the total capital indebtedness and buy himself out of the annual capital levy, or when the parcel changes hands, the Government can thus take the full amount owing on that parcel, without in any way affecting the general plan of repayment.

I support the suggestion very strongly.

PRICE FLUCTUATIONS.

The settling rate per pound of butter-fat of the Fraser Valley Milk Producers' Association over a period of years shows clearly the price fluctuations during the time. The prices to-day are comparable, though somewhat lower to the prices received from 1917 to 1920. It is interesting to note that the first year of the postponment of payments on capital indebtedness, 1932, is the year of lowest prices. This was followed by ten disastrous years, from which most of the farmers are only now beginning to recover. The settling rates were as follows:—

	Per Pound of Butter-fat. Cents.		Per Pound of Butter-fat. Cents.
1917	67.30	1932	28.67
1918	77.40	1933	30.52
1919	90.90	1934	30.73
1920	85.30	1935	33.21
1921	63.50	1936	36.80
1922	61.50	1937	38.65
1923	57.50	1938	39.59
1924	62.50	1939	34.21
1925	56.25	1940	37.93
1926	60.75	1941	44.68
1927	61.20	1942	51.58 + subsidy
1928	60.50	1943	64.80 + subsidy
1929	59.85	1944	70.82 + subsidy
1930	54.10	1945	69.41 + subsidy
1931	36.70		

INTEREST AND SINKING FUND PAYMENTS POSTPONED.

A point over which there seems to be some confusion in the minds of some is whether or not the payments on interest and to the Sinking Fund were cancelled. These payments were not cancelled. The payments were postponed. This was done by amendments to the various Acts at many sessions of the Legislature between 1932 and 1945. Payments were not postponed by the 1946 session of the Legislature.

Detailed explanations are not necessary. The amendments vary in detail, but all are the same in principle. They postponed payments on principal and interest for given periods.

The following are quoted as examples only:—

AN ACT TO AMEND THE "DYKING ASSESSMENTS ADJUSTMENT ACT, 1905."

[Assented to 20th November, 1936.]

(4.) Where, in the opinion of the Minister of Finance, the moneys at the credit of the sinking fund account in respect of any district, with the interest accruing and to accrue thereon, are sufficient for the repayment of the capital charge against the lands in that district at the time fixed for the payment thereof, the Minister of Finance may by writing authorize the Inspector of Dykes, or the municipal corporation vested with the powers of the Inspector of Dykes in respect of that district, to omit from the assessment roll for that district for any year the amount otherwise assessable therein for capital charge.

AN ACT TO AMEND THE "DEWDNEY DYKING DISTRICT RELIEF ACT."

[Assented to 28th March, 1945.]

2. The Commissioner shall not levy taxes to provide for interest and sinking fund upon lands in the district or the owners thereof in the year 1945, and the insufficiency thereby arising shall be levied for and collected in the year 1982.

The original postponement reads as follows:—

AN ACT TO AMEND THE "DYKING ASSESSMENTS ADJUSTMENT ACT, 1905."

[Assented to 7th April, 1933.]

3. In this and the following sections the expression "principal Act" means the "Dyking Assessments Adjustment Act, 1905." In the year 1933 the Inspector of Dykes shall make or raise only such assessments as are required to meet the cost for the year ending on the thirtieth day of September, 1933, of operating, maintaining, repairing, and managing the dyking-works in the several districts within the scope of the principal Act, respectively."

Please note that the Inspector of Dykes was authorized to make or raise only such assessments as are required to meet the cost for the year for operating, maintaining, repairing, and managing the dyking-works in the several districts.

No provision was made, nor has been made, for renewals, replacements, and improvements. This is important. The recommendations are based on the assumption that provision has first been made for necessary renewal, replacement, and improvement reserves.

MUNICIPAL LEVIES.

In order to obtain some information with regard to municipal tax collections, interviews were held with the clerks of Sumas, Pitt Meadows, and Matsqui municipalities. These interviews provided good information with regard to seven of the ten districts in the terms of reference.

Undoubtedly, tax collections have improved and arrears have been reduced. There seem to be at least two reasons for this. First, times and conditions have improved somewhat, especially since 1942, and, secondly, in some instances the levies were reduced during the period when economic conditions were very bad.

CORPORATION OF THE DISTRICT OF SUMAS.

Information obtained from Mr. McPhail, clerk, October 23rd, 1946.

Arrears of Taxes.

Year.	Accumulated Arrears of Municipal Taxes.	Total Levy.
1929	\$12,891.54	\$26,956.18*
1930	7,002.31	24,768.30†
1931	15,103.27	34,007.91
1932	24,184.09	33,020.02
1933	31,764.90	30,495.88
1934	37,984.97	28,850.00
1935	43,111.77	29,103.37
1936	46,927.99	27,508.40
1937	49,633.29	28,456.18
1938	49,760.71	28,571.44
1939	46,044.97	28,745.93
1940 (wrote off over \$30,000)	16,948.53	29,050.14
1941	16,104.57	29,419.82
1942	14,042.38	33,967.07
1943	7,837.81	37,133.00
1944	7,974.92	43,928.05‡
1945	5,051.40	49,718.96

* This assessment included the lake-bottom lands which were later covered by the 1929 and 1931 amendments to the "Sumas Dyking, Drainage, and Development Act."

† Some of the land in the lake area was still unsold at this time.

‡ School levy was increased.

Tax sales have been negligible. In this connection it should be noted that large amounts of arrears were written off by the municipality because they could not sell certain lands for non-payment of taxes.

CORPORATION OF THE DISTRICT OF PITT MEADOWS.

Information obtained from Mr. Wm. McDermott, clerk, October 22nd, 1946. (Re Pitt Meadows No. 1, No. 2, and Maple Ridge Dyking and Drainage.)

Arrears of Taxes.

Year.	Accumulated Arrears, Three-year Period.	Total Levy.
1930	\$13,450.00	\$22,620.00
1931	19,042.00	23,120.00
1932	19,326.00	16,423.00
1933	17,779.00	16,257.00
1934	18,009.00	14,704.00
1935	12,260.00	15,296.00
1936	8,971.00	13,610.00
1937	8,578.87	13,039.59
1938	6,702.45	12,721.00
1939	7,449.96	12,646.00
1940	7,290.29	13,893.00
1941	6,750.00	12,945.00
1942	6,865.00	14,929.00
1943	6,313.00	14,292.00
1944	6,326.00	16,115.00
1945	2,886.00	18,926.00

MATSQUI MUNICIPALITY.

Information obtained from Mr. Bain, October 23rd, 1946.

*Arrears of Taxes, Ward 4.**

Year.	Accumulated Arrears, Three-year Period.	Total Levy.
1929	\$2,638.29	\$16,283.44
1930	3,086.16	16,240.63
1931	4,223.41	17,022.28
1932	8,243.25	13,598.35
1933	5,239.84	10,946.64
1934	4,402.94	8,102.59
1935	2,721.24	10,797.03
1936	2,253.69	10,766.43
1937	2,501.33	11,140.97
1938	2,736.67	11,821.81
1939	4,125.59	16,008.31
1940	5,219.82	17,802.77
1941	4,792.16	18,124.98
1942	4,039.43	18,788.81
1943	3,101.06	18,643.21
1944	2,597.83	20,787.70
1945	2,946.27	26,539.73

* Ward 4 consists mostly of the higher better-grade lands in Matsqui Dyking District. The drainage district is largely in Ward 3. The productivity of parts of Ward 3 is scarcely comparable to the productivity of most of Ward 4.

Seven of the ten dyking and drainage districts in the terms of reference are for the most part included in the three municipalities mentioned above.

A study of the above tables indicates clearly that some improvement has taken place, that arrears of taxes have been reduced, and that the districts are now in a position to pay something on their indebtedness.

GENERAL FARMS (OPERATOR INCOMES).

An attempt was made to obtain an income picture of the general farms. Not all of the farms in the following table are in dyking and drainage districts, but I believe the picture as depicted by the table is a true one for the districts.

The returns for interest and labour (operator income) vary markedly. Of the farms listed, less than 40 per cent. paid operator incomes of \$1,000 or more in 1945. Half of them paid less than \$800.

No dairy-farms are included in this list, but from unpublished data now in my hands it is fair to draw the conclusion that the situation on the dairy-farms varies little from that on the general farms.

Table 24.—General Farms—Lower Fraser Valley.

(Arrayed in descending order of labour income.)

Report No.	Labour Income.	Report No.	Labour Income.
C104	\$6,803.05	A172	\$2,048.35
B112	4,265.11	B121	1,852.63
A136	3,410.64	B105	1,795.41
B120	2,666.60	A153	1,768.87
B190	2,573.08	B119	1,687.71

Table 24.—General Farms—Lower Fraser Valley—Continued.

Report No.	Labour Income.	Report No.	Labour Income.
A191	\$1,563.35	B177	\$657.60
B159	1,542.69	D149	563.94
A149	1,534.80	A110	401.78
A171	1,414.22	D131	395.77
B117	1,320.14	A189	349.46
D113	1,315.71	B107	337.18
C103	1,191.15	D125	255.71
A130	1,168.05	A123	154.35
B106	1,054.97	A108	133.41
A112	980.09	A106	.03
D106	931.25	B136	—33.34
A195	913.06	B193	—98.55
A163	899.07	A177	—176.92
B196	881.62	A109	—398.24
B157	875.47	C111	—445.40
B148	793.14	B151	—835.55
A205	769.92	A154	—847.04
B160	718.36	D168	—1,034.38
D137	700.82	A134	—1,840.44
B108	670.44	A157	—2,277.18

OPERATOR INCOMES ON SOME SPECIALIZED FARMS, 1945.

The following array shows the income distribution of a group of men in the dyking districts. The figures are the labour earnings of men who appeared as witnesses and who agreed to submit figures on farm operations. In every case the farm was visited by a qualified enumerator who obtained the necessary data for examination in the office.

The sample, though small, is typical and therefore may be considered to be fairly accurate. It can be expected that the relative positions of the farms will change from year to year.

