

Project Report  
RE-03-13-82

AN INVENTORY OF CHANGES IN  
ALBERTA'S AGRICULTURAL LAND BASE  
BETWEEN 1976 AND 1980

Prepared By:  
Project Leader  
ALFRED BIRCH  
Resource Economist

March, 1982  
Edmonton, Alberta

Resource Economics Branch  
Alberta Agriculture

## ACKNOWLEDGEMENTS

Grateful acknowledgement is made of the cooperation and assistance of all those who contributed to this study. The following agencies made data on agricultural land conversion available:

1. All of the Regional Planning Commissions (Peace River, Edmonton, Battle River, Red Deer, Calgary, Oldman River, Southeast Alberta and Palliser)
2. Alberta Municipal Affairs: Planning Services Div., Finance and Administration Division
3. Alberta Energy and Natural Resources: Public Lands Div, Resource Evaluation and Planning Div.
4. Alberta Environment: Land Reclamation Division
5. Alberta Transportation: Regional Transportation Division
6. Energy Resources Conservation Board
7. Environment Council of Alberta

Staff of the Resource Economics Branch Alberta Agriculture and summer students provided valuable assistance in data collection and management, and typing this report. The staff of the Computer Services Branch, Alberta Agriculture, also helped with data management and analysis. The author extends his sincere thanks to all of these.

## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS .....	ii
LIST OF TABLES .....	v
LIST OF FIGURES .....	ix
SUMMARY .....	x
I. INTRODUCTION .....	1
II. DATA COLLECTION .....	4
1. The Agricultural Land Base .....	4
2. Agricultural and Non-Agricultural Regions .....	5
3. Prior Use .....	7
4. Canada Land Inventory Classification .....	8
5. Public Land Disposition and Reservations .....	10
6. Non-Agricultural Subdivisions .....	12
7. Urban Annexation .....	17
8. Roads .....	18
9. Oil and Gas Well Sites and Gas Plants .....	19
10. Coal Strip Mines .....	22
11. Other Non-Agricultural Uses .....	24
12. Data Analysis .....	26
III. STUDY RESULTS .....	28
1. An Overview of Agricultural Land Base Change ..	28
2. Public Land Dispositions and Reservations .....	42
3. Non-Agricultural Subdivision .....	48
4. Urban Annexation .....	57

5. Highways .....	62
6. Oil and Gas Wellsites and Gas Plants .....	66
7. Coal Strip Mines .....	68
8. Other Non-Agricultural Uses .....	69
IV CONCLUSIONS AND IMPLICATIONS .....	76
REFERENCES .....	83
APPENDIXES .....	84

## LIST OF TABLES

TABLE NUMBER	Page
1. Summary of Agricultural Land Base Changes in Alberta, 1976 - 1980 .....	29
2. Removals of Agricultural Land, Adjusted for Prior Use .....	31
3. Annual Agricultural Land Base Changes in Alberta .....	33
4. Land Base Changes by C.L.I. Class, Alberta, 1976 - 1980 .....	34
5. Arable Land as Proportion of Land Conversions, Alberta, 1976 - 1980 .....	36
6. Percentage Distribution of Land Conversions By Region 1976 - 1980 .....	37
7. Land Base Changes in the Southern Region By C.L.I. Class, 1976 - 1980 .....	38
8. Land Base Changes in the Central Region By C.L.I. Class, 1976 - 1980 .....	39
9. Land Base Changes in the Northern Region By C.L.I. Class, 1976 - 1980 .....	40

10.	Land Base Changes in the Peace Region By C.L.I. Class, 1976 - 1980 .....	41
11.	Permanent and Temporary Removals of Agricultural Land by Region and C.L.I. Class, 1976 - 1980 .....	43
12.	Annual Public Land Dispositions, Alberta .....	44
13.	Public Land Dispositions: Region, Type of Disposition and C.L.I. Class, 1976 - 1980 .....	46
14.	Public Land Reservations: Region and C.L.I. Class, 1976 - 1980 .....	47
15.	Non-Agricultural Subdivisions By Intended Use and Year, Alberta .....	49
16.	Arable Land as Proportion of Non-Agricultural Subdivision, Alberta, 1976 - 1980 .....	51
17.	Non-Agricultural Subdivision: Intended Use and C.L.I. Class, Alberta, 1976 - 1980 .....	52
18.	Average Size of Subdivided Parcels, By Region and Intended Use, 1976 - 1980 .....	54
19.	Non-Agricultural Subdivision: Intended Use and Year, Edmonton - Calgary Corridor .....	55
20.	Non-Agricultural Subdivisions: Intended Use & C.L.I. Class, Edmonton - Calgary Corridor, 1976 - 1980 .....	56

21. Annexation: Urban Area and Year .....	58
22. Annexation: Urban Area and C.L.I. Class, 1976 - 1980 .....	59
23. Arable Land as a Proportion of Urban Annexed Land, 1976 - 1980 .....	60
24. Regional Distribution of Annexed Land, 1976 - 1980 .....	61
25. Highways: Type of Use and Year, Alberta .....	63
26. Highways: Type of Use and Region, 1976 - 1980 .....	64
27. Highways: Type of Use and C.L.I. Class Alberta, 1976 - 1980 .....	65
28. Gas Plants: Region and C.L.I. Class, 1976 - 1980 .....	67
29. Coal Strip Mines: Disturbance Prior to 1976 and Total Approved Mine Area .....	68
30. Miles of Powerlines in Alberta: Year and Type .....	69
31. Miles of Pipelines in Alberta .....	71
32. Railway Abandonments in Alberta: Year, Length and Location .....	73

- A1. Land Conversions in the Southern Region: Type of Conversion  
by C.L.I. Class, 1976 - 1980
- A2. Land Conversions in the Central Region: Type of Conversion  
by C.L.I. Class, 1976 - 1980
- A3. Land Conversions in the Northern Region: Type of Conversion  
by C.L.I. Class, 1976 - 1980
- A4. Land Conversions in the Peace Region: Type of Conversion  
by C.L.I. Class, 1976 - 1980
- A5. Public Land Reservations by Municipality and Year



LIST OF FIGURES

1. Study Regions, 1981 ..... 6
2. Statutory Boundaries of Regional Areas, 1979 ..... 14

## SUMMARY

1. During the period of 1976 to 1980 the total additions to Alberta's agricultural land base were 386.7 thousand acres, or about 77 thousand acres per year. Total removals of agricultural land during this period were 390.1 thousand acres, or about 78 thousand acres per year. Thus there was a net loss of 3.4 thousand acres of agricultural land over this five year period, or an average of 680 acres or approximately 1 section per year. (Table 1). This is an insignificant reduction in comparison with the total agricultural land base of approximately 52 million acres.
2. In general both annual gains and losses of agricultural land in Alberta increased during the 1976 to 1980 period. Additions of agricultural land rose from 57.4 thousand acres in 1976 to 101.8 thousand acres in 1980. Removals increased from 54.1 thousand acres in 1976 to 95.8 thousand acres in 1979, falling somewhat in 1980. (Table 3). This high, and increasing, rate of land conversion activity is likely related to the level of economic activity in the province and to changes in provincial population.
3. During the study period there was a net loss of 90.9 thousand acres of agricultural land in Canada Land Inventory class 1 to 3. This

constituted about 0.3 percent of the province's 26.5 million acres of class 1 to 3 land. During the same period there was a net gain of 85.0 thousand acres of agricultural land in C.L.I. class 4 to 6 and "organic". This was approximately 0.1 percent of the province's 85.3 million acres of this type of land. Although these net conversion acreages are small in relation to the total agricultural land base, they can have important effects on such things as farm production costs, choice of crops, yields and financial risk born by farmers. (Table 4).

4. Aside from new and abandoned wells, for which regional identification was unavailable, there was a net gain of 233.6 thousand acres of agricultural land in the Peace Region during the 1976 to 1980 period. This is equivalent to approximately 47 thousand acres or 73 sections per year. In the remainder of the province (white zone) there was a net loss of 147.4 thousand acres of agricultural land during the study period, or about 29 thousand acres or 46 section per year. This geographical shift is closely related to the shift in average agricultural capability mentioned above. It has implications for the location of production, the cost of transportation, and required investment in infrastructure. (Tables 7 - 10).

5. The net loss of C.L.I. class 1 to 3 land during the study period was as follows:

Southern Region	9.3 thousand acres
Central Region	51.9 thousand acres
Northern Region	55.7 thousand acres

(See Figure 1 for regional definition). These losses of class 1 to 3 land constituted, respectively, 0.2 percent, 0.6 percent, and 0.7 percent of the total class 1 to 3 land in the Southern, Central, and Northern Regions. The Peace Region had a net gain of 53.9 thousand acres of class 2 and 3 agricultural land. (These regional figures do not include the use of agricultural land for well sites. See Tables 7 to 10).

6. Public land dispositions totalled 371.2 thousand acres during the 1976 - 1980 period. This total included, in approximately equal amounts, dispositions leading to title (sales), dispositions not leading to title (leases and permits), and grazing reserves. Public land reservations totalled 28.9 thousand acres. (Table 13 and 14).

7. Non-agricultural subdivisions totalled 139.8 thousand acres during the 1976 to 1980 period. Approximately 32 percent of this was accounted for by single parcel country residential and farmstead separation parcels. Another 52 percent was used by multi-parcel country residential subdivision. Of the agricultural land which was used for single parcel country residential and farmstead separation, approximately 58 percent was in C.L.I. classes 1 to 3. For multi-parcel country residential subdivision this was 29 percent. Of the land used for all other subdivisions, approximately 56 percent was in C.L.I. classes 1 to 3. (Tables 16 and 17).

8. Total annexed land in Alberta during the study period was approximately 91 thousand acres, or 18 thousand acres per year. Close to 50 percent of this went to the following major population centers: Calgary, Edmonton, Fort Saskatchewan, Grande Prairie, Leduc, Lethbridge, Medicine Hat, Red Deer and St. Albert. The 43.2 thousand acres annexed by these urban areas between 1976 and 1980 was equivalent to 38 percent of their total area in 1979. C.L.I. class 1 and 2 land accounted for 52 percent of total annexed land in the study period, while class 3 land accounted for another 25 percent. (Tables 21 and 23).

9. Highway and road construction and widening in the study period used 25,077 acres of agricultural land. Of this, 28.2 percent was used for municipal road construction and 52.5 for municipal road widening. (Table 25).

10. Assuming an average well site area of 4.5 acres, new oil and gas wells removed 103.1 thousand acres of agricultural land during the 1976 to 1980 period. Abandoned wells returned 13.5 thousand acres to the agricultural land base during that period. (Table 1, 3 and 5).

11. Coal strip mines removed 1895 acres of agricultural land during the study period, while 1970 acres were returned through reclamation. The majority of the mining disturbance was on C.L.I. class 2 and 3 land. (Table 5).

## CHAPTER I

### INTRODUCTION

The preservation of farmland in Alberta has recently been a matter of particular public concern. Although the agricultural land resources of the province may, at one time, have been taken for granted, there is a growing awareness that these resources are limited and must be managed and allocated with care. The apparent rate of conversion of farmland to urban uses has generated fears that our agricultural productive capacity is being threatened, with undesirable consequences for rural welfare and the provincial economy as a whole.

Accurate information is a primary requirement for informed public debate and the design of appropriate government policy. We cannot make intelligent decisions on how to use our land resources if we have poor or incomplete information on how they are being used. The intent of this project has been to provide accurate and comprehensive information on land being added to and removed from agriculture. Although some previous information was available on the amount of land being converted to non-agricultural uses, that information was of a general nature and was not uniformly reliable.

The objective of the present study has been to develop a computerized inventory of agriculture land use changes, including the following information:

- a. The amount of land being converted to or from agriculture.
- b. The intended use categories of the land being removed from agriculture, giving a detailed breakdown when possible.
- c. The date of recorded change of use.
- d. The location of the land being converted.
- e. The Canada Land Inventory Classification for agricultural purposes, of the affected land.

This range of information, collected for each of the converted parcels of land, allows the determination of historical trends and geographical patterns of land use in the province.

The categories of land use conversion which have been included in the computerized inventory are as follows:

1. Additions to the agricultural land base
  - a. Dispositions of crown land for agricultural use.
2. Deletions from the agricultural land base
  - a. Approved subdivision of agricultural land for non-agricultural use.
  - b. Annexation by urban areas
  - c. Rural road and highway construction and right-of-way extension.
  - d. Oil and gas wells and gas plants.
  - e. Surface coal mines

A number of other land use categories were given a more cursory investigation, either because of the difficulty of collecting detailed information or because they appeared to constitute a disturbance or inconvenience to agricultural activity rather than a significant loss of agricultural land. These categories include the following:

- a. Buried pipelines
- b. Powerlines
- c. Railroads
- d. Airports
- e. Gravel pits

Details on the data collection procedures used in this study are discussed in Chapter II. The judgements made in defining such concepts as the agricultural land base are also described there. Chapter III gives the analytical results of the study, describing both geographical and historical patterns. Conclusions are given in Chapter IV.



## CHAPTER II

### DATA COLLECTION AND ANALYSIS

The purpose of this chapter is to describe the methodology of data collection and analysis used in this study. Concepts such as "the agricultural land base" are discussed and the various categories of land conversion which this study employs are defined. This information will help the reader to interpret the results presented in Chapter III.

#### 1. The Agricultural Land Base

The focus of this study is on changes in the agricultural land base in Alberta, not on the total amount of land in agriculture. In order to answer the question, "How much land is being added to and removed from agriculture?" it is necessary to define which land is agricultural.

A large proportion of the land in Alberta has some agricultural potential, though much of the land which is not presently farmed would require improvement such as clearing or draining to bring it into production. Also, annual production costs would be high on some of this land. The main question concerns the economic feasibility of agricultural production, whether in cultivation or grazing. In order to measure changes in the province's agricultural land base it would be desirable to identify those parcels where administrative or physical changes added or removed land on which agricultural production is

economically feasible. Since economic feasibility could not be determined in this study, the approach used was to record administrative or physical changes affecting land where the present (for land removals) or probable (for land additions) use was agricultural. Present use was identified on a case by case basis where possible and on a probability or regional basis otherwise, as discussed below. Information on Canada Land Inventory (C.L.I.) classification was included only as a description of parcels being converted to or from agriculture. A number of factors affecting the definition of the agricultural land base are discussed in the remainder of this chapter.

## 2. Agricultural and Non-Agricultural Regions

For the purpose of administering provincial public land in Alberta, the Department of Energy and Natural Resources has defined several broad regions. In general, agricultural production takes place in the Peace Region (which is equivalent to the Energy and Natural Resources "yellow area") and in the "Northern", "Central" and "Southern" Regions (which together constitute the E.N.R. "white area").<sup>1</sup> The remainder of the province (the E.N.R. "green area") consists mainly of non-settled forest

---

1. The regions in Figure 1 are defined for the purpose of this report only. The "Southern" region corresponds to Alberta Agriculture's Southern Region. The "Central" region corresponds to that part of Agriculture's South Central and North Central Regions which is also in the E.N.R. white area. The "Northern" region corresponds to the parts of Agriculture's North Eastern and North Western Regions which are also in the white area. There is also approximate correspondence between the regions shown in Figure 1 and the Regional Planning Commission areas shown in Figure 2.

