IMPACTS '75 - '85

PART 1

DISTRICT OF SPARWOOD

AN EVALUATION OF POTENTIAL IMPACTS FROM PROJECTED LABOUR FORCE INCREASES AT KAISER RESOURCES LTD.'S EXISTING OPERATIONS AND AT KAISER COAL CANADA LTD.'S PROPOSED HOSMER-WHEELER PROJECT

THE UNECON PARTNERSHIP

THE UNECON PARTNERSHIP
Project Consultants

McCARTER, NAIRNE & PARTNERS
Planning Consultants

ASSOCIATED ENGINEERING SERVICES Ltd.
Municipal Engineering Consultant

ACKNOWLEDGEMENTS

The Unecon Partnership wishes to acknowledge the assistance afforded by the following:

British Columbia Hydro and Power Authority

British Columbia Telephone Company

Columbia Natural Gas Limited

District of Sparwood

Environmental & Land Use Committee - Secretariat

Kaiser Resources Ltd.

Regional District of East Kootenay

Royal Canadian Mounted Police

School District No. 1 (Fernie)

Swan Wooster Engineering Co. Ltd.

Underwood, McLellan and Associates Limited

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PREAMBLE

In 1974 Kaiser Resources Ltd., in their interest of attracting and stabilizing a quality labour force, had requested McCarter, Nairne & Partners:

1. to appraise the existing situation of both Fernie and Sparwood,

2. to project future requirements based on Kaiser employment figures for the existing operation and a proposed new operation at Hosmer, and

3. to recommend the best solutions consistent with both short and long term employee and company development needs.

A preliminary appraisal was submitted recommending that Sparwood should be considered the community identified as the centre for the Kaiser operations, and that all development required to meet present and future needs should be concentrated there. If the Hosmer Mine developed, a phased program should be undertaken to locate, over a period of time, all employees from the present Harmer and Michel operations at Sparwood. Most of the employees for the Hosmer mine would then be located at Fernie.

It was recognized in this preliminary appraisal that the current master plan of Sparwood required review to meet both the projected short and long term requirements. The short term requirements could not justify expanding Sparwood beyond its present area defined by the highway and the river. For the long term requirements, this master plan should be reassessed to better effect a more cohesive community, identified positively with Kaiser, of 6,000 to 7,000 people.

These recommendations were accepted by Kaiser Resources Ltd. and McCarter, Nairne & Partners were required to:

1. appraise in more detail all aspects of Sparwood as it exists, and

2. project the model community based on the present population and increased by both Kaiser's immediate and future labour forecasts.

A draft - unpublished - report entitled "IMPACTS '75 - '81" was prepared and presented to Kaiser Resources Ltd. for review.

ASSIGNMENT

The Unecon Partnership were commissioned by Kaiser Coal Canada Ltd.:

to update the unpublished report drafted by McCarter, Nairne and Partners in 1974 recognizing:

- The Kaiser Resources Ltd. increased work force at the Harmer and Michel operations of 2,051.
- The Kaiser Coal Canada Ltd. amended work force projections for the Hosmer-Wheeler operation of 759.
- The community impacts that require reference under the "Guidelines for Coal Development" issued by the Environment and Land Use Committee

It should be recognized that continuity of reporting has been achieved through The Unecon Partnership personnel who worked on the development of the McCarter, Nairne report prior to the formation of The Unecon Partnership.

Mr. W.R. Gibson of McCarter, Nairne and Partners has continued to fill an advisory role.

CHAPTER I

INTRODUCTION

A. A Brief History of the Development of Sparwood:

1950 - The Village of Sparwood was established by Crows Nest Industries Limited as the settlement for their employees in nearby mining activities. Town layout and development was very limited and confined to an area identifiable as the high or upper terrace level immediately South of Michel Creek near its junction with the Elk River. Until 1966 most growth was confined to this area - Figure 1.

1966 - A major urban renewal scheme was declared for the Natal-Sparwood area and a study was made by the Regional Planning Division of the B.C. Department of Munici Affairs and Underwood, McLellan & Associates Limited study culminated in a 1967 report which recommended:

- that Natal be abandoned as a settlement area because of the unsuitable environment created by nearby industrial activities, and

- that Sparwood be developed as the only available and acceptable site in the immediate area. Sparwood was incorporated as a District Municipality in 1966.

This study projected land use in Sparwood to serve a population of 3,500 persons.

- Kaiser Resources Ltd. acquired mining properties and operations from Crows Nest Industries Ltd., and projected an employment of 1,000 persons by 1971. Sparwood, being the closest settlement, was expected to absorb most of the growth created by increased employment in mining. The 1971 Canada census established the population of the District of Sparwood at 2,990 persons. The growth areas suggested in the 1967 urban renewal report were developed only on the west side of the highway. Development extended southward in this area beyond the area recommended, and along the higher terrace lands north of Michel Creek. Development in this latter area was largely of a temporary, low quality and less desirable type whereas that in the townsite area proper was generally of the higher quality, longer life type.

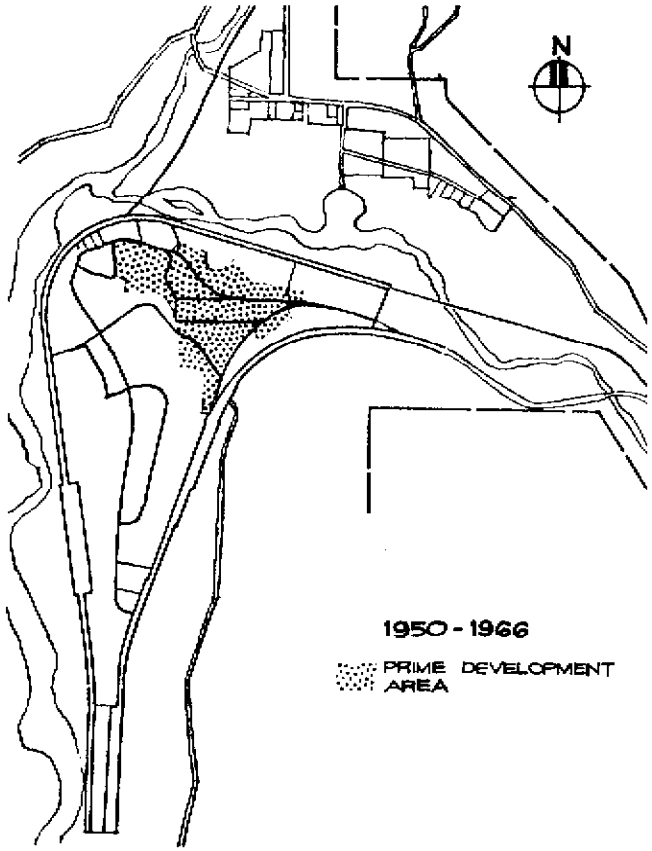
A. A Brief History of the Development of Sparwood (continued)

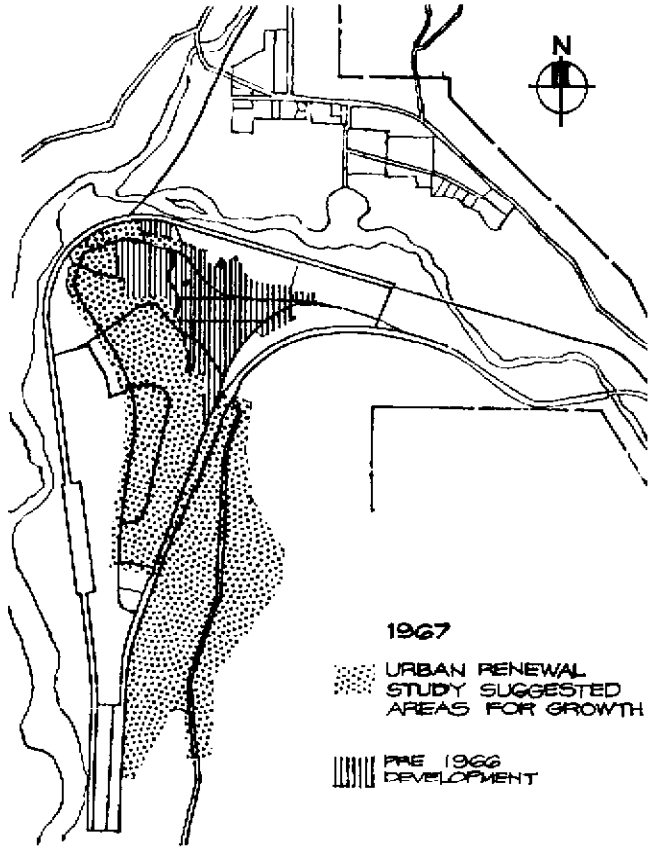
1971 - Kaiser Resources Ltd. negotiated a 15 year contract to supply coal to the Japanese steel industry and began to intensify their Harmer operation. In late 1973 or early 1974 the population of Sparwood exceeded the 3,500 persons projected by the 1967 study. By September 1974, 964 employees of the Harmer operation resided in Sparwood and the total Sparwood population was estimated to be about 3,600 persons with some 2,700 of these residing within the area defined in the 1967 study report. By March 1975, 978 employees of the Harmer operation resided in Sparwood.

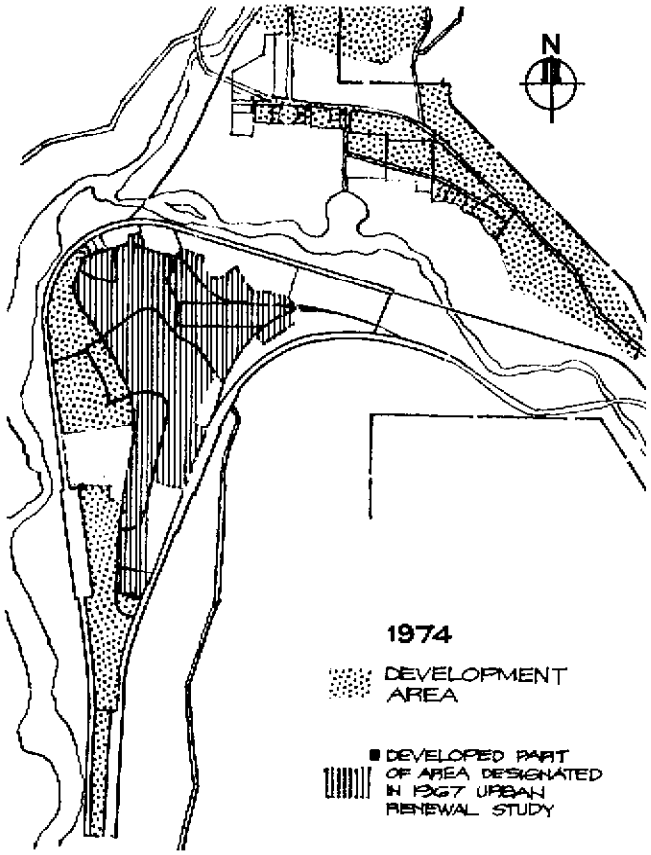
1974 - McCarter, Nairne & Partners studied the impact of the forecast increase in total Harmer employment to 1,900 persons. They concluded that the direct employment increase, the increased employment of married persons, and a potential decision of employees who currently reside in Alberta to move to Sparwood when housing is available, would combine to ensure significant growth in Sparwood. Their study was not published.

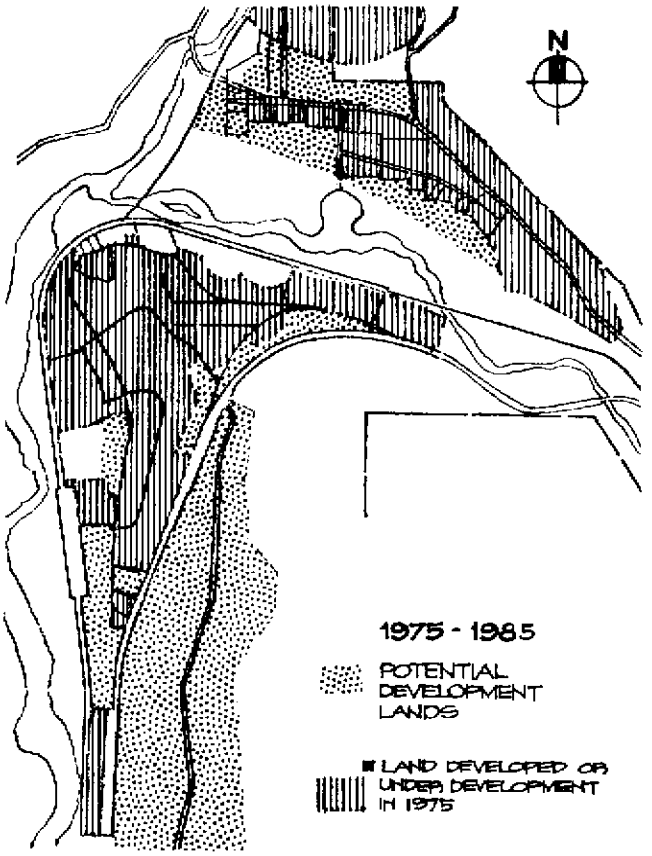
1975-1985 - This report explores the further prospect of growth in Sparwood that would result from a decision to bring the proposed new Hosmer-Wheeler mine into operation. It is expected that feasibility will be determined in 1976/1977. If the decision is to proceed immediately, mine start-up is anticipated in the fall of 1979 and a state of full employment is expected to be reached by the start of 1982/1983. It is expected that many of the mining employees currently living in Fernie will elect to transfer to the closer Hosmer-Wheeler operation. They will be replaced by new arrivals to the Harmer operation, most of whom will reside in Sparwood if adequate housing is made available.

The growth pattern of Sparwood from 1950 to present time and projected to serve identifiable growth possibilities to 1985, is illustrated - Figure 1. Precise delineation of useable lands is dependent upon additional detailed study of topography, hydrology and soils, to define urban suitability and identify hazards from ground bearing instability and landslip/landslide potential.









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SPARWOOD GROWTH PATTERNS — 1950 TO PRESENT **Fig. 1**

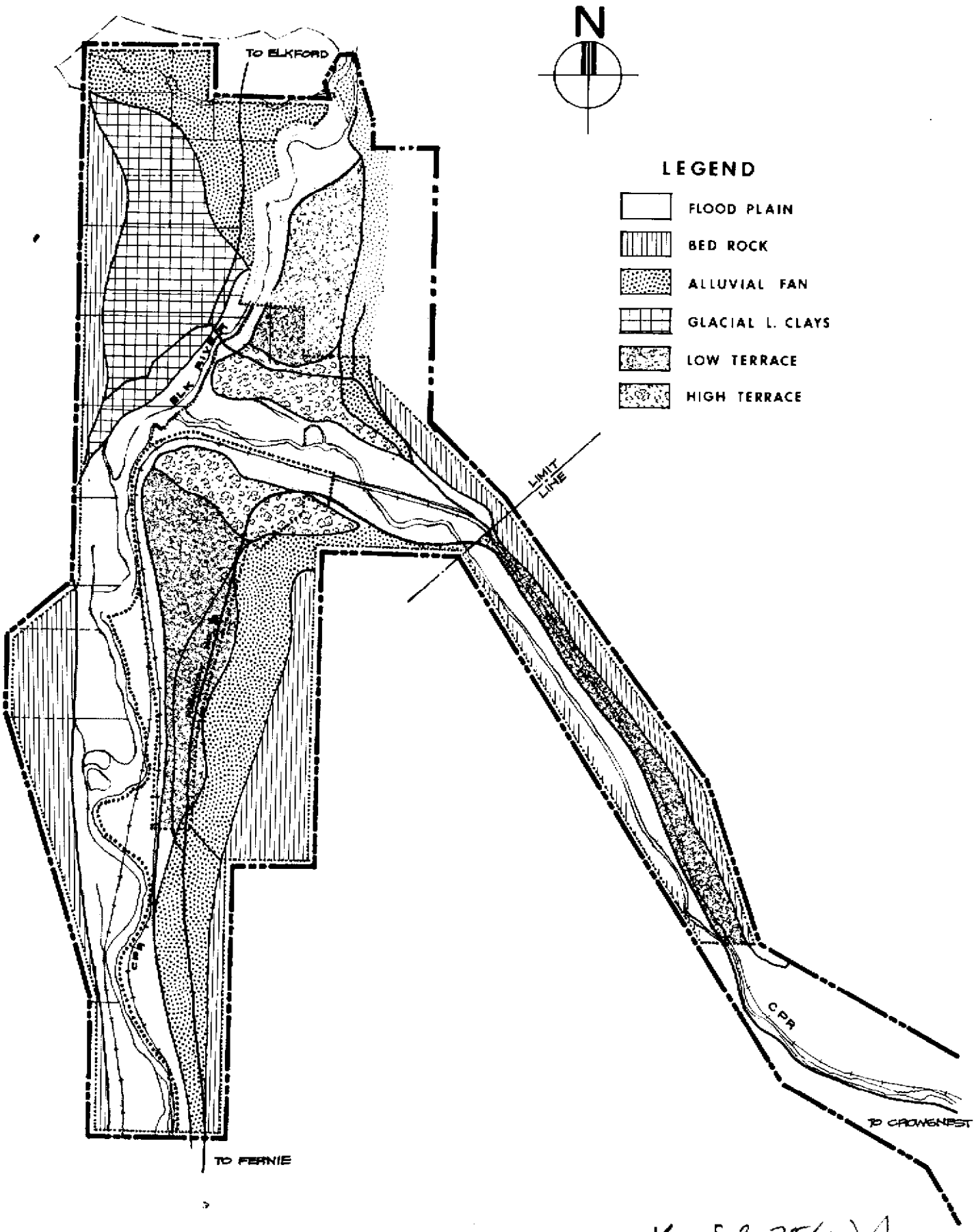
B. A Review of Factors Affecting Sparwood Development:

1. Availablity of land for Sparwood growth:

Figure 2 illustrates the present boundaries of the District of Sparwood and designates, for purposes of analysis, a portion of the District in which it is anticipated that foreseeable Sparwood growth would occur.