Some of the farms that show a loss in 1945 might well show a substantial labour income in 1946, and, likewise, some farms showing substantial labour incomes in 1945 will show losses in 1946. Chance plays an important part in all operations in these districts.

Operator No.	Labour Earnings.	Operator No.	Labour Earnings.
1	\$4,628.49	14	\$398.74
2	4,390.82	15	325.60
3	2,093.67	16	269.76
4	2,092.63	17	1.81
5	1,489.77	18	—109.62
6	1,466.29	19	—355.12
7	1,290.19	20	—646.31
8	1,162.44	21	—869.67
9	1,126.17	22	—1,201.72
10	927.41	23	—1,356.80
11	891.86	24	—2,179.12
12	514.38	25	—3,164.43
13	456.52		

SOME IMPORTANT FACTS.

The tables that follow were prepared for the most part by Mr. Bruce Dixon, Inspector and Commissioner of Dykes, and his staff, New Westminster. They were prepared in answer to a series of questions and, I believe, bring out the necessary facts with regard to the business situations in the districts.

Some of the pertinent facts are as follows:—

- (a.) Total acres reverted (Table 25).
- (b.) Increase in indebtedness (Table 25).
- (c.) Miles of dykes in relation to the total acres protected (Table 25).
- (d.) Total indebtedness, simple interest added (Table 26).
- (e.) Arrears in assessments in 1931 as compared with those in 1946 (Table 27).
- (f.) The "productivity" situation (Table 28).
- (g.) Estimated required replacements over a period of time, and amounts borrowed for replacements and additions since 1905 (Table 29).
- (h.) Dyking and drainage assessments, 1946, both capital and maintenance, as compared with those of 1932 (Table 30).

"DYKING ASSESSMENTS ADJUSTMENT ACT, 1905."

The "Dyking Assessments Adjustment Act, 1905," recited in its preamble the various expenditures made by the Government of the Province in each district, and finished the preamble with this clause:—

"And, whereas, in order that the Province may recover some portion of the moneys expended as aforesaid and that the progress and development of the said districts may not be retarded, it is deemed advisable in the public interests that the assessments imposed on the said lands should not be greater than the owners and occupiers thereof can pay."

The above is quoted only as a matter of interest.

Table 25.—Acreage and Indebtedness.

Name of District.	Total Number of Acres.	TOTAL ACRES REVERTED.			Miles of Dykes.	Miles of Drainage.	Acres in Drainage.	MAINTENANCE AND OPERATION COSTS PER ACRE.			INDEBTEDNESS PER ACRE.	
		1932.	1939.	1945.				1939.	1945.	1945.*	1932.	
											\$	\$
Chilliwaek Dyking District.....	19,000.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coquitlam Dyking District.....	3,213.48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dewdney Dyking District.....	3,362.00	.....	499.00	625	8.41	.....	.....	.....	.....	.....	.....	.....
“ A ” lands.....	775.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ B ” lands.....	944.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ C ” lands.....	1,030.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ D ” lands.....	489.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ E ” lands, maintenance only.....	118.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maple Ridge Dyking District.....	8,382.31	.....	1,378.00	662	14.38	.....	.....	.....	.....	.....	.....	.....
High land.....	2,623.46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Low land.....	5,758.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maple Ridge Drainage District.....	5,477.27	.....	967.00	440	.....	41.66	5,473.03	.....	.....	.....	.....	.....
“ A ” lands.....	1,739.13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ B ” lands.....	2,904.29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ C ” lands.....	833.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Matsqui Dyking District.....	10,174.00	374	386.00	232	7.20	.....	.....	.....	.....	.....	.....	.....
Matsqui Drainage District.....	3,982.89	374	377.00	208	.....	.....	3,982.89	.....	.....	.....	.....	.....
“ A ” lands.....	2,910.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ B ” lands.....	472.83	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ C ” lands.....	599.16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pitt Meadows Dyking District No. 1.....	1,174.78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pitt Meadows Dyking District No. 2.....	1,091.64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sumas Drainage, Dyking, and Development District.....	28,075.00	20	1,151.30	1,005	6.08	.....	.....	.....	.....	.....	.....	.....
“ A ” lands.....	9,837.764	.....	502.00	255	5.46	.....	.....	.....	.....	.....	.....	.....
“ B ” and “ C ” lands.....	9,671.49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ D ”, “ E ”, “ F ”, and “ G ” lands.....	6,249.634	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ H ” lands.....	951.66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ I ” lands.....	487.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
“ J ” lands.....	473.84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Indian reserves.....	403.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Simple interest added.

Table 26.—Summary of Debt Analysis—Dyking Districts, 1945.

	Initial Debt.	Total 1932 Debt.	Interest not levied (Simple).	Total 1945 Debt.	Acres.
September 30th—					
Chilliwack Dyking District.....	See Remarks.				19,000.00
Coquitlam Dyking District.....	\$108,755.32	\$37,984.21	\$38,372.49	\$71,386.10	3,213.48
Maple Ridge Dyking District.....	251,783.61	103,826.15	98,030.23	187,402.46	8,382.31
Maple Ridge Drainage District.....	24,636.75	15,602.18	9,127.28	24,729.46	5,477.27
Pitt Meadows Dyking District No. 1.....	30,474.34	12,540.90	11,547.18	18,739.11	1,174.78
Pitt Meadows Dyking District No. 2.....	34,044.14	9,628.40	10,202.83	16,164.38	1,091.64
Matsqui Dyking District.....	219,127.09	119,223.27	93,201.42	180,102.99	10,174.00
Matsqui Drainage District.....	54,131.78	42,452.60	24,834.77	67,287.37	3,982.89
December 31st—					
Dewdney Dyking District.....	76,657.32*	58,086.17	42,558.11	113,176.23	3,362.00
Sumas Drainage, Dyking, and Development District.....	See Remarks.			674,753.58	28,075.00
Totals.....	\$799,610.35	\$899,343.88	\$327,874.31	\$1,353,741.63	83,933.37

* Adjusted 1939 at conclusion of trust.

Table 27.—Total Amount in Arrears on Assessments.

Name of District.	SEPTEMBER 30TH, 1931.			SEPTEMBER 30TH, 1946.			
	Capital.	Main-tenance.	Total.	Capital.	Main-tenance.	Consoli-dated Arrears.	Total.
Coquitlam Dyking District.....	\$3,876.66	\$7,678.24	\$11,554.90	\$3,594.65	\$11,542.41	.....	\$15,137.06
Maple Ridge Dyking District.....	4,289.13	8,511.44	12,800.57	14.45	5,848.26	\$753.54	6,616.25
Maple Ridge Drainage District.....	1,778.28	355.50	2,133.78	.....	354.44	.....	354.44
Matsqui Dyking District.....	4,387.27	9,381.60	13,768.87	.....	5,129.32	122.16	5,251.48
Matsqui Drainage District.....	4,374.83	955.39	5,330.22	.....	1,196.79	.....	1,196.79
Pitt Meadows Dyking District No. 1....	153.39	625.02	778.41	.....	371.40	113.10	484.50
Pitt Meadows Dyking District No. 2....	1,007.16	3,458.72	4,465.88	.....	1,852.52	266.36	2,118.88
Dewdney Dyking District.....	2,048.16	2,113.96	4,162.12	4,812.60	4,257.50	.....	9,070.10
Sumas Drainage, Dyking, and Development District (December 31st, 1932).....	75,907.05	41,678.99	117,586.04	25.04	6,276.02	564.66	6,865.72*

* December 31st, 1945.

NOTE.—Of the arrears shown as at September 30th, 1946, \$14,314.39 in the Coquitlam Dyking District, \$3,970.08 in the Maple Ridge Dyking District, \$423.45 in the Pitt Meadows Dyking District No. 1, and \$1,923.20 in the Pitt Meadows Dyking District No. 2 are owing by the municipal corporations for dyking taxes on roads and streets. This is also true in the Matsqui Dyking and Matsqui Drainage Districts in the amounts of \$1,775.88 and \$700 respectively.

Table 28.—Estimate of Number of Acres at Various Levels in the Districts.

Name of District.	PRODUCTIVITY CLASSIFICATIONS.*			
	High.	Medium.	Low.	Waste Land
	Acres.	Acres.	Acres.	Acres.
Coquitlam Dyking District (3,212 acres)	325	1,950	900	37 (400)
Dewdney Dyking District (3,355 acres)	1,000	1,300	800	253
Maple Ridge Drainage District (5,462 acres)	See Maple Ridge Dyking.			
Maple Ridge Dyking District (8,333 acres)	2,600	1,430	4,000	300 (550) †
Matsqui Drainage District (3,993 acres)	See Matsqui Dyking.			
Matsqui Dyking District (10,246 acres)	200	8,600	1,200	246 (130)
Pitt Meadows Dyking District No. 1 (1,175 acres) .....	.....	.....	500	675 (975)
Pitt Meadows Dyking District No. 2 (1,091 acres) .....	.....	.....	1,000	90 (35)
Sumas Drainage, Dyking, and Development District.....	1,925	15,500	10,355 ‡	200

* "High" means above average freshet heights. "Medium" means below average freshet heights but admitting of 4 feet of drainage. "Low" means below lowest freshet and admitting of less than 4 feet of drainage but more than 2 feet. "Waste land" means swamp or slough margins of uncertain use. () Bracketed figures denote areas in ownership of Crown at this date, November, 1946.

† Would be more except for activity in peat products.

‡ Lake area—continuous pumping admits of sufficient drainage.

Table 29.—Replacement Schedule.