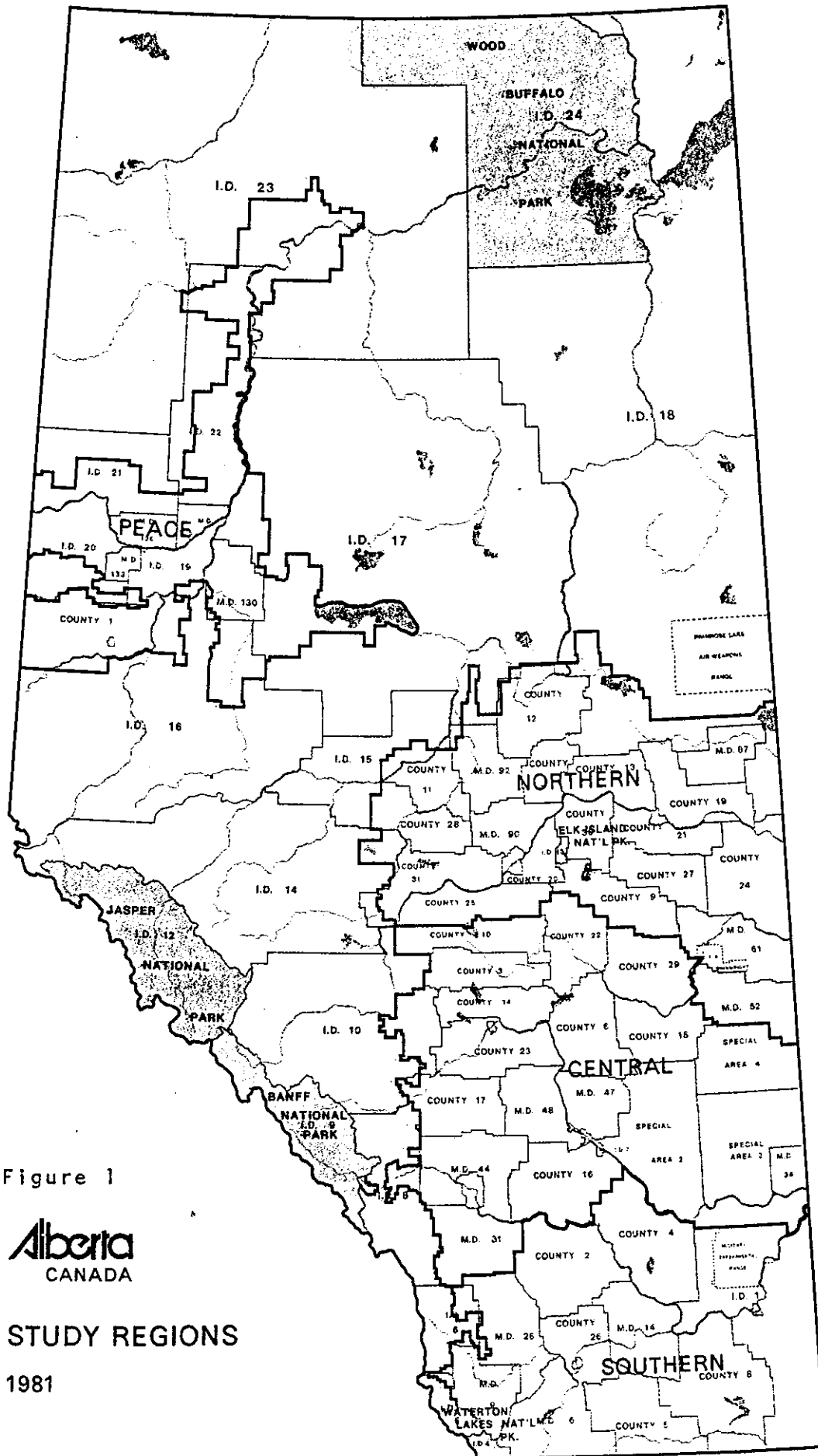


Figure 1

**Alberta**  
CANADA

**STUDY REGIONS**

1981

lands. Provincial public lands in this area are managed primarily for forest production, watershed protection, recreation and wildlife. Some multiple use, including grazing, is also permitted. For the purposes of this study, conversions from agricultural to non-agricultural uses in the green area have been ignored. Dispositions within the green zone of public lands into agriculture and restrictions on such dispositions have been recorded, however.

Also excluded from consideration in this study are Indian reservations, military areas (the Suffield Range and C.F.B. Wainwright) and land within incorporated urban centers.

### 3. Prior Use

In order to assess the amount of land being removed from the provincial agricultural land base it is necessary to know the existing use of parcels prior to their conversion. All conversions to a non-agricultural use cannot, for example, be assumed to remove land from agriculture; even within the "agricultural" areas of the province there is considerable non-agricultural land.

With respect to rural subdivisions, the prior use of the land was determined from the subdivision application forms submitted to regional planning commissions or the Department of Municipal Affairs. It is recognized that there is some inaccuracy in identifying agricultural land by this procedure. Where subdivision involves a farm building site

there may be no actual loss of agricultural land, particularly where farm consolidation has taken place.

With respect to conversions to other non-agricultural uses such as highways, oil and gas well sites and urban annexation, case by case information on prior use was unavailable. An estimate was made of the ratio of agricultural land to non-agricultural land for each type of land conversion by examining aerial photographs and municipal assessment records for a sample of cases. It was determined, for example, that a higher percentage of the land used by oil and gas well sites is agricultural than the land used by highways and annexation to urban areas. Results are given in the next chapter.

Prior use considerations are also important with respect to public land dispositions. This study assumes that a temporary lapse in agricultural disposition does not constitute a loss of agricultural land. This is discussed further under "Public Lands Dispositions" below.

#### 4. Canada Land Inventory Classification

Information on the Canada Land Inventory (C.L.I.) classification of land being converted to or from agriculture was derived from one of two sources. First, many of the regional planning commissions subdivision files contained C.L.I. information. In some cases the C.L.I. class of the specific parcel or parcels concerned was available; in other cases

the predominant C.L.I. class for the entire quarter section had to be used. Second, in the remaining subdivision cases and in all other conversion categories (eg. urban annexation, well sites, highways) the C.L.I. information was obtained from the Department of Municipal Affairs and matched with this study's data on the basis of legal descriptions of parcels. The Municipal Affairs "Landup" program lists C.L.I. class and subclass information on a quarter section basis, derived from C.L.I. maps of 1:50,000 scale (and in a few cases, 1:250,000 scale). Use of this information in the present study involved the assumption that the predominant C.L.I. class applied to the entire quarter section.

In some cases the use of large scale maps or the use of a single C.L.I. class for a quarter section may have biased the C.L.I. measures in this report. Rural subdivisions are an example of this. To the extent that planning commissions are successful in directing subdivision onto land of lower agricultural capability, there is an incentive for applicants to select sites for development on such land. However, where these sites are on quarter sections which have predominantly higher agricultural capability soils, the subdivision sites themselves will be reported as having a higher C.L.I. class than is actually the case. The opposite type of bias may take place in the case of well sites. Oil and gas companies are likely to have an incentive to select locations within quarter sections where the drilling site is on land which is clear level and well drained, i.e. on higher C.L.I. land. The reported C.L.I. may be lower, however, reflecting the rest of the quarter section. The result may be that the C.L.I. ratings in this report are somewhat

overestimated for subdivisions and somewhat underestimated for well sites. There does not appear to be the same probability of bias in the other conversion categories such as roads, urban annexation or strip mines.

#### 5. Public Land Dispositions and Reservations

Information on the disposition of public land in Alberta for agricultural purposes was collected from the Public Lands Division of Alberta Energy and Natural Resources. Data were collected for the following disposition categories: civilian homestead sales, farm development sales, public land sales for agricultural use, farm development leases, grazing permits, cultivation permits, forest grazing leases and grazing reserves.<sup>1</sup> These disposition categories can be combined into three groups. The first three are dispositions which lead to the transfer of legal title, provided certain conditions are met. The leases and permits are dispositions to agricultural use which do not lead to a change in title. Grazing reserves are community pastures which are financed, developed and managed by the Public Lands Division. Staff of that Division estimate that not more than 60 percent of the land in grazing reserves is eventually developed for improved grazing.

---

1. Further information on these categories can be obtained from the Public Lands Division or from Alberta Energy and Natural Resources, "The Administration and Management of Alberta Public Lands", E.N.R. Report No. 85, Public Lands Division, April 1979.

The Special Areas Board also administers the disposition of public land in the special areas. The Board reports that there have been no new dispositions of public land recently, though approximately 10 to 12 sections of land per year go from grazing lease to cultivation lease.

It was found to be impractical to collect data within the standard format on one additional disposition category: grazing (or ranch) leases. Record keeping procedures make it impossible to distinguish between new and renewed leases on a case by case basis and thus impossible to accurately report additions to the agricultural land base on a yearly basis. Some approximate figures are given in the next chapter.

In the context of public land disposition it is difficult to accurately distinguish between agricultural and non-agricultural land. In the categories listed above the permitted agricultural uses range from grazing as part of multiple use management to cultivation. Land improvements range from none to considerable. Administrative categories clearly do not correspond to agricultural productivity. This means, for example, that a change from one agricultural disposition category to another should not be counted as new agricultural land and that a short lapse between successive agricultural dispositions should not be recorded as a reduction and later an increase in the agricultural land



base. For the purposes of this study a period of 20 years was chosen as the minimum lapse after which an agricultural disposition would be counted as new agricultural land. Dispositions following a period of less than 20 years since the termination of previous agricultural use were not recorded.

As part of the management of public lands, reservations (ie. use restrictions) are placed on certain parcels by the Public Lands Division. These reservations may specify such things as no agricultural use of a portion of a quarter section prior to initial disposition, or temporary removal from grazing in order to restore native forages, or some change in multiple use management. Reservations are for varying periods of time but all are reviewed on a regular basis. Those reservations which clearly do not involve the removal of agricultural land (such as reservations prior to the initial disposition) are not reported in this study. Those which involve a break in production for some period of time are reported, though it should be kept in mind that they may not actually constitute a reduction in the agricultural land base (in line with the assumption stated above that lapses of 20 years or less between agricultural dispositions do not constitute a loss of agricultural land).

## 6. Non-Agricultural Subdivisions

There are eight regional planning commissions in Alberta, each of

which is responsible for subdivision approval in an area of the province.<sup>1</sup> These commissions are as follows: Peace River (in Grande Prairie), Edmonton, Battle River (In Wetaskiwin), Red Deer, Calgary, Oldman (in Lethbridge), Southeast Alberta (in Medicine Hat), and Palliser (in Hanna).<sup>2</sup> Subdivision approval for the remaining rural portion of the province is under the jurisdiction of the Planning Services Division of Alberta Municipal Affairs. Subdivision appeals are heard by the Alberta Planning Board. Data on approvals of both applications and appeals were collected from the regional planning commissions and the Planning Services Division, with the exception that data on subdivisions in the Edmonton, Battle River, Red Deer and Calgary areas during the period of 1977 through 1979 were obtained directly from the Environment Council of Alberta.

The subdivision procedure in Alberta involves a number of stages: application, consideration and ruling by the approving authority, appeal to Planning Board in some cases, endorsement of plans, and registration with Land Titles office where approval is given. In those cases where Commission or Planning Division records indicated approval and registration with Land Titles, data on such things as location, intended use and C.L.I. class (where available) were recorded. In these cases

---

1. See Figure 2.

2. The County of Parkland commenced subdivision approval on April 1, 1981. The Edmonton commission area was split into two commissions on January 1, 1982.

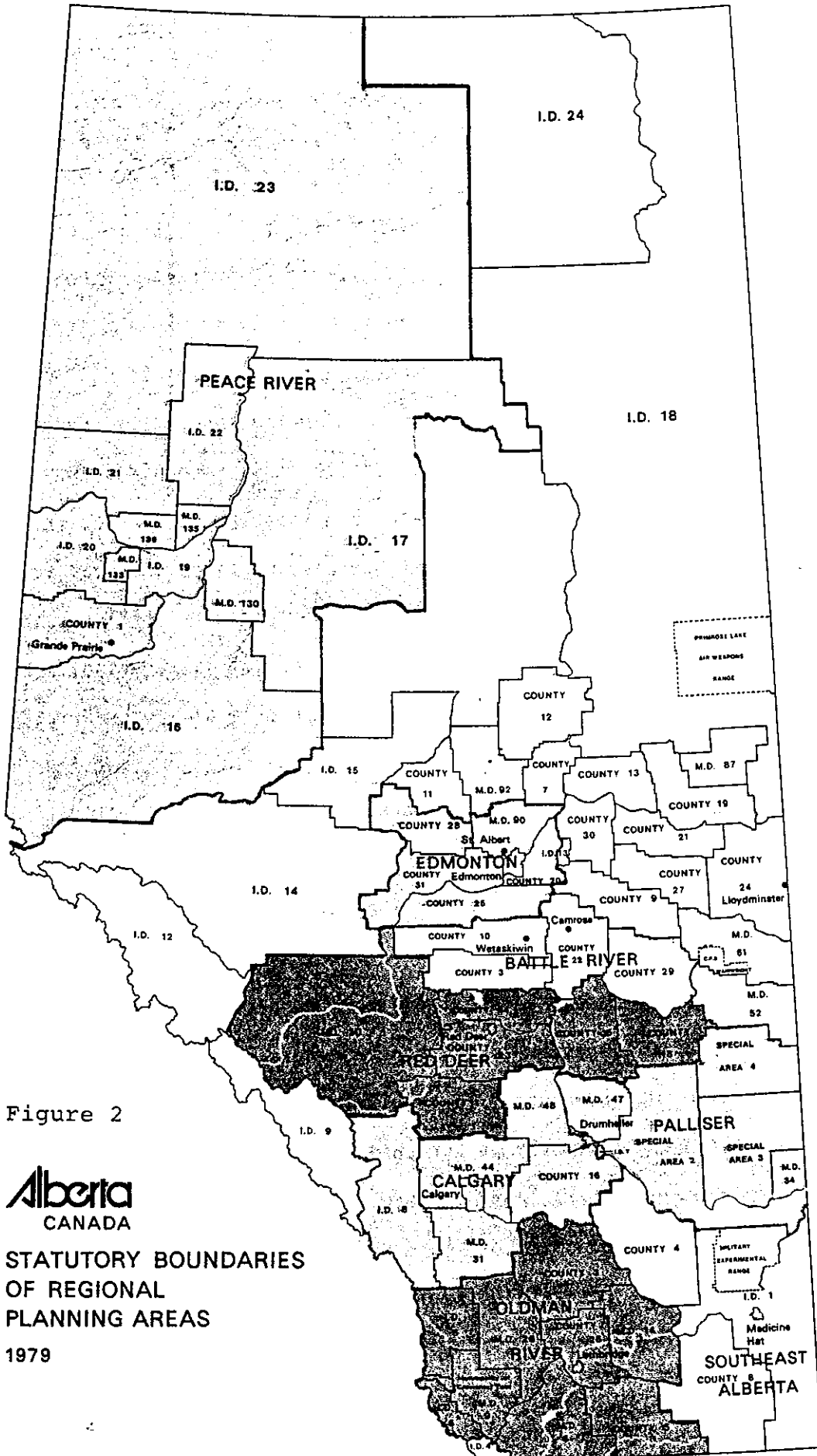


Figure 2

**Alberta**  
CANADA

STATUTORY BOUNDARIES  
OF REGIONAL  
PLANNING AREAS

1979

the data of registration was also recorded. In those cases where approval of either an original application or an appeal was shown but no record of Land Titles registration was given, the subdivision file was examined to determine if endorsement had been given. Where it had, the case was recorded on the assumption that the stated subdivision and land use change had taken place, though it is recognized that this is not always the case. Those cases where endorsement was not shown were ignored. If less than one year had elapsed since approval at either the application or appeal stage, endorsement is still possible. Such cases would be recorded in a future review of the commission and Planning Division records. In some cases the date of approval rather than the date of endorsement was recorded. The data received from the Environment Council of Alberta included only the date of application.