Figure 2 also illustrates the zones of basic surface geology which occur within this area. Based on mapping which was included in the 1967 Natal - Sparwood Urban Renewal Study Report, these geological zones and their areas as an approximate percentage of total land area within the greater Sparwood area are indicated as follows. The characteristics of each zone as they affect development are noted alongside

Geological Category	Approximate % of Greater Sparwood Land Area	Characteristics Relating to Potential Development
Flood plains	32%	frequent flooding, ground-water at river level.
Glacial lake clays	11%	high erosion upon clearing, slopes vulnerable to slippage and slides.
Low level gravel terraces	9%	high water table, potential flood hazard, elevating of land or flood controls required.
High level gravel terraces	8%	prime development land, deficient in organic materials and water holding capabilities.
Alluvial cones and fans	18%	complex and erratic soils, subject to run-off erosion, susceptible to slides.
Bedrock	22%	steep slopes, potential of small avalanches.



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SURFICIAL GEOLOGY — GREATER SPARWOOD AREA **Fig. 2**

B. A Review of Factors Affecting Sparwood Development (continued)

2. Developable Land and Suggested Priorities

Much of the high level terrace land has already been developed, and some development has occurred or has been committed to low level terrace and glacial lake clay areas. It is noted that the 1967 Natal - Sparwood Urban Renewal Study indicated townsite growth east of the present highway on low level terrace and alluvial fan overburden lands, and west of the highway on upper portions of the low level terrace. The portion of low level terrace indicated for development was identified as being within flood prone territory, and raising of ground level together with use of water-tight sub-surface utilities was recommended. Dike control was suggested as impractical because of the excessive depths of impervious strata in soils at the edge of floodplains, and costs to reclaim relatively low acreages from flood conditions was generally considered prohibitive.

Figure 3. identifies three areas, in a numbered order of priority, for future Sparwood growth through either new development or redevelopment of temporary or sub-standard contents. Each growth area is separated from the townsite proper by either a natural or man-made barrier.

Figure 3. is accompanied by a short listing of the positive and negative aspects associated with each of these areas.

ANALYSIS OF POTENTIAL DEVELOPMENT AREAS

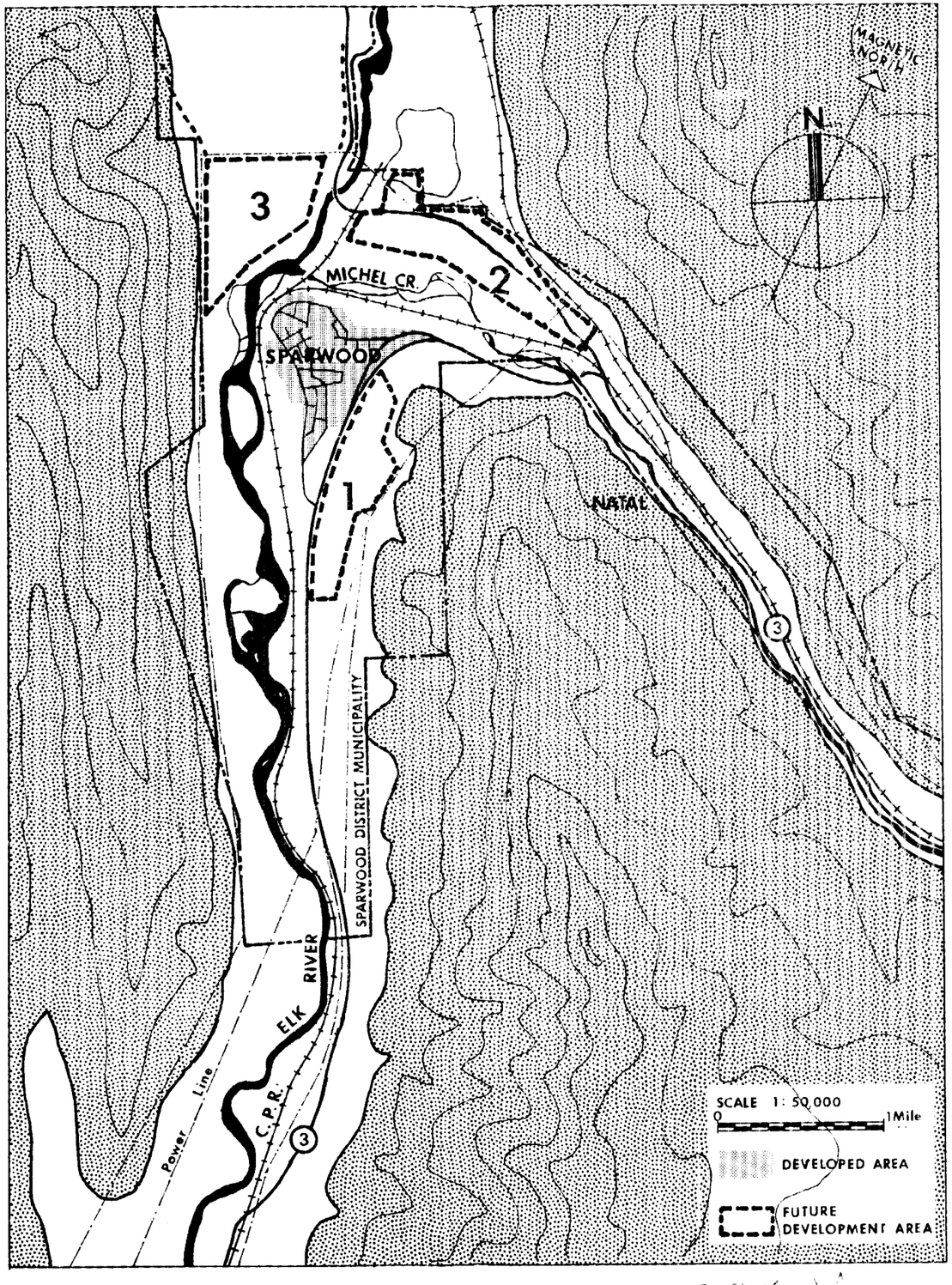
FOR HOUSING & GROWTH

General Statement:
Sparwood is located in a narrow valley gap which is dissected west to east by:

Elk River
C.P. Railway
B.C. Highway No. 3
East Kootenay Power Line

Evaluation of potential growth areas 1, 2 and 3

AREA	POSITIVE	NEGATIVE
1.	1. Closest to existing development. 2. Relates to Servicing Master Plan and 1967 report suggestions. 3. Farthest removed from possibly objectionable mining activities. 4. Possible view lots. 5. Treed area amenity. 6. Ownership.	1. Cut off from town by Highway. 2. Steep topography - view possibility but east sun (early) precluded. 3. Long linear pattern remote (at its southern extremity) from convenient shopping and existing schools. 4. Possibly windy area (south end of Elk Valley gap). 5. Slope stability doubtful. 6. Major power line parallels eastern edge for half length of subdivision (south end). 7. Service indudstrial zoned land across highway to west not compatible with residential unless large treed buffer allowed.
2.	1. Flat open land. 2. Area is badly in need of tightened controls and clean up which large scale development could foster.	1. Existing low to moderate quality sprawl development and mixed use - industrial, residential, commercial (office). 2. Area has 'other side of tracks' context and is remote from Sparwood core. Requires improved connections. 3. Linear extension of Natal image. 4. Proximity to heavy industrial. 5. Narrow area bisected by Highway. 6. Services. 7. Required flood plain edge delineation.
3.	1. Flat land. 2. Open view and possible expansion to north. 3. Possible visual relationship to River. 4. Semi-cleared land. 5. Area available for expansion. 6. Depending on Elk River crossing, closer to existing schools than Area 1. 7. Ownership.	1. Cut off from town by Elk River - requires improved connection. 2. Clay soil area. 3. Industrial activities (settling pond and wash plant) may be incompatible; wind blown dust - visual aspect. 4. Municipal servicing difficulties. 5. Steep topography at west edge, evening sun cut off. 6. Power line across north edge.



SPARWOOD GROWTH AREAS

Fig. 3

B. A Review of Factors Affecting Sparwood Development (continued)

3. Basic Problems Confronting Sparwood Development:

a. General scarcity of prime development land.

Previous commentary has illustrated that land of this quality is scarce and has been largely exhausted by development to date. This means that development on lands having inherent soil and water problems must be increasingly contemplated. In such cases development must occur knowingly and must solve the inherent problems, usually at varying additional expense. The potentially most attractive land available for significant growth is the area located immediately east of the highway and consists of the upper portion of the low level gravel terrace and lower toe areas of the alluvial overburden area at the foot of Sparwood ridge. Soil tests carried out in 1966 indicated underlying silty clays near the old highway alignment which bisects this potential first priority growth area. Additional testing and investigation will be required to permit a more precise delineation for development, and the development patterns and type will have to be very carefully related to natural conditions.

b. Limited access highway as a barrier.

The 1966 Urban Renewal Study recognized this highway as a barrier between the townsite proper and the significant developable lands on its eastward side. It is suggested that discussions be initiated with the Department of Highways to determine whether a realignment of this highway into a by-pass route is feasible. It is possible that new coal operations to the north will create a need for new settlements and that these will extend the Elk Valley highway to a point where connection to the Jasper-Calgary highway section is feasible. The establishment of this highway link as a strong route between Calgary and East Kootenay centres could set the stage for modifications in the Sparwood area relating to a north-south dominance over east-west traffic.

c. Michel Creek and Elk River as barriers.

Development Area 2. located north of the Michel Creek floodplain is connected to the townsite area by a loop-back started from the Natal part of the highway at a point where the Michel Creek floodplain pinches into the Natal-Michel valley. Partly as a consequence of

B. A Review of Factors Affecting Sparwood Development (continued)

3. Basic Problems Confronting Sparwood Development (continued)

c. Michel Creek and Elk River as barriers (continued)

this extended contact distance and partly because of proximity to the Harmer mining operation, this area has assumed the character of a sub-standard part of town. In fact to some it will not appear as part of the town. In a similar way Development Area 3, in the north-west area across the Elk River, exists as a location beyond Area 2 on a route northward. It is even farther away from the town-site proper. In both cases the watercourses and their 1,000-1,500 foot wide floodplain areas present obstacles which require relatively expensive solutions to effect more direct travel contact.

Should development of the northward highway route to Alberta be contemplated in the near future, and should the need to by-pass the main townsite area of Sparwood along the west side of the Elk River become apparent, such a by-pass could provide improved contact through interchange at the Elk River crossing between Areas 2 and 3.

d. Railroad as a barrier.

Location of trackage along the toe of the high terrace bank minimized intrusion in this part of town. To the west and southwest, however, the trackage runs along the floodplain-low level terrace boundary. In this area it adds a clearance requirement problem to the solution of any highway by-pass crossing the Elk River floodplain. Level crossing is precluded from consideration because of "highway standard" requirements and "flood immunity" considerations.

e. Dispersed municipal servicing as a problem.

The geological nature of greater Sparwood suggests problems for development of municipal service utilities because of eventual forced decentralization. Fire-fighting and police services will be similarly hampered.

C. Land Use Characteristics of Sparwood at Present Time:

Figure 4. shows existing zoning (1976) in the Sparwood townsite area. Figure 5. shows existing land use (1976) in the greater Sparwood area. Comparison of these figures suggests several things:

1. Sparwood growth had tended to be rather haphazard and resulted more along the lines of response to immediate, isolated, problems rather than orderly procedure along development paths.

2. The Sparwood north area beyond Michel Creek has been allowed to develop in a haphazard manner to the point where it reads either as a separate community or as a second class part of Sparwood.

3. The District of Sparwood has not enjoyed first-class planning assistance. Lack of means, Regional District denials of assistance, and Provincial Government policies may all be contributors.

Because of its land forms, the proper development of Sparwood is not an easy problem. Development has already progressed into geological zones having complicating and cost-increasing factors. And in addition, it has inherited some complicating factors - unfortunate highway and railway routings which failed to allow adequately for settlement growth.

D. Nature of Sustaining Industry:

Within a relatively short period of time the levels of coal mining employment have increased some 1½ to 2 times over what was initially considered an ultimate employment level. This raises the questions: how high will employment go, and how long will it last at these levels?

While the purpose of this report is to assess impacts and requirements associated with growth, the implications of marked reductions in employment, the physical effect on community, and overbuilding in permanent forms during a period of optimism and growth should be given some serious consideration.

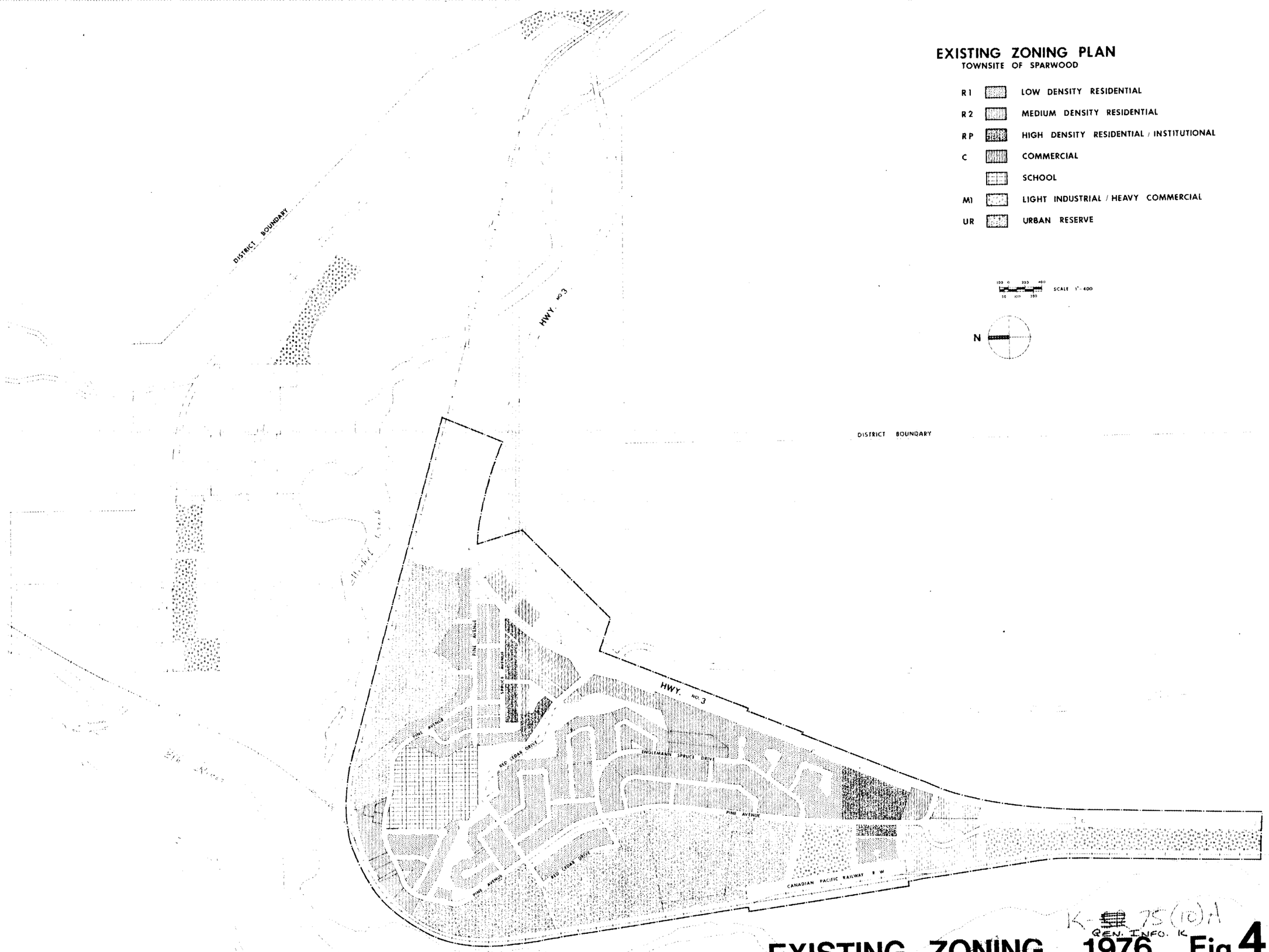
EXISTING ZONING PLAN
TOWNSITE OF SPARWOOD