Name of District.	Original Cost.	Present Age (Years).	Date due for Renewal.	Estimated Cost of Replacement and Additions for Ten-year Period 1946-56.	Amount borrowed for Replacements and Additions since 1905.
<i>Coquitlam Dyking District.</i>					
Dykes.....	(\$151,280.35) * \$57,988.00	48		Annual maintenance as required Addition, \$6,000	\$50,767.00
Pumps.....	18,016.07	34	1962		
	12,500.00	8	1988		
Flood-boxes.....	10,954.82	32			
Back-ditch improvement.....	8,775.17	23			
Total.....	\$108,234.06				
<i>Dewdney Dyking District.</i>					
Dykes.....	(\$202,500.00) † \$79,832.00			Renewal of discharge-pipe, \$2,000	\$15,000.00 (Repaid in two years.)
Pumps.....	20,184.92	9	1987		
Total.....	\$100,016.92				
<i>Maple Ridge Dyking District.</i>					
Dykes.....	(\$221,981.96) * \$127,396.00	48		Annual maintenance as required	\$15,308.11
Pumps.....	17,533.73	34	1962		
Dykes.....	21,162.45	25	1971	Possible addition, one small pump, \$4,000	109,079.56
Pumps.....	23,463.67	8	1987		
Flood-boxes.....	11,338.95	34			
	6,300.00	23			
McKenney Creek diversion.....	9,664.50	26			
Drainage, No. 1.....	18,262.47	23			
Total.....	\$235,121.77				
<i>Maple Ridge Drainage District.</i>					
41.66 miles of ditches.....	\$24,636.75	21	Annual	Maintenance	<i>Nil</i>
<i>Matsqui Dyking District.</i>					
Dykes.....	(\$209,915.60) * \$125,000.00	41		Annual maintenance as required	\$9,685.86
Pumps.....	10,152.83	32	1964		
Dykes.....	39,041.13	26	1970	River-bank protection, \$10,000	80,090.23
Pumps.....	15,590.00	2	1994	Possible addition; motor, pipe-line, and installation for additional pump now in stock, \$12,000	
Flood-boxes.....	15,266.94	26			
	13,983.85	26			
Total.....	\$234,301.69				
<i>Matsqui Drainage District.</i>					
4.5 miles of canals and 17.3 miles of ditches	(\$106,464.32) * \$54,131.78	26	Annual	Maintenance	<i>Nil</i>

* Bracketed figures are costs as at 1st November, 1904.

† Bracketed figures are costs as at 1st November, 1929.

Table 29.—Replacement Schedule—Continued.

Name of District.	Original Cost.	Present Age (Years).	Date due for Renewal.	Estimated Cost of Replacement and Additions for Ten-year Period 1946-56.	Amount borrowed for Replacements and Additions since 1905.
<i>Pitt Meadows Dyking No. 1.</i>					
Dykes.....	(\$44,436.55)* \$17,815.32	46		Annual maintenance as required	\$4,177.58
Pumps.....	5,764.46	34	1962	Depends upon service requirement	8,481.44
Flood-boxes.....	2,526.37	34			
Total.....	\$26,106.15				
<i>Pitt Meadows Dyking No. 2.</i>					
Dykes.....	(\$44,436.56)* \$17,052.68	46		Annual maintenance as required	\$16,991.46
Pumps.....	9,104.51	34	1962	Possible change in equipment to give required drainage, \$6,000	
Flood-boxes.....	1,500.00	34			
Drainage extension (part of district).....	2,351.85				
Total.....	\$33,865.20				
<i>Sumas Drainage, Dyking, and Development District.</i>					
Vedder Canal and East and West Vedder Dykes†.....					
Dykes†.....	\$529,549.53	24		Difficult to estimate (see Note) ‡	
Pumps, main.....	110,000.00				
Pumps, with dam.....	793,997.58	23	1972		
Pumps, McGillivray.....	31,329.28	24	1972		
Pumps, with dam.....	56,438.28				
Dykes inclusive of above items.....	3,615,459.12	23-24		Annual maintenance as required	
<i>Maintenance.</i>					
Dredging equipment—					
1 drag-line.....	\$28,800.00	20			
1 brush-puller.....	1,000.00	6			
Sundry items—					
1 drag-line on order..	14,000.00	New		\$15,000	

* Bracketed figures are costs as at 1st November, 1904.

† Figures taken from report of former Commissioner.

Books of account do not segregate in this manner.

‡ NOTE.—The Vedder Canal was made large enough to provide material for the parallel dykes on either side, and approximately 2,900,000 cubic yards were excavated. The worst storm on record was estimated to have discharged 27,000 second-feet from the Vedder River, and the canal, as originally constructed, would accommodate 60,000 second-feet, and therefore had a factor of safety of 2.22. Silting has, we know, taken place and to a considerable extent. It is the opinion of the Sumas Commissioner that if further silting can be prevented, we will maintain a factor of safety of 1.5. Approximately 100,000 cubic yards have been excavated from a settling-basin in the last two years in an effort to prevent further silting.

Table 30.—*Dyking and Drainage Assessments (1932 and 1946).*

Name of District.	COLLECTED IN 1932.					
	Maintenance.		Capital Levy.		Total Charges.	
	Total Amount.	Per Acre Levy.	Total Amount.	Per Acre Levy.	Total Amount.	Per Acre Charges.
Chilliack Dyking District.....	\$	\$	\$	\$	\$	\$
Coquitlam Dyking District— Ordinary Maintenance.....	4,340.04	1.05	2,899.40	0.897	9,287.23	2.847
Deferred Maintenance.....	2,907.79	.90				
Dewdney Dyking District.....	3,366.93	1.00	3,739.24	" A " 1.75 " B " 1.30 " C " .88 " D " .44	7,106.17	" A " 2.75 " B " 2.30 " C " 1.88 " D " 1.44
Maple Ridge Drainage District.....	508.84	" A " .15 " B " .075 " C " .037	2,512.50	" A " .7417 " B " .3708 " C " .1854	3,016.34	" A " .8917 " B " .445 " C " .222
Maple Ridge Dyking District— Ordinary Maintenance.....	5,495.78	High .446 .599	6,369.80	High .5166	19,391.03	High 1.56
Deferred Maintenance.....	7,525.45	Low .751 1.018		Low .8706		Low 2.64
Matsqui Drainage District.....	999.41	.25	4,371.06	" A " 1.32 " B " .66 " C " .33	5,370.47	" A " 1.67 " B " .91 " C " .58
Matsqui Dyking District— Ordinary Maintenance.....	11,032.33	1.07	6,250.00	.617	23,822.72	2.34
Deferred Maintenance.....	6,540.39	.65				
Pitt Meadows Dyking District No. 1— Ordinary Maintenance.....	1,766.13	1.50	890.77	.758	4,104.39	3.49
Deferred Maintenance.....	1,447.49	1.235				
Pitt Meadows Dyking District No. 2— Ordinary Maintenance.....	1,759.75	1.58 .83 or 2.43	852.63	.76663	4,015.18	3.176 or 4.776
Deferred Maintenance.....	1,402.80					
Sumas Drainage, Dyking, and Development District.....	33,274.22	" A " 2.00 " B " 1.10 " C " 1.10 " D " .65 " H " .275	45,188.95	" B " " C " 3.10 " D " " G " 1.86 " H " 1.24 " I " .62 " J " .31	78,463.00	" A " 2.00 " B " " C " 4.20 " D " " G " 2.41 " H " 1.515 " I " .895 " J " .585

Table 30.—*Dyking and Drainage Assessments (1932 and 1946)*—Continued.

Name of District.	ASSESSED FOR IN 1946.					
	Maintenance.		Capital Levy.		Total Charges.	
	Total Amount.	Per Acre Levy.	Total Amount.	Per Acre Levy.	Total Amount.	Per Acre Charges.
\$	\$	\$	\$	\$	\$	
Chilliwack Dyking District.....						
Coquitlam Dyking District—						
Ordinary Maintenance.....	5,940.68	1.8476	4,104.54	1.3644	14,193.09	4.59
Deferred Maintenance.....	4,147.87	1.3788				
Dewdney Dyking District.....	3,356.05	1.00	6,332.23	" A " 2.99 " B " 2.24 " C " 1.49 " D " .75	9,688.28	" A " 3.99 " B " 3.24 " C " 2.49 " D " 1.75
Maple Ridge Drainage District.....	1,362.35	" A " .40 " B " .20 " C " .10	4,055.35	" A " 1.198 " B " .599 " C " .2996	5,417.70	" A " 1.598 " B " .799 " C " .399
Maple Ridge Dyking District—						
Ordinary Maintenance.....	15,009.10	High 1.20 1.125 Low 2.044 1.907	10,270.86	High .8395 Low 1.414	39,148.40	High 3.16 Low 5.37
Deferred Maintenance.....	13,868.44					
Matsqui Drainage District.....	2,049.72	.50	4,018.85	" A " 1.21 " B " .61 " C " .30	6,068.57	" A " 1.71 " B " 1.11 " C " .80
Matsqui Dyking District—						
Ordinary Maintenance.....	10,087.45	.9818	6,250.00	0.6155	23,202.04	2.27
Deferred Maintenance.....	6,864.59	.6760				
Pitt Meadows Dyking District No. 1—						
Ordinary Maintenance.....	1,591.10	1.35438	1,444.16	1.2993	5,595.39	4.76
Deferred Maintenance.....	2,560.13	2.17925				
Pitt Meadows Dyking District No. 2—						
Ordinary Maintenance.....	2,713.43	2.48565	1,382.33	1.2663	6,369.95	5.12 or 7.89
Deferred Maintenance.....	2,274.19	1.37 or 4.14				
Sumas Drainage, Dyking, and Development District.....	40,578.64	" A " 2.25 " B " " C " 1.35 " D " " G " .675 " H " " J " .3375	38,270.00	" B " " C " 2.39 " D " " G " 2.05 " H " 1.78 " I " .89 " J " .44	78,849.00	" A " 2.25 " B " " C " 3.74 " D " " G " 2.72 " H " 2.12 " I " 1.23 " J " .78

INDIVIDUAL DYKING AND DRAINAGE DISTRICT SUMMARIES.

CHILLIWACK DYKING DISTRICT.

(Hearings held in Municipal Hall, Chilliwack, July 11th, 1946.)

SUMMARY OF DATA.