In all cases the prior or existing use of the parcels in question was checked. Only those parcels where prior use was agriculture (or in a small number of cases, vacant land) were recorded. It is recognized that there is some inaccuracy in this procedure, as mentioned above in the discussion of prior use. Farm building sites or wooded areas may be reported as being currently in agriculture, causing an overestimate of the loss of agricultural land. However, this study's definition of the agricultural land base includes land which, with little or no further improvement, has immediate agricultural potential even if it is not currently supporting production. Inclusion of such land therefore, is appropriate.

Some agriculture to non-agriculture conversions do not require subdivision approval and are therefore not included in this study. These include conversion of entire parcels without the creation of one or more new titles or the creation of separate titles to fragmented parcels caused by a physical barrier such as a road or railroad. Subdivisions in which the intended use remains agricultural were recorded but are not reported in this study since they do not constitute a loss of agricultural land.

Information on the intended use of subdivided land, as reported on the subdivision application form, was recorded for each case. The following categories were distinguished:

- a) Single and multi-parcel country residence. Subdivisions for residential purposes. The Subdivision Regulations under the Planning Act, 1977, place a 10 acre limit on such parcels, though the Planning Board can grant exceptions. Prior to 1978 country residence parcels were permitted up to 20 acres.
- b) Farmstead separation. Also for residential purposes, but distinguished from "country residence" category by the presence of existing farm buildings.
- c) Commercial/industrial. Subdivision for such purposes as the development of industrial plants, warehouses, highway commercial sites, private airfields, resorts, etc., in accordance with municipal zoning and regional plans.
- d) Public/institutional. Includes such uses as churches, parks, cemeteries, community centers, municipal airfields, etc.

- g) Private recreation. Subdivision for stated recreation use such as horse stables.
- h) Other. Includes such things as community well, wildlife conservation, etc.

The distinction between agricultural and non-agricultural uses of subdivided land is difficult to draw, particularly when this distinction is based on stated intentions at the time of making a subdivision application. The stated acreage taken by the country residence, farmstead separation and private recreation categories may overestimate the impact on the agricultural land base since some production may take place on these parcels, though often at a lower intensity. Acreage going to farmstead separation, on the other hand, may overestimate the impact on agriculture since much of this land was not involved in agricultural production prior to subdivision.

## 7. Urban Annexation

Annexation approval authority is held by the Local Authorities Board, subject to Cabinet approval. For this study information on Board annexation decisions was collected from the Planning Services Division of Alberta Municipal Affairs. The files which were used contained both published information and maps (1:2400 and 1:7200 scale) showing annexed areas. Information on the amount of land (acreage) annexed by urban areas was not available in published form and so had to be determined from the maps by use of a planimeter.

As mentioned earlier, information on the prior use of annexed land was also unavailable. A separate estimate of the ratio of agricultural and non-agricultural land annexed by urban centers was derived from aerial photographs and municipal tax assessment records. The results are reported in the next chapter.

Finally, the assumption was made that all land annexed by urban areas was removed from agriculture on the date of annexation. Although this is clearly not the case, the assumption was necessary within the limits of this study. In the long run such an assumption would be reasonable since land is gradually developed for non-agricultural use following annexation. In the short run there is an overestimate of the impact of annexation on agricultural production in this study.

#### 8. Roads

The Property Services Branch of Alberta Transportation provided information on land used for the construction or widening of roads and highways. Separate figures were collected on a) construction and b) widening, and on roads and highways under a) provincial and b) municipal control. Roads within improvement districts and special area are under provincial jurisdiction and land used for these was recorded under the "provincial" headings. Roads within urban areas were not recorded. Other highway uses such as rest stops, maintenance yards and gravel pits were also recorded.

The road plans from which data were taken gave a separate listing for the area of land not formerly included in a road plan or existing road allowance. Only this area was recorded. It is recognized, however, that some agricultural production (such as haying) does take place on road allowances and that the procedures used here may somewhat overestimate the impact of highway development on agricultural production. On the other hand there may be an underestimate of the impact of highways on agriculture in that the reduced production on parcels fragmented by highway construction is not taken into account.

As in the category of urban annexation the prior use of land used for highways was not known. The methodology described above with respect to prior use was employed; the results are given in the next chapter. The date recorded for conversions to highway use is the date of plan registration.

## 9. Oil and Gas Well sites and Gas Plants

### a) Well sites

The Alberta Energy Resources Conservation Board provided data on oil and gas wells for this study. This information included location, date and type of well for all wells in the agricultural ("white and yellow areas") of the province. Although a large number of well types (well status codes) are distinguished by the E.R.C.B., only two







categories were used here: new and abandoned. "New" wells include all types other than those designated by E.R.C.B. as abandoned. Abandoned wells are coded as such by the E.R.C.B. and are primarily "dry holes" - those where no oil or gas was discovered. Reclamation of these well sites usually takes place within one year. The spud date (date of drilling) was recorded for all wells in the "new" category. Date of abandonment was recorded for all abandoned wells.

The E.R.C.B. file does not include the leased area on a case by case basis. Board staff stated that a provincial average area of 4.5 acres per well site should be used for all wells, being comprised of 3 acres for the well site itself and 1.5 acres for the access road. Considerable variation exists in well site leased area. In those cases where the well is connected to a pipeline system the well site lease may be smaller than average. Where battery (storage) tanks and/or flare pits are constructed the leased area will generally be larger. The spacing pattern of the well on the quarter section will also affect the leased area. Where the site is adjacent to an existing road no access road will be required. This may be more common in southern Alberta where corner locations have been used for a longer period of time to facilitate sprinkler irrigation. Gas wells may require less area than oil wells since they are more frequently connected to a pipeline system. Despite these factors, an area of 4.5 acres per well site (both new and abandoned) has been used in this study.

With respect to well site area, it should also be noted that the leased area may be larger than the area removed from agricultural production. During the drilling stage the whole lease is likely used, but once the well is in production the farmer may be allowed to resume use of some proportion of the site if topsoil has not been stockpiled. In some cases the access road may also be farmable. Details would be subject to local agreement between farmers and leaseholders. No account of these factors has been made in this study and therefore the impact of oil and gas well development on agricultural production may be somewhat overestimated. Once again there may be offsetting negative impacts, however, through such things as disruption of farming patterns.<sup>1</sup>

The E.R.C.B. compiles information on storage batteries but this information does not include the date of construction or the amount of land used. As mentioned above, many batteries are built on well sites. It has not been possible to include those batteries not on a well site in this study.

b) Gas Plants

Companies operating natural gas plants in Alberta were identified from a list provided by the Energy Resources Conservation Board. These

---

1. See for example, Frank Hanus, "Well Site Spacing Pattern: An Agricultural Perspective", Resource Economics Branch, Alberta Agriculture, Feb. 1981.

companies were contacted and asked for information on the amount of agricultural land used by each plant. The reported areas do not include owned or leased land which is still in agricultural production nor do they include land not formerly in agriculture. Gas plants in the non-agricultural ("green area") of the province are not included.

#### 10. Coal Strip Mines

The Land Reclamation Division of Alberta provided information on coal strip mining and reclamation activity in the plains (agricultural) area of the province. Five major mines were reported.

- a) Whitewood Mine - Trans Alta Utilities Ltd.  
(north side of Lake Wabamun, Parkland County)
  
- b) Highvale Mine - Trans Alta Utilities Ltd.  
(south of Forestburg, Flagstaff County)
  
- c) Diplomat Mine - Forestburg Collieries Ltd.  
(south of Forestburg, Flagstaff County)
  
- d) Vesta Mine - Manalta Coal Ltd.  
(south of Forestburg, Paintearth County)
  
- e) Roselyn Mine - Manalta Coal Ltd.  
(near Sheerness, Special Area 2)

In addition to these mines, annual plains coal production is estimated by the Land Reclamation Division of Alberta Environment to be approximately 100,000 tons, causing only an additional 20 acres or so in annual mining land disturbance. This additional land disturbance is not taken into account in this study.

The Land Reclamation Division identified the area of annual land disturbance and general location of each of the major mines. The identification of the exact quarter sections where disturbance took place was done by examining aerial photographs. There is therefore a chance of a small amount of error in the acreage distribution across C.L.I. classes, though the total annual acreage of disturbance is correct.

No C.L.I. distribution is reported for reclaimed land since productivity may be changed from what it was prior to disturbance. Alberta's Coal Development Policy states that "The primary objective in land reclamation is to ensure that the mined or disturbed land will be returned to a state which will support plant and animal life or be otherwise productive or useful to man at least to the degree it was before it was disturbed".<sup>1</sup> The Development and Reclamation Review Committee does not, however, demand that this requirement be met within small land units. It looks, rather, at the total disturbance area in

---

1. Government of Alberta, "A Coal Development Policy for Alberta", Department of Energy and Natural Resources, June 15, 1976, page 7.

seeking to ensure that the land use capabilities present before disturbance will be returned proportionately by reclamation.

## 11. Other Non-Agricultural Uses

### a) Powerlines

The Energy Resources Conservation Board maintains records of electric power generation, distribution and consumption in Alberta. At the present time the exact legal descriptions and areas of powerline rights of way are not available, however. Also, powerlines constitute more of an inconvenience to agricultural production than a direct removal of agricultural land (aside from the relatively small amount actually removed by towers and poles).<sup>1</sup> For these reasons data on powerlines were not included in the computerized data base of this study. A brief discussion of powerline rights of way is given in the next chapter, however. Information presented there is based on published E.R.C.B. reports and personal conversations with E.R.C.B. staff.

### b) Pipelines

The treatment of pipeline information in this study is similar to

---

1. See Frank Hanus, "Assessment of the Effects of Power Lines on Farming Operations in Alberta", Resource Economics Branch, Alberta Agriculture, April, 1979.

that of powerlines. Details on area and legal description of pipelines were unavailable and, although pipelines involve a greater amount of actual land disturbance per linear mile than do powerlines, the land is usually reclaimed in a relatively short period of time. Pipeline data were excluded from the computerized data base but summary information is presented in chapter III. That information is based on correspondence with E.R.C.B. staff

c) Railroads

There has been no railroad main line construction in Alberta in the period of 1976 to 1979. Railroad abandonment totalled 247 miles during that period. Further discussion is given in the next chapter, based on Statistics Canada data. Little information was available on the possible agricultural use of this land, though it is likely that some of it will be converted to that use.

d) Airports

Detailed information on airport construction in Alberta is not readily available. Reports by Resource Economics Branch (1980) and Miller (1974) give total airport acreage figures and make possible an estimate of annual land conversion to airport use.<sup>1</sup> Some airport

---

1. Resource Economics Branch, "Estimated Alberta Surface Land Area By Various Types of Land Uses, 1979", Alberta Agriculture, March, 1980.  
R. Miller, "Recreational and Miscellaneous Land Uses", Technical Report No. 3, Alberta Land Use Forum, 1974.



acreage was included in the subdivision categories of "commercial - industrial" and "public-institutional" so it would be incorrect to add the figures derived here to the subdivision total.

It is also impossible to know what amount of agricultural land is used for airports. The Aviation Branch of Alberta Transportation states that preservation of farmland is a factor which is taken into account in airport siting. Some land within airports may be leased to farmers for certain agricultural uses, thus reducing their negative impact on agricultural production. On the other hand there may be zoning restrictions associated with airports which will affect agricultural activity outside the airport boundaries (eg. building restrictions on flight paths).

e) Gravel pits

Some gravel pits are listed in this study under the highways category of "other uses". No comprehensive information is available, however, on gravel pits in the province, though the Land Reclamation Division of Alberta Environment is currently undertaking a survey of pits. A paper by D.G. Harrington of the Land Reclamation Division presented some information on gravel pits. This is quoted in the next chapter.<sup>1</sup>

## 12. Data Analysis

Data analysis procedure in this study have been fairly simple and

---

1. D.G. Harrington, "Type of Resource Developments Affecting Agricultural Lands", Presented to the Alberta Institute of Agrolologists, February 1981.

straight forward. The Statistical Package for the Social Sciences (SPSS) was used to perform frequency distributions and cross-tabulations. The objective has been to identify land use conversion trends and geographical patterns and to correlate these with land productivity classes.

## CHAPTER III

The purpose of this chapter is to present the results of the study, emphasizing the trends, geographical patterns and land productivity implications of conversions affecting the province's agricultural land base. Information on the geographical distribution of land use changes is presented on the basis of the regions which were defined in chapter II (see Figure 1). More detailed information on the regional breakdown of land use changes is presented in the Appendix. The reader is referred to chapter II for a discussion of data collection and analysis procedures.

### 1. An Overview of Agricultural Land Base Changes

Table 1 presents a summary of agricultural land base changes in Alberta during the period of 1976 - 1980. It can be seen that on a gross basis, with no consideration of geographical location or land productivity, the total loss of agricultural land exceeds gains by 6,500 acres during the study period. The great majority of the gains in new agricultural land are through public land dispositions. Abandoned oil and gas wells generally are those which were "dry" (non-producing and soon reclaimed) and are therefore on land which has been out of the agricultural land base for only a short period of time.

TABLE 1 Summary of Agricultural Land Base Changes  
in Alberta, 1976 - 1980

	('000 Acres)	(%)
A. Additions of Agricultural Land		
1. Public land dispositions	371.2	96.0
2. Abandoned oil and gas wells	13.5	3.5
3. Reclaimed strip mines	2.0	0.5
Total additions	386.7	100.00
B. Removals of Agricultural Land		
1. Non-agricultural subdivisions	139.8	35.8
2. Urban annexations	90.9	23.3
3. Roads	25.1	6.4
4. Oil and gas wells	103.1	26.4
5. Gas plants	0.4	0.1
6. Coal strip mines	1.9	0.5
7. Public land reservation	28.9	7.4
Total removals	390.1	100.0
Additions less removals	-3.4	

Losses of agricultural land are more evenly distributed between three major categories: subdivisions, urban annexation and oil and gas wells. The other loss categories account for smaller amounts of land. The public land reservations category, as mentioned in chapter II includes those lands which are either temporarily or permanently removed from the agricultural disposition. It does not include land which has not already been under an agricultural disposition.