R1		LOW DENSITY RESIDENTIAL
R2		MEDIUM DENSITY RESIDENTIAL
RP		HIGH DENSITY RESIDENTIAL / INSTITUTIONAL
C		COMMERCIAL
		SCHOOL
M1		LIGHT INDUSTRIAL / HEAVY COMMERCIAL
UR		URBAN RESERVE

100 0 200 400
50 100 200 SCALE 1" = 400

N

DISTRICT BOUNDARY



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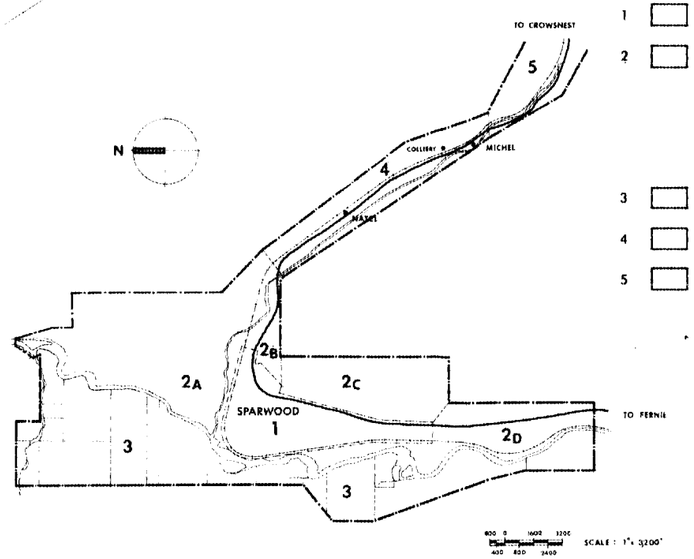
EXISTING ZONING _ 1976 _ Fig 4

DISTRICT OF SPARWOOD



1 EXISTING TOWNSITE OF SPARWOOD
GENERAL URBAN 555 ACRES

2 EXTENSION OF TOWNSITE
URBAN RESERVE 2,752 ACRES
2_A 1444.92 ACRES
2_B 181.36 ACRES
2_C 594.72 ACRES
2_D 531.00 ACRES

3 NORTHWEST PORTION OF DISTRICT
AGRICULTURE 2,055 ACRES

4 EXISTING VILLAGES OF NATEL & MICHEL
HEAVY INDUSTRY 630 ACRES

5 BALANCE OF DISTRICT
UNORGANIZED 6609 ACRES

DISTRICT BOUNDARY

EXISTING LAND USE

	WITHIN TOWN SITE ACRES	AREA 1 ACRES	AREA 2 ACRES
RESIDENTIAL MIXED USE	139.57	-	104.33
COMMERCIAL MIXED USE	21.60	-	11.48
SCHOOLS & INSTITUTIONS	31.00	-	9.58
PARKS & RECREATION BUFFER ZONES ETC.	58.55	-	-
INDUSTRIAL MIXED USE	26.05	-	81.06
VACANT LAND UNASSIGNED USE	278.23	194.00	355.55
TOTAL ACREAGE	555.00	194.00	562.00

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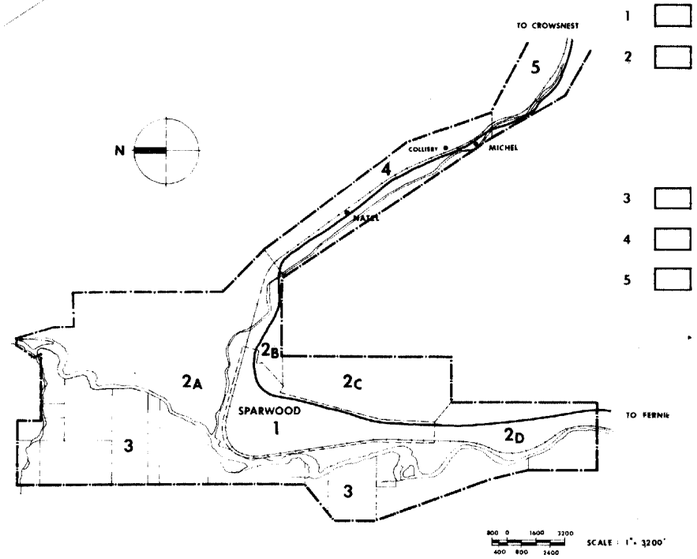
EXISTING LAND USE _ 1976 _ Fig 5

DISTRICT OF SPARWOOD



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EXISTING LAND USE - 1976 - Fig 5

CHAPTER II

SPARWOOD 1976

In the late summer of 1976 a survey was made of the contents of the District of Sparwood for purposes of defining the state of development at a point in time; such definition to provide a base condition for evaluation of completeness, and for assessment of general growth requirements.

A degree of completeness was sought which would permit a reasonably accurate evaluation; one sufficiently beyond the level of influence from the minor discrepancies that might arise from inaccurate information, minor omission or incorrect definition. Since a town community is an organic entity and is capable of wide variation within definitions of acceptable life styles, no precise "formula" for a community to serve so many persons can be applied with impunity. Comparison with other successful communities of similar size can, however, provide indicators of possible deficiencies or can confirm adequacies.

The survey of 1976 covered the following:

1. District boundary definition, land area, and geological land types.
2. Inventory of lands within the "greater Sparwood" area; developed lands, and lands potentially available for development.
3. Existing land uses and existing zoning.
4. Inventory of existing housing of all types with some identification of those owned and rented and some observation concerning age and condition of units and subdivision areas.
5. Inventory of retail and service commercial outlets, their type, their floor area, and their numbers of employees.
6. Inventory of educational facilities; size, site size, enrollments, staff numbers. In addition, some identification of the number of students from areas outside of the District of Sparwood was obtained.
7. Inventory of park and recreation facilities, sites, contents, and plans for development.
8. Inventory of other content; locations, sizes, etc.

Findings of this survey are presented in this text under the following headings:

A. Land Inventory

B. Housing Inventory

C. Commercial Inventory

D. Educational Facility Inventory

E. Parks and Recreation Inventory

F. Inventory of Other Facilities

G. Inventory of Developable Land

A. Land Inventory

1. District Lands (accuracy contingent on accuracy of available mapping)

Existing townsite urban area	approx.	555 acres
East expansion area (Area 1)	"	194 "
North expansion area (Area 2)	"	562 "
Northwest expansion area (Area 3)	"	442 "
Approx. total greater Sparwood area		1,753 acres
Remainder lands	approx.	10,848
Approx. total District area.		12,601 acres

These areas are illustrated in Figure 5.

2. Developed Lands (accuracy contingent on accuracy of available mapping)

	Townsite	North Sparwood	Totals
Residential	139.57	104.33	243.90
Commercial	21.60	11.48	33.08
Educational/Institutional	31.00	9.58	40.58
Parks & Recreation	58.55	-	58.55
Industrial	26.05	81.06	107.11
	276.77	206.45	483.22
Vacant Land	278.23	355.55	633.78
Totals in acres	555.00	562.00	1,117.00

These areas are illustrated in Figure 5.

B. Housing Inventory

As of September 1976

Location	Mobile Homes & Trailers	Apartment Units	Townhouse Units	Duplex Units	Detached Houses	Totals
1. Lodgepole Park (Elk Prairie)	15					15
2. Cummings Creek Elk Valley Trailer Court	92				2	2 92
3. Elk River Bridge (Lower Bench)					6	6
4. L.6251 (Upper Bench)	3				10	13
5. Lower Elk Valley Road (North)	53				20	73
6. Elk Valley Road (incl. Industrial Strip)	5				3	8
7. K.R.L. Mine Road					2	2
8. Elk Valley Road (South)					42	42
9. Spardel Trailer Court	90				10	100
10. Upper Townsite	6	188*	34+	10	136	374
11. Lower Townsite	27	23+	76	78	313	517
12. Natal/Michel					9	9
13. Industrial Strip	8					8
14. Mountain View M.H. Park	114					114
TOTALS	413	211	110	88	553	1,375

* 101 Hostel units included

+ Under Construction 1976

C. Commercial Inventory (Retail and Service Commercial)

As of September 1976.

Outlet	Floor Area	Employees Male	Employees Female	Total
a. Mall Retail				
1. Furnishings-Gallery Home	1,183	1		1
2. Liquor Vendor	2,344	3		3
3. Greenwood Yarn Barn	412		1	1
4. Sporting Goods	1,150	2		2
5. Vic's Mens Store	1,982	1		1
6. Murphy's Camera & Stereo	839	1	1	2
7. S.S. Drug Store Ltd.	3,460	1	4	5
8. Food Store	11,737	13	8	21
9. Dairy Bar	350		1	1
10. Children's Wear	880		1	1
11. Sears	1,093		3	3
12. Quality Drapery	693		1	1
13. Marcella's Cheeses	916		2	2
	27,039			44
b. Mall Service & Professional				
1. C.I.B.C.	2,965	3	5	8
2. I.C.B.C.	395		1	1
3. Royal Bank of Canada	2,965	4	6	10
4. Linda's Coiffures	538		1	1
5. Ray's Barber Shop	432	1		1
6. Hislop and Company -Barristers & Solicitors	936	(1)		(1)
	8,231			21
Totals - 19 outlets	35,270	30	35	65

C. Commercial Inventory (Retail and Service Commercial) (continued)

Outlet	Floor Area	Employees Male	Employees Female	Total
c. Centennial Square Retail				
1. Drapery Shop	1,875		1	1
2. Minton-Cook Pharmacy	3,750		6	6
3. Birite Confectionery	1,875	1	1	2
4. Fontana's Meats	1,375	1		1
5. European Delicatessen	1,875	1	1	2
6. Blue Jay Bakery	1,875	1	2	3
7. TV Appliances	1,875	1		1
8. Gallery Furniture Corporation	1,875	2	1	3
9. Willjean Shoe Store	1,875		3	3
10. Delfont Hardware	3,750	1	5	6
11. Groceries	3,750	1	1	2
12. Pierre Edsyl Fashion	1,875		3	3
13. Villa Furniture	1,875	1	1	2
14. Vacant Store	1,000			
	30,500			35
d. Centennial Square Service and Professional				
1. Elk Valley Building Supplies	1,875	3		3
2. Paradise Beauty Salon	1,875		2	2
3. Columbia Natural Gas	100	1		1
4. Adams Chartered Accountant	1,000	1	1	2
5. Golden Arch Cabaret Ltd.	3,750	1	3	4
6. Dr. Lungren's Office	1,875	1	3	4
7. Newspaper Office	1,775	1	1	2
8. Coles Insurance Agencies	1,775	1	3	4
9. Dental Office	500	1	1	2
10. Sparwood Dry Cleaners	1,875	1	1	2
11. Credit Union - Law Office	600	(1)	(2)	(3)
12. E.K. Health Unit	500		(2)	(2)
	17,500			26
Totals - 26 outlets	48,000	21	40	61

C. Commercial Inventory (Retail and Service Commercial) (continued)

Outlet	Floor Area	Employees Male	Female	Total
e. Elk Valley Road Service & Industrial				
1. Natal Tires		2		2
2. East Kootenay Steel Ltd.		44	2	46
3. Fraiser Distributors		1	1	2
4. Esko		1	1	2
5. Kiki Transfer		5	1	6
6. Miller & Brown Trucking		5	1	6
7. KRL Offices				
8. B.C. Hydro Substation				
9. Daniels Tire Service Ltd.		16	1	17
10. Fontana, Lou - Trucking		1		1
11. Siep, Charles - Excavating		2		2
11 outlets		77	7	84
f. Elk Valley - Spardel Court Service - Industrial				
1. Finning Tractor		42	3	45
2. KRL Unit Rig & Equipment Co.		2		2
3. Acklands		3	1	4
4. J.T. Industries		3	1	4
5. Corner Store & Gasoline		1	1	2
6. Shaw Equipment		3		3
7. Sparks Contractors Ltd.		2		2
8. Sparwood Glass		2		2
9. Industrial		2	1	3
9 outlets		60	7	67
g. Natal-Industrial & Commercial				
1. C.P. Transport Trucking				
2. Fred Sawchuck Trucking		92		92
3. Bakery		1	1	2
4. Michel Hotel		2	10	12
4 outlets		95	11	106

C. Commercial Inventory (Retail and Service Commercial) (continued)

Outlet	Floor Area	Employees Male	Employees Female	Total
h. Highway No. 3 Service Commercial				
1. Sparwood Motel		2	3	5
2. Sparwood Restaurant		2	2	4
3. Black Nugget Hotel		5	25	30
3 outlets		9	30	39
i. Highway No. 3 Service - Industrial				
1. Welders Supplies Ltd.		4	1	5
2. Double K Builders Supply		1	1	2
3. Dac Production Ltd.		8		8
4. Pacific 66 Bulk Plant		2	1	3
5. R.B. Steel Fabricators Ltd.		25		25
6. Lowen's Plumbing & Heating		4	1	5
7. Sparwood Collision Repair		3		3
8. McGauley Ready-Mix		7	1	8
9. Bullins Contracting		5		5
10. Furniture Storage		2	1	3
11. Bel-Mac Supplies		10		10
12. Tezik Trucking				
13. Sparwood Shock & Muffler		1		1
14. Dodge Dealer		12	1	13
15. Sparwood Auto Parts		1		1
16. Pic-a-pop		1		1
17. Trans Canada Glass		1		1
17 outlets		87	7	94
j. Aspen Road - Service Commercial				
1. Sparwood Esso Station		3		3
2. Sparwood Texaco Station		3	1	4
2 outlets		6	1	7
k. Village - Service Commercial				
1. Elk Valley & District Credit Union		1	2	3
1 outlet				3

D. Educational Facility Inventory

Based on School District No. 1 (Fernie) enrollment summary for June 1976

Facility	Enrollment	Staff	Site Area (acres)	Site Capability Max. Enrollment Allowance	% Developed (approx.)
Support Personel: Janitors & Bus-drivers		17			
1. Sparwood Secondary (less Elkford students)	500 -128 372	31	20 (shared site)	1,100	44%
2. Sparwood Elementary Kindergarten	432 +60 492	20		530	100%
3. Mountain View Elementary	304	14	11 (called 8)*	570	42%
Totals	1,168	82 (M-48) (F-34)	31	2,200	51%

* Because the lower portion of the Mountain View Elementary School site is in the high ground water area and is vulnerable to flooding, and because of the long shape of the site, this 11 acre site has been discounted to the level of an 8 acre elementary school site equated with an enrollment potential of 570 pupils.

E. Park and Recreation Inventory

Figure 6 shows park and recreation land within the urban townsite area of Sparwood. Such land consists of:

1. Recreation Centre Site	-	26.85 acres
2. Lion's Park	-	4.70 "
3. Neighbourhood Park	-	2.10 "
4. Crown Park	-	2.30 "
5. Green belts, Pedestrian strips, Squares	-	22.60 "
Total - approximately	-	58.55 acres

The approximate total population of Sparwood was estimated to be 2,700 persons within the townsite area and 3,600 persons within the District. Therefore the park provision per 1,000 inhabitants is about 21.7 acres for townsite population and 16.3 acres for District population.

The Recreation Centre consists at present of:

1. Ice Sheet - 185' x 85'; change rooms, bleachers
2. Banquet Room - 60' x 40'; seat 250
3. Kitchen - to serve banquet room
4. Meeting Room - seat 25
5. Curling Rink - 4 sheets; viewing area and lounge
6. Concession area - to serve Ice Arena and Curling

The District Parks and Recreation Commission has shown a keen desire to improve facilities in Sparwood. Unfortunately, the means have not been available to do much more than maintain facilities and make minor additions. Development level of parks and playgrounds is very low.