Location.—The Chilliwack Dyking District is located at the eastern end of the Lower Fraser Valley, and in point of distance is farthest away among the milk-producing areas for the cities of Vancouver and New Westminster.

Description of Area.—The total area is approximately 19,600 acres and, generally speaking, is relatively level. The City of Chilliwack is within the area.

Description of Works.—The dyke in this District is the only one commenced and completed by the Government. As the dyke for the most part was constructed by train fill and the only obstacles encountered were three slough crossings, the original cost per acre was comparatively low, \$15 per acre approximately, as against more than \$125 per acre for Sumas.

Great care was taken in the construction of this dyke. Where it went through forest, the ground was properly grubbed, and muck ditches were constructed under the fill in some cases. The strata was broken to give as nearly as possible an impervious embankment. These precautions resulted in a solid dyke which has required very little expenditure for maintenance.

Ownership and Size of Holdings.—The area is privately owned, and the holdings vary in size from a few acres to quite large dairy-farms.

No Reverted Lands.—There are no lands in this District which have reverted for non-payment of dyking assessments.

Land Sales.—Land sales have been many in recent years. Some of the best lands have sold at \$500 or more per acre.

Indebtedness to the Government.—The original estimate for constructing the dyke in this District was \$149,717, but this was later raised to \$265,000. Construction was completed by March, 1903.

In 1918 administration of the Chilliwack Dyking District was turned over to the Corporation of the District of Chilliwack.

Because of the comparatively low capital and maintenance charges, the District took advantage of the opportunity to postpone capital payments for two years only. As a result, the amount accumulated in the Sinking Fund was sufficient to pay off the total capital charge by 1940, and the District is now merely paying some back interest. This will be paid off by 1948.

The following is a statement of the standing of this District with regard to its indebtedness to the Government:—

	Total.	Per Acre.
Total debt as at November 1st, 1904	\$289,899.79	\$15.00
Amount of capital forgiven	89,899.79	-----
Total debt as set by D.A.A. Act, 1905	200,000.00	10.00
Total debt as at 1945—		
Capital	Nil	-----
Interest	Nil	-----
*Annual charges as at 1940—		
Capital	\$3,000.00	
Interest	7,000.00	
	10,000.00	-----
*Annual charges as at 1945—		
Capital		
Interest	\$7,000.00	7,000.00

* Approximate figures.

Dyking Charges.—Before the capital debt was paid up, the dyking charges in the Chilliwack Dyking District were as follows:—

	Per Acre.
Annual maintenance	\$0.277
Capital charge (sinking fund and interest) .....	.473
Total charges, 1939	\$0.75

In 1946, with the capital debt paid off and interest only being levied, the dyking charges are as follows:—

	Per Acre.
Annual maintenance	\$0.277
Capital charge (interest only) .....	.373
Total charges, 1946	\$0.65

Production.—This is a well-farmed highly productive area. The production is mixed, ranging from good dairy cattle to small fruits and vegetables.

Special Factors.

River-bank Protection.—Although the cost of maintenance on the Chilliwack dyke has been very low, large expenditures have been made on river-bank protection where erosion has endangered the dyke. The Dominion Government, because of its interest in keeping the river-channel navigable, and the Provincial Government, because of the protection afforded to the roads, shared in these costs. The following statement indicates the amounts spent on river-bank protection over a period of years:—

Expenditure on river-bank protection, 1924-38—	
Dominion and Provincial Governments	\$33,765.00
Corporation of the District of Chilliwack	25,600.00*
	\$59,365.00

Expenditure on river-bank protection, 1942-46—	
Dominion Government	\$5,704.53
Provincial Government	14,045.67
Corporation of the District of Chilliwack	10,489.83

* Of this amount, 10 per cent. was charged to the Municipality of Chilliwack as a whole, and 90 per cent. to the Dyking District.

COMMENTS AND RECOMMENDATION.

This District has been well managed. The original capital cost was relatively low, and except for a short period the District has met its obligations with definite regularity. Some interest only remains to be paid.

The District can pay and is meeting regularly all its obligations to the Government. The indebtedness will have been completely liquidated by 1948. Since this is the case, no recommendation is necessary.

COQUITLAM DYKING DISTRICT.

(Hearings in the Municipal Hall, Pitt Meadows, 9.30 a.m., July 9th, 1946.)

SUMMARY OF DATA.

Location.—The Coquitlam Dyking District is located on the west bank of the Pitt River, near the confluence of the Pitt and the Fraser. It lies partly within the boun-

daries of the Corporation of the District of Coquitlam and partly in the Municipality of Coquitlam. The main line of the Canadian Pacific Railway runs through this District.

Description of Area.—The total area is 3,213.48 acres, of which 205 acres are used for the C.P.R. yards.

Except for a few hundred acres, this is not first-class land. It requires good drainage and repeated applications of lime and fertilizer to render it reasonably productive. The water-table comes very close to the surface in the winter-time and during the spring freshet.

Description of Works.—In this District there is an earthen dyke 8.41 miles long and an interception ditch 3.75 miles long, constructed to an elevation 2 feet above the 1894 high-water contour.

Gravity drainage at low water is permitted by three flood-boxes through the dykes, with a combined sectional area of 318 square feet.

Artificial drainage is provided by three pumping plants with 230 connected horsepower and a rating of 57,000 i.g. per minute against a 10-foot head.

Ownership and Size of Holdings.—There are 116 owners in the District, of whom forty-two are non-resident and may be assumed to be not *bona fide* farmers. The largest holding consists of 690 acres. The average holding is 27.75 acres, but thirteen owners hold 1 acre or less each, forty-four hold 5 acres or less each, and seventy-seven hold 10 acres or less each.

Reverted Lands.—By 1932, 201 acres had reverted to the Crown for non-payment of dyking assessments; by 1939 the number of reverted acres totalled 499, and by 1945, 625. Of these, 50 per cent. had not been ploughed since 1921, but were used for pasture. The water-table is too high on these lands for cultivation at present. To lower the water-table, another pump would be required.

Land Sales.—A great deal of land has changed hands recently in this District. Some has been purchased from the Crown at as low as \$20 an acre; some has been bought from the Crown, subdivided and sold for from \$100 to \$150 an acre. This latter sum, in my judgment, is a very high price to pay per acre, even for small holdings, if the amount is to be earned from the land.

Indebtedness to the Government.—This District operates under the provisions of the "Dyking Assessments Adjustment Act, 1905," with amendments. The following statement indicates the standing of the Coquitlam Dyking District with regard to its debt to the Government:—

	Total.	Per Acre.
Debt as in November, 1904.....	\$151,280.35	\$47.00
Debt as set by D.A.A. Act, 1905.....	57,988.00	18.00
Further advances up to 1932.....	38,267.32	-----
Total payments up to 1932 (interest, sinking fund, and deferred maintenance)....	129,324.68	-----
Total debt as in 1932.....	37,984.21	11.82
Advances since 1932.....	12,500.00	-----
Total debt as at September 30th, 1945.....	71,386.10*	22.21

* Simple interest added since 1932.

Dyking Assessments.—In 1932, when the annual capital payments were postponed, the dyking assessments were as set forth in Table 30.

In 1946, with the capital levy restored after a postponement of thirteen years, the dyking assessments are as set forth in Table 30.

Production.—In this District there is a fair acreage planted to beans, potatoes, and general truck crops. There are also some small fruits, and dairying is carried on to some extent. Sometimes all or part of the crops are lost due to high water in early spring.

Relative Productivity.—The productivity is about on a par with the respective productivities of Maple Ridge and Pitt Meadows No. 2, but is not the equal of productivity in Sumas and Chilliwack.

For estimates of renewals, replacements, and additions *see* Table 29.

Special Factors.—Representatives of the city and municipality pointed out that additional services are required by the many newcomers to this area. The land cannot bear the increased cost of education, hospitalization, roads, ditches, etc., in addition to the heavy dyking charges.

Since the timber has been logged and burned off the hills, a greatly increased volume of water comes down the creeks at freshet-time and washes away the soil.

COMMENTS AND RECOMMENDATIONS.

The total dyking charges assessed against this District in 1946—\$4.50 per acre—would appear to be well beyond the power of the average farm operator to pay. In my opinion the larger part of any new assessment should be spent on renewals and improvements, and to this end I recommend:—

- (1.) That the sum of \$1,200 be collected annually and be paid into the Renewal Reserve Account; and
- (2.) That the present indebtedness be amortized over a period of forty years and that \$300 be paid annually to the Government, and, further, that this token payment of \$300 be accepted as full payment for the amount due that year.

DEWDNEY DYKING DISTRICT.

(Hearings held in Municipal Hall, Mission, July 10th, 1946.)

SUMMARY OF DATA.

Location.—The Dewdney Dyking District is located 3 miles east of Mission City, around Hatzic Lake and Eastwood. It is traversed by the main line of the Canadian Pacific Railway, the grade of the railway forming the dyke.

Description of Area.—The total area is approximately 3,362 acres. In 1924 the lands were divided into five classifications, based upon benefits received and ability to pay, as follows:—

“ A ” lands: 775 acres (lands difficult of drainage).

“ B ” lands: 944 acres.

“ C ” lands: 1,030 acres.

“ D ” lands: 489 acres.

“ E ” lands: 118 acres (these pay maintenance charges only).

Practically all of this area is suitable for dairying, and a considerable portion of it is adapted to intensive cultivation. There is good land in the Hatzic Island section and around the lake-shore.

Description of Works.—As the grade of the railway formed the dyke, reclamation-work in this District consisted merely of filling in trestles, constructing a flood-box for gravity outflow, and the installation of pumping equipment for artificial drainage. The works are in fair condition, but owing to their design require constant attention.

Ownership and Size of Holdings.—The lands are privately owned, and the farms vary in size from small areas of raspberries, strawberries, and vegetables to 80- to 100-acre dairy-farms.

No Reverted Lands.—At the present time there is no land in the area which has reverted to the Crown for non-payment of dyking assessments.