Table 1 includes only those land conversion categories which were included in this study's computerized data base. As mentioned in chapter II, the impact on the agricultural land base from such non-agricultural uses as pipelines and oil storage batteries may be of some significance, but lack of adequate data on these conversion categories prevented full treatment of them here.

It should also be mentioned that for four of the land removal categories (annexation, roads, wells and strip mines) the prior use of the land was not known on a case by case basis. As discussed in chapter II, the procedure used to determine prior use involved the examination of aerial photographs and municipal assessment records in order to determine a province-wide (white and yellow areas) ratio of agricultural land converted to each of these non-agricultural categories. The

results of that procedure are as follows:

	Agricultural land as % of total land converted to:
Urban annexation	89
Roads	88
Oil and gas wells	94
Coal strip mines	80*

\* Estimated from information provided by staff of the Land Reclamation Div., Alberta Environment. Considerable variation exists between the mines in terms of prior agricultural potential.

The figures in Table 1 do not take this prior use factor into consideration. Making the adjustment in the appropriate figures gives the results shown in Table 2.

Table 2 Removals of Agricultural Land, Adjusted for Prior Use

	('000 acres)	(%)
1. Non-agricultural subdivision	139.8	37.7
2. Urban annexations	80.9	21.8
3. Roads	22.1	5.9
4. Oil and gas wells	96.9	26.2
5. Gas plants	0.4	0.1
6. Coal strip mines	1.5	0.4
7. Public land reservations	28.9	7.8
Total removals	370.5	100.0

The differences between these figures and those shown in Table 1 are significant in some cases, but the result is only a 5 percent reduction in total land removals when the adjustment for prior use is

made. Since this information is not available on a case by case basis, it is not possible to determine the adjustment which would need to be made on more disaggregated conversion figures. The prior use adjustment will therefore not be mentioned in the context of the discussion of the detailed study results, though it will be taken into account in drawing conclusions.

Table 3 shows the annual changes in the major land conversion categories over the period of 1976 - 1980. Both total annual additions and total annual removals of agricultural land appeared to increase over the study period, though there were minor reversals in both trends. The balance between additions and removals alternated between net gain and net loss of agricultural land. Although conversions affecting the agricultural land base are under the jurisdiction of many different agencies and are influenced by many different factors, there appears to be increasing land conversion activity. One common factor which may explain much of this increasing land conversion activity is the growth in provincial population and economic activity which took place during the study period. It also appears that conversion has an effect on both the geographical distribution of the agricultural land base and its average productivity.

The distribution of land conversion acreage among C.L.I. classes is important since it is closely related to changes in agricultural productivity in the province. Table 4 shows this relationship between

Table 3 Annual Agricultural Land Base  
Changes in Alberta (000' acres)

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
A. Additions of Agricultural Land					
1. Public land dispositions	56.8	58.0	92.1	68.0	96.3
2. Abandoned oil and gas wells	0.4	0.2	3.3	4.5	5.1
3. Reclaimed strip mines	0.2	0.3	0.5	0.6	0.4
Total additions	57.4	58.5	95.9	73.1	101.8
B. Removals of Agricultural Land					
1. Subdivisions	16.6	36.4	37.8	29.4	19.6
2. Urban annexations	7.0	8.4	17.8	34.7	23.0
3. Roads	5.4	5.1	5.2	3.5	5.9
4. Oil and gas wells	21.3	21.1	19.4	18.4	22.9
5. Coal strip mines	0.3	0.3	0.4	0.4	0.5
6. Public land reservations	3.5	3.7	2.2	9.4	11.1
Total removals*	54.1	75.0	82.8	95.8	83.0
Additions less removals*	3.3	-16.5	13.1	-22.7	18.8

\* Not including gas plants, approximately 400 acres.



Table 4 Land Base Changes by C.L.I. Class, Alberta, 1976 - 1980

Conversion Category	C.L.I. CLASS*							Total		
	1	2	3	4	5	6	7		Organic	Undeter- mined
<b>A. Additions of Agricultural Land**</b>										
1. Public lands dispositions ('000 acres) (%)	0.0	8.9	75.6	168.9	80.3	3.4	3.6	26.0	4.5	371.2
	0.0	2.4	20.4	45.5	21.6	0.9	0.9	7.0	1.3	100.0
2. Abandoned oil and gas wells ('000 acres) (%)	0.5	2.8	3.4	3.3	2.2	0.7	0.1	0.5	0.0	13.5
	3.9	20.7	25.6	24.7	16.2	4.8	0.6	3.5	0.0	100.0
Total additions ('000 acres)	0.5	11.7	79.0	172.2	82.5	4.1	3.7	26.5	4.5	384.7
<b>B. Removals of Agricultural Land</b>										
1. Non-Agricultural Subdivisions ('000 acres) (%)	6.5	19.9	32.7	36.8	30.4	8.7	1.3	2.2	1.3	139.8
	4.6	14.2	23.4	26.3	21.7	6.2	0.9	1.6	0.9	100.0
2. Urban annexations ('000 acres) (%)	11.2	35.6	22.7	8.0	6.2	3.3	0.7	1.0	2.1	90.9
	12.4	39.2	25.0	8.8	6.8	3.7	0.7	1.1	2.3	100.0
3. Roads ('000 acres) (%)	1.2	3.6	6.3	7.0	4.4	0.9	0.3	1.0	0.4	25.1
	4.7	14.5	25.1	27.8	17.7	3.7	1.1	3.9	1.5	100.0
4. New oil and gas wells ('000 acres) (%)	3.8	12.7	19.2	27.4	19.9	7.0	0.9	12.2	0.0	103.1
	3.7	12.3	18.6	26.6	19.3	6.7	0.9	11.9	0.0	100.0
5. Gas plants ('000 acres) (%)	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.4
	2.8	17.8	11.2	29.8	19.8	1.7	0.0	0.9	16.1	100.0
6. Coal strip mines ('000 acres) (%)	0.0	0.5	0.7	0.2	0.1	0.3	0.1	0.0	0.0	1.9
	0.0	26.4	36.6	11.7	4.1	14.5	4.8	1.8	0.0	100.0
7. Public land reservations ('000 acres) (%)	0.0	0.4	5.0	4.2	2.6	1.2	10.0	5.5	0.0	28.9
	0.0	1.4	17.3	14.5	9.0	4.2	34.6	19.0	0.0	100.0
Total removals ('000 acres)	22.7	72.8	86.6	83.7	63.7	21.4	13.3	21.9		390.1
Additions less removals ('000 acres)	-22.2	-61.1	-7.6	88.5	18.8	-17.3	-9.6	4.6		

\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions and somewhat higher for new well sites. See discussion in Chapter II.

\*\* Not including reclaimed strip mines.

conversion categories and C.L.I. classes. The most important conclusion from that table is that there has been a net loss of 90.9 thousand acres of class 1 - 3 land and a net gain of 85.0 thousand acres of lower capability land in the agricultural land base. Another summary of this information is shown in Table 5.

Table 5 shows some significant differences in the C.L.I. ratings of land being added to and removed from the province's agricultural land base. Only 3.1 percent of the added land is in C.L.I. classes 1 and 2, while 24.5 percent of the losses are in these classes. For all arable land (classes 1 to 4) the proportions are quite similar, though Table 4 showed a net loss of 2.4 thousand acres.

Tables 4 and 5 show some significant differences among use categories in the C.L.I. ratings of land being added to and removed from the province's agricultural land base. Urban annexations account for the highest proportion of land removals in the arable category (C.L.I. classes 1 - 4), followed by subdivisions, highways, and strip mines. Public land reservations showed the highest proportion of land in the non-arable category, a significant difference with respect to public land dispositions. The relative amounts of land in these conversion categories must be appreciated in interpreting these results (see Table 1). The method of assigning C.L.I. values to converted parcels must also be kept in mind: the assigned value is the predominant class in the quarter section in which the conversion occurred. In the case of

Table 5 Arable Land As Proportion Of Land Conversion,

Alberta, 1976 - 1980

Conversion Category	C.L.I. CLASS*			Non-Arable & Undetermined	Total
	1-2	1-3	1-4		
-----%					
A. Additions of Agricultural Land					
1. Public land disposition	2.4	22.8	68.3	31.7	100
2. Abandoned wells	24.6	50.2	74.9	25.1	100
Total additions	3.1	23.7	68.5	31.5	100
B. Removals of Agricultural Land					
1. Non-Agricultural subdivisions	18.8	42.2	68.5	31.5	100
2. Urban annexations	51.6	76.6	85.4	14.6	100
3. Roads	19.2	44.3	72.1	27.9	100
4. New oil and gas wells	16.0	34.6	61.2	38.8	100
5. Gas plants	20.6	31.8	61.6	38.4	100
6. Coal strip mines	26.4	63.0	74.7	25.3	100
7. Public land reservations	1.4	18.7	33.2	66.8	100
Total removals	24.5	46.7	68.1	31.9	100

\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions and somewhat higher for new well sites. See discussion in Chapter II.

subdivisions and wells there may be a difference between the reported C.L.I. class and the actual productivity of the parcels in question. The geographical pattern of land conversions is presented in Tables 7 to 10. This information is summarized in Table 6:

Table 6 Percentage Distribution of Land Conversion by Region  
1976 - 1980

	<u>Southern</u>	<u>Central</u>	<u>Northern</u>	<u>Peace</u>	<u>Total</u>
Total Additions	0	6.8	18.2	75.0	100
Total Removals	5.8	30.9	47.2	16.1	100

Table 6 shows the striking regional differences between additions and removals of agricultural land. Tables 7 to 10, understate the loss of agricultural land since they do not include new or abandoned wells. A regional breakdown of these is as yet unavailable. Tables 7 to 10 show the conversion category and C.L.I. classification within each region. The figures in these tables do not include the acreage of new and abandoned wells and therefore do not give correct net agricultural land base information. The percentages in Tables 7 to 10 are column percentages, showing the proportion of the loss of land from each C.L.I. class accounted for by each type of conversion. It can be seen, for example, that in the Peace Region the public land reservations make up more than half of the loss of land in C.L.I. classes 4 to "organic". In the other regions the subdivision and annexation categories are generally the largest users of agricultural land.

Table 7 Land Base Changes in the Southern Region by C.L.I. Class, 1976 - 1980\*

Conversion Category	1	2	C.L.I. CLASS**					7	Organic	Under- mined	Total
			3	4	5	6					
Removals of Agricultural Land											
1. Non-Agricultural subdivision (acres)	360	1152	1349	1013	1278	377	62	0	18	5608	
(%)	52.5	20.0	48.0	34.5	39.1	44.5	100	0		33.6	
2. Urban annexations (acres)	50	3784	603	857	1189	266	0	0	166	6916	
(%)	7.3	65.7	21.5	29.2	36.3	31.4	0	0		41.5	
3. Roads (acres)	275	826	858	1044	770	204	0	0	121	4099	
(%)	40.2	14.3	30.5	35.6	23.5	24.1	0	0		24.6	
4. Gas plants (acres)	0	0	0	18	34	0	0	0	0	52	
(%)	0	0	0	0.7	1.0	0	0	0		0.3	
Total (acres)	685	5762	2810	2932	3271	847	62	0	305	100	
(%)	100	100	100	100	100	100	100	0		100	

\* There are no reclaimed strip mines or public land dispositions in this region. A Regional breakdown of new and abandoned oil and gas wells was not available.

\*\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter II.

Table 8 Land Base Changes in the Central Region by C.L.I. Class, 1976 - 1980\*

Conversion Category	C.L.I. CLASS**							Undeter- mined	Total	
	1	2	3	4	5	6	7			
<b>A. Additions of Agricultural Land</b>										
1. Public land dispositions (acres)	0	0	934	884	18302	1440	0	2654	0	24214
2. Reclaimed coal strip mines*** (acres)										
Total additions (acres)										1280
<b>B. Removals of Agricultural Land</b>										
1. Non-Agricultural subdivisions (acres)	1730	6847	9462	4656	11537	2823	545	300	492	38392
(%)	28.6	31.0	39.8	54.2	62.9	54.1	43.6	13.2		43.3
2. Urban annexations (acres)	3787	13738	12235	2205	3221	1842	508	850	612	39899
(%)	62.6	62.3	51.4	25.7	17.6	35.3	40.7	37.3		45.0
3. Roads (acres)	528	1104	1862	1525	1816	327	93	87	20	7362
(%)	8.7	5.0	7.8	17.7	9.9	6.3	7.4	3.8		8.3
4. Gas plants (acres)	9	60	26	80	51	7	0	0	1	234
(%)	0.1	0.3	0.1	0.9	0.3	0.1	0	0		0.3
5. Coal strip mines (acres)	0	313	199	115	92	222	103	0	0	1044
(%)	0	1.4	0.8	1.3	0.5	4.3	8.2	0		1.1
6. Public land reservations (acres)	0	0	0	0	1630	0	0	1039	0	2669
(%)	0	0	0	0	8.8	0	0	45.7		3.0
Total removals (acres)	6054	22062	23784	8585	18347	5221	1249	2276		88700
(%)	100	100	100	100	100	100	100	100		100
Additions less removals (acres)	-6054	-22062	-22850	-7701	-45	-3781	-1249	378		-63206

\* Regional breakdown of new and abandoned wells is unavailable.

\*\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter II.

\*\*\* C.L.I. breakdown unavailable.

Table 9 Land Base Changes in the Northern Region by C.L.I. Class, 1976 - 1980\*

Conversion Category	C.L.I. CLASS**						Undeter- mined	Total	
	1	2	3	4	5	6			7
<b>A. Additions of Agricultural Land</b>									
1. Public land dispositions (acres)	0	1745	5376	22162	30115	680	320	6836	67234
2. Reclaimed coal strip mines (acres)***									690.
Total additions (acres)									
<b>B. Removals of Agricultural Land</b>									
1. Non-Agricultural subdivisions (acres)	4403	8117	18278	28489	17086	5297	113	1762	651
(%)	36.1	37.1	63.5	76.8	83.7	76.4	80.1	29.9	62.2
2. Urban annexations (acres)	7408	12323	7124	4648	1751	1211	4	178	1340
(%)	60.8	56.3	24.7	12.5	8.6	17.5	2.8	3.0	35987
3. Roads (acres)	366	1246	2898	3820	1554	368	24	745	26.6
(%)	3.0	5.7	10.1	10.3	7.6	5.3	17.0	12.7	11146
4. Gas plants (acres)	3	7	17	19	0	0	0	4	0
(%)	0	0	0.1	0.1	0	0	0	0.1	51
5. Coal strip mines (acres)	0	176	473	112	0	55	0	32	0
(%)	0	0.8	1.6	0.3	0	0.8	0	0.5	849
6. Public land reservations (acres)	0	0	0	0	20	0	0	3164	0
(%)	0	0	0	0	0.1	0	0	53.8	0
Total (acres)									
	12180	21869	28790	37088	20411	6931	141	5885	135415
(%)	100	100	100	100	100	100	100	100	100
Additions less removals (acres)-12180									
	-20124	-23414	-14926	9704	-6251	179	951	-67491	

\* Regional breakdown of new and abandoned wells is unavailable.