DISTRICT BOUNDARY

HWY. NO 3

DISTRICT BOUNDARY

Michel Creek

N

100 0 200 400
50 100 300
SCALE : 1" = 400'

PINE AVENUE

SPRUCE AVENUE

PINE AVENUE

HWY. NO 3

RED CEDAR DRIVE

ENGLEMANN SPRUCE DRIVE

PINE AVENUE

PINE AVENUE

RED CEDAR DRIVE

Elk River

CANADIAN PACIFIC RAILWAY R/W

K-ER 15(0)4
GEN. INFO K

EXISTING PARK & RECREATION LANDS - Fig 6

E. Parks and Recreation Inventory (continued)

The District contains ample land for hiking, camping, and other outdoor pursuits. The region offers opportunity for hunting and fishing within relatively short travel distances.

Any significant population growth (e.g. a new mine put into production) should be accompanied by an increase in provision of indoor facilities for use by children, teenagers, and housewives in particular. The use of a survey to determine preferences of the inhabitants and to establish a definite priority for expansion of facilities is recommended as a first step toward providing for leisure time activity in the community.

F. Inventory of Other Facilities

	Employees Male	Female	Total
a. Municipal Services			
1. Village Hall	(3)	4	4
2. Library -1,152 s.f. in Shopping Mall		1	1
3. Recreation Centre	1	1	2
4. Works Yard	12		12
5. R.C.M.P.	11	1	12
6. Fire Fighting	(25)		
	24	7	31
b. Private Services and Utilities			
1. Churches	3		3
2. B.C. Telephone Company	2	1	3
3. Salus Funeral Chapel	(1)		(1)
	5	1	6
c. Government Services			
1. Kootenay Health Unit - Centennial Square		(2)	(2)
2. Department of Highways Yard	5		5
3. C.P. Railway Co.	11	3	14
4. Post Office	1	8	9
5. UMWA Union Hall	2		2
	19	11	30

G. Inventory of Developable Land:

Figure 7. shows a mapping of major land parcels within the townsite, the property east of the highway, and the property immediately north of Michel Creek which are not yet developed.

Some of the parcels indicated are within areas having high ground water levels and subject to flooding. Others may contain pockets of soils on which development may be unduly expensive. The precise delineation will depend upon more accurate site information than exists at present.

The following table lists parcels, a discount allowance for site area lost to high ground water, steep slopes, storm water channels and flood plain edges. As an aid to preliminary evaluation, each parcel is designated for a likely use and a high-low yield range is indicated which translates into the listed theoretical yield after a 10-20% allowance for roads, etc.

Parcel Number	Gross Acres	Discounted Net Acreage*	Assumed Land Use	Yield Range Units/acre	Estimated Yield-units
Townsite Area					
1	20.2		Treatment Plant Add.		
1A	24.0	19.0	Mixed Residential		
2	10.0		Hospital		
3	28.5	20.0	Central Commercial		see Chap. VI
4	10.0	9.0	Elementary School		see Chap. V
5	184.0	138.0	Mixed Residential		see Chap. V
Total	276.7	186.0			
North Sparwood Area					
6	27.2	21.5	Mixed Residential	8.0/acre	170 units
7	22.0	16.5	Mobile Homes	7.0/acre	115 units
8	15.5	14.5	Elementary School		
9	75.0	60.0	Mixed Residential	5.5/acre	330 units
Totals	139.7	91.0			

* Net land discounted for:

a. hazard land - steep slopes, flood area
b. development loss land - road allowances, buffers, park areas

DISTRICT BOUNDARY

HWY. No 3

Michel Creek

ELK River

PINE AVENUE

SPRUCE AVENUE

RED CEDAR DRIVE

ENGLEMANN SPRUCE DRIVE

CANADIAN PACIFIC RAILWAY R/W

N

100 0 200 400
50 100 200

SCALE: 1" = 400'

K- ~~EE~~-75(10)A
GEN. INFO. - K

DEVELOPABLE LAND PARCELS - Fig 7

CHAPTER III

POTENTIAL IMPACTS FROM KAISER RESOURCES LTD. AND KAISER COAL CANADA LTD. EMPLOYMENT INCREASES

At the present time it is contemplated that the Kaiser Resources Ltd. Harmer and Michel operations' employment will rise to an ultimate level of about 2,051 employees.

Kaiser Coal Canada Ltd. is also studying the feasibility of initiating a mining operation near Hosmer for which direct employment has been projected at 759 persons.

The presently contemplated employment level for Harmer is about 1½ to 2 times the ultimate originally contemplated for this operation and indicates a much heightened rate of extraction. The immediate questions raised are - will this level be sustained for an appreciable period of time - for potential mine life or for a period in excess of normal financing periods? The nature and form of settlement growth requires an answer as cut-backs in basic employment produce a traumatic circumstance in related communities. The employment requirements, as projected by Kaiser Resources Ltd. to meet current contracts, indicate sustained employment at these levels for 10 years, based on optimism that the world fuel resource circumstance will support continuation at these extraction rates. Therefore, Kaiser Resources Ltd. view settlement requirements as moderately long-range in nature, barring major changes in extraction technology or in fuel source emphasis.

In order to assess all implication of such growth impacts it is necessary to establish a base condition and reasonable simulations of condition which will equate with a short term growth of the Harmer and Michel employment to 2,051 at mine site, and the longer term potential of a Hosmer-Wheeler operation with an employment of 759 persons at mine site.

For purposes of this study the base condition is established as an April 1976 condition, supported by the Kaiser Resources Ltd. 'Status of Employees Report' of April 30, 1976.

At this point in time the existing minesite labour force was listed as 1,858 employees, and area of residence was listed as:

Sparwood	938 employees
Fernie	570 employees
Alberta communities -	350 employees

From this base plus survey data of general Sparwood content, projections of deficiencies, support and service industries, school enrollments, etc. will be made to define:

- The impact from short term increase in Harmer and Michel mine employment to 2,051 in 1976, and requirements to satisfactorily accommodate a major proportion of this work force in Sparwood - called Condition I.

- The impact from a long term further increase created by a new Hosmer-Wheeler operation - employment of 759 - called Condition II.

  This projection will be analyzed in terms of 'start-up' and 'full employment' conditions taken from figures supplied by Kaiser Coal Canada Ltd.

Condition I - Harmer employment increased to 2,051 at minesite.

This employment increase contains the following implications for Sparwood growth, in line with current Company policies:

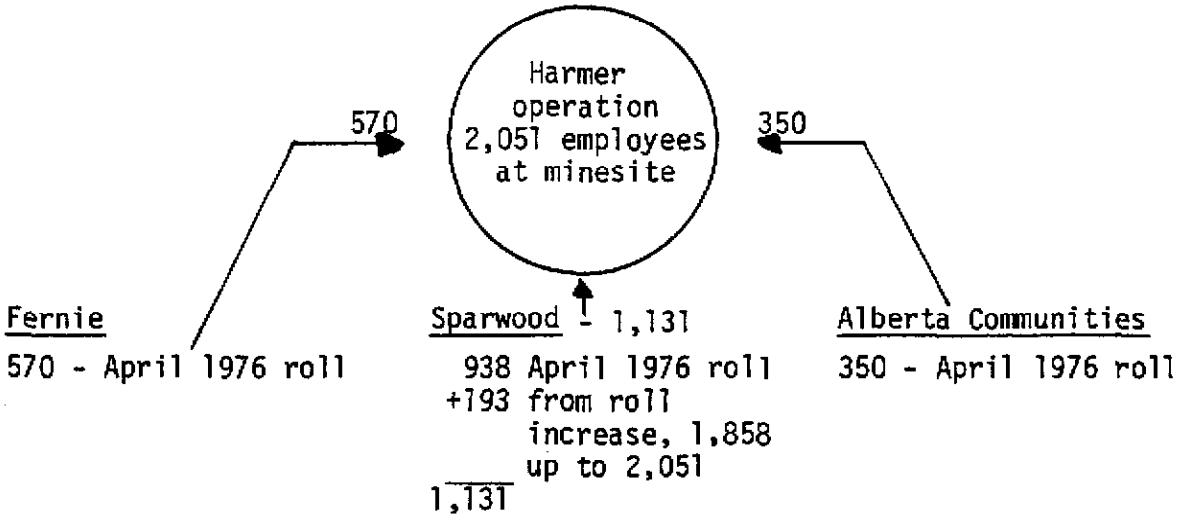
1. An adequate cross-section of housing will be actively developed by the Company, the objective being to provide for all employees who might elect to reside in Sparwood.

2. A numerical increase equal to the difference between 2,051 and 1,858; i.e. 193 new employees.

Potential Sparwood resident numbers are therefore defined as 938 (April 30, 1976 base) plus 193 (roll increase) = 1,131 employees.

Condition I - KRL Harmer employment and employee residence picture is diagrammed as follows:

Figure 8.



The impact of this condition on Sparwood will be analyzed in Chapter IV.

Condition II - Hosmer-Wheeler employment at minesite:
319 at start-up to 759 full production

This employment increase contains the following implications for Sparwood growth, in line with current Company policies:

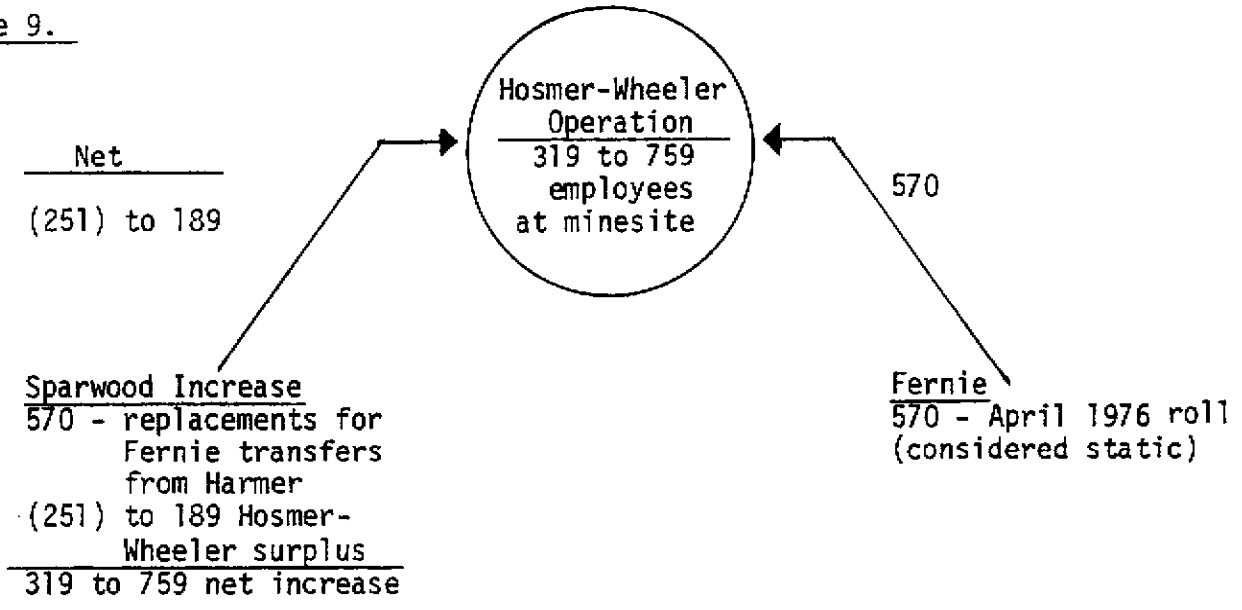
1. A majority of positions will likely be filled by persons currently residing in Fernie. Vacancies created by such transfers from the Harmer to the Hosmer-Wheeler operation will be filled by new employees who will be housed in Sparwood.

2. The balance of Hosmer-Wheeler employees beyond those who will continue to reside in Fernie will be housed in Sparwood.

3. The net effect of the above will result in direct and total response to the Hosmer-Wheeler housing requirement within Sparwood. The growth potential for Fernie is viewed as minimal and associated more with contingency or safety-valve considerations at this time.

Condition II - KRL Hosmer-Wheeler employment and employee residence picture is diagrammed as follows:

Figure 9.



The impact of this condition on Sparwood will be analyzed in Chapter V. - on the basis that the entire Hosmer-Wheeler surplus requirement will be housed in Sparwood.

CHAPTER IV

EVALUATION OF CONDITION I IMPACT ON SPARWOOD

POPULATION : HOUSING : LAND

A. POPULATION FORECAST

(a) Population generated by basic industry:

Assumptions:

1.	Kaiser Resources Ltd. employment (Sparwood-resident)	1,131	
	Independent loggers, farmers, ranchers, etc. (Greater Sparwood)	20	1,151
2.	KRL maximization of married employees will translate into an accomplishment of 70% married 1131 x .70	792	
	30% single 1131 x .30	339	1,131
3.	KRL single status employees will comprise:		
	10.5% female 339 x .105	36	
	89.5% male 339 x .895	303	339
4.	KRL married status employees will comprise:		
	23.5% childless 792 x .235	186	
	76.5% w/children 792 x .765	606	792
5.	KRL childless married status employees will comprise:		
	7% working wives 186 x .07	13	
	Net employed husbands 186 - 13	173	186
	Net non-employed wives 173 - 13	160	346
6.	KRL married w/children status employees will comprise:		
	Allowance for 1% working wives	6	
	Net employed husbands 606 - 6	600	606
	Net non-employed wives 600 - 6	594	1,200
7.	KRL employment of females:		
	Single status (3 above)	36	
	Married childless status (5 above)	13	
	Married w/children status (6 above)	6	55
8.	Child dependents of 600 KRL employed families (606-6) will average 2.25 children/family (Sept. 76 Status Report) therefore children = 600 x 2.25 =	1,350	
9.	Non KRL Basic Industry employment of 20 is assumed to comprise:		
	20% single males 20 x .2	4	
	80% married w/children 20 x .8	16	20
	wives - 16 families	16	36
	children - 16 families @ 2.2/family	35	71

A. POPULATION FORECAST (continued)

(a) Population generated by basic industry:

Summary tabulations

Status	Base Industry Employed KRL		Other		Non-Employed	Population generated	
Single							
Males	303		4			307	
Females	36					36	343
Childless Married							
Males	173					173	
Females	13				160	173	346
Married w/children							
Males	600		16			616	
Females	6				610	616	
Children		(1,350)		(35)	1,385	1,385	2617
Totals	1,131		20			(T1)	3,306

A. POPULATION FORECAST (continued)

(b) Population generated by support and service industries:

Assumptions:

1. Support and service industry growth will not be proportional to basic industry growth, but will follow a curve of diminishing proportion. Job opportunities are projected as 700; an increase of 23 from the 677 documented in 1976.

2. Support and service industry jobs will be filled:

30% by females	700 x .3	210	
70% by males	700 x .7	490	700

3. Status of support and service industry employees is assumed to be 15% single and 85% married:

single females	210 x .15	32	
single males	490 x .15	73	105
married females	210 x .85	178	283
married males	490 x .85	417	700

4. Married employees comprise:

23.5% childless	417 x .235	98	
76.5% w/children	417 x .765	319	417

5. Employment status of support and service industry

wives	417	
employed married females (3 above)	178	
net non-employed females	239	
100% childless wives employed (4 above)	98	
net wives w/children employed 127 - 45	80	417

6. Child dependents of 319 support and service families (417-98) will average 2.125 children/family

Therefore children - 319 x 2.125	=	678
Discount 8% for older children employed under single status (3 above)	=	54
Net non-employed children	=	624

A. POPULATION FORECAST (continued)

(b) Population generated by support and service industries:

Summary tabulations

Status	Employed	Non-Employed	Population Generated	
Single				
Males	73		73	
Females	32		32	105
Childless Married				
Males	98		98	
Females	98		98	196
Married w/children				
Males	319		319	
Females	80	239	319	
Children		624	624	1,262
Totals	700	863	(T2)	1,563

A. POPULATION FORECAST (continued)

(c) Population from retired and other non-employed sources:

This increment of population will be very low in a relatively new community such as Sparwood, however, it is assumed that a number of the older residents of the greater Sparwood area will continue to live in the area as retired couples, or as single survivors living with their children's families.

For purposes of this study, an allowance of 1% of the population generated by basic, support and service industries is assigned to this category and this number is assumed to be 60% in status of retired or non-employed couples and 40% single survivors.