Land Sales.—Land sales in recent years have been numerous. Prices vary but many farms have changed hands at prices from \$200 per acre up.

Indebtedness to the Government.—This District operates under the “Drainage, Dyking, and Development Act” and the “Dewdney Dyking District Relief Act.” The original debt of the District was \$202,500, but in 1929 the “Dewdney Dyking District Relief Act” authorized the expenditure of \$150,000 in the purchase of the District’s outstanding debentures and \$15,000 to discharge the liabilities of the Commissioners. Although \$164,875 was actually expended, this Act set the debt owing to the Government at \$60,000 and ordered that the assets of the District, estimated at \$48,000, be liquidated. The insufficiency arising from the disposition of these assets was deemed to be money loaned by the Government to the Commissioners, and accordingly an item called “adjusted capital” was put through the books in the amount of \$16,657.32. The Act of 1929 also provided for the transfer of the administration of the District from the Commissioners to the Inspector of Dykes.

The following statement shows the standing of the Dewdney Dyking District with regard to its debt to the Government:—

	Total.	Per Acre.
Capital debt as at 1929.....	\$60,000.00	“ A ” \$28.03 “ B ” 21.03 “ C ” 14.02 “ D ” 7.01
Total debt as in 1933.....	58,086.17	
Adjusted capital, 1939.....	16,657.32	
Total debt as in 1939.....	76,657.32	
Total debt as at December 31st, 1945.....	113,176.23*	“ A ” 53.38 “ B ” 40.04 “ C ” 26.69 “ D ” 13.35

* Interest added since 1939.

Dyking Assessments.—In 1932, when the annual capital payments were postponed, the dyking assessments were as set forth in Table 30.

In 1946, with the capital levy restored after a postponement of thirteen years, the dyking assessments are as set forth in Table 30.

Relative Productivity.—The lands in this area vary very much in productivity. Generally speaking, the area is less productive than Matsqui, Sumas, or Chilliwack. Some portions are highly productive.

Reserve for Additions and Replacements.—During the period of postponement of the capital levy, slightly increased maintenance and operation charges have been levied in this District. From the fund so accumulated, the sum of \$20,184.92 has been expended on additional pumping facilities. In addition, there is in reserve a sum of approximately \$7,000 which is being held in anticipation of expenditures for renewal of the discharge-pipes under the C.P.R. grade which constitutes the dyke.

For estimates of future renewals, replacements, and additions see Table 29.

Special Factors.

1. *Special Postponement of Payments.*—Because there was no provision for postponement, a levy for repayment of capital was made in Dewdney in 1942, but a delegation from the District went to Victoria at that time and obtained a further postponement for a three-year period.

2. *Effect of Logging off High Lands.*—It is claimed that clearing and logging off the higher lands above the dyked area has increased the run-off onto Hatzic Prairie. Silt has filled in the channel under the bridge to within 18 inches of the bridge. Creeks which formerly took several days to come up after a storm now rise overnight, carrying away rocks, stumps, and soil. According to the evidence submitted, the pumps cannot handle this water during a heavy rain.

COMMENTS AND RECOMMENDATIONS.

This District is in a position to make some repayment annually on its indebtedness and, in addition, should make additional provision for replacements and improvements.

To this end I recommend:—

- (1.) That the sum of \$1,200 be collected annually and be paid into the Renewal Reserve Account; and
- (2.) That the present indebtedness be amortized over a period of forty years and that \$900 be paid annually to the Government, and, further, that this token payment of \$900 when paid each year be accepted as full payment for the amount due that year.

MAPLE RIDGE DRAINAGE DISTRICT.

(Hearings held in Municipal Hall, Pitt Meadows, July 9th, 1946.)

SUMMARY OF DATA.

Description of Area.—Within the low-land classification of the Maple Ridge Dyking District there is a special drainage area consisting of 5,477.27 acres. This area, known as Drainage No. 2, is divided into classifications as follows:—

- “ A ” lands: 1,739.13 acres of land that receive 66 lineal feet of ditch per acre.
- “ B ” lands: 2,904.29 acres of land that receive 33 lineal feet of ditch per acre.
- “ C ” lands: 833.85 acres of land that receive an outlet only (in parcels of up to 40 acres).

Description of Works.—In the Drainage District there are 41.66 miles of laterals, constructed in 1925.

Reverted Lands.—By 1932, 232 acres had reverted to the Crown for non-payment of dyking and drainage assessments; by 1939 the number of reverted acres totalled 967. This figure had been reduced by 1945 to 440 acres.

Indebtedness to the Government.—The following is a statement of the standing of the Maple Ridge Drainage District with regard to its debt to the Government:—

Borrowed in 1925 for construction of	Total.	Per Acre.
drainage-works.....	\$24,636.75	
Total payments up to 1932.....	17,635.82	
Total debt as in 1932.....	15,602.18	“ A ” \$4.61
		“ B ” 2.30
		“ C ” 1.16
Total debt as at September 30th, 1945.....	24,729.46*	“ A ” 7.28
		“ B ” 3.64
		“ C ” 1.82

* Simple interest added since 1932.

The original cost was extended over a period of fifteen years by Order in Council No. 973, dated September 5th, 1924. This provided for repayment of the debt by 1940.

Drainage Assessments.—In 1932, when the annual payments were postponed, the drainage assessments were as set forth in Table 30.

In 1946, with the capital levy restored after a postponement of thirteen years, the drainage assessments are as set forth in Table 30.

Since all the drainage lands are within the Maple Ridge Dyking District, owners of these lands pay the dyking charges in addition to the charges listed above.

Originally the drainage-works were to be maintained by a maintenance fund built up by annual assessments comprising 20 per cent. of the capital assessments. This amounted to \$503 per year, but proved insufficient and was increased during the post-

ponement period to \$1,370 per year. With the moneys so collected, the drainage-works are now being reconditioned. At present there is more work to be done than can be paid for out of this accumulated maintenance fund of approximately \$9,000.

Production.—This is largely a dairy-cattle milk-producing area.

Relative Productivity.—It is a fair hay- and pasture-producing area. Productivity is not the equal of Sumas and Chilliwack.

Estimate of Renewals, Replacements, and Additions required.—These are given as a part of the dyking system (see Table 29).

COMMENTS AND RECOMMENDATIONS.

The drainage system, though good, has not been adequate for the result it was intended to attain. Improvements are being made now and more will have to be made. If this area is ever to reach its maximum production, the water-table will have to be lowered considerably.

I doubt the ability of the District to meet more than a small part of its indebtedness for some years to come.

To this end I recommend:—

- (1.) That the sum of \$300 be collected annually and be paid into the Renewal Reserve Account; and
- (2.) That the present indebtedness be amortized over a period of forty years and that \$200 be paid annually to the Government, and, further, that this token payment of \$200 when paid each year be accepted as full payment for the amount due that year.

MAPLE RIDGE DYKING DISTRICT.

(Hearings held in Municipal Hall, Pitt Meadows, July 9th, 1946.)

SUMMARY OF DATA.

Location.—The Maple Ridge Dyking District is located on the east bank of the Pitt River, between the South Allouette and the Fraser. The main line of the Canadian Pacific Railway runs through the District.

Description of Area.—The total area is 8,382.31 acres, divided as follows: High land, 2,623.46 acres; low land, 5,758.85 acres.

A section along the Fraser River, about 1 mile in depth, is good land, but the remainder is of less value, requiring considerable expenditure in drainage-works and fertilization to make it reasonably productive. A large portion of the land cannot be underdrained because there is little or no run-off.

Description of Works.—There is an earthen dyke 14.38 miles long, constructed to 2 feet above the 1894 high-water contour, and an interception ditch 1.5 miles in length.

Gravity drainage to the District lands is permitted by four flood-boxes with a combined cross-sectional area of 392 square feet.

Artificial drainage is provided at high-water stages by five pumps whose combined capacity is 103,000 i.g. per minute against a head of 10 feet (see also Drainage District).

Ownership and Size of Holdings.—The lands are privately owned, with the exception of the acreage reverted to the Government. The holdings vary from a few acres used for small fruits to quite large dairy-farms.

Reverted Lands.—By 1932, 282 acres had reverted to the Crown for non-payment of dyking assessments; by 1939 this figure had increased to 1,378 acres. Partly because of the demand for peat-bogs, the total number of acres of reverted land still in the name of the Crown was reduced by the year 1945 to 662.

Land Sales.—Reverted lands in this area have been sold by the Crown at from \$15 to \$30 per acre. Some land well located, which had reverted to the Canadian Farm Loan Board, has sold at \$135 to \$150 per acre.

Indebtedness to the Government.—This District operates under the provisions of the "Dyking Assessments Adjustment Act, 1905," with amendments. The following statement indicates the standing of the Maple Ridge Dyking District with regard to its debt to the Government:—

	Total.	Per Acre.	
Debt as in November, 1904.....	\$221,981.96	\$26.50	
Debt as set by D.A.A. Act, 1905.....	127,396.00	15.20	
Further advances up to 1932.....	100,923.94	-----	
Total payments up to 1932 (interest, sinking fund, and deferred main- tenance).....	274,827.47	-----	
Total debt as in 1932.....	103,826.15	High	8.39
		Low	14.22
Advances since 1932.....	23,463.67		
Total debt as at September 30th, 1945.....	187,402.46*	High	15.13
		Low	25.65

* Simple interest added since 1932.

Dyking Assessments.—In 1932, when the annual payments were postponed, the dyking assessments were as set forth in Table 30.

In 1946, with the capital levy restored after a postponement of thirteen years, the dyking assessments are as set forth in Table 30.

Relative Productivity.—Only a portion of these lands are comparable to Sumas and Chilliwack in productivity. A large percentage of the acreage requires constant study and good farming practice in order to make it reasonably productive annually.

Estimate of Renewals, Replacements, and Additions required.—Heavy replacements, renewals, and improvements are required between now and 1987 (see Table 29).

Special Factors.—The C.P.R. does not contribute to dyking taxes because the railway was built before the dyke was constructed.