\*\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter II.

\*\*\* C.L.I. breakdown is unavailable.

Table 10 Land Base Changes in the Peace Region by C.L.I. Class, 1976 - 1980\*

Conversion Category	1	2	3	C.L.I. CLASS**			6	7	Organic	Undeter- mined	Total
				4	5						
<b>A. Additions of Agricultural Land</b>											
1. Public land dispositions (acres)	0	7179	69293	145924	31915	1279	3272	16475	4454		279791
<b>B. Removals of Agricultural Land</b>											
1. Non-agricultural subdivisions (%)	0	3817	3623	2683	369	220	598	170	101		11582
	0	36.6	30.0	34.3	23.1	14.9	5.5	10.2			25.1
2. Urban annexations (%)	0	5789	2776	317	0	0	160	0	0		9043
	0	55.4	23.0	4.1	0	0	1.5	0	0		19.6
3. Roads (acres)	0	459	639	593	309	35	165	146	102		2449
	0	4.4	5.3	7.6	19.4	2.4	1.5	8.7			5.3
4. Gas plants (acres)	0	10	5	5	0	0	0	0	0		20
	0	0.1	0	0.1	0	0	0	0	0		0
5. Public land reservations (acres)	0	361	5039	4221	916	1223	9967	1357	0		23094
	0	3.5	41.7	54.0	57.5	82.7	91.5	81.8			50.0
Total (acres)	0	10436	12082	7819	1594	1478	10890	1673			46178
	0	100	100	100	100	100	100	100			100
Additions less removals (acres)	0	-3257	57211	138105	30321	-199	-7618	14802			233613

\* Regional breakdown of new and abandoned wells is unavailable.

\*\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter II.



Another perspective from which to view changes in the province's agricultural land base had to do with the distinction between permanent and temporary removals of agricultural land. As mentioned in chapter II, the conversion categories used in this study can be grouped under these two headings. Non-agricultural subdivisions, urban annexation, roads and gas plants can generally be considered permanent removals of agricultural land. Wells, strip mines and public land reservations, on the other hand, can generally be considered temporary removals. Table 11 shows the regional and C.L.I. breakdown of acres under the permanent and temporary removal headings. It can be seen there that about 66 percent of all removals were permanent during the 1976 to 1980 period. However, permanent removals accounted for an average of 77 percent of all removals of land in C.L.I. classes 1 to 3 during the same period. It should be noted that well site areas are included in the total figures but not in the regional breakdowns in Table 11.

## 2. Public Land Dispositions and Reservations

As mentioned in chapter II, public lands disposed to agricultural uses can be grouped under three headings: dispositions leading to title (sales), dispositions not leading to title (leases and permits), and grazing reserves. Public land reservations were also discussed there. Table 12 lists the annual breakdown of acreage by these categories. Although the figures there do not show clear trends, there appears to have been an increase in permits and leases and a decrease in sales

Table II. Permanent and Temporary Removals of Agricultural Land By Region and C.L.I. Class, 1976 - 1980\*

Region	C.L.I. CLASS**							Undeter- mined	Total	
	1	2	3	4	5	6	7			Organic
A. Permanent Removals***										
1. Southern	0.7	5.0	2.8	2.9	3.3	0.8	0.1	0	0.3	16.7
2. Central	6.1	21.7	23.6	8.5	16.6	5.0	1.1	1.2	1.1	84.9
3. Northern	12.2	21.7	28.3	37.0	20.4	6.8	0.1	2.7	2.1	131.4
4. Peace	0	10.0	7.1	3.6	0.7	0.3	0.9	0.3	0.2	23.1
Total permanent removals	18.9	59.2	61.8	51.9	41.1	13.0	2.3	4.2	3.7	256.1
Permanent as % of total removals (%)	83.3	81.3	71.4	62.0	64.5	60.7	17.3	19.2	100	65.6
B. Temporary Removals****										
1. Southern	0	0	0	0	0	0	0	0	0	0
2. Central	0	0.3	0.2	0.1	1.7	0.2	0.1	0	0	3.7
3. Northern	0	0.2	0.5	0.1	0	0.1	0	3.2	0	4.0
4. Peace	0	0.4	5.0	4.2	0.9	1.2	10.0	1.4	0	23.1
Total temporary removals*	3.8	13.7	24.9	31.8	22.6	8.5	11	17.7	P	133.9
Temporary as % of total removals (%)	16.7	18.6	28.6	38.0	35.5	39.3	82.7	80.8	0	34.4

\* Well site area included in totals but not in regional figures.

\*\* C.L.I. values are estimated in most cases. See discussion in Chapter II.

\*\*\* Includes subdivisions, annexations, roads and gas plants.

\*\*\*\* Includes strip mines and public land reservations.

Table 12 Annual Public Land Dispositions, Alberta

Disposition Category	YEAR					Total
	1976	1977	1978	1979	1980	
	-----('000 acres)-----					
1. Dispositions leading to title	17.1	37.0	26.7	24.9	17.6	123.3
2. Dispositions not leading to title	14.2	21.0	21.1	21.6	31.4	109.3
Grazing reserves	25.5	0	44.3	21.5	47.3	138.6
Total dispositions	56.8	58.0	92.1	68.0	96.3	371.2

during the study period. This has affected the pattern of agricultural land tenure.

Table 13 shows the breakdown of agricultural dispositions by type of disposition, region and C.L.I. class. Table 14 shows the same information for public land reservations. It can be seen that there were no new public land dispositions for agriculture in the southern region and only grazing reserve development in the central region. The great majority of the land disposed to agriculture was in the Peace region, and most of that was in dispositions leading to title. As expected, the land developed for grazing reserves has a generally lower productivity (higher C.L.I. number). The other disposition categories had a higher average productivity (ie. more of it was arable classes 1 - 4) since that land included both grazing and cultivation areas.

As mentioned in chapter II, public land reservations are applied by the Public Lands Division of Alberta Energy & Natural Resources for the purposes of land management. According to staff in that Division, much of the land is temporarily removed for purposes such as the regeneration of forest growth or the restoration of grazing capacity where over-grazing has taken place. The land removed through reservations has a lower average productivity than does land being added to the agricultural base through dispositions.

Table 13 Public Land Dispositions: Region, Type of Disposition and C.L.I. Class, 1976 - 1980

Conversion Category	C.L.I. CLASS*							Undeter- mined	Total	
	2	3	4	5	6	7	Organic			
<b>A. CENTRAL REGION</b>										
1. Grazing Reserve (acres)	0	934	884	18302	1440	0	0	2654	0	24214
(%)	0	3.9	3.6	75.6	5.9	0	0	11.0	0	100
<b>B. NORTHERN REGION</b>										
1. Leading to title (acres)	474	1916	7208	6837	0	0	0	2390	0	18829
(%)	2.5	10.2	38.3	36.3	0	0	0	12.7	0	100
2. Not leading to title (acres)	1266	3461	9514	4872	520	320	0	920	0	20873
(%)	6.1	16.6	45.6	23.3	2.5	1.5	0	4.4	0	100
3. Grazing Reserve (acres)	0	0	5440	18405	160	0	0	3526	0	27531
(%)	0	0	19.8	66.9	0.5	0	0	12.8	0	100
<b>C. PEACE REGION</b>										
1. Leading to title (acres)	4116	28375	56875	7551	302	79	1827	5335	1827	104459
(%)	3.9	27.2	54.4	7.2	0.3	0.1	1.7	5.1	1.7	100
2. Not leading to title (acres)	2743	33401	36821	6665	177	3034	2627	3022	2627	88489
(%)	3.1	37.7	41.6	7.5	0.2	3.4	3.0	3.4	3.0	100
3. Grazing Reserve (acres)	320	7518	52229	17699	800	160	0	8118	0	86843
(%)	0.4	8.7	60.1	20.4	0.9	0.2	0	9.3	0	100

\* C.L.I. values are estimated in most cases. See discussion in Chapter II.

Table 14 Public Land Reservations: Region and C.L.I. Class, 1976 - 1980\*

Region	C.L.I. CLASS**							Total
	2	3	4	5	6	7	Organic	
1. Central (acres)	0	0	0	1630	0	0	1039	2669
(%)	0	0	0	61.1	0	0	38.9	100
2. Northern (acres)	0	0	0	0	0	0	3164	3164
(%)	0	0	0	0	0	0	100	100
3. Peace (acres)	361	5041	4222	963	1223	9968	1357	23108
(%)	1.5	21.1	17.7	4.1	5.1	41.7	5.7	100
Total (acres)	361	5041	4222	2566	1223	9968	5560	28941
(%)	1.2	17.4	14.6	8.9	4.2	34.4	19.2	100

\* See Table A5 for further details.

\*\* C.L.I. values are estimated in most cases. See discussion in Chapter II.

### 3. Non-Agricultural Subdivision

Table 15 lists subdivided acreage, classified by intended use and date of subdivision. As discussed in chapter II, the information on intended use is taken from subdivision applications, and may, in some cases, be different from actual use after approval. Also, agricultural subdivisions (those with an intended agricultural use) are excluded from this study.

Table 15 shows a considerable amount of fluctuation from year to year in the amount of land used by the various subdivision categories and in the total amount of subdivided land. The greatest fluctuation is in the country residence categories. The commercial/industrial category, though accounting for a much smaller total acreage, followed much the same pattern. Although the country residence and farmstead separation categories are shown separately in Table 15, they all refer to parcels intended for residential purposes. Table 15 shows that these categories together account for between 80 and 90 percent of the total subdivided land in each of the years. As mentioned earlier, the total amount of subdivision activity in Alberta is likely related to the change in provincial population and the general level of economic activity. The demand for subdivided land during the 1976 to 1980 period may have been at a level which will not be sustained in the future.

Table 17 shows subdivided acreage listed by intended use and C.L.I.

Table 15 Non-Agricultural Subdivision: Intended Use and Year, Alberta

Intended Use Category	YEAR					Total
	1976	1977	1978	1979	1980	
1. Single parcel country residence (acres) (%)	2043 12.3	4690 12.9	4894 12.8	6813 23.1	3081 15.6	21520 15.3
2. Multi-parcel country residence (acres) (%)	5865 35.3	22633 62.0	24280 63.7	14947 50.7	6526 33.0	74251 52.7
2. Farmstead separation (acres) (%)	5512 33.1	3594 9.9	3522 9.3	3964 13.5	6571 33.4	23163 16.6
3. Commercial/industrial (acres) (%)	350 2.1	3314 9.1	3197 8.5	2597 8.8	2084 10.6	11543 8.2
4. Public/institutional (acres) (%)	394 2.4	830 2.3	974 2.6	396 1.3	449 2.3	3043 2.2
5. Hamlet expansion (acres) (%)	201 1.2	88 0.2	137 0.4	165 0.6	465 2.4	1056 0.8
6. Waste disposal area (acres) (%)	526 3.2	232 0.6	346 0.9	271 0.9	378 1.9	1753 1.3
7. Private recreation (acres) (%)	1738 10.4	758 2.1	209 0.6	166 0.6	201 1.0	3071 2.2
8. Other (acres) (%)	2 0	339 0.9	557 1.5	163 0.6	0 0	1061 0.8
Total (acres) (%)	16672 100	36441 100	37799 100	29393 100	19647 100	139952 100



class. The information in Table 17 is summarized in Table 16.

A considerable difference can be seen between the various subdivision categories in terms of their proportionate use of land in different C.L.I. classes. Single parcel country residence and farmstead separation subdivisions, for example, used a higher proportion of agriculturally productive land than did the multi-parcel country residence subdivisions. This is very significant in light of the Subdivision Regulations under the Planning Act, 1977, which state that:

21 (1) In a rural municipality, a subdivision approving authority shall not approve an application for subdivision approval for county residential use unless the land that is the subject of the application has, in the opinion of the subdivision approving authority, a low capability for agricultural use.

(2) Subsection (1) does not apply if the land that is the subject of the application

(a) is the site of a farmstead that is to be separated from an unsubdivided quarter section, or

(b) is the first parcel to be separated from a quarter section and the nearest boundary of the parcel is at least 1000 feet from the right of way of a highway,

and the regional plan affecting the land permits either or both of the subdivisions referred to in this subsection.

It must be remembered, as discussed in Chapter II, that the C.L.I. ratings given in Tables 16 and 17 may somewhat overestimate the agricultural productivity of the land used for subdivision purposes.

Table 16 Arable Land as Proportion of Non-Agricultural Subdivision,  
Alberta 1976 - 1980

Subdivision Category	C.L.I. Class*			Non-Arable & Undetermined	Total
	1-2	1-3	1-4		
	-----%				
1. Single parcel country residence	22.8	51.0	78.8	21.2	100
2. Multi-parcel country residence	9.2	29.1	60.5	39.5	100
3. Farmstead separation	32.5	64.9	82.1	17.9	100
4. Commercial/industrial	39.0	61.0	76.5	23.5	100
5. Public/institutional	32.7	54.3	73.3	26.7	100
6. Hamlet expansion	78.8	99.7	100	0	100
7. Waste disposal	27.8	69.3	83.6	16.4	100
8. Private recreation	0.1	11.6	45.2	54.8	100
9. Other subdivision	36.2	74.0	81.2	18.8	100
Total subdivision	18.8	42.2	68.5	31.5	100

\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for subdivisions. See discussion in Chapter II.

Table 17 Non-Agricultural Subdivision: Intended Use and C.L.I. Class, Alberta, 1976 - 1980

Intended Use Category	C.L.I. CLASS*							Undeter- mined	Total
	1	2	3	4	5	6	7		
1. Single parcel country residence (acres) (%)	1068 5.0	3784 17.8	6003 28.2	5932 27.8	2637 12.4	1408 6.6	159 0.7	309 1.5	21302 100
2. Multi-parcel country residence (acres) (%)	1301 1.8	5412 7.4	14609 19.9	23054 31.4	23137 31.6	4077 5.6	461 0.6	1270 1.7	73327 100
3. Farmstead separation (acres) (%)	1777 7.7	5751 24.8	7499 32.4	3985 17.2	2737 11.8	847 3.7	226 1.0	174 0.7	23156 100
4. Commercial/industrial (acres) (%)	1563 13.5	2938 25.5	2537 22.0	1788 15.5	1298 11.2	653 5.7	239 2.1	234 2.0	11543 100
5. Public/institutional (acres) (%)	433 14.2	563 18.5	657 21.6	578 19.0	254 8.4	298 9.8	49 1.6	166 5.4	3043 100
6. Hamlet expansion (acres) (%)	60 5.7	771 73.1	220 20.9	4 0.3	0 0	0 0	0 0	0 0	1056 100
7. Waste disposal (acres) (%)	121 6.9	366 20.9	728 41.5	251 14.3	59 3.4	204 11.6	0 0	24 1.4	1753 100
8. Private recreation (acres) (%)	0 0	4 0.1	352 11.5	1033 33.6	252 8.2	1161 37.8	220 7.2	49 1.6	3071 100
9. Other (acres) (%)	170 16.0	215 20.2	401 37.8	76 7.2	152 14.4	41 3.9	0 0	0 0	1061 100
Total (acres)	6493 4.6	19934 14.2	32713 23.4	36840 26.3	30431 21.7	8716 6.2	1318 0.9	2232 1.6	139953 100

\* C.L.I. values are estimated in most cases. True capacity may be somewhat lower for subdivisions. See discussion in Chapter II.