T1 generation	3,306		
T2 generation	1,563	4,869	
1% of 4,869		49	4,918
Couples 49 x .6 =	30/2 =	15 couples	
Couples 49 x .4 =		19 couples	

TOTAL SPARWOOD POPULATION IDENTIFIED WITH CONDITION I

Basic industry generation	3,306
Support and service industry generation	1,563
Retired and other non-employed	49
	4,918 persons

B. HOUSING REQUIREMENT FORECAST

(a) Summary of marital and basic household status from population forecast:

Status	Basic industry		Service/ support industry		Other	Totals requiring housing	
Singles - male	307		73		(7)*	380	
- female	36	343	32	105	(12)*	68	448
Childless married	173			98	15		286
Married w/children	616			319	-		935
					Total households		1,699

* assumed resident in other households

B. HOUSING REQUIREMENT FORECAST (continued)

(b) Analysis of household sizes and housing preferences:

Household size	Number	Anticipated housing requirement			Number
1 person - male	380	66%	-	singles unit	251
		19%	-	studio apt.	72
		15%	-	boarding*	57
- female	68	50%	-	boarding*	34
		50%	-	studio apt.	34
2 person - childless couples	286	34%	-	1 bedroom apt.	97
		45%	-	mobile home	129
		21%	-	trailer	60
3 person - married w/children	291	35%	-	2 bedroom apt.	102
		25%	-	2 bedroom townhouse	73
		40%	-	mobile home	116
4 person - married w/children	324	24%	-	3 bedroom townhouse	78
		17%	-	3 bedroom duplex	55
		17%	-	mobile home	55
		42%	-	3 bedroom det. house	136
5 person - married w/children	195	19%	-	3 bedroom duplex	38
		21%	-	3 bedroom det. house	40
		17%	-	4 bedroom duplex	34
		43%	-	4 bedroom det. house	83
6+ person - married w/children	125	26%	-	3 bedroom det. house	32
		74%	-	4 bedroom det. house	93
Total households	1,699				1,699

*Boarding - includes boarders, sharers & working children living at home.

B. HOUSING REQUIREMENT FORECAST (continued)

(c) Housing requirement indicated from household and preference analysis:

1.	Single men's permanent units			251
	Single men's boarding* - no provision (absorbed)			(57)
2.	Single women's boarding* - no provision (absorbed)			(34)
3.	Apartments:	single women's studio	34	
		single men's studio	72	106
		childless couples - 1 bedroom	97	
		couples with child - 2 bedroom	102	199
4.	Trailers for childless couples - no provision (Sparwood north)			(60)
5.	Mobile homes	childless couples	129	
		couples with child	116	
		couples with 2 children	55	300
6.	Townhouses:			
	couples with child - 2 bedroom		73	
	couples with 2 children - 3 bedroom		78	151
7.	Duplexes:			
	couples with 2 children - 3 bedroom		55	
	couples with 3 children - 3 bedroom		38	
	couples with 3 children - 4 bedroom		34	127
8.	3 bedroom detached houses:			
	couples with 2 children		136	
	couples with 3 children		40	
	couples with 4 children		32	208
9.	4 bedroom detached houses:			
	couples with 3 children		83	
	couples with 4 or more children		93	176
Total listed				1,699
Net total of units to be provided (1,699- 57 - 34 - 39)				1,548

*Boarding - includes boarders, sharers & working children living at home.

B. HOUSING REQUIREMENT FORECAST (continued)

(d) Inventory of existing and currently planned housing:
(based on 1976 inventory and known current developments)

Location	Apartments studio	1BD	2BD	Mobile homes & trailers	Condominiums Town-houses 3BD	4BD	Duplexes 3BD	4BD	Det-ached houses
Hostel	32	69							
Over service stn.			3						
Macon Apts.		24	12						
Spruce Apts.		1	14						
Greenwood Apts.		1	14						
Sr. Citizen Apts.			18						
*South Pine Ave., Apts.		7	16						
Mountain View Park				114					
Lodgepole Park				15					
Elk Valley Court				92					
Upper Bench				3					
Lower Elk Valley Rd.				58					
Spardel Court				90					
Townsite				41					
*North Pine Avenue Condominium					34				
Lower Townsite					60	16	72	16	
Cummings Creek									2
Elk River Benches									16
Lower Elk River Rd.									20
Industrial & Mine Rd.									5
S. Elk Valley Rd.									42
Spardel Area									10
Upper Townsite									136
Lower Townsite									330
Natal/Michel									9
Totals/type & size	32	102	77	413	94	16	72	16	570
Total/type		211		413	110		88		570

*Under Construction 1976

B. HOUSING REQUIREMENT FORECAST (continued)

(e) Comparison of projected requirement and 1976/current inventory:

Accommodation Type	Requirement		1976/Current Inventory		Indicated Surplus	Indicated Deficiency
Apartments:						
studio	357		32			325
1 BD	97		102		5	
2 BD	102	556	77	211		25
Mobile Homes & Trailers	(60) 300	360		413	53	
Townhouses/ condominiums:						
2 BD	73		-			73
3 BD	78		94		16	
4 BD	-	151	16	110	16	
Duplexes:						
3 BD	93		72			21
4 BD	34	127	16	88		18
Detached Houses:						
3 BD	208		-			
4 BD	176	384		570	186	
Totals		1,578		1,392	276	462

net deficiency - 186 units

B. HOUSING REQUIREMENT FORECAST (continued)

(f) Reconciliation of suggested surplus and deficiency categories:

1. Family Accommodation

It is proposed that each surplus accommodation has the capability of absorbing deficiencies in types of lower standing within the hierarchies of space/basic use. Such approach presupposes that Company subsidies applied to sale and rental units in Sparwood will support a natural inclination to acquire a slightly larger unit of accommodation - whether rental or purchase.

The most pronounced indication of surplus within family accommodation categories is in the number of existing detached houses. Deficiencies are indicated for both townhouses and duplex categories. It is therefore suggested that the indicated surplus of 186 detached houses will in effect absorb the deficiencies in duplex and townhouse family accommodations as follows:

186 surplus det. houses absorb:

18 - 4 BD duplex units = 168 net surplus
and 21 - 3 BD duplex units = 147 net surplus
plus 32 surplus townhouses/condominiums = 179 net surplus

There is a suggested deficiency of 2 bedroom accommodations in apartment and townhouse categories of 25 + 73 = 98 units. It is suggested that the indicated 53 unit surplus in the mobile home/trailer category will be absorbed by this deficiency still leaving 98 - 53 = 45 unit deficiency. The 179 detached house surplus accommodations could absorb this deficiency for a 179 - 45 = a 134 detached house surplus.

Summary - Family Accommodation Requirements

From the above it is suggested that Sparwood has the capability within present housing inventories (both existing and currently under construction 1976) to absorb all family housing requirements projected for the Harmer operation at a 2,051 employment level (Condition I).

B. HOUSING REQUIREMENT FORECAST (continued)

(f) Reconciliation of suggested surplus and deficiency categories:

2. Singles and Childless Couples Accommodation

Within these accommodation categories, a 5 unit surplus of 1 bedroom accommodations is indicated, but a 325 unit deficiency is indicated in studio apartment and single men's hostel provisions. This deficiency in single persons accommodation already reflects some sharing of larger available accommodations by two or more single persons and by the generally unsatisfactory recourse to boarding. Diminished privacy and inherent social problems render both solutions unsatisfactory to a majority of single persons and the result could be expected to show in high turnover rates among single employees. If one assumes the existing surplus of 199 detached and mobile homes accommodates a cross-section of residency types allowing the singles to find accommodation in the remaining cross-section, the net requirement is reduced as follows:

325 singles unit deficiency

less absorption of 5 - 1 bedroom surplus

less absorption of 134 detached home surplus

= 325 - 5 - 134 = 186 net deficiency

Summary - Singles and Childless Couple Accommodation Requirements

If some allowance is made for optimism in the anticipated realignments, the deficiency in single men's accommodation could be identified as a 100 singles unit requirement. It is recommended that this requirement be tested by building and releasing to market in two or three stages, with evaluation of waiting list indications at the end of each stage to ensure against over building.

C. LAND REQUIREMENT FORECAST

accommodation type	parcels	units/acre	acres
1. single men's permanent units (100 units)	1	35/	3.00
2. apartments (need absorbed by surplus in mobile homes)			
3. mobile homes (no need indicated)			
4. townhouses (need absorbed by surplus in detached houses)			
5. duplexes (need absorbed by surplus in detached houses)			
6. detached houses (no need indicated)			
Total net acres/housing			3.00
Add allowance for roads, buffers, etc.			.50
Total land requirement (acres)			3.50

Location

It is generally considered preferable to locate permanent accommodations for single men within easy walking distance from the social and commercial recreation facilities within the central commercial area. This suggests location between the present hostel site and the town center area or a new location within a development east of the highway which is opposite the commercial area. Because of highway traffic conflict with pedestrian travels, the former location is preferable.

CHAPTER V

EVALUATION OF CONDITION II IMPACT ON SPARWOOD

POPULATION : HOUSING : LAND

In June, 1976, an amended summary of manpower requirements for the proposed new Hosmer-Wheeler mine was provided. A detailed manpower build-up was made available September 1976.

Projections were based on:

1. The given employment forecasts.

2. The assumption that approximately 15% of personnel would be indirectly housed. (i.e. Boarding, sharing, children living at home).

3. Start-up at Month 30 with full employment in desired ratios at Month 90. (Note: due to quick employment build-up at start-up, Month 36 figures were used).

4. Marital status of employees at start-up to be assumed as 50% single and 50% married, and at full employment to be 30% single and 70% married.

The basis of analysis is therefore as follows:

	start-up (month 30-36)	full employment (month 90)
Manpower		
Field	498	705
Administration	36	54
Total Employment	534	759
(single)	50% - 267	30% - 228
(married)	50% - 267	70% - 531

A. POPULATION FORECAST

- generation from basic industry only

		Start up condition		Full Employment condition	
1.	total employment	534		759	
2.	single employees	267		228	
	married employees	267	534	531	759
3.	singles - female	28		24	
	- male	239	267*	204	228*
4.	married -childless	63		125	
	- with children	204	267	406	531
5.	childless married:				
	working wives allowance	4		9	
	net employed husbands	59	63	116	125
	net unemployed wives	55	118*	107	232*
6.	married with children:				
	working wives allowance	2		4	
	net employed husbands	202	204	402	406
	net unemployed wives	200	404*	398	804*
7.	child dependents @ 2.25/family	(202)	454*	(402)	904*
	Summary population totals projected from Basic Employment:		1,243		2,168

* Collected up to totals.

Potential Increases in Service and Support Industry Employment
Generated by Impact of Hosmer-Wheeler Operation on Sparwood.

In Chapter IV, the impact of a Condition I level of Harmer and Michel employment suggested a service and support industry development to a level of 700 job opportunities and a population of 1,563 persons generated by such employment.

The survey of retail and service outlets made in the late summer of 1976 indicated a relatively healthy development of such facilities in Sparwood. At this level of community development, the response of service and support industry to employment increases in the basic industry will tend to take the form of greater utilization of existing outlets. Higher turnover of goods and increases in employment will be more likely than any significant increase in number of outlets. New outlets are more likely to appear two or more years after the actual basic industry growth - when the potential market for the new sales or service outlet can be determined with some confidence.

It is reasonable to expect the increase in service and support industry employment to approximate the following:

Base Industry		Related Service & Support Employment Increase
Start-up	-	12 job opportunities
Full employment	-	20 job opportunities

Since there will be ample potential within a community of some 6,500 - 7,500 people to fill a significant number of these new support and service job opportunities, it is reasonable to estimate that 50% will be filled by wives and teenagers who are already resident in the community. The remaining 50% can be viewed as new arrivals who will require housing accommodation of some kind.

Based on the above assumptions, the conditions associated with full employment of new basic industry might give a maximum housing requirement as follows:

When Basic Industry is at Full Employment:

Related maximum support and service job opportunities	20
Less 50% filled by local residents already housed	-10
New arrivals requiring housing	10

Assume support and service growth as:
2 new retail outlets employing 1 manager and 2 employees each
(managers are married with 1 child each, employees are single)
1 new service outlet employing 1 manager and 3 employees
(manager has wife, employees are single)

∴ Population increase = 10 + 3 wives + 2 children = 15 persons
Housing requirement = 7 studio apartments
1 - 1 bedroom apartment
2 - 2 bedroom apartments
10 apartments = approx. 0.33 acre

Note: Land requirement allowances, subject to stated qualifications, contain adequate margin to cover the above additional housing requirements for support and service employees, in any form in which they might occur.

B. HOUSING REQUIREMENT FORECAST

(a) Analysis of household sizes and housing preferences:

Household size	Start-up No.	Full employment No.	Anticipated housing requirement
1 person - male	239	204	(35 difference to temp. camp) 60% - single's unit 15% - studio apt. 25% - boarding in town/doubling/ children
- female	28	24	50% - boarding in town/doubling/ children 50% - studio apt.
2 person - childless couples	59	116	30% - 1 bedroom apt. 60% - mobile home 10% - trailer
3 person - married w/children	63	126	40% - 2 bedroom apt. 33% - 2 bedroom townhouse 27% - 2 bedroom duplex
4 person - married w/children	70	139	10% - 3 bedroom townhouse 20% - 3 bedroom duplex 70% - 3 bedroom det. house
5 person - married w/children	41	82	15% - 3 bedroom duplex 35% - 3 bedroom det. house 50% - 4 bedroom det. house
6 person - married w/children	19	37	30% - 3 bedroom det. house 70% - 4 bedroom det. house
7 person - married w/children	6	11	100% - 4 bedroom det. house (1 bedroom add capability)
8 person - married w/children	3	7	100% - 4 bedroom det. house (2 bedroom add capability)
Total households	528	746	

B. HOUSING REQUIREMENT FORECAST (continued)

(b) Housing requirement indicated from household and preference analysis:

		for start up		for full employment	
1.	Single mens boarding - no provision	(60)		(51)	
	Single mens camp	28		0 (phased out)	
2.	Single mens permanent units	122	150	122	122
3.	Single womens boarding-no provision	(14)		(12)	
4.	Apartments:				
	single womens studio	12		12	
	single mens studio	31	43	31	43
	childless couples - 1 bedroom	18		35	
	couples with child - 2 bedroom	25	43	50	85
5.	Trailers for childless couples - no provision	(6)		(11)	
6.	Mobile homes for childless couples	35	35	70	70
7.	Townhouses:				
	couples + child - 2 bedroom	21		42	
	couples + 2 children - 3 bedroom	7	28	14	56
8.	Duplexes:				
	couples + child - 2 bedroom	17		34	
	couples + 2 children - 3 bedroom	14		28	
	couples + 3 children - 3 bedroom	6	37	12	74
9.	3 bedroom detached houses:				
	couples + 2 children	49		97	
	couples + 3 children	14		29	
	couples + 4 children	6	69	11	137
10.	4 bedroom detached houses:				
	couples + 3 children	21		41	
	couples + 4 children	13		26	
	couples + 5 children	6		11	
	couples + 6 or more children	3	43	7	85
Total listed		448		672	
Net total of units to be provided		(528-60-14-6)		(746-51-12-11)	

*Boarding - includes boarders, sharers, and working children living at home.

% Constructed housing/workforce - 83.9% 88.5%

C. LAND REQUIREMENT FORECAST

accommodation type	start-up condition parcels	units/acre	acres	full employment condition parcels	units/acre	acres
1. single men's camp (100 units)	1		3.25	phased out		0
2. single men's perm. units (90 units)	1	35/	3.50	1	35/	3.50
3. apartments:						
walk-up	1	30/	2.05	1	30/	2.60
garden	1	24/	1.05	1	24/	2.10
4. mobile homes	35	7/	5.00	70	7/	10.00
5. townhouses	28	12/	2.35	56	12/	4.65
6. duplexes	37	7/	5.30	74	7/	10.55
7. detached houses:						
3 bedroom	69	4.5/	15.35	137	4.5/	30.45
4 bedroom	43	4.5/	9.55	85	4.5/	18.90
Total net acres/housing			47.40			82.75
Add parks allowance @ 6 acres/1000			7.50			13.00
Add elementary school allowance @ 6 acres			6.00			6.00
Add serviced land allowance for services and support workers			2.65			3.50
Total net acres			63.55			105.25
Add 20% for roads, etc.			12.71			21.00
Add 20% for land reserves, slopes, etc.			12.71			25.00
Projected total land requirement (acres)			88.97			151.25
rounded off:			90.00			151.25

Conclusion - Condition II Requirements

In Chapter I an area called "Area 1" was identified as the priority #1 site for a Sparwood growth associated with relatively large numbers in a short time frame. This is the characteristic of a Condition II growth.

Figure 10. shows the magnitude of land requirements associated with Condition II growth applied to "Area 1".