Maple Ridge Dyking District is the only district under the "Dyking Assessments Adjustment Act" with more than one land classification. The effect of the high-land and low-land classifications, which were set up when the District was first organized, is that 21.18 per cent. of the District's debt and operational expense is charged to high land, and 78.82 per cent. to low land. This is not equitable now that drainage services are of prior importance in the area. Some adjustments should be made.

COMMENTS AND RECOMMENDATIONS.

I doubt very much if this District will reach maximum production and consequent ability to pay until the water can be maintained at a lower level during the winter and spring months. Adequate drainage is essential, and so far, though it has been fair, it has not been adequate. This factor, along with others, has been kept in mind when considering the situation there. Improvements are essential.

To this end I recommend:—

- (1.) That the sum of \$2,400 be collected annually and be paid into the Renewal Reserve Account; and
- (2.) That the present indebtedness be amortized over a period of forty years and that \$1,200 be paid annually to the Government, and, further, that this token payment of \$1,200 when paid each year be accepted as full payment of the amount due that year.

MATSQUI DRAINAGE DISTRICT.

(Hearings held in Municipal Hall, Mission, July 10th, 1946.)

SUMMARY OF DATA.

Description of Area.—A total of 3,983.49 acres within the boundaries of the Matsqui Dyking District have been organized into the Matsqui Drainage District. These consist of a fringe of peat-land farthest from the river and the low-lying lands which were difficult of drainage. Generally speaking, they comprise the poorer lands of the Dyking District. They are classified for assessment purposes as follows: "A" lands, 2,910.90 acres; "B" lands, 472.83 acres; "C" lands, 599.16 acres. There is considerable discontentment over this division.

Description of Works.—The drainage-works were constructed from 1919 to 1921 at a total cost of \$106,464.32.

Reverted Lands.—By 1932, 374 acres had reverted to the Crown for non-payment of dyking and drainage assessments; by 1939 the total was 377. This figure was decreased by resales, until by 1945 there were 208 acres remaining in the name of the Crown.

Indebtedness to the Government.—The drainage-work was done under section 58 of the "Dyking Assessments Adjustment Act, 1905, Amendment Act, 1920." The following statement shows the standing of the Matsqui Drainage District with regard to its debt to the Government:—

	Total.	Per Acre.
Original cost of works	\$106,464.32	-----
Government grant	60,000.00	-----
District debt, 1921	54,131.78	-----
Payments up to 1932	47,877.79	-----
Total debt as at 1932	42,452.60	" A " \$12.87
		" B " 6.44
		" C " 3.22
Total debt as at September 30th, 1945	67,287.37*	" A " 20.40
		" B " 10.20
		" C " 5.10

* Simple interest added to 1932.

It is noted that the original cost of these drainage-works far exceeded the estimates.

Drainage Assessments.—In 1932, when the annual payments were postponed, the drainage assessments were as set out in Table 30.

In 1946, with the capital levy restored after a postponement of thirteen years, the drainage assessments are as in Table 30.

Production.—Much of the land is used for pasture and hay, but some small fruits are grown.

COMMENTS AND RECOMMENDATIONS.

The relative productivity of this area is not high. Some of the less productive lands of the area are contained within it. The history of some of the farms in the area is not encouraging. Some have been abandoned more than once. Some few farms are highly productive.

To this end I recommend:—

- (1.) That the sum of \$600 be collected annually and be paid into the Renewal Reserve Account; and
- (2.) That the present indebtedness be amortized over a period of forty years and that \$200 be paid annually to the Government, and, further, that this token payment of \$200 when paid each year be accepted as full payment for the amount due that year.

MATSQUI DYKING DISTRICT.

(Hearings held in Municipal Hall, Mission, July 10th, 1946.)

SUMMARY OF DATA.

Location.—The Matsqui Dyking District is located on the south bank of the Fraser River, about 35 miles from New Westminster and directly across the river from Mission City. The main line of the Canadian National Railways, a branch of the Canadian Pacific Railway, and the Chilliwack branch of the British Columbia Electric Railway run through this District. The trunk highway to Sumas, Washington (one of the three recognized ports of entry from the United States to the Coast district of British Columbia), also passes through Matsqui.

Description of Area.—The total area is 10,174 acres, about 85 per cent. of which consists of delta or alluvial deposits. This is heavy clay land, highly productive, except for 2,500 acres which are low lying and difficult to drain. There is an overburden of peat on about 15 per cent. of the total area, forming a fringe farthest from the river.

Description of Works.—There is an earthen dyke 7.2 miles in length, built to an elevation 2 feet above the 1894 high-water contour.

The dyke crosses the main sloughs or natural waterways, and flood-boxes in these permit of gravity drainage at low water, the opening being 264 square feet in cross-sectional area.

Artificial drainage at high-water stages is provided by two pumping plants of two units each, with a combined capacity of 55,000 i.g. per minute against a 20-foot head and 78,000 i.g. per minute against a 10-foot head.

Ownership and Size of Holdings.—There are approximately 328 families in the District. Some holdings are small, but most of them are family unit dairy-farms. Recently, substantial holdings of raspberries have been set out on many of the dairy-farms.

Reverted Lands.—By 1932, 374 acres of land in the Dyking District had reverted to the Crown for non-payment of dyking assessments; by 1939 this figure had reached 386 acres. In 1945 there were still 232 acres of reverted land in the name of the Crown.

Indebtedness to the Government.—This District operates under the provisions of the "Dyking Assessments Adjustment Act, 1905," with amendments, but application of the Act was deferred in this case until 1908. The following statement indicates the standing of the Matsqui Dyking District with regard to its debt to the Government:—

	Total.	Per Acre.
Debt as in November, 1904.....	\$209,915.60	\$20.68
Debt as set by D.A.A. Act, 1905.....	125,000.00	12.32
Further advances up to 1932.....	89,776.09	-----
Total payments up to 1932 (interest, sinking fund, and deferred maintenance).....	231,333.77	-----
Total debt as in 1932.....	119,223.27	11.75
Total debt as at September 30th, 1945.....	180,102.99*	17.75

* Simple interest added since 1932.

Dyking Assessments.—In 1932, when the annual payments were postponed, the dyking assessments were as set out in Table 30.

In 1946, with the capital levy restored after a postponement of thirteen years, the assessments are as set forth in Table 30.

Production.—A large portion of the acreage is devoted to dairying and the growing of small fruits. The dairy-farmers grow silage crops and, in some cases, a small amount of grain, but for the most part they feel it is not profitable to grow grain here. Some canning-corn is also produced. The small-fruit plantings are quite recent, corresponding with the high prices for berries.

Relative Productivity.—In the opinion of Mr. Dixon, the average lands in Matsqui are not as productive as the average lands at Sumas. There is, of course, considerable variation within each of these districts. Generally speaking, the lands nearest the river are highly productive and compare favourably with some of the best lands in the Lower Fraser Valley.

Estimate of Renewals, Replacements, and Addition to Works.—(See Table 29.)

Special Factors.—There has been some seepage in the Matsqui District, particularly along the river-bank. This was very evident during the high water of 1936, and again in 1946. In 1946, 115 acres of pasture-land and 12 acres of crops were flooded.

River-bank erosion, which is increasing at the present time and constitutes a serious problem, appears to be closely connected with seepage areas. In the past fifteen years a total of \$43,998.88 has been expended for river-bank protection along the Matsqui foreshore. Of that amount, the Provincial Government contributed \$13,597.82, the Dominion Government \$8,368.52, the Canadian National Railways \$5,999.85, and the Matsqui Dyking District \$17,032.67. River-bank erosion is accentuated by the velocity of the river at Matsqui and by the soil-structure of the area.

Although a branch line of the Canadian Pacific Railway runs through the District, the line was constructed before the dyke was built, and therefore the C.P.R. makes no contribution to dyking costs or maintenance. The Canadian National Railways and the British Columbia Electric Railway pay the same dyking charges per acre as are paid by the farmers.

Summary of Brief Presented by Land-owners.—1. The farmers feel that the Canadian National Railways, the Canadian Pacific Railway, and the British Columbia Electric Railway receive benefits from the dyke for which they do not pay sufficient compensation.

2. The timbered areas above the dyked lands are drained by the District, but do not bear any portion of the cost.

3. The arterial highway from Abbotsford to Mission benefits from the Matsqui dyke.

4. Farmers in the area are not receiving sufficient for their products, while labour costs, living costs, and municipal taxes have greatly increased. Under the circumstances these farmers feel that they would have great difficulty in meeting a dyking and drainage assessment which includes the capital levy with accrued interest.

5. They request that the capital charge be abolished, and that the maintenance charge be set at \$1.25 per acre.

In supporting their brief, some farmers testified that although they or their fathers had farmed these lands for twenty-five or thirty years, they had just made a bare living and had not been able to pay off their mortgages on the land.

COMMENTS AND RECOMMENDATIONS.

Generally speaking, this District is in a favoured position. The dyked area is quite large, being over 10,000 acres, and the acreage is high in relation to the miles of dykes. A difficult situation is found within the drainage area, but the District as a whole is able to pay something on its indebtedness.

To this end I recommend:—

- (1.) That the sum of \$2,100 be collected annually and be paid into the Renewal Reserve Account; and
- (2.) That the present indebtedness be amortized over a period of forty years and that \$2,200 be paid annually to the Government, and, further, that this token payment of \$2,200 when paid each year be accepted as full payment for the amount due that year.

PITT MEADOWS DYKING DISTRICT No. 1.

(Hearings held in Municipal Hall, Pitt Meadows, July 9th, 1946.)

SUMMARY OF DATA.

Location.—The Pitt Meadows Dyking District No. 1 is located between the North and South Allouette Rivers, 2 miles from the junction of the Allouette and the Pitt, and 2 miles from the Dewdney Trunk Road.

Description of Area.—The total area of the District is 1,174.78 acres. It lies wholly below the high-water contour of 1894 and is completely surrounded by its dyke.

The land appears to be very inferior. Only a small part of it is cultivated, the remainder being covered with hardhack.