Private recreational development has the lowest proportionate use of arable land, likely due to the fact that rough areas with low agricultural potential are often desirable for recreational use. Although there appears to be significant variation between subdivision categories in Table 16, the impact of these uses on the province's agricultural land base should be viewed in light of the absolute amounts of land which are used. Hamlet expansion, for example, used only arable, but the total acreage of arable land used was less than any other category (except "other subdivisions").

Table 18 shows the average size of subdivided parcels. In most of the categories the average size is fairly consistent from one region to another. The average size of separated farmsteads is slightly larger than that of country residence parcels. Both of these show a larger average size than does the hamlet expansion category (though in the Peace Region the difference is small). The latter category likely includes mostly urban-type lots rather than acreages.

Much of the attention on land use in Alberta is focused on the Edmonton-Calgary corridor. This area can be defined as consisting of counties 3, 10, 14, 19, 20, 23, 25, 28 and 31 and M.D.'s 31, 44 and 90. Table 19 shows the annual breakdown of subdivision activity for this area, while Table 20 shows the proportional use for subdivision of land

Comparing Tables 19 and 15 shows that over half of the subdivision

Table 18 Average Size of Subdivided Parcels,  
by Region and Intended Use, 1976 - 1980

---

Intended Use Category	REGION				Total
	Southern	Central	Northern	Peace	
	-----Acres-----				
1. Single parcel country residence	7.8	8.0	8.3	9.3	8.3
2. Multi-parcel country residence	8.2	5.2	3.9	2.6	4.1
3. Farmstead separation	10.6	13.7	10.0	16.7	12.1
4. Commercial/industrial	8.3	4.3	5.1	7.0	5.0
5. Public/institutional	29.2	13.8	14.5	8.4	14.6
6. Hamlet expansion	3.7	4.7	0.9	3.6	1.5
7. Waste disposal area	20.%	23.6	24.2	14.5	22.0
8. Private recreation	15.5	119.9	3.3	--	6.6
9. Other subdivisions	40.5	7.9	17.1	--	17.0

Table 19 Non-Agricultural Subdivision: Intended Use and Year,  
Edmonton-Calgary Corridor.\*

Intended Use	YEAR					Total
	1976	1977	1978	1979	1980	
1. Single parcel country residence (acres) (%)	430 7.0	2679 11.2	2682 10.4	2906 17.5	516 5.7	9213 11.3
2. Multi-parcel country residence (acres) (%)	2803 45.7	17277 72.5	19497 75.5	10577 63.8	3992 44.7	54146 66.6
3. Farmstead separation (acres) (%)	2440 39.8	929 3.9	559 2.2	749 4.5	2568 28.7	7245 8.9
4. Commercial/industrial (acres) (%)	120 2.0	2218 9.3	2042 7.9	2011 12.1	1060 11.9	7452 9.2
5. Public/institutional (acres) (%)	205 3.3	378 1.6	550 2.1	242 1.5	278 3.1	1653 2.0
6. Hamlet expansion (acres) (%)	30 0.5	0 0	5 0	0 0	402 4.5	437 0.5
7. Waste disposal area (acres) (%)	108 1.8	118 0.5	13 0	0 0	27 0.3	266 0.3
8. Private recreation (acres) (%)	0 0	0 0	0 0	0 0	93 1.0	93 0.1
9. Other (acres) (%)	1 0	239 1.0	484 1.9	83 0.5	0 0	807 0.9
Total (acres) (%)	6137 100	23838 100	25832 100	16568 100	8936 100	81382 100

\* See definition of Edmonton-Calgary corridor in text above.

Table 20 Non-Agricultural Subdivisions: Intended Use and C.L.I. Class, Edmonton - Calgary Corridor, 1976 - 1980\*

Intended Use Category	C.L.I. CLASS*							Organic	Undeter- mined	Total
	1	2	3	4	5	6	7			
1. Single parcel country residence (acres) (%)	945 10.3	1876 20.4	2954 32.1	1718 18.7	1024 11.1	454 4.9	50 0.5	147 1.6	45 0.5	9213 100
2. Multi-parcel country residence (acres) (%)	1080 2.0	3473 6.4	11061 20.4	17115 29.9	17842 33.0	3352 6.2	98 0.2	777 1.4	349 0.6	54146 100
3. Farmstead separation (acres) (%)	1191 16.4	1409 19.5	1948 26.8	568 7.8	1584 21.9	457 6.3	0 0	8 0.1	80 1.1	7245 100
4. Commercial/industrial (acres) (%)	1408 18.9	1957 26.3	1604 21.5	1055 14.2	786 10.6	201 2.7	239 3.2	98 1.3	103 1.4	7452 100
5. Public/institutional (acres) (%)	379 22.9	360 21.8	480 29.0	132 8.0	48 2.9	45 2.7	0 0	166 10.0	43 2.6	1653 100
6. Hamlet expansion (acres) (%)	0 0	400 91.4	37 8.6	0 0	0 0	0 0	0 0	0 0	0 0	437 100
7. Waste disposal area (acres) (%)	0 0	18 6.9	231 86.9	17 6.2	0 0	0 0	0 0	0 0	0 0	266 100
8. Private recreation (acres) (%)	0 0	4 4.1	10 11.3	0 0	29 31.2	0 0	0 0	49 53.4	0 0	93 100
9. Other (acres) (%)	170 21.1	110 13.7	400 49.6	67 8.3	53 6.6	1 0.1	0 0	0 0	6 0.7	807 100
Total (acres) (%)	5173 6.4	9607 11.8	18725 23.0	19672 24.2	21366 26.3	4510 5.5	387 0.5	1245 1.5		81312 100

\* See definition of Calgary - Edmonton corridor in text above.  
 \*\* C.L.I. values are estimated in most cases. True capability may be somewhat lower for non-agricultural subdivisions. See discussion in Chapter III.

activity in Alberta took place in the Edmonton-Calgary corridor. Country residence development in both this area and in the full province accounted for more than half of the total subdivided acreage. Table 20 shows, as does Table 17, that multi-parcel country residence development uses somewhat less productive land than does single parcel and farmstead separation from the various C.L.I. classes.

#### 4. Urban Annexation

Table 21 gives the annual breakdown of land annexed by urban centers. It can be seen that these annexations occur at irregular intervals, though they often involve large blocks of land. Table 22 shows the breakdown of annexed areas by C.L.I. class. The information from Table 22 is summarized in Table 23.

Tables 22 and 23 show a concentration of annexed land in the higher agricultural capability C.L.I. classes. This is not unexpected since annexed lands are adjacent to urban centers and these centers are often located in agriculturally productive areas. It does indicate, however, that there has not been as much success in directing annexation on to less agriculturally productive land than there has been with rural subdivision, though this may be due in part to the relative scarcity of such land adjacent to urban centers.

Table 24 shows the regional distribution of annexed land.



Table 21 Annexation: Urban Area and Year

Urban Area	YEAR					Total
	1976	1977	1978	1979	1980	
	-----acres-----					
1. Calgary	0	0	0	17432	0	17432
2. Edmonton	0	0	0	3160	1120	4280
3. Fort Saskatchewan	320	45	4388	0	63	4816
.. Grande Prairie	4901	0	0	0	0	4901
5. Leduc	0	0	480	0	960	1440
6. Lethbridge	0	0	1800	0	0	1800
7. Medicine Hat	435	0	320	285	209	1249
8. Red Deer	0	2080	0	0	1600	3680
9. St. Albert	0	0	0	0	3615	3615
10. All other annexation	1325	6243	10851	13865	15448	47733
Total	6982	8368	17840	34742	23014	90945

Table 22 Annexation: Urban Area and C.L.I. Class, 1976 - 1980

Urban Area	C.L.I. CLASS*										Undeter- mined	Total
	1	2	3	4	5	6	7	Organic				
1. Calgary (acres) (%)	640 3.7	4667 26.8	7805 44.8	945 5.4	2235 12.8	808 4.6	0 0	0 0	0 0	332 1.9	17432 100	
2. Edmonton (acres) (%)	1280 29.9	1880 43.9	320 7.5	0 0	0 0	320 7.5	0 0	0 0	0 0	480 11.2	4280 100	
3. Fort Saskatchewan (acres) (%)	325 6.8	4095 85.0	0 0	0 0	54 1.1	342 7.1	0 0	0 0	0 0	0 0	4816 100	
4. Grande Prairie (acres) (%)	0 0	2626 53.6	2276 46.4	0 0	0 0	0 0	0 0	0 0	0 0	0 0	4901 100	
5. Leduc (acres) (%)	160 11.1	0 0	0 0	1280 88.9	0 0	0 0	0 0	0 0	0 0	0 0	1440 100	
6. Lethbridge (acres) (%)	0 0	1800 100	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	1800 100	
7. Medicine Hat (acres) (%)	0 0	165 13.2	0 0	364 29.1	560 44.8	0 0	0 0	0 0	0 0	160 12.8	1249 100	
8. Red Deer (acres)	0 0	3360 91.3	320 8.7	0 0	0 0	0 0	0 0	0 0	0 0	0 0	3680 100	
9. St. Albert (acres) (%)	2033 56.3	16 0.4	1310 36.2	40 1.1	216 6.0	0 0	0 0	0 0	0 0	0 0	3615 100	
10. All other annexations (acres) (%)	6808 14.3	17026 35.7	10709 22.4	5298 11.3	3097 6.5	1850 3.9	672 1.4	1028 2.2	1146 2.4	47733 100		
Total (acres) (%)	11246 12.4	35634 39.2	22739 25.0	8027 8.8	6162 6.8	3320 3.7	672 0.7	1028 1.1	2118 2.3	90945 100		

\* C.L.I. values are estimated in most cases. See discussion in Chapter II.

Table 23 Arable Land as a Proportion of Urban Annexed Land,  
1976 - 1980

Urban Area	C.L.I. Class*			Non-Arable & Undetermined	Total
	1-2	1-3	1-4		
	-----%				
1. Calgary	30.5	75.3	80.7	19.3	100
2. Edmonton	73.8	81.3	81.3	18.7	100
3. Fort Saskatchewan	91.8	91.8	91.8	8.2	100
4. Grande Prairie	53.6	100	100	0	100
5. Leduc	11.1	11.1	100	0	100
6. Lethbridge	100	100	100	0	100
7. Medicine Hat	13.2	13.2	42.3	57.7	100
8. Red Deer	91.3	100	100	0	100
9. St. Albert	56.7	92.9	94.0	6.0	100
10. Other annexations	50.0	72.4	83.7	16.3	100
Total annexations	51.6	76.6	85.4	14.6	100

\* C.L.I. values are estimated in most cases. See discussion in Chapter II.

Table 24 Regional Distribution of Annexed Land, 1976 - 1980

<u>Region</u>	<u>(000' acres)</u>	<u>(%)</u>
Southern	6.9	7.6
Central	38.9	42.8
Northern	36.1	39.7
Peace	9.0	9.9
Total	90.9	100

The majority of annexation occurred in the central and northern regions during the study period, with Calgary accounting for 19.2 percent of the total provincial annexation, and Edmonton for 4.6 percent.<sup>1</sup>

---

<sup>1</sup> On January 1, 1982, Edmonton annexed 86,000 acres, an amount approximately equal to total annexations in Alberta during the 1976 - 1980 period. This amount is not included in the total annexed area reported in this study.

## 5. Roads

As discussed in chapter II, the information on highway use of land was collected under the following headings: roads under municipal jurisdiction a) new roads, b) widenings; roads under provincial jurisdiction c) new roads, d) widening; and e) related areas (maintenance yards, gravel pits, rest stops, etc.). Table 25 lists the annual breakdown of land converted to roads under these headings. It can be seen there that municipal roads, particularly through widening, account for most of the land conversion in this category. The noticeable trend in Table 25 is the reduction in new provincial road construction during the study period.

Table 26 shows the regional shares of land being converted to highways and roads. In all the categories except related area the northern region has the highest proportion of land conversion to roads and highways. The regional shares are fairly consistent across the use categories, except for related areas.

Table 27 gives the breakdown of highway land use by C.L.I. class. Once again, it must be kept in mind that the C.L.I. designation refers to the predominant class in the entire quarter section and may differ from the C.L.I. class of the strip of land used for a highway or road. There is no apparent reason for a systematic bias however. The proportionate use of land from the various C.L.I. classes is fairly consistent between the various highway and road land use categories,

Table 25 Highways: Type of Use and Year, Alberta

Intended Use Category	YEAR					Total
	1976	1977	1978	1979	1980	
1. New municipal roads (acres)	1512	1796	1378	1146	1231	7063
(%)	28.1	35.5	26.5	32.5	20.8	28.2
2. Municipal road widening (acres)	2600	2036	2880	1885	3756	13161
(%)	48.4	40.3	55.3	53.5	63.6	52.5
3. New provincial roads (acres)	1006	791	726	57	25	2606
(%)	18.7	15.7	13.9	1.6	0.4	10.4
4. Provincial road widening (acres)	193	149	143	288	36	808
(%)	3.6	2.9	2.7	8.2	0.6	3.2
5. Related sites (acres)	66	284	81	151	858	1438
(%)	1.2	5.6	1.5	4.3	14.5	5.7
Total (acres)	5378	5057	5208	3530	5905	25077
(%)	100	100	100	100	100	100

Table 26 Highways: Type of Use and Region, 1976 - 1980

Intended Use Category	REGION				Total
	Southern	Central	Northern	Peace	
1. New municipal roads (acres)	852	1722	3492	997	7063
(%)	12.1	24.4	49.4	14.1	100
2. Municipal road widening (acres)	2070	4498	5731	860	13158
(%)	15.7	34.2	43.6	6.5	100
3. New provincial roads (acres)	539	541	1102	423	2606
(%)	20.7	20.8	42.3	16.2	100
4. Provincial road widening (acres)	158	172	436	42	808
(%)	19.6	21.3	53.9	5.7	100
5. Related sites (acres)	479	429	404	126	1438
(%)	33.3	29.8	28.1	8.8	100
Total (acres)	4098	7362	11165	2449	25074

Table 27 Highways: Type of Use and C.L.I. Class, Alberta, 1976 - 1980

Intended Use Category	C.L.I. CLASS*							Undeter- mined Total		
	1	2	3	4	5	6	7			
1. Municipal road construction (acres)	303	520	1523	2176	1435	374	239	367	126	7063
(%)	4.3	7.4	21.6	30.8	20.3	5.3	3.4	5.2	1.8	100
2. Municipal road widening (acres)	619	2203	3671	3629	2032	405	39	330	232	13161
(%)	4.7	16.7	27.9	27.6	15.4	3.1	0.3	2.5	1.7	100
3. Provincial highway construction (acres)	215	345	490	681	520	94	6	252	3	2606
(%)	8.2	13.2	18.8	26.1	19.9	3.6	0.2	9.7	0.1	100
4. Provincial highway widening (acres)	14	64	202	343	163	4	0	9	10	808
(%)	1.7	7.9	25.0	42.4	20.2	0.5	0	1.1	1.2	100
5. Public works (acres)	21	506	374	155	301	59	0	22	0	1438
(%)	1.5	35.2	26.0	10.8	20.9	4.1	0	1.5	0	100

\* C.L.I. values are estimated in most cases. See discussion in Chapter II.



apart from the use of slightly more productive land in the related areas category. Of total road land use, 72 percent was arable land (C.L.I. classes 1-4), 21.4 percent was grazing land (classes 5-6), 5 percent was non-agricultural, and 1.5 percent had undetermined C.L.I. class.