The illustration shows land requirements associated with start-up employment (50% married) and with full employment (70% married). A further purpose of the illustration is to provide a reasonable basis for the preliminary review of land servicing as presented in Chapter VI.

Summary Tabulation of Employment and Population Projections for Sparwood.

Condition I Plus Condition II

	Condition I Harmer Related	Condition II Hosmer/Wheeler Related	Conditions I + II
Employment:			
Base Industry	1,131	759	1,890
Support & Service Industry	700	20	720
Totals	1,831	779	2,610
Population:			
Base Industry	3,306	2,168	5,474
Support & Service Industry	1,536	15	1,551
Others	49	-	49
Totals	4,891	2,183	7,074

N

100 0 100 200 300

SCALE 1"= 200'

L E G E N D

NO.	TYPE	ACRES	UNIT YIELD	NO	TYPE	ACRES	UNIT YIELD
1	WALK UP APARTMENTS	2·05	61	12	DETACHED HOUSING (CLUSTER FORMS)	8·9 NET	40 LOTS
2	WALK UP APARTMENTS	0·55	17	13	DETACHED HOUSING (CLUSTER FORMS)	10·4 NET	45 LOTS
3	CLUSTER TOWNHOUSES	2·35	28	14	DETACHED HOUSING (CLUSTER FORMS)	5·25 NET	25 LOTS
4	CLUSTER TOWNHOUSES	2·30	28	15	DETACHED HOUSING (RESERVE)	8·0 NET	36 LOTS
5	SINGLE MEN'S UNITS (HOSTEL FORM)	3·50	122	16	CONSTRUCTION CAMP - FUTURE MOBILE HOME PARK OR CLUSTER HOUSING	5·0	35
6	DETACHED HOUSING (CLUSTER FORMS)	6·0 NET	27 LOTS	17	CONSTRUCTION CAMP - FUTURE MOBILE HOME PARK OR CLUSTER HOUSING	5·0	35
7	DETACHED HOUSING	18·8 NET	85 LOTS	18	ELEMENTARY SCHOOL SITE	6·0	–
8	GARDEN APARTMENTS	1·05	25	19	RESERVE	3·8	114
9	GARDEN APARTMENTS	1·05	25	20	GARDEN APARTMENTS (RESERVE)	2·25	54
10	DUPLEXES IN CLUSTER LOTTING	5·3	37	21	DETACHED HOUSING (RESERVE)	13·6 NET	61 LOTS
11	DUPLEXES IN CLUSTER LOTTING	5·25	37	22	PARK		

EXPANSION FOR FULL EMPLOYMENT

RESERVE LAND

START-UP EMPLOYMENT

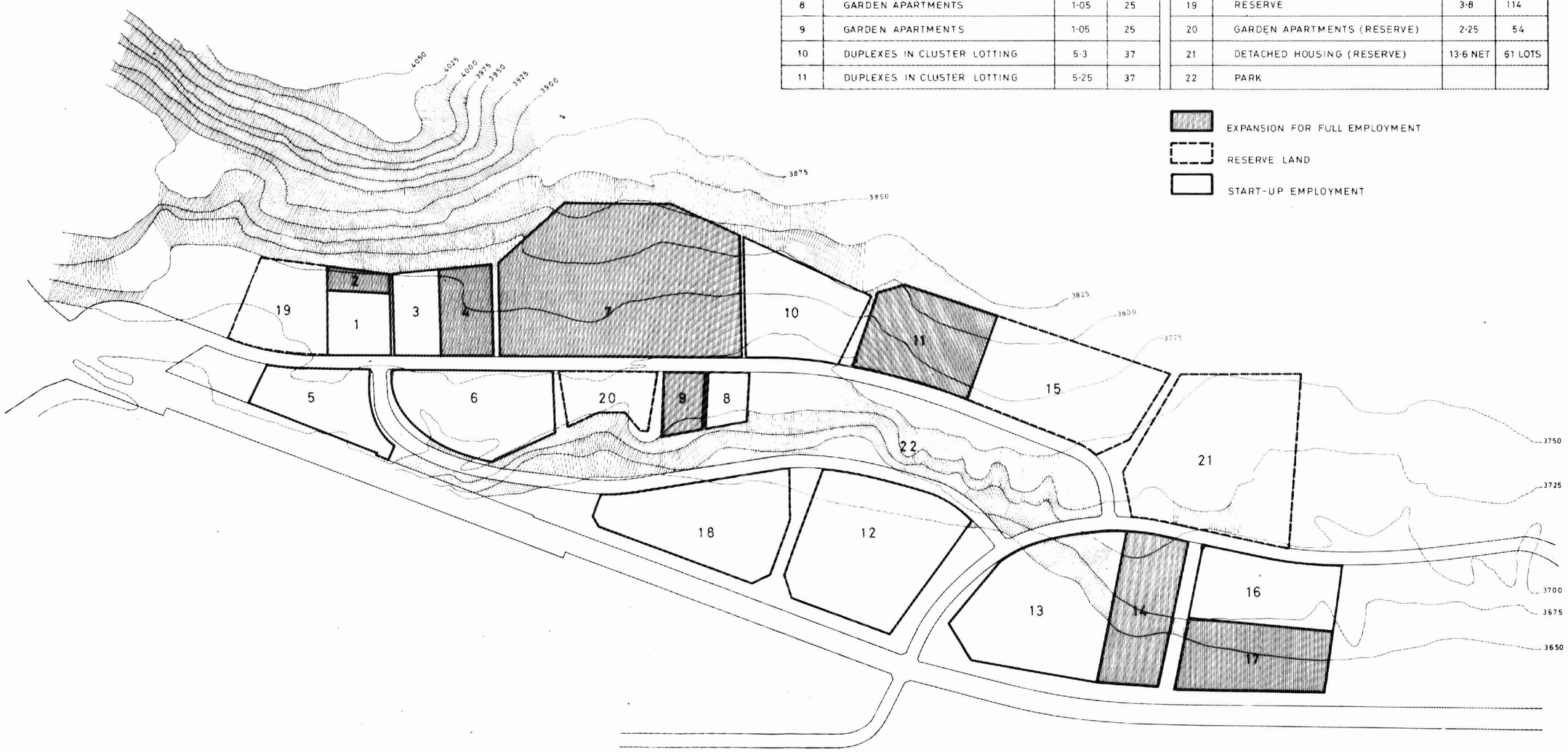


ILLUSTRATION OF LAND REQUIREMENT FOR CONDITION II

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Fig 10

CHAPTER VI

EVALUATION OF CONDITION II IMPACT ON SPARWOOD SERVICING

An appraisal of the existing facilities and the impact of the suggested development has been made, and is presented in the following text under the headings:

A. Water Supply & Distribution

B. Sanitary Sewer Collection and Disposal

C. Storm Drainage

D. Roads and Pavements

E. Electrical Distribution

F. Natural Gas Distribution

G. Telephone Distribution

H. Television

I. Maintenance, Firefighting & Ambulance Facilities.

A. Water Supply & Distribution

The existing development is serviced with water supplied from a system of wells to the west of the Elk River, and distributed by high lift pumps to common supply mains and high level storage facilities.

Information sources[1] indicate that by providing additional wells, pumps, and high level storage, the existing system has the capability of being expanded to supply adequate year-round potable water at good pressures for both domestic and fire protection needs, as illustrated in Figure 11.

Preliminary appraisals suggest the provision of lift pump and a reservoir with a capacity of 500,000 U.S. gallons to provide adequate pressure for high elevation development and required fire-flows.

The established practice in the existing development of looped distribution mains where possible with deep burial to avoid frost damage, and fire hydrants at approximately 500 feet intervals, will be continued.

1. Underwood McLellan and Associates Limited

N

100 0 100 200 300

SCALE : 1" = 200'

EXISTING RESERVOIR

PROPOSED RESERVOIR

MAIN TO SHARWOOD WELLS

PUMP STATION FOR PROPOSED RESERVOIR

4050
4025
4000
3975
3950
3925
3900
3875
3850
3825
3800
3775
3750
3725
3700
3675
3650

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ILLUSTRATION OF WATER DISTRIBUTION SYSTEM

Fig 11

B. Sanitary Sewer Collection & Disposal

The existing development is serviced by a gravity flow collection system, of sufficient gradient to maintain self-cleansing velocities, discharging to an Oxidation Ditch/Clarifier/Chlorination treatment facility.

Figure 12 illustrates that the natural slope of the proposed development area favours a continuation of the established collection systems, although some isolated pumping systems may be required in local areas.

Preliminary appraisals suggest collecting the future development system at Highway No. 3 to the South-East of the development and transporting waste to the existing treatment plant site. Here either major modifications to the existing plant or a parallel package plant will be located to serve the increased capacity.

Secondary treatment of the sewage is proposed to meet the requirements of the Health & Pollution Control authorities.

C. Storm Drainage

The existing development is served by a primary system of surface drainage ditches with small supplementary culvert and storm sewer collectors in specific areas.

For the purpose of this report storm drainage considerations have been separated into:

a. Minimum system: including swales, open ditches and culverts, continuing the established practice, and

b. Improved system: including curbs, gutters, catchbasins and storm sewers.

The stormwater collected from the system will be conveyed along natural drainage courses to a number of outfall points along Highway No. 3, which has been considered the main drainage course.

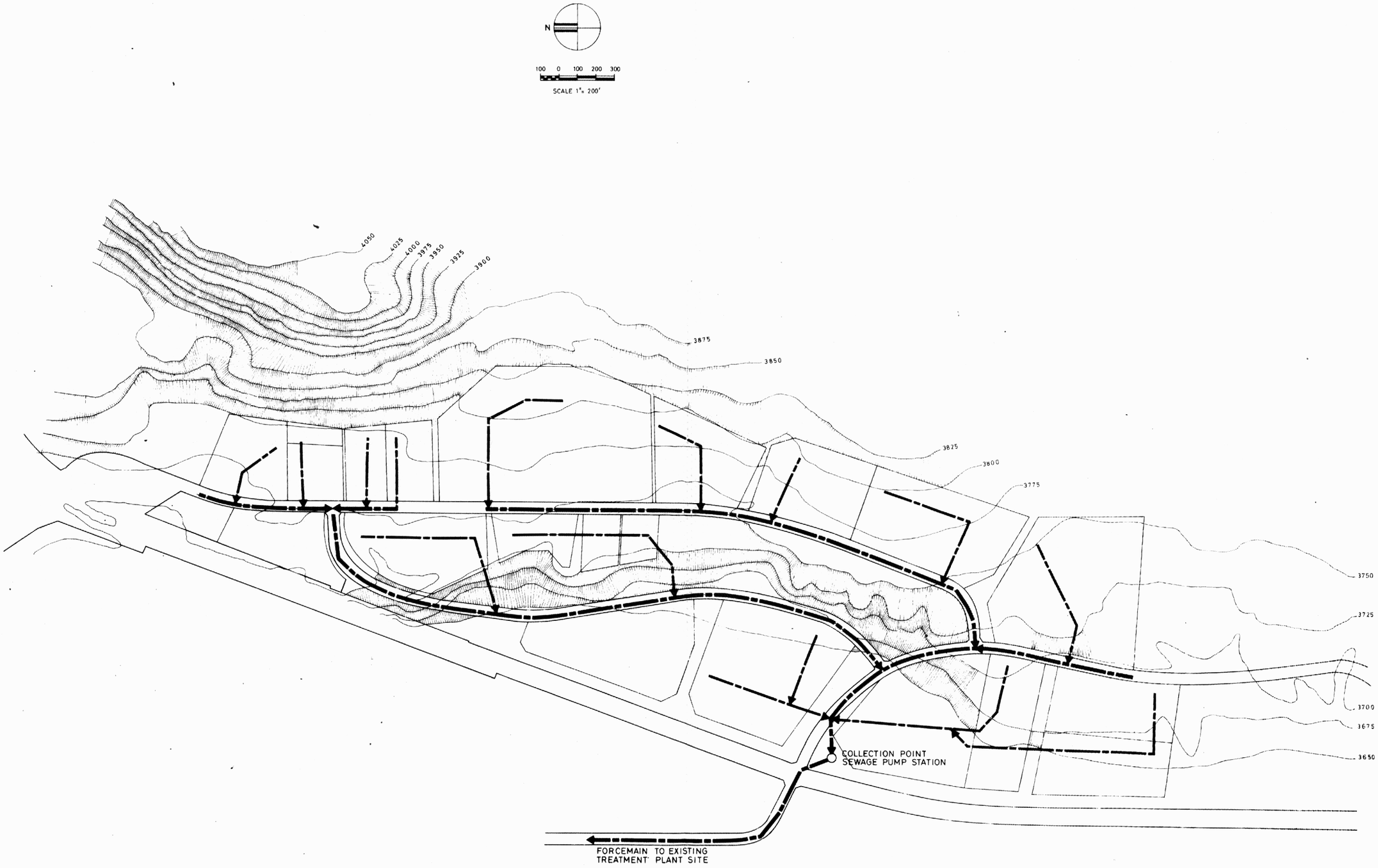

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ILLUSTRATION OF SEWERAGE SYSTEM

Fig 12

D. Roads & Pavements

The existing development is serviced by asphaltic concrete travel surface for vehicles and minimum concrete sidewalks serving the Commercial Area only.

The established criteria, including minimum/maximum grades for drainages and winter operating conditions, have been projected into the considerations of this report, with the added allowance for cast-in-place concrete curbs and gutters.

It has been assumed a balanced cut/fill section of native material sub-grade level, with imported granular sub-base and base courses supporting an asphaltic concrete wearing surface will be applicable to the future development.

Provision of principal intersections with the B.C. Provincial Highway No.3 have been assumed the responsibility of the Provincial Government Highways Department.

E. Electrical Distribution

The existing development is serviced by an aerial high voltage system, through distribution transformers to low voltage lines. The District of Sparwood has required underground distribution for recent development.

A major new sub-station is being constructed by the supply Authority to the south of the existing town and adjacent to the east alignment of Highway No. 3. This development should ensure adequate supply for proposed future development.

An underground distribution system incorporating adequate street lighting has been allowed in estimates for this service.

F. Natural Gas Distribution

The existing development is serviced by Columbia Natural Gas Limited. The proposed development is of sufficient magnitude to make it economically feasible for Columbia Natural Gas to provide a distribution system at no additional cost to the developer other than the regular connection charge for each individual user.

G. Telephone Distribution

Municipal installations such as the existing development, and proposed future developments, are normally provided at no cost to the developer.

When underground electrical distribution is being planned, the telephone company coordinates their installation with the electrical authority and installs their distribution cables in common trenches.

H. Television

The existing developed area is serviced by cable television operated by Fernie T.V. Services.

It is expected that negotiations with this Company would result in an underground cable distribution system installed with the telephone system to provide service at acceptable rates to the individual user at no direct cost to the developer.

I. Maintenance, Firefighting & Ambulance Facilities

These services are presently established within the existing developed area, and operated by the Municipal and Provincial Governments respectively.

1. Maintenance

The Municipality presently owns and operates maintenance equipment as follows:

1 car
4 pick-up trucks
2 dump trucks complete with sanders & snow ploughs
1 street sweeper
1 grader
1 combination back-hoe loader
1 loader
1 garbage packer
1 water truck
3 dump trucks
miscellaneous small tools, pumps, rodding sets, etc.
repair material inventory

It is assumed that development of this service to meet the demands of an enlarged community would be carried out by the Municipality, with funding as presently established from general taxes.

I. Maintenance, Firefighting & Ambulance Facilities (continued)

2. Firefighting

The present service operates the following equipment:

2 pumper trucks
1 emergency vehicle

The service is manned by local volunteers who are on call through an emergency telephone network.

The demand of an enlarged community would require the establishment of a permanent Municipal firefighting crew utilizing existing equipment.

3. Ambulance

This facility, utilizing one appliance, is operated by the Provincial Government. It is assumed this authority would expand its service to meet the demands of future development.

CHAPTER VII

EVALUATION OF NON-RESIDENTIAL REQUIREMENTS GENERATED BY CONDITIONS I AND II

In Chapter IV and V impacts from defined growth circumstances were translated into population, housing requirements, and residential land requirements. The non-residential requirement must be tested, and recognition taken of potential deficiencies and possible solutions.

From Chapter IV and V, the following information will serve as a basis for evaluating the present content and future requirements:

Impact	Population	Employment	Ration Population:Employment
Condition I	4,891	1,851	2.64
Condition II + III	7,074	2,630	2.67

This Chapter will address the non-residential requirements against the abovementioned base.