Description of Works.—In this District there is an earthen dyke 6.08 miles in length, built to an elevation 2 feet above the 1894 high-water contour.

Gravity drainage at low water is permitted through one flood-box with two openings, with a combined sectional area of 72 square feet.

Artificial drainage is provided by a pumping plant with a capacity of 12,000 i.g. per minute against a 10-foot head. No pumping was undertaken in this District for fifteen years until 1946, when the pump operated for three weeks.

Ownership.—Approximately 146 acres have been purchased by four individuals. The balance is in the name of the Crown.

Reverted Lands.—By 1939, 1,151.30 acres, or the entire area with the exception of that portion used for municipal roads, had reverted to the Crown for non-payment of dyking assessments. In 1945 the reverted lands remaining unsold totalled 1,005 acres.

Indebtedness to the Government.—This District operates under the provisions of the "Dyking Assessments Adjustment Act, 1905," with amendments. The following statement indicates the standing of the Pitt Meadows Dyking District No. 1 with regard to its debt to the Government:—

	Total.	Per Acre.
Debt in November, 1904	*	\$39.22
Debt as set by D.A.A. Act, 1905	\$17,815.32	15.00
Further advances up to 1932	12,659.02	-----
Total payments up to 1932 (interest, sinking fund, and deferred maintenance)	37,843.21	-----
Total debt as in 1932	12,540.90	10.67
Total debt as at September 30th, 1945	18,739.11†	15.95

* Total debt at that time grouped with that of Pitt Meadows No. 2—combined debt was \$88,873.11.

† Simple interest added since 1932.

Dyking Assessments.—In 1932, when the annual capital payments were postponed, the dyking assessments were as set forth in Table 30.

In 1946, with the capital levy restored after a postponement of thirteen years, the dyking assessments are as set forth in Table 30.

Production.—The land is now being used for rough pasture only. Some attempts are being made to cultivate a small portion.

Relative Productivity.—It is not productive in its present state. No persons are living on it full time.

Estimate of Renewals, Replacements, and Additions required.—Are set out in Table 29.

Special Factors.—It was pointed out in the evidence that many attempts have been made to cultivate this land, but without success. The suggestion was made that Pitt Meadows Dyking District No. 1 should be allowed to revert to wild land or be made into a game reserve.

COMMENTS AND RECOMMENDATION.

I hesitate to suggest that all of this land be put into a game reserve, but under present conditions, and unless some one is prepared to spend at least \$100,000 on it for improvements to dykes, pumps, and land, I can see no alternative. The District is non-productive and can pay nothing on its indebtedness.

PITT MEADOWS DYKING DISTRICT No. 2.

(Hearings held in Municipal Hall, Pitt Meadows, July 9th, 1946.)

SUMMARY OF DATA.

Location.—The Pitt Meadows Dyking District No. 2 is located at the junction of the Allouette and Pitt Rivers, on the north bank of the Allouette.

Description of Area.—The total area is 1,091.64 acres. The District is triangular in shape, the rivers forming two sides and Sherridan Hill the third side. Because of its relatively small size and triangular shape, this District has abnormally high dyking maintenance charges.

The land is similar to that of the Coquitlam District and part of Maple Ridge. It has been cultivated considerably during the past twenty years, with indifferent success. There are about 800 acres of improved or partly improved land and 250 unimproved acres.

Description of Works.—The dyke is in the form of a loop, with both ends tied to Sherridan Hill. It is an earthen dyke, built to an elevation 2 feet above the 1894 high-water contour, and is 5.46 miles in length.

Gravity drainage at low water is permitted by a flood-box with two openings, having a combined sectional area of 72 square feet.

Artificial drainage is provided by a pumping plant with a capacity of 24,000 i.g. per minute.

Ownership and Size of Holdings.—Much of the land is divided into 5 and 10-acre blocks. There are at present about fifty-two owners or operators.

Reverted Lands.—By 1932 about 20 acres had reverted for non-payment of dyking assessments. By 1939 the total number reverted had increased to 502 acres, which is almost half of the area of the District. Some of these lands have been resold, decreasing the number of reverted acres by the year 1945 to 255.

Land Sales.—There have been a few sales by the Crown since March, 1946, but only of small acreages. Prices on these and previous sales have ranged from \$20 to \$35 per acre.

Indebtedness to the Government.—This District operates under the provisions of the "Dyking Assessments Adjustment Act, 1905," with amendments. The following statement indicates the standing of Pitt Meadows Dyking District No. 2 with regard to its debt to the Government:—

	Total.	Per Acre.
Debt as in November, 1904.....	*	\$39.22
Debt as set by D.A.A. Act, 1905.....	\$17,052.62	16.40
Further advances up to 1932.....	15,491.46	-----
Total payments up to 1932 (interest, sinking fund, and deferred maintenance).....	46,261.06	-----
Total debt as in 1932.....	9,628.40	8.82
Advances since 1932.....	1,500.00	-----
Total debt as at September 30th, 1945.....	16,164.38†	14.81

* Total debt at that time was grouped with that of Pitt Meadows No. 1—the combined debt was \$88,873.11.

† Simple interest added since 1932.

Dyking Assessments.—In 1932, when the annual capital payments were postponed, the dyking assessments were as set forth in Table 30.

In 1946, with the capital levy restored after a postponement of thirteen years, the dyking assessments are as set forth in Table 30.

Estimates of Renewals, Replacements, and Additions.—Are as set forth in Table 29.

Production.—There are a few medium-sized herds of dairy cows in the District. For the most part, the dairy-farmers grow silage crops and buy their grain. Some truck-gardening is also carried on.

Relative Productivity.—The area is not prosperous, and never has been. Given similar drainage, cultivation, and fertilization, it would be about the equal of Coquitlam and Maple Ridge in productivity, and superior to the peat-lands at Matsqui.

Brief Presented by Land-owners.—A brief presented on behalf of the land-owners of the District stressed the following points:—

- (1.) The dyke is in serious condition, and immediate repairs should be made.
- (2.) Additional pumping facilities are required to control the water-table, which is too high.
- (3.) Attention should be given to drainage-ditches.
- (4.) Because of the small acreage, the annual maintenance expenses are heavy on a per-acre basis.
- (5.) Before the District can pay more, the farmers will have to get better production. They cannot get better production under present conditions.

The farmers in this area feel that they should not have to bear the entire cost of the dykes, as the benefits are not limited to the farmer. Without the dykes, they claim, there would be no roads in the valley.

COMMENTS AND RECOMMENDATIONS.

This District is not in a position to pay until such time as the land is more productive. Improvement in productivity is not entirely, but in part, a dyking and drainage problem. Improvements are essential.

To this end I recommend:—

- (1.) That the sum of \$400 be collected annually and be paid into the renewal Reserve Account; and
- (2.) That the present indebtedness be amortized over a period of forty years and that \$100 be paid annually to the Government, and, further, that this token payment of \$100 when paid each year be accepted as full payment for the amount due that year.

SUMAS DRAINAGE, DYKING, AND DEVELOPMENT DISTRICT.

(Hearings held in Municipal Hall, Chilliwack, July 11th, 1946.)

SUMMARY OF DATA.

Location.—The Sumas Drainage, Dyking, and Development District is located mainly in Sumas Municipality, with a small portion in Chilliwack Municipality. It includes the old Sumas Lake bottom and the adjoining lands that were subject to flooding during the spring high water. The lands around the lake were settled and occupied previous to the draining of the lake.

Description of Area.—The total area, excluding road and canal allowances, is 28,075 acres. The lands are divided for assessment purposes into the following classifications, on the basis of elevation and frequency of flooding during the period of record before reclamation:—

- “A” lands (lake-bottom) : 9,837.76 acres.
- “B” and “C” lands : 9,671.49 acres.

"D," "E," "F," and "G" lands: 6,249.63 acres.

"H" lands: 951.66 acres.

"I" lands: 487.05 acres.

"J" lands: 473.84 acres.

There are also 403.1 acres in Indian reserve, which pay maintenance charges only.

Description of Works.—The reclamation programme in this District involved pumping the water out of Sumas Lake and converting the lake-bottom into an agricultural area. To accomplish this and to ensure that the lands so drained would be protected from inundation in the future, it was necessary to construct very extensive dyking and drainage works.

An artificial canal 4 miles in length, with dykes on either side high enough and of sufficient sectional area to bar the Fraser freshet, leads the Vedder River direct to the Fraser, by-passing Sumas Lake.

An interception canal, 10 miles in length, diverts the run-off waters from approximately 103 square miles of the surrounding territory (66 square miles of which are in the State of Washington), whose natural sump was Sumas Lake. This canal is so located as to provide gravity flow except during freshet periods, and is supplemented by a dyke throughout its length to protect the lands below it from the maximum known run-off.

There is an internal drainage system with many miles of main canals and laterals. Adequate pumping facilities are provided.

Ownership and Size of Holdings.—The area is at present divided into approximately 1,300 holdings.

Around Yarrow and the Sumas Prairie Road the land has been very finely subdivided and is held in small lots used for berry-growing. The dairy-farms are mostly in parcels of 40 acres and up.

No Reverted Lands.—There are no lands in the District which have reverted to the Crown for non-payment of dyking assessments.

Land Sales.—Land in this area has been selling at as high as \$250 an acre. The high prices are being paid by people coming in from other parts to the milder climate at the Coast, and by people wanting homes.

Indebtedness to the Government.—This District operates under the "Drainage, Dyking, and Development Act" and the "Sumas Drainage, Dyking, and Development District Act," and amending Acts.

The District was originally organized under the "Drainage, Dyking, and Irrigation Act," 1893, but little was done until 1917, when members of the Land Settlement Board were appointed as Commissioners under the "Dyking, Drainage, and Development Act." The entire construction-work, with the exception of the internal drainage, was completed by the Land Settlement Board by March, 1926, when the Inspector of Dykes was appointed sole Commissioner in its stead.