## 6. Oil and Gas Well Sites and Gas Plants

### a. Well Sites

Table 3 showed the annual acreage of land used for oil and gas wells and the annual acreage of land in abandoned well sites. These acreage figures are derived by assuming an average well site size of 4.5 acres, as discussed in chapter II. The annual amount of land used by new well sites appears to have been fairly constant during the study period, but the total annual acreage of abandoned well sites increased sharply from 1.7 percent of the new well site acreage in 1976 to 22.3 percent in 1980.

Table 5 showed the distribution of new and abandoned wells among C.L.I. classes. This table must be interpreted with care. As mentioned in Chapter II, the estimated C.L.I. class for well sites may somewhat underestimate the agricultural productivity of the land which is involved. Also, with respect to abandoned wells, the productivity of the abandoned (and reclaimed) well site may not be equal to what it was before disturbance and the figures in Table 5 may therefore overestimate the productivity of reclaimed well sites. This would not explain the

apparently higher productivity of abandoned than new well sites in Table 5 (61 percent of new wells and 75 percent of abandoned wells are on class 1-4 land), but it would suggest that the productivity of the reclaimed wells is somewhat overestimated. The regional distribution of new and reclaimed well sites was not available as of the date of this report.

b. Gas Plants

Table 28 shows the regional and C.L.I. class distribution of land used for gas plants in Alberta. It can be seen that the total amount of land removed from agriculture by gas plants is very small. Information provided by companies operating gas plants showed that larger amounts of land were often purchased but much of it was leased back to local farmers. The average areas used by gas plants was 6.5 acres.

Table 28 Gas Plants: Region and C.L.I. Class, 1976-1980

Region	C.L.I. CLASS*								Undeter- mined	Total
	1	2	3	4	5	6	7	Organic		
-----acres-----										
1. Southern	0	0	0	18	34	0	0	0	0	52
2. Central	9	60	26	80	51	7	0	0	1	234
3. Northern	3	7	17	19	0	0	0	4	0	51
4. Peace	0	10	5	5	0	0	0	0	0	20
Total	12	77	48	122	85	7	0	4	1	357

\* C.L.I. values are estimated in most cases. See discussion in Chapter II.

## 7. Coal Strip Mines

Table 3 showed the annual distribution of land disturbance and reclamation by coal strip mines. Table 4 indicated the distribution of disturbed land among C.L.I. classes. The C.L.I. class for reclaimed land is not known, though reclamation policy states the objective of returning land to a productivity at least equal to what it was before disturbance.

Table 29 shows the amount of land disturbed prior to 1976 and the total approved mine area (i.e., subject to eventual disturbance). Total disturbed land during the study period was 2,215 acres (1,895 acres mined plus 320 for plant site) and total reclaimed land was 1,970 acres. The reclaimed land is still all under the ownership of the mining companies but much of it is farmed under some type of agreement with local farmers.

Table 29 Coal Strip Mines: Disturbance Prior to 1976 and Total Approved Mine Area.

	Disturbed Prior to 1976 (mined, plants and cooling ponds)	Total Approved Mine Area
A. Northern Region	-----(acres)-----	
1. Whitewood	2160	2500
2. Highvale	3740	11,250
B. Central Region		
1. Diplomat	1730	2600
2. Vesta	1480	3500
3. Roselyn	650	900

8. Other Non-Agricultural Uses

a. Powerlines

The E.R.C.B. reports the following electric transmission and distribution lines in Alberta:

Table 30 Miles of Powerlines in Alberta: Year & Type

Year	Transmission (over 60 kv)	Sub-Transmission and Distribution (60 kv and below)	Rural Electrification Area Lines	Utility Owned Farm Lines
1975	8134	26777	44578	2940
1976	8296	28431	44287	3750
1977	8556	25616*	44777	4448
1978	8727	31696	44774	4768
1979	8986	32588	44693	5023
1980	9262	35958	42415	6239

\* Apparent reduction due to reporting of some farm lines in this category in previous years. Source: Adapted from E.R.C.B., "Alberta Electric Industry, Annual Statistics, 1980". E.R.C.B. 81-28, p. 32.

E.R.C.B. staff estimate that there are 1,200 to 1,500 miles of 240 kv lines in 1980, having a 90 foot right-of-way. The remaining lines over 60 kv have an estimated average right-of-way of 40 feet, most of

this on road allowance. The 60 kv and below line has an estimated average right-of-way of 25 feet and almost all is on existing road allowance. The rural electrification lines and utility owned farm lines are built under agreements which do not specify right-of-way widths.

Assuming the ratio of 240 kv line to other line over 60 kv remained constant during the 1975 to 1980 period, the following amounts of land were added to electric powerline right-of-ways during that period (excluding rural electrification and utility owned farm lines).

Additions to Powerlines Rights-of-Way, 1976-1980

240 kv	-	1793 acres
Other lines over 60 kv	-	4671 acres
60 kv and below	-	<u>27821 acres</u>
Total		34285 acres

It must be emphasized that a large though unspecified proportion of this additional powerline right-of-way area may coincide with existing road allowance and therefore may not constitute a loss of agricultural land. Also, the proportion of this new powerline right-of-way occurring in the non-agricultural (green) area of the province may be significant. Finally, for those lines which do cross agricultural land the amount of land lost around towers or poles is very small compared to the right of way area. The inconvenience of farming around these obstructions is likely more important than the actual loss of land.

b. Pipelines

It has not been possible within this study to determine the annual additions to pipeline rights-of-way in Alberta or the impact which such additions have on the province's agricultural land base. The E.R.C.B. reports the following total miles of pipeline as of May 31, 1981:

Table 31 Miles of Pipelines in Alberta

Oil Lines	7580
Secondary oil lines	5231
Gas lines	13229
Secondary gas line	22861
Secondary water & other substance lines	6932
Distribution line	42999
Flow lines	<u>9845</u>
Total	108,678

Source: Personal correspondence

The width of rights-of-way vary, depending mostly upon the size of pipeline and whether or not the right-of-way has more than one pipeline within its boundaries. The average width is between 50 and 65 feet, though in exceptional cases they may be as narrow as 7 feet, or as wide

as 130 feet. Assuming an average width of 50 feet, total right-of-way area in 1981 is 658,650 acres.

It must be emphasized that this is an approximate total pipeline right-of-way acreage, not an annual increment. A large amount of this right-of-way area is likely to be on non-agricultural land and, for the remainder, the proportion which has been reclaimed or is reclaimable is likely very high. The impact of pipelines on the province's agricultural land base is therefore considerably less than the large large right of way acreage quoted above.

#### c. Railroads

Railroad abandonments in Alberta during the period of 1976 - 1979 are shown in Table 32. Assuming a main line right-of-way of 115 feet, this abandonment is equal to 3725 acres (13.94 acres per mile).

At present the Alberta Government has obtained some of the abandoned lines and is negotiating with the railway companies for the remainder. The designated primary use for this land is transportation and utility corridors. However, interim uses will be allowed provided they are compatible with adjacent land use. In other words, if abandoned lines run through farm land, they could be leased to adjoining land owners for agricultural use. It is also projected that 5 to 10 percent of the land will be reserved for recreation and an additional amount of up to 10

Table 32 Railway Abandonments in Alberta: Year, Length & Location

<u>Year</u>	<u>Miles</u>	<u>Municipality</u>
1976	13.0	Beaver (County 9)
	10.3	Camrose (County 22)
	17.4	Special Area 2
	35.6	Rocky View (M.D. 44)
1977	34.9	I.D. 1
	23.4	Newell (County 4)
1978	13.0	Beaver (County 9)
	40.6	Stettler (County 6)
	6.9	Special Area 2
	27.8	Rocky View (M.D. 44)
	9.2	Minburn (County 27)
1979	15.4	Two Hills (County 21)
Total	247.5	

Source: Statistics Canada, "Railway Transport, Part III" Catalogue No. 52-209, 1976-1979.

percent will be set aside for wildlife. The eventual impact of the abandonments listed in Table 32 on the agricultural land base could be an addition of up to 2980 acres (3725 X 0.8), depending on adjacent land use and administrative decisions.

d. Airports

In a report on land use in Alberta in 1973, Miller stated that



there were 19,000 acres in airports.<sup>1</sup> Through personal contact with the author it was determined that this acreage figure referred to federally operated airports. The Resource Economics Branch indicated that there were 20,840 acres in federal airports in 1979, along with 8120 acres in provincial, forestry (mostly in the green zone) and community airports (excluding private airstrips).<sup>2</sup> It appears, therefore, that the land in federal airports increased by less than 2000 acres during the period of 1973 to 1979. Most of this was, in fact, in the Villeneuve Airport (M.D. of Sturgeon) where land was purchased in 1974.

The Aviation Branch of Alberta Transportation reported that in the past few years there have been approximately four new provincially licensed airports built each year and that the average size of these is 90 acres. If these estimates are accurate there has been 360 acres per year or 1800 during the period of 1976 to 1980 which has been taken by provincial airports. As mentioned in chapter II, it is very difficult to determine the impact of this airport expansion on the province's agricultural land base, though the actual loss of farm land is likely considerably less than the acreage figures given here.

---

1. R. J. Miller, "Recreational and Miscellaneous Land Uses," Alberta Land Use Forum Technical Report No. 3, 1974, p. 5.

2. Resource Economics Branch, "Estimated Alberta Surface Land Area By Various Types Of Land Uses, 1979," Economic Services Division, Alberta Agricultural, March, 1980.

e. Gravel Pits

In a paper presented to the Alberta Institute of Agrologists, D. Harrington of the Land Reclamation Division, Alberta Environment stated that:

There are 13,880 acres of known sand and gravel pits in existence on agricultural lands. The mean size of gravel pits in Counties and M.D.'s is between 5 to 10 acres. In addition there are probably another 10,000 acres of pits on Crown Lands and Special Areas which brings the total to around 25,000 acres. This does not include the pits in the major river valleys or in the Green Zone.<sup>1</sup>

---

1. D. G. Harrington, "Type of Resource Developments Affecting Agricultural Lands". Paper presented to the Alberta Institute of Agrologists, February, 1981.

CHAPTER IV  
CONCLUSIONS AND IMPLICATIONS

The results of this study were presented and briefly discussed in the previous chapter. This chapter will draw some of these findings together and describe their implications.

Table 1 showed that the total net reduction in Alberta's agricultural land base during the period of 1976 to 1980 was 3400 acres, or an average of 680 acres or slightly more than 1 section per year.<sup>1</sup> This is an insignificant reduction in comparison with the total agricultural land base of 51.7 million acres.<sup>2</sup> The major source of new agricultural land was the disposition of public lands by Alberta Energy and Natural Resources; the major losses of agricultural land were to subdivisions, oil and gas well sites and to urban annexations. A distinction can be drawn between permanent and temporary losses of agricultural land. Table 11 showed the relative impact of these; permanent losses (including subdivisions, annexations, roads and gas

- 
1. Taking the estimated prior use of converted land into account (Table 2), this net loss becomes a net gain of approximately 13,000 acres.
  2. Resource Economics Branch, "Estimated Alberta Surface Land Area By Various Types Of Land Uses, 1979" Economic Services Division, Alberta Agriculture, 1980, p. 14. The area of 51.7 million acres is the sum of 49.9 million acres in agricultural holdings reported in the 1976 Census of Agriculture and 1.8 million acres in grazing association leases and grazing reserves in 1979 (not included in census). This definition of the land base does not correspond exactly to the definition used in this study.

plants) accounted for approximately 256 thousand acres or 66 percent of total removals of agricultural land. The remaining 34 percent of agricultural land removals (for wells, strip mines and public land reservations) can be considered temporary, though productivity may be affected.

Both annual additions and removals of agricultural land showed a generally increasing trend over the study period (Table 3). Average annual additions to the agricultural land base during the study period were 77.3 thousand acres (approximately 121 sections of land), while average annual losses were 78.1 thousand acres (approximately 123 sections). If this approximate balance between gains and losses is to continue there must be either increasing amounts of public land made available or significant reductions in the rate of conversion of agricultural land to non-agricultural uses. Furthermore, if this increase in land conversion activity continues as it has done during the 1976 to 1980 period, it will cause continuing shifts in the geographical location of the province's agricultural land base.

One of the significant conclusions from this study has to do with the losses and gains of agricultural land in different capability classes (Tables 4 and 11). For the province as a whole there was a net loss of 90.9 thousand acres of C.L.I. class 1 to 3 land. This constituted about 0.3 percent of the province's 26.5 million acres of C.L.I. class 1 to 3 land; for C.L.I. classes 4 and below there was a net gain of 85.0 thousand acres of agricultural land during the study

period, or about 0.1 percent of the province's 85.3 million acres of this type of land.<sup>1</sup> Although the amount of land being added to or removed from agriculture is relatively small in relation to the total actual or potential agricultural land base, the shift toward less productive land will cause significant changes for the agricultural industry. While much of the land in C.L.I. class 4 and below is important for forage as well as some cereal and oilseed production, the increasing proportion of this land in the agricultural base will lead to such things as increased production risk due to climate, lower crop yields and crop quality and fewer crop choices for the producer. Some of these tendencies can be partially offset by increasing the level of inputs, but this will lead to smaller net revenue and greater financial risk. The loss of more productive and gain of less productive land also means, in general, a loss of improved and a gain of unimproved land. Thus, this trend in land conversion will necessitate investments in such things as land clearing, seeding, drainage, etc., which will add to the increase in production costs.