A. COMMERCIAL

Present Commercial Land Areas

Townsite central	-	14.23 acres
South local	-	3.84 "
North Sparwood (areas)	-	11.48 "

Present Commercial Outlets by Group

Foods	26,097	9
General Merchandise	1,093	1
Automotive (allow)	3,000	3
Apparel and Accessories	6,612	4
Hardware and Furnishings	8,683 +	5
Others	18,912	3
Basic Retail	64,397 s.f.	25 outlets
Service	19,375	19
Recreation	1,562	2
Total	85,334 s.f.	46 outlets

Basis of Evaluation - requirements for potential population of 7,500 persons

Evaluation 1 - by square foot allocation rule of thumb.

a. Gross Commercial allowance of 10 s.f. floor area per person.

7,500 persons @ 10 s.f. per person = 75,000 s.f. total

Note: Present commercial capacity provides adequate space in basic retail and service content to meet this level.

B. Gross Commercial allowance at 5.76 s.f. of sales floor per person[1] and gross land requirement at 32 s.f. per person[1].

7,500 persons @ 5.76 s.f. per person = 43,200 s.f. total floor area

7,500 persons @ 32 s.f. per person = 240,000 s.f. total land area (5.5 acres)

Note: Both are satisfied by present commercial content.

1. De Chiara & Koppelman,- "Planning Criteria"

A. Commercial (continued)

Evaluation 2 - commercial land requirement of relationship between total population and commercial land.[1]

By graph[1], gross land requirement is 0.31 acres/100 at population level 7,500.

∴ Theoretical commercial land requirement

= 7,500/100 x 0.31 = 23.25 acres

Note: Present commercial lands exceed this area.

1. H. Bartholomew, "Land Use in American Cities"

A. Commercial (continued)

Evaluation 3 - comparison of number of commercial outlets with those of other centers having similar population at time of survey.[1]

Center in B.C./Alta.	Population at time of Survey (1966)	Total Outlets	Food	Gen. Mdse.	Auto	Apparel	Hdwe. Furniture	Other
Port Moody	7,021	33	9	1	11	2	3	7
White Rock*	7,787	87	21	5	11	19	11	20
Cranbrook	7,849	92	15	6	24	14	16	17
Chilliwack	8,681	119	16	7	22	27	17	30
Average of above	7,835	83	15	5	17	15	12	19
Sparwood 1974	3,600 approx.	28	8	0	3	4	5	8
Sparwood future (based on factored average/above)	7,500	77	14	5	16	14	11	17
Sparwood future (based on Port Moody/Cranbrook average)	7,500	62	12	4	17**	8	9	12
Suggested target for 7,500 pop. (not discounted)		60	12	4	15	8	9	12

* White Rock - high outlet numbers in food and other outlets relates to high summer tourism during vacation period. Tourist influx reflection rather than stable population.

** Cranbrook - automotive considered high because of transportation link and nature of center.

Note: Sparwood contains only about 50% of the number of outlets that can theoretically be supported by a population of 7,500. The proximity of Fernie and the proximity of sales tax free shopping in Alberta centers is a modifying factor. It is therefore suggested that the requirements of Sparwood at 7,500 population could well be satisfied by a 20% discounting of the above suggested target.

	Total	Food	Gen. Mdse.	Auto	Apparel	Hdwe Furn.	Other
Discounted level	48	10	3	12	6	7	10
Present level	28	8	0	3	4	5	8
Indicated Commercial Growth Potential	20	2	3	9	2	2	2

1. D.B.S. Census Data Sheets - latest data 1966 survey.

A. Commercial (continued)

Evaluation 4 - based on estimated expenditure in community on local commercial merchandise.

a. Estimated gross annual income:

Employment Grouping	Employment Number	Averaged Annual Salary	Est. Annual Gross income
Male: Basic Industry	1,798	$18,500	$33,263,000
Service Industry	500	15,000	7,500,000
Female: Basic Industry	92	8,500	782,000
Service Industry	220	9,000	1,980,000
Totals	2,610		$43,525,000

To reflect the incidence of extra income from working wives which will go to savings rather than expenditure on merchandise, the above estimated total annual gross income from Sparwood residents will be reduced to $42,500,000.

b. Proportion of gross annual income to local retail commercial:

It is generally accepted that approx. 62.5% of annual income is expended on retail sale items.

∴ $42,500,000 x .625 = $26,562,500/annum

Because of the proximity of Fernie and sales-tax-free shopping in Alberta, and because of gaps in outlet types and merchandise types in Sparwood, it is suggested that local retail outlets will capture only about 50% of this annual expenditure, as follows:

Commodity Group	% total expenditures ($26,562,500)	% captured Locally	Annual Sales Volume	Assumed Sales Vol. / s.f.	Indicated Sales area Required
Food	25.8	22.0	$5,844,850	150	38,966
Gen. Mdse.	19.8	11.8	3,134,965	60	52,249
Automotive	24.3	10.0	2,656,750	55	47,741
Apparel/Acces.	5.2	2.5	664,187	45	14,760
Hdwe/home furn.	5.6	3.9	1,036,132	40	25,903
Other retail	19.3	8.0	2,125,400	55	38,644
Totals	100%	58.2%	$15,462,284		218,263 s.f.

A. Commercial (continued)

Evaluation 4 (continued)

c. Translation of 28,263 s.f. retail floor into land requirement:

Retail Area	- 218,263 s.f.
Service and office area allowance	- 54,566 s.f.
Approx. gross area	- 272,829 s.f.
Parking and buffer allowance @ 2.0 x gross	- 545,658 s.f.
Suggested total retail commercial land requirement	- 818,487 s.f.
	= 20.25 acres
Add allowance for service commercial	= 4.5 acres
Add allowance for commercial recreation	= 1.25 acres
Suggested total commercial land requirement	= 26.00 acres

Conclusion - Adequacy of Commercial Development

There is a wide variance in commercial content of centers having comparable populations. In some cases the reason for variance is easily apparent, the special content or amplified content being the reflection of a locational advantage or of a special circumstance of market (tourism, resort aspect, distribution center for large trading area, etc.).

The foregoing methods of evaluation are quite disparate and this process of evaluation is primarily one of comparing indicators to determine in broad terms whether development is potentially deficient, adequate or superfluous. In the end analysis, land use efficiency, outlet efficiency, range of content, and quality of merchant and merchandise become the determinatives of satisfactory commercial content in the community, and no hard and fast formula is applicable.

A. Commercial (continued)

Conclusion - Commercial Land Adequacy

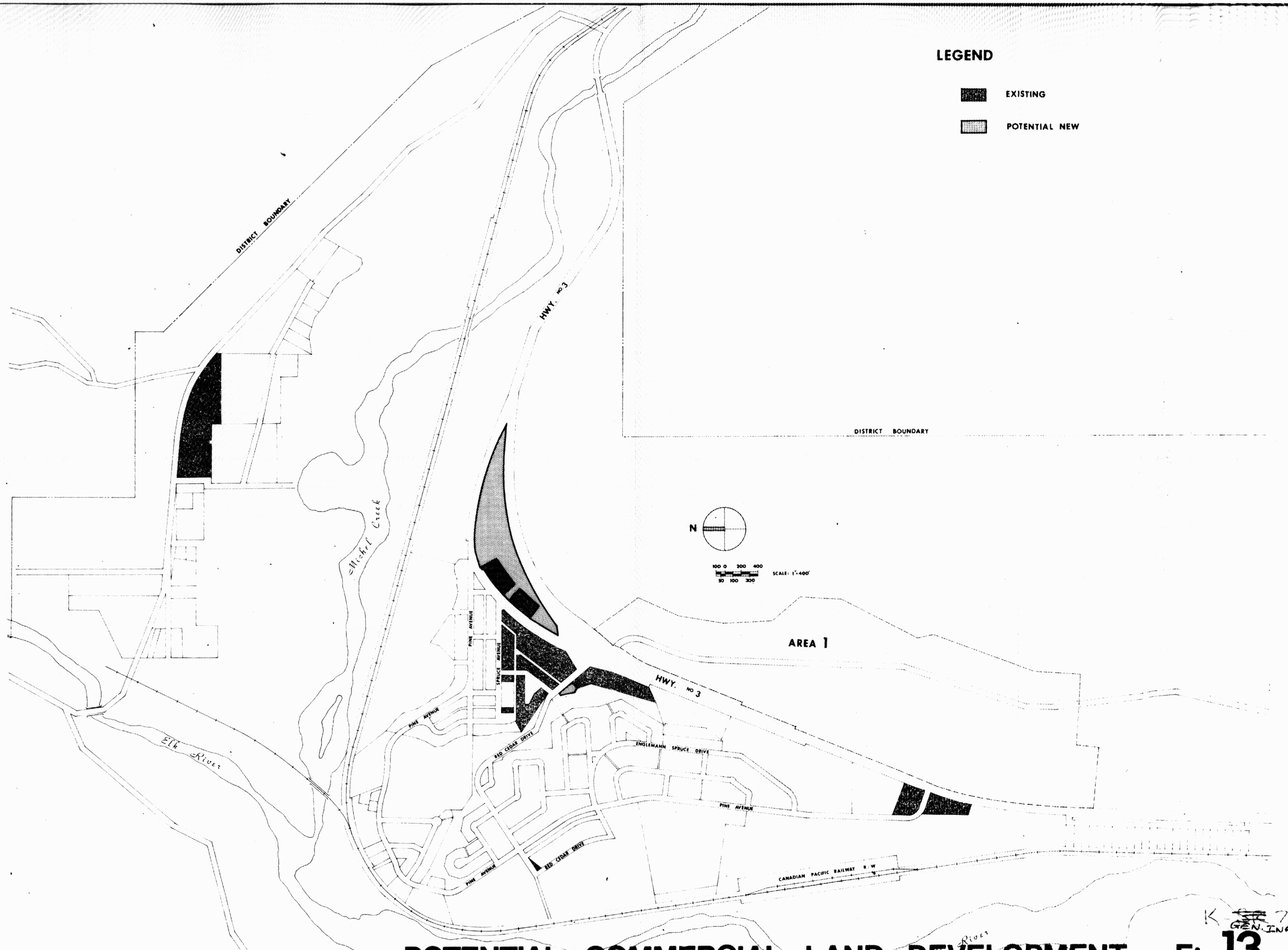
The four methods of evaluation tend to support the view that the present 29.59 acres of commercial land is adequate in size to serve a population of 7,500 persons. However, since 85% of this population will reside in the townsite proper area and only 61% of the total commercial land relates to this area, the town center commercial area must be considered deficient. For a population of 7,500 persons, housed as proposed in this report, the area of central commercial land should be increased by from 2.5 to 6.5 acres, depending on buffer and off street parking requirements of the community.

Figure 13 illustrates how such additional central commercial land can be developed in Sparwood.

Conclusion - Commercial Content Adequacy

Group	Present level	(outlets)	Indicated level for 7,500	(outlets)
Food	26,097	(9)	33,917	(10)
General Merchandise	1,093	(1)	45,478	(3)
Automotive	3,000	(3)	42,045	(12)
Apparel & accessories	6,612	(4)	12,847	(6)
Hardware & furnishings	8,683	(5)	22,547	(7)
Others	18,912	(3)	33,636	(10)
	64,397	(25)	190,470	(48)

From evaluations 3 and 4, as summarized above, a population increase to about 7,500 persons could stimulate a commercial growth of up to 130,000 s.f. and 20+ additional outlets. The indicated large growth potential for automotive group outlets is seen as a late development potential, related to the prospect of northward highway development. The largest suggested deficiency is in the general merchandise category which would include junior department store, variety stores, yard goods, and similar types. The proximity of Alberta centers, Fernie, and Cranbrook could diminish the potential for development in this category even beyond the 40% discount made in evaluation 4. Much of the above development could and should occur within an expansion of the central commercial area, as suggested in Figure 13.



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POTENTIAL COMMERCIAL LAND DEVELOPMENT - Fig 13

B. EDUCATIONAL

This section will evaluate the school requirements for a population of 7,074 persons as projected in Chapters IV and V. Present enrollment figures are from School District Enrollment Report for June 1976 as presented in Chapter II.

Generator (Condition I + II)	Est. Total Child Population	Pre-school-aged Children	School-aged Children	Kinder-garten/ Elementary 5-12 yrs.	Jr. Secondary 13-15 yrs.	Sr. Secondary 16-18 yrs.
Base Industry	2,289	984	1,305	848	336	121
Service/ Support Industry	626	281	345	224	89	32
Totals	2,915	1,265	1,650	1,072	425	153
Present enrollment as of October 1974				796	273*	99*
Indicated magnitude of enrollment increase associated with KRL employment growth (Conditions I and II)				276	152	54
					204	
Teaching equivalent units				8-9	5-6	

*Figure reflects the subtraction of 130 Elkford-resident secondary school students. Current growth of Fording Coal Ltd. employment suggests that secondary school facilities may be developed in Elkford.

B. Educational (continued)

Conclusion - Adequacy of Educational Development

School requirements for Condition I growth can be satisfied through minor expansions to, and full utilization of, present facilities. Mountain View Elementary School has site capacity for an enrollment of 500 or more students, or over two times its present enrollment.

Condition II growth indicates potential need for an additional elementary school. It is suggested that the area of land located across the highway east of the town (Area 1) would provide the best area for residential development required by Condition II growth. The magnitude of this expansion would suggest location of an elementary school within this development area. Secondary school requirements could be satisfied by expansion of the existing Sparwood Secondary School, perhaps by replacing present Sparwood Elementary School classrooms. The mixing of secondary level pupils with elementary level pupils on one site is considered questionable because of the undesirable influences of junior secondary aged children on the younger children.

It is therefore proposed that development of Area 1 should include provision of an elementary school site of approximately 8 acres. Such provision and location should be discussed with the local School District. Figure 14. illustrates potential educational facility development in Sparwood.

LEGEND

EXISTING

NEW

(1) SPARWOOD ELEMENTARY SECONDARY

(2) MOUNT VIEW ELEMENTARY

DISTRICT BOUNDARY

DISTRICT BOUNDARY

HWY. NO 3

Michel Creek

N

100 0 200 400
30 100 300
SCALE : 1" = 400'

AREA 1

HWY. NO 3

PINE AVENUE

SPRUCE AVENUE

PINE AVENUE

RED CEDAR DRIVE

ENGELMANN SPRUCE DRIVE

PINE AVENUE

RED CEDAR DRIVE

PINE AVENUE

CANADIAN PACIFIC RAILWAY R/W

Elk River

Elk River

K-SERS(10)A
GEN. INFO.-K

POTENTIAL EDUACATIONAL FACILITY DEVELOPMENT - Fig 14

C. RECREATION

The inventory of public open space within a town or small city is commonly categorized for study purposes as follows:

Neighbourhood Parks - offering passive recreation land with a minimum of active recreation content - usually limited to playlots for pre-school children, tennis courts, and bowling greens. Such parks are located centrally in major residential areas to serve persons residing within a 1/4 mile radius. Sizes range from 1.00 to 1.75 acres per 1,000 persons depending upon the nature of the terrain.

Playing Fields - offering active recreation space for the organized games of older youths and adults. Such fields are commonly sized on a basis of 1.25 acres per 1,000 persons, of 1 field per 2,000 persons. An ideal size for the town's major playing field would be approximately 250' x 500'.

Playgrounds - offering active playspace for children from 6 to 15 years of age. Such areas normally contain a small field for games, open play space, apparatus area, some paved surface, etc. and are often located adjacent to elementary schools since they are used primarily by children in this age group. Common standards are 1.00 to 1.50 acres per 1,000 persons or 1 playground per 4,000 persons. When combined with playlots for pre-school children, they are often sized on a basis of 1.25 acres per 1,000 persons. When combined with neighbourhood parks they are sized jointly at 8.00 to 15.00 acres serving 2,000 to 5,000 persons within 1/4 mile radius.

Playlots - offering active play space for pre-school children. Such areas are more highly developed in densely built up residential areas where safe playspace is minimal. In areas of low and dispersed population density and relatively large parcels with ample open space, playlots are normally incorporated in neighbourhood parks or playgrounds on a basis of 1 playlot per 85 pre-school children or 1 playlot per 300 to 800, or as many as 1,100 persons, depending on the nature of the community and terrain. Playlot sizes may vary from 2,400 to 5,000 square feet in area and be located centrally to serve residents within a radius of 1/8 to 1/4 mile.

Tennis Courts - are often provided on a basis of 1 court per 1,200 to 2,000 persons depending on length of season and the interest of the community.