The cost of the work far exceeded the original estimates. The total debt, including maintenance for the years 1921 to 1925, was \$3,615,459.12. It was planned to repay this amount to the Government through the sale of the lake area of approximately 12,000 acres, and by annual levy upon the lands which were privately owned. Amendments to the "Sumas Drainage, Dyking, and Development Act" subsequently set a definite construction charge per acre on the privately owned lands, and specified that the insufficiency arising out of the sale of the lake area be charged to the Consolidated Revenue Fund of the Province.

The following is a statement of the standing of the Sumas Drainage, Dyking, and Development District with regard to its debt to the Government:—

	Total.	Per Acre.
Initial debt for construction and for maintenance, 1921-25	\$3,615,459.12	-----
Sale of lake area	720,159.32	-----
January 1st, 1928: Construction charges were fixed at definite amounts per acre by amendment to the "Sumas Dyking, Drainage, and Development Act"—		
"B," "C" lands		\$50.00
"D," "E," "F," "G" lands		30.00
"H" lands		20.00
"I" lands		10.00
"J" lands		5.00
January 1st, 1937: Construction charges were set by further amendment to the Act at these amounts—		
"B," "C" lands		30.00
"D," "E," "F," "G" lands		25.00
"H" lands		20.00
"I" lands		10.00
"J" lands		5.00
Total construction charge as at 1945*	674,753.58	-----
"B," "C" lands		42.15
"D," "E," "F," "G" lands		36.13
"H" lands		31.44
"I" lands		15.72
"J" lands		7.86

* Simple interest added since 1932.

For details of assessments see Table 30.

It should be noted that there is no capital charge against the "A" lands (lake-bottom land).

There is also no capital charge against the lands in the Indian reserve.

Under existing regulations the debt owed to the Government must be repaid by January 1st, 1981, at 4½ per cent. interest.

Dyking and Drainage Assessments.—The "Sumas Drainage, Dyking, and Development District Act Amendment Act, 1929," set up reduced construction charges per acre as at the 1st day of January, 1928, stipulating that the annual levies of taxes on the reduced construction charges should be made to provide interest at the rate of 5½ per cent. per annum on those amounts and to create a sinking fund sufficient to repay by January 1st, 1969. Five annual levies were made on this basis before the Government postponed the annual payments in 1932.

The "Interest Reduction (Crown Moneys) Act," 1936, reduced the rate of interest from 5½ per cent. to 4½ per cent. as at June 1st, 1936, and the "Sumas Drainage, Dyking, and Development District Act Amendment Act, 1936," further reduced the construction charge as at January 1st, 1937. The accumulation of interest through the thirteen-year postponement period has, of course, raised these construction charges per acre considerably.

The following statement shows the comparative assessments for maintenance and for capital repayment (including interest) in 1932 and 1946:—

Comparative Assessments, 1932 and 1946.

Classification of Land.	MAINTENANCE PER ACRE.		CAPITAL LEVY PER ACRE.		TOTAL CHARGES PER ACRE.	
	1932.	1946.	1932.	1946.	1932.	1946.
	\$	\$	\$	\$	\$	\$
"A".....	2.00	2.25	.....	.....	2.00	2.25
"B" and "C".....	1.10	1.35	3.10	2.39	4.20	3.74
"D," "E," "F," "G".....	.55	.675	1.86	2.05	2.41	2.725
"H".....	.275	.3375	1.24	1.78	1.515	2.1175
"I".....	.275	.3375	.62	.89	.895	1.2275
"J".....	.275	.3375	.31	.44	.585	.7775
Indian reserve.....	.....	1.10	.....	.....	.....	1.10

Production.—This area is devoted mainly to dairy-farming. The dairymen grow hay, fodder, and silage, but buy most of their concentrates.

There is some small-fruit growing, particularly in the Yarrow district, on small acreages.

On the lake-bottom lands there are a number of hop-fields, and there is some acreage used for growing grass for dehydrating purposes.

Some mixed farming is carried on in both Upper and Lower Sumas.

Relative Productivity.—This District contains some of the most highly productive land in the Lower Fraser Valley. A portion is gravelly and another portion is peaty, but these areas are not very large. The land and productivity as a whole compare very favourably with the highly productive Chilliwack and Delta areas.

Estimate of Renewals, Replacements, and Additions to Works.—(See Table 29.)

Special Factors.

1. *Dyke Benefit to Province as a Whole.*—In the brief presented by the land-owners, it was claimed that the Sumas dyke enabled the Government to build the Trans-Canada Highway through that area at a lower cost than would have been possible without the dyke, as it saved taking the road around Vedder Mountain and over several railway crossings. In addition, draining Sumas Lake eliminated the mosquito pest in the whole area. The farmers therefore argue that an additional part of the cost should be borne by the Province.

2. *Accrued Interest.*—The brief also took exception to the addition to the total debt of the interest which has accumulated during the thirteen-year postponement period.

Arrears on Assessments.—The arrears on capital payments and assessments as at September 30th, 1931, was \$117,586.04. By September 30th, 1946, this had been reduced to \$6,865.72, or in other words the District had been able, for various reasons, to pay more than \$7,300 a year on back assessments. This was during the period when the capital assessments were postponed.

Thanks to Mr. Jones.—I wish to thank Mr. E. S. Jones, District Engineer, who examined the works and advised on certain engineering aspects.

COMMENTS AND RECOMMENDATIONS.

This is one of the most fertile areas in the Lower Fraser Valley and compares favourably with Chilliwack and the Delta. Economically it differs materially from these other two districts in that maintenance and pumping costs are relatively much greater and the original capital costs were over \$125 per acre, as compared to \$15 or less in the other two. The District has carried on with some success for about twenty-

five years, but during that time, while the facilities have been maintained, no attempt has been made to set up a Reserve Replacement Account. Some replacements are due at or before 1972, and certain changes and improvements are necessary in the near future.

To this end I recommend:—

- (1.) That the sum of \$14,000 be collected annually and be paid into the Renewal Reserve Account; and
- (2.) That the present indebtedness be amortized over a period of forty years and that \$7,000 be paid annually to the Government, and, further, that this token payment of \$7,000 be accepted as full payment for the amount due that year.

LADNER MUNICIPALITY.

(Information obtained from Mr. Smith, Municipal Clerk, on October 29th, 1946.)

This statement is included because of the many references to the Ladner District, where all of the original dyking and nearly all of the original drainage costs have been paid.

DYKING.

Capital charges on the dykes were paid up years ago.

There are two large dykes:—

	Acres served.	Miles of Dyke.
1892 dyke	8,000	5.511
1895 dyke	16,250	15.043
Totals	24,250	20.554

Maintenance and Replacements.—No maintenance or other charges are levied on the lands under the 1892 dyke. There has been no levy on these lands for about twenty years. Tidal action on this area is very slow. High tides and a big wind in December might possibly do some damage, but over the years there has been very little work required on the 1892 dyke.

There is a maintenance charge of 15 cents per acre on the land under the 1895 dyke; that is, on 16,250 acres. This is the dyke on the river side. From this levy a total of \$10,363.57 had been accumulated as at December 31st, 1945, which can be used for maintenance or renewals. There is no specific Renewal Reserve Fund.

On the gulf side there was a washout in 1934 which necessitated an expenditure of about \$10,000 for replacements.

The dyke is built to an elevation of about 6 feet. In a very high water in 1936 the water came up almost to the level of the dyke.

There is some seepage where there is quicksand, but not a great deal.

No lands have reverted for non-payment of taxes.

Dyke.	Original Construction Cost.	Cost up to 1939.
1892 dyke	\$31,812.00	\$64,627.36
1895 dyke	66,112.79	222,061.36
	<u>\$97,924.79</u>	<u>\$286,688.72</u>
Contributed by Dominion Government		\$11,937.50
Contributed by Provincial Government		23,251.70
Contributed by Dominion and Provincial Governments (relief labour)		1,884.75
Contributed by municipality		249,614.77
		<u>\$286,688.72</u>

The original cost of the dykes to protect 24,250 acres was \$97,924.79. This is just a fraction over \$4 per acre.

DRAINAGE SYSTEMS.

System.	Acres.	Construction Cost.	ANNUAL LEVY.	
			Maintenance.	Capital.
River area, 1937.....	8,435	\$18,960.00	\$1,773.79	\$2,450.75
East Delta, 1937.....	10,643	25,500.00	5,049.07	2,281.46
Central drainage (no pumps).....	14,217	30,000.00	1,881.47	3,788.16
English Bluff (no pumps).....	1,389	48,000.00	407.71	620.45
Tilbury Island.....	423	3,000.00	345.75	387.78
Totals.....	35,107	\$125,460.00	.....	.....

The lands are assessed on the basis of a mill rate on the value of the land only, without improvements.

There is a large area of bog in the East Delta (about 3,000 acres) which is valued at about \$15 per acre and taxed accordingly. The good lands are assessed on the basis of an evaluation of about \$115 per acre.

1945 Levies.

Drainage (maintenance and capital)	\$14,091.75
Dykes (maintenance)	2,531.95

Pumps.

	Capacity Gallons.
East Delta (three pumps—two obsolete), one pump.....	20,000
River area, one pump	20,000
Tilbury Island, one pump	3,000

There is no special fund for replacement of pumps. They have \$7,000 put up by the peat companies which they could use for pump replacement. As soon as the capital debt is paid up on the drainage, they plan to replace the pumps.

While the cost per acre varies with each system, the over-all cost is nevertheless quite low. The original cost of draining 35,107 acres was \$125,460 or around \$3.50 per acre.

Maintenance Equipment.—They have two drag-lines, all paid for. When required, these will be replaced out of the general funds secured through charging \$35 per day for use of the drag-line on each of the drainage schemes.

COMMENT.

This is a low-cost district, comparable only to Chilliwack, and not comparable in any way to the districts in the terms of reference in so far as either maintenance or original costs per acre are concerned.

VICTORIA, B.C. :

Printed by DON McDIARMID, Printer to the King's Most Excellent Majesty.

1947.