Another perspective on the loss of agricultural land is provided by distinguishing between permanent and temporary removals of

---

1 Lands Directorate, 1977, Canada Land Inventory: Agricultural Land and Urban Centres, Fisheries and Environment Canada, Report No. 11, July. Note that the total areas quoted in the text (26.5 million acres of class 1-3 land and 85.3 million acres of class 4 and below) include only land classified for C.L.I. The Lands Directorate lists 6.6 million acres of unclassified land in the C.L.I. area. There may be an additional 40 million acres not covered by C.L.I.

agricultural land (Table 11). Permanent removals (subdivisions, annexations, roads and gas plants) accounted for 139.9 thousand acres of C.L.I. class 1 to 3 land in Alberta during the 1976 - 1980 period, or about 77 percent of the total agricultural land removals. This compares with 91.2 thousand acres of C.L.I. class 1 to 3 land added to the agricultural land base in the same period.

Permanent losses can also be related to the total provincial supply of land within each C.L.I. class, as follows:

C.L.I. Class	Permanent Removals as	
	Percent of Total Provincial Acres <sup>1</sup>	
1		0.97%
2		0.62
3		0.41
4		0.23
5		0.15
6		0.13
7		0.02

Although these figures show that permanent losses of agricultural land in the 1976 - 1980 period constituted less than one percent of the provincial supply of land in each class, the relationship between the

---

<sup>1</sup> Total provincial acreage within each C.L.I. class taken from: Lands Directorate, 1977, Canada Land Inventory: Agricultural Land and Urban Centres, Fisheries and Environment Canada, Report No. 11, July. Includes only land classified for C.L.I.

rates of removal is significant. The higher class land is consistently removed at a faster rate than is land of lower agricultural capacity. Class 1 land is removed more than four times as fast, in relation to it's total supply, as is Class 4 land.

In conjunction with the productivity shift due to land conversions, this study found considerable differences in the productivity of land used by the various types of conversions (Table 5). A high proportion of the land annexed to urban areas was from the most productive land classes, for example. The distinction between annexation and other types of conversions is particularly noticeable with respect to the proportionate use of classes 1 and 2. The results shown in Table 5 must be viewed along with those in Table 1 in order to appreciate the relative impact of the different types of conversions on the productivity of the entire agricultural land base. This information is of importance in any attempts to preserve the province's agricultural production potential.

This study also produced significant results with respect to rural subdivisions for residential and non-residential use. Single parcel subdivisions ("first parcel out") and farmstead separation removed a total of 25.9 thousand acres of C.L.I. class 1 to 3 land between 1976 and 1980. This was approximately 58 percent of the total land used by these two subdivisions categories. As mentioned in Chapter III, multi-parcel country residential development is subject to more restriction with respect to the use of agriculturally productive land.

Multi-parcel developments used 21.3 thousand acres of C.L.I. class 1 to 3 land during the 1976 to 1980 period, or 29 percent of the total land used by such development. Once again, the method of estimation of C.L.I. values may have somewhat overestimated the agricultural capability of the subdivided land, as discussed in Chapter II. It would seem safe to conclude, however, that the subdivision approving authorities are having some success in directing multi-parcel development onto land of lower agricultural capability, though there is still room for improvement.

This study also identified a strong locational shift in the agricultural land base (Table 6). Aside from new and abandoned well sites, for which regional identification was unavailable, there was a net loss of 147.4 thousand acres of agricultural land in the Southern, Central, and Northern Regions (White Zone) during the 1976 to 1980 period, and a net gain of 233.6 thousand acres in the Peace Region (Yellow Zone). If regional information were available on well sites it would likely moderate this regional imbalance only slightly.

Although the Southern Region shows no additions of agricultural land, its net loss during the study period was less than the loss in the Central and Northern Regions because of the much higher subdivision and annexation activity in those areas. It is noteworthy that the 86,000 acre annexation by the City of Edmonton (January 1, 1982) approximately equaled total annexations in the Southern, Central and Northern Regions



during the entire 1976 to 1980 period.

One of the consequences of this geographic shift in the agricultural land base is the increase in transportation requirements and cost for the province's agricultural industry. The production base has shifted way from the province's major population centers and has also increased the transportation distance for provincial agricultural exports. Furthermore, there are increased investment requirements in facilities for agricultural product processing, storage and transportation. The magnitude of these effects will depend on the resulting shift in regional agricultural output and product mix.

In addition to these broad trends in conversions affecting the agricultural land base in Alberta, this study has documented a number of specific and local effects on the quantity of agricultural land. Further information is presented in the Appendix on regional land use conversion activity.

References

1. Alberta Energy and Natural Resources. 1979. The Administration and Management of Alberta Public Land. Public Lands Division. E.N.R. Report No. 85.
2. Energy Resources Conservation Board. 1980. Alberta Electric Industry, Annual Statistics. E.R.C.B. 81-28.
3. Government of Alberta. 1976. "A Coal Development Policy for Alberta" Department of Energy and Natural Resources. June 15.
4. Hanus, Frank. 1979. "Assessment of Effects of Power Lines on Farming Operations in Alberta". Resource Economics Branch, Alberta Agriculture.
5. \_\_\_\_\_. 1981. "Well Site Spacing Pattern: An Agricultural Perspective". Resource Economics Branch, Alberta Agriculture. Information Bulletin RE-02-20-81.
6. Harrington, D.G. 1981. "Type of Resource Developments Affecting Agricultural Lands". Paper presented to the Alberta Institute of Agrologists, Calgary chapter, February.
7. Lands Directorate. 1977. Canada Land Inventory: Agricultural Land and Urban Centres. Fisheries and Environment Canada. Report No. 11, July.
8. Miller, R.J. 1974. "Recreational and Miscellaneous Land Uses". Alberta Land Use Forum, Technical Report No. 3.
9. Resource Economics Branch. 1980. "Estimated Alberta Surface Land Area By Various Types of Land Uses, 1979". Alberta Agriculture, Information Bulletin 80-3-2.
10. Statistics Canada. Various years. "Railway Transport, Part III, Annual". No. 52-209.
11. Thompson, P. S. 1981. "Non-Agricultural Land Use". Paper presented to the Alberta Soil Science Workshop, Edmonton. February.

APPENDIXES

Table A1 Land Conversions in the Southern Region: Type of Conversion by C.L.I. Class, 1976 - 1980

Removals of Agricultural Land	C.L.I. CLASS*							Undeter- mined Total	
	1	2	3	4	5	6	7		
1. Single parcel country residence	78	97	255	146	81	105	0	0	763
2. Multi-parcel country residence	30	166	289	293	526	104	62	0	1468
3. Farmstead separation	139	692	513	209	168	160	0	18	1899
4. Commercial/industrial	70	88	105	127	308	8	0	0	705
5. Public/institutional	5	2	2	196	190	0	0	0	395
6. Hamlet expansion	39	0	105	0	0	0	0	0	144
7. Waste disposal area	0	27	80	11	5	0	0	0	123
8. Private recreation	0	0	0	31	0	0	0	0	31
9. Other subdivision	0	80	1	0	0	0	0	0	81
10. Lethbridge annex.	0	1800	0	0	0	0	0	0	1800
11. Medicine Hat annex.	0	165	0	364	560	0	0	160	1249
12. Other annex.	50	1819	603	493	629	266	0	6	3867
13. New municipal road	56	119	199	145	241	66	0	0	852
14. Municipal road widening	78	338	496	695	305	70	0	88	2070
15. New provincial road	140	64	150	85	33	64	0	3	539
16. Provincial road widening	0	34	7	86	21	4	0	6	158
17. Related area	0	271	5	34	169	0	0	0	479
18. Gas plants	0	0	0	18	34	0	0	0	52

\* C.L.I. values are estimated in most cases. True capability may be somewhat higher for new well sites. See discussion in Chapter II.

Table A2 Land Conversions in the Central Region: Type of Conversion by C.L.I. Class, 1976 - 1980 (acres)

Conversion Category	C.L.I. CLASS*							Undeter- mined Total		
	1	2	3	4	5	6	7			
<b>A. Additions of Agricultural Land</b>										
1. Grazing reserve	2654	0	934	884	18302	1440	0	0	24214	
2. Reclaimed strip mines	0	0	0	0	0	0	0	0	1280	
<b>B. Removals of Agricultural Land</b>										
1. Single parcel country residence	164	2071	1487	998	1097	242	78	69	44	6250
2. Multi-parcel country residence	449	2271	4498	1900	8033	649	0	31	56	17887
3. Farmstead separation	667	1701	1972	434	1668	343	8	0	80	6872
4. Commercial/industrial	221	490	1015	974	618	419	239	81	166	4223
5. Public/institutional	184	204	291	38	27	0	0	70	43	856
6. Hamlet expansion	0	33	0	0	0	0	0	0	0	33
7. Waste disposal area	45	42	174	116	24	8	0	0	0	409
8. Private recreation	0	4	10	62	51	1161	220	49	0	1559
9. Other subdivision	0	3	0	9	35	1	1	0	0	48
10. Calgary annex.	640	5080	8360	960	1520	360	0	0	3600	20520
11. Red Deer annex.	0	3360	320	0	0	0	0	0	0	3680
12. Other annex.	3147	5711	4110	1260	932	981	508	850	280	17780
13. New municipal road	212	132	331	381	484	72	84	26	0	1722
14. Municipal road widening	236	854	1134	984	1034	180	9	51	15	4498
15. New provincial road	66	74	211	48	126	16	0	0	0	541
16. Provincial road widening	0	19	19	90	40	0	0	0	4	172
17. Related areas	14	25	168	22	132	59	0	9	0	429
18. Coal strip mines	0	295	181	97	74	204	85	0	0	936
19. Gas plants	9	60	26	80	51	7	0	0	0	234
20. Public land reservations	0	0	0	0	1630	0	0	1039	0	2669

\* C.L.I. values are estimated in most cases. True capability may be somewhat higher for new well sites. See discussion in Chapter II.

Table A3 Land Conversions in the Northern Region: Type of Conversion by C.L.I. Class, 1976 - 1980 (acres)

Intended Use Category	C.L.I. CLASS*							Undeter- mined Total		
	1	2	3	4	5	6	7			
<b>A. Additions of Agricultural Land</b>										
1. Dispositions leading to title	0	479	1916	7209	6838	0	2390	0	18830	
2. Dispositions not leading to title	0	1266	3461	9514	4872	520	920	0	20873	
3. Grazing reserves	0	0	0	5440	18405	160	3526	0	27531	
4. Reclaimed strip mines									690	
<b>B. Removals of Agricultural Land</b>										
1. Single parcel country residence	836	1239	3757	4623	1441	1017	47	230	133	13313
2. Multi-parcel country residence	822	2091	9068	19807	14221	3165	98	1201	564	51037
3. Farmstead separation	971	1812	2915	2268	760	344	7	70	11	9155
4. Commercial/industrial	1272	1848	1093	668	367	226	0	153	93	5719
5. Public/institutional	244	324	328	283	37	298	0	96	0	1610
6. Hamlet expansion	21	377	110	4	0	0	0	0	0	512
7. Waste disposal area	76	197	417	85	31	196	0	6	0	1008
8. Private recreation	0	0	341	940	201	0	0	0	0	1482
9. Other subdivision	170	132	400	67	118	40	0	0	6	933
10. Edmonton annex.	1280	1880	320	0	0	320	0	0	480	4280
11. Fort Saskatchewan annex.	325	4095	0	0	0	288	0	0	0	4708
12. Leduc annex.	160	0	0	1280	0	0	0	0	0	1440
13. St. Albert annex.	2033	16	1310	40	216	0	0	0	0	3615
14. Other annex.	3610	6333	5495	3328	1535	603	4	178	860	21944

15. New municipal road	35	165	731	1436	610	206	16	284	9	3492
16. Municipal road widening	302	780	1719	1755	632	148	8	252	115	5712
17. New provincial road	8	207	79	396	210	13	0	189	0	1102
18. Provincial road widening	14	10	169	133	102	0	0	8	0	436
19. Related area	7	84	201	100	0	0	0	13	0	404
20. Coal strip mines	0	176	473	112	0	55	0	32	0	849
21. Gas plants	3	7	17	19	0	0	0	4	0	51
22. Public land reservations	0	0	0	0	20	0	0	3164	0	3184

\* C.L.I. values are estimated in most cases. True capability may be somewhat higher for new well sites. See discussion in Chapter II.

Table A4 Land Conversions in the Peace Region: Type of Conversion by C.L.I. Class, 1976 - 1980 (acres)

Intended Use Category	C.L.I. CLASS*							Undeter- mined Total	
	2	3	4	5	6	7	Organic		
<b>A. Additions of Agricultural Land</b>									
1. Dispositions leading to title	4116	28374	56875	7551	302	79	5335	1827	104459
2. Dispositions not leading to title	2743	33200	36815	6665	177	2709	3022	2627	87958
3. Grazing reserves	320	7518	52229	17699	800	160	8118	0	86843
<b>B. Removals of Agricultural Land</b>									
1. Single parcel country residence	349	393	152	19	25	34	10	26	1008
2. Multi-parcel country residence	884	416	1055	184	160	271	38	18	3027
3. Farmstead separation	1547	2100	1074	141	0	214	104	51	5231
4. Commercial/industrial	513	325	19	6	0	0	0	21	883
5. Public/institutional	33	35	60	0	0	49	0	0	178
6. Hamlet expansion	361	5	0	0	0	0	0	0	366
7. Waste disposal	100	57	38	0	0	0	18	0	213
8. Grande Prairie annex.	2626	2276	0	0	0	0	0	0	4901
9. Other annex.	3164	501	317	0	0	160	0	0	4141
10. New municipal road	105	262	214	99	30	139	56	92	997
11. Municipal road widening	228	320	193	59	5	20	25	10	860
12. New provincial road	0	50	152	151	0	6	64	0	423
13. Provincial road widening	0	7	34	0	0	0	1	0	42
14. Related area	126	0	0	0	0	0	0	0	126
15. Gas plants	10	5	5	0	0	0	0	0	20
16. Public land reservations	342	4669	422	610	544	8137	1198	0	19757

\* C.L.I. values are estimated in most cases. True capability may be somewhat higher for new well sites. See discussion in Chapter II.



Table A5 Public Land Reservations by Municipality and Year

Municipality	YEAR				
	1976	1977	1978	1979	1980
	-----Acres-----				
1. County 1 (Grande Prairie)	510				161
2. County 11 (Barrhead)					639
3. M.D. (Westlock)					2525
4. M.D. 130 (Smoky River)	140	2511		140	160
5. M.D. 135 (Peace)			24		109
6. M.D. 136 (Fairview)				241	
7. I.D. 10	332		320		239
8. I.D. 11				1113	675
9. I.D. 16	996	720	726	1391	404
10. I.D. 17	985		23	46	2294
11. I.D. 19			779	2703	1868
12. I.D. 20	40			480	
13. I.D. 21					375
14. I.D. 22				1558	432
15. I.D. 23	148	400		1963	776
Total	3142	3631	1872	9634	10658