C. Recreation (continued)

Recreation Center - offering a wide range of active recreation and some social and spectator recreation for a wide cross-section of community residents. Because of a need for high operating efficiencies, low construction and maintenance costs, and easy useage by the community, it is essential that ample land be reserved to handle what will normally be a progressively developed series of facilities to match community growth. It is equally essential that the center be pre-planned in its entirety and that a plan for staged development along a line of priorities be firmly established. Current recommendations suggest a minimum site area of 10 acres, of which 6 acres are assigned to buildings and parking and the remaining 4 acres are assigned to development of a major playing field with spectator seating and such minor areas as tennis courts, playlot, etc.

Chapter II. outlined the present park and recreation land content of Sparwood. From this content it can be appreciated that the District of Sparwood contains ample lands for such outdoor pursuits as hiking, camping, climbing, and picnicing. This assessment will therefore be restricted to an evaluation of indoor and local outdoor needs of a community having a maximum population of 7,500 persons, being an approximation of the population generated by mining industry growth of a magnitude defined as Condition I plus II.

The following table is a translation of the above-listed standards to a community of this magnitude:

C. Recreation (continued)

Facility	Criteria	Resultant Requirement (criteria x 7.5)
1. Neighbourhood Parks	1.25 acres/1,000	9.4 total acres allocated between neighbourhoods on basis of neighbourhood population.
2. Playing Fields	1.25 acres/1,000	9.4 total acres, distributed as 2.5-3.0 acres with recreation centre, remainder by school site provisions.
3. Playgrounds	1.00 - 1.50 acres/ 1,000	7.5 - 11.0 total acres, incorporated in two neighbourhood parks.
4. Playlots	1 - 2,400 - 5,000 s.f. lot/85 pre-schoolers	1265/85 = 15 lots* dispersed and incorporated in neighbourhood parks.
5. Tennis Courts	1/2,000	3 - 4 courts on recreation centre site
6. Recreation Centre	1.00 - 1.50 acres /1,000	10 acres minimum for comprehensive indoor-outdoor centre.

* a standard generally associated with densely populated urban residential areas. Location should be in relation to served areas of 1/8 to 1/4 mile radius. Lots developed in quieter areas of large park spines are preferable to 'postage-stamp' dispersals.

In summary, the above requirement calls for:

Neighbourhood parks	-	9.4 acres
Playing fields	-	9.4 acres
Playgrounds	-	7.5 acres
Playlots (8 @ 3,000)	-	0.5 acres
Recreation Centre	-	10.0 acres
		36.8 acres

- or 36.8/7.5 = 4.9 acres/1,000 persons

For a more densely populated and larger land area, general open space requirements would prompt provisions in the order of 6.0 acres/1,000 persons, or more (45 acres for 7,500 population).

C. Recreation (continued)

Conclusion - Adequacy of Park and Recreation Development

Chapter II inventoried 58.55 acres of existing park and recreation land including 26.85 acres of recreation center site. This total exceeds requirements based on common criteria and suggests that Sparwood is already well provided for in park and recreation land. Evaluation must therefore relate to distribution to serve neighbourhood areas and to level of actual development (content and quality).

a. Distribution:

Condition II growth (Chapter V) suggests development of a new major residential neighbourhood in Area 1, east of the highway. This neighbourhood should contain a neighbourhood park, an elementary school, and general neighbourhood recreation content for a population of approximately 2,000 - 2,500 persons as follows:

Neighbourhood park	-	3.15 acres
Playfield	-	3.15 acres (2.5 elem. school plus 0.65 other)
Playgrounds	-	2.5 acres
Playlots	-	0.16 acres (2 @ 3,600 s.f.)

b. Development Level:

Approximately 38% of existing park land inventoried is in the form of spines of steep sloped land, boulevard strips, and small squares. As such, it is an open space provision rather than a provision for active recreation. Approximately 45% of existing land is in the form of a consolidated large site for recreation centre development. While this site is impressively large, the adjacent railway trackage and the high ground water level in the lower half of the site will tend to influence its development. Its size, however, should serve to ensure its position as the major active recreation area in the town and District.

In general, the development level of existing recreation facilities must be considered very low. The current plans of an active Parks and Recreation Commission suggest that with financial support a sound and orderly approach to park and recreation development will be made. Figure 15 illustrates potential park and recreation land development in Sparwood.

LEGEND

- EXISTING PARK LAND
- NEW PARK LAND
- (1) NEIGHBORHOOD PARK
- (2) CROWN PARK
- (3) COMMUNITY CENTER
- (4) LIONS PARK

DISTRICT BOUNDARY

DISTRICT BOUNDARY

HWY. NO 3

Michel Creek

Elk River

N

SCALE : 1" = 400'

AREA 1

HWY. NO 3

PINE AVENUE

SPRUCE AVENUE

ENGELMANN SPRUCE DRIVE

RED CEDAR DRIVE

CANADIAN PACIFIC RAILWAY R.W

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GEN. INFO. -K

POTENTIAL PARK & RECREATION LAND DEVELOPMENT - Fig 15

D. EMPLOYMENT

i) Preamble:

Industrial development in the East Kootenay Region over the past decade has focused on the coal industry. Operating mines have increased employment 2.5 times to that of five years ago.

The contemplated Hosmer-Wheeler coal mining operation projects an initial 325 construction job opportunities at mine site over three years, leading into a projected 759 permanent jobs for direct operation. A labour force of this magnitude located in an expanded existing town and based on accepted projection ratios and family sizes, generates 20 further jobs in service and support industry plus approximately 200 construction job opportunities during townsite build-up. Thus it is projected that approximately 780 permanent jobs would be generated within the District for the operational life of the mine together with 525 additional jobs during a projected five year construction period.

Kootenay Region statistics for 1974[1] indicate a regional unemployment rate of 6½ - 8%, a rate higher than the corresponding B.C. rate. The Mining Industry pays $1,000 or more above the B.C. average wage and offers year-round employment. With potential for training local labour, incentives from higher than average wages, subsidized housing, and an expanded community, the project provides major direct employment and real potential for reducing regional unemployment rates.

ii) Labour Source:

In view of the anticipated growth of the coal mining industry in North America and other major industries such as the Syncrude development, a widespread shortage of qualified manpower for the mining industry is expected within the next few years. Shortages are expected in the managerial and salaried contingent as well as the hourly paid labour force. The number of available certified underground miners will be particularly acute.

To meet the demand, the Company will be required to extend proposed training programs and to possibly recruit qualified personnel from other companies. Overseas recruitment of coal miners may account for about 1/3 of this total recruitment. The ratio of Canadians trained to skilled foreigners recruited, (i.e. 2:1) would conform to the guidelines established by Canada Manpower and Immigration.

About 1/5 of the maintenance tradesmen would probably also be supplied from overseas.

1. Canada Manpower

D. Employment (continued)

ii) Labour Source: (continued)

General labour, plant operators and supervision would not involve overseas recruitment; much of this labour hopefully being drawn from the B.C. workforce using Company sponsored and Government supported training programs to fill skill gaps.

iii) Turnover:

Labour turnover is traditionally very high during the initial period of a mine start-up. This is primarily due to the isolation and lack of permanent accommodation and community facilities. The Hosmer-Wheeler mine should present more stable circumstances, being based near existing communities. The estimated turnover rate initially could be in the order of 60% - 70% per annum.

Initially, employment will involve a relatively high proportion of single men. Above average turnover, differing social values, and problems related to social instability can therefore be expected. As the "married" proportion of employees increases, these problems will tend to diminish.

It is anticipated, based on established history from Kaiser Resources Ltd. that turnover could be reduced to between 32% and 35% per annum. A peak of late summer turnover results from employment of summer casuals used in seasonal workforce buildup. The highest turnover is experienced in the low skill/difficult environment areas, e.g. Byproducts Plant. The lowest turnover is experienced in the Underground & Maintenance skill areas.

iv) Training:

Expansion of existing Kaiser Resources Ltd. developed training programs is anticipated.

These programs offer - exposure to Grade 11 and 12 secondary school students in Company assisted Mining courses.

- trade training for all required trades
- special training, such as Underground Mining where a 56 week program has been established. Men with a minimum of grade 8 educational background can undertake survival course instruction and tests, obtain their provisional

D. Employment (continued)

iv) Training: (continued)

certificate (after 6 months), work at the coal face for an additional 6 months, and finally apply to obtain their certification from the Provincial Superintendent of Mines. About 50 men per year can be trained on an on-going basis.

Such training is provided by the Company at no cost to the trainee - wages are maintained - and the Company seeks no direct protection (contract term) of their investment.

Encouragement through Labour Organization committees for apprentice programs leading to certified trades will be given.

v) Equal Opportunity for Women:

The Company proposes to adopt a policy, similar to that practiced by Kaiser Resources Ltd., whereby equal opportunity is given to women for both employment and training programmes.

The only exception to this policy are in those areas where equal opportunity is specifically denied by current legislation and/or regulations.

The Company has undertaken to consider, and respond to, the request from the Women's Economic Rights Branch, Department of Economic Development that more positive action be taken to encourage women into training and employment within the mining industry.

E. TRADE, SERVICES AND SECONDARY EFFECTS

i) Construction:

During the construction phase it is expected, because the region would not be able to supply a very large proportion of the labour force, that a high proportion of these workers would live in a construction camp. Spending patterns and demand for services from this source would be relatively small compared to that of permanent residents, and would be directed to Sparwood, Fernie and possibly Cranbrook; with a back-up wholesale supply service from regional depots. This requirement will stimulate wholesale supply activity in Cranbrook, and supplementary retail sales and services in Fernie.

E. Trade, Services and Secondary Effects (continued)

ii) Tidewater Facilities:

Expansion will be required of the existing coal loading facilities operated by Westshore Terminals Ltd. at Robert's Bank on the Greater Vancouver lower mainland.

The present facility site will require a minimum 50 acre site expansion to accommodate the proposed growth. This expansion would be provided by the National Harbour Board who plan to increase site capability to 200 acres in 50 acre packages.

The present terminal with its facilities is effective for the following throughputs: [1]

i) Train unloading system - to 9.0 MLTPY
ii) Stockpiling system - to 9.5 MLTPY
iii) Shiploading system - to 12.0 MLTPY

Additional staged development will provide allowable throughputs as follows:

Stage I	Install second Dumper including new trainloop Add new #4A conveyor in order to twin feed shiploaders Add connecting conveyors, transfer point, upgrade electrical distribution.	10.6 MLTPY
Stage II	Add new 200' boom bucket wheel stacker/ reclaimer in new pile location, including connecting conveyors.	12.5 MLTPY
Stage III	Install new shiploader, offices, warehouse, etc.	19.00 MLTPY
Stage IV	Install new 200' bucket wheel stacker/reclaimer including connecting conveyors.	23.25 MLTPY
Stage V	Discard existing twin-boom stacker, and install new 200' bucket wheel stacker/reclaimer.	24.1 MLTPY

This staged development is estimated to take 40 months to complete.

The existing workforce of 70 employed by Westshore Terminals Ltd. is projected to be increased by 50 to a total of 120. This will generate a demand for related goods and services supply and provide an added source of Government revenues.

1. Swan Wooster Engineering Co. Ltd.

F. TAXES

All levels of government will receive revenues from the construction and operation phases of the project.

Corporate income tax would be generated on the profits of Canadian equipment and material suppliers and contractors.

Personal income tax would be generated by both the direct and indirect employment.

Import duties and sales taxes would be derived from equipment and materials supplied.

Local taxes would be generated by the mine operation* and the expanded town.

* Dialogue must continue between the communities adjacent to the operation, and Government to determine when the benefits of local taxes will fall.

G. MEDICAL AND HOSPITAL SERVICES

Resident medical facilities, in the form of a 17 bed hospital at Michel presently exist. Two Doctors practice in Sparwood.

A 27 bed hospital is proposed for immediate construction at Sparwood, replacing the Michel facility. Based on a rule of thumb 7 beds per 1,000 population, the proposed hospital would be undersized by almost 50%, however as this facility would be supplemented by the existing 66 bed hospital at Fernie, service should be adequate for the projected population increase.

Major disasters or unusual medical procedures would require the use of larger, more adequately equipped Regional hospitals in Cranbrook or Calgary.

The existing ambulance service consists of one vehicle.

H. LAW ENFORCEMENT

i) Police Protection:

Maintenance of law and order is carried out through standard Provincial contracts with the Royal Canadian Mounted Police, through the Nelson Division.

H. Law Enforcement (continued)

i) Police Protection: (continued)

Based on a rule-of-thumb of one police officer for each 700 persons, a 10 to 11 man detachment would be required for policing duties. Associated facilities of office, storage, 4-cell lockup (3 for men and 1 for women/juveniles) and vehicle storage would be required, as an adjunct to other Municipal - Public Safety facilities.

These facilities presently exist, and if it is assumed peripheral policing duties (such as Elkford) are eliminated by the establishment of other detachments, they should adequately service the expanded population.

ii) Judicial:

The existing Provincial court activities originating in Fernie would continue, though probably requiring some expansion of facilities as an adjunct to the existing Municipal - Public Safety buildings. Based on recommendations set out by the Attorney-General's Department a fulltime Probation worker and a part-time clerical assistant will be required.

I. SOCIAL SERVICES

The Department of Human Resources maintains offices at Cranbrook and Fernie. From September 1974 statistics it can be ascertained that an average of 41.6 cases per 1000 population are experienced.

The Fernie office, which maintains a staff of 3 has a staff/client ratio of 1:175 which is by far the highest in the Kootenay Region. The added load of approximately 2,250 persons to service, which would focus on the Fernie office, makes it apparent that these services will need expanding to provide an acceptable level of service, not only to the new residents, but to the existing population.

Departmental recommendations of one social worker per 2,600 suggests a need for at least two additional staff members.

J. TRANSPORTATION

i) Road:

Both rail and developed public road systems including Provincial Highway No. 3 presently service this area.

J. Transportation (continued)

i) Road: (continued)

Maintenance of the existing road system on a year-round basis will benefit local employment and related services.

There is a daily bus service travelling Highway No. 3 to regional and continental destinations.

ii) Rail:

The existing railway system used to transport processed coal to tidewater facilities will require improvement. C.P. Rail have given assurances that the system can handle the added transportation demand.

An independent study[1] suggests that improvement to track construction and gradients will be required in three specific areas, together with upgraded railbed throughout the system to enable the system to cope with the increased intensity of utilization from coal transporation as well as freight from points further east.

These requirements will add short-term construction job impacts at the Regional and Provincial level, in addition to generating continuing related employment, goods and services supply and Government revenues.

iii) Air:

Scheduled air service to continental destinations operates from Cranbrook. There are studies and negotiations presently underway to locate an airport (3000+ ft. --- sealed runway) in the more immediate subregional locality centred on Sparwood.

iv) General:

Development of road and air transport services, would have an impact in opening the area to recreation and tourist activities from wider Regional and Provincial sources.

K. UTILITIES

i) Power:

B.C. Hydro advises that the existing demand together with the projected growth of demand, can be adequately serviced from existing and/or proposed generation sources and transmission systems and substations.

1. R.C. Steele

K. Utilities (continued)

ii) Telephone:

The telephone system has potential for expansion to meet the increased demand.

iii) Gas:

Columbia Natural Gas advises the increased demand can be met from the existing arterial system.

iv) T.V.:

Television reception may benefit in that the increased demand will give commercial justification to improved district receiver equipment and service distribution.

L. SOCIAL ADJUSTMENTS

i) Cultural Impacts:

Recent experiences by Kaiser Resources Ltd. related to the immigration of British miners and Asian employees with their families is very encouraging. Evidently, integration within the community has proceeded without incident.

ii) Social Problems:

Social problems are not considered to be of any greater magnitude in this community than in any like community.

The Company anticipates joining with Kaiser Resources Ltd. and Fording Coal Ltd. in existing company sponsored Alcohol and Drug Abuse counselling programs which presently retain a full-time Counsellor.

This program is available to the community-at-large, and is not restricted to Company employees.

CHAPTER VIII

RECOMMENDATIONS FOR MITIGATING ACTIONS & FURTHER STUDY

A. COMMUNICATION WITH LOCAL INTEREST GROUPS & SUPPORT SERVICE COMPANIES

Special interest groups at the local & regional level have interest in this project, as do all support service/utility companies. A methodology must be developed to open and maintain adequate channels of communication to keep these people informed and complete their input. Possible methods may lie in the study of like mechanisms used by B.C. Hydro at the Seven-Mile hydro electric project near Trail, B.C.

B. DIALOGUE WITH GOVERNMENT

Detailed dialogue should be maintained with Government to determine approvals and established Government participation in the infrastructure and support services.

C. DEVELOPMENT SITE-RELATED IMPACTS

A number of the items dealt with on a broad base in the foregoing text require further detailed study and analysis before final solutions could be determined.

The detailed geo-physical study proposed for development lands east of Highway No. 3 to establish their suitability for such development is most critical.