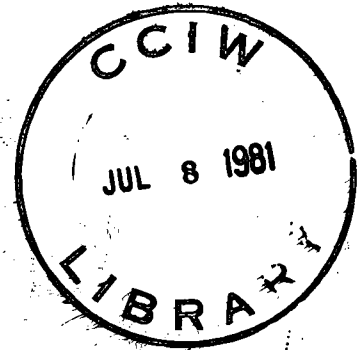


#17



**LANDS  
DIRECTORATE**

**DIRECTION GÉNÉRALE  
DES TERRES**



**LAND USE CLASSIFICATION  
FOR LAND USE MONITORING**

**WORKING PAPER No. 17**

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LAND USE CLASSIFICATION  
FOR LAND USE MONITORING

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March 1981

Lands Directorate  
Environment Canada

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de l'utilisation des terres

### ABSTRACT

Canada is a vast country with a variety of land cover and uses of land. In 1977, the Lands Directorate of Environment Canada began a project to develop a program to monitor changes in the use of Canada's land. One of the areas of development of the program was the designing of a new land use classification system. This report presents the rationale and criteria for the development of a new classification system, and an outline of the new system itself. The report also shows how the new system can be related to the Canada Land Inventory Land Use Classification system.

It is hoped that the philosophy behind the development of the new classification system will be discussed by potential users and aid in the formation of a national land use classification system for Canada.

### RÉSUMÉ

Le Canada est un vaste pays qui possède une grande variété d'utilisation de ses terres. En 1977, la Direction générale des terres d'Environnement Canada, entreprenait un projet afin de développer un programme pour dénombrer les changements d'utilisation des terres au Canada. Un des aspects de ce programme était de concevoir un nouveau système de classification. Ce document présente la logique et les critères utilisés pour ce nouveau système de classification; et en donne aussi un bref aperçu. Ce document démontre aussi comment ce nouveau système peut-être relié au présent système de classification de l'Inventaire des terres du Canada.

Il est à espérer que la philosophie sous-jacente de ce nouveau système de classification sera analysée par ces différents utilisateurs et aidera éventuellement à la conception d'un système national de classification de l'utilisation des terres au Canada.

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## 1. INTRODUCTION

Canada is a vast country with a variety of land cover and uses of land. About one-third of the land cover in Canada has been in some way determined or modified by man's activities. Much more serves or potentially serves some purpose to man. The capability of the land for any one of man's uses also varies greatly. For example only 10.5 percent of the land area of Canada can support some agriculture. Even smaller areas are capable of supporting specific agricultural activities. Man's management of his land resources varies greatly as well. In most areas a number of uses are potentially possible on a particular parcel of land. Some uses are compatible, others are not. All of man's activities on the land have some environmental affect which may be detrimental to present and future generations.

This use of the land and how it changes was and is determined by historical and present decisions by individuals, governments, and businesses. All these decisions are influenced by economic, social, and physical factors.

In 1977, the Lands Directorate of Environment Canada began a project to develop a land use monitoring program for Canada. The Federal Government's land management responsibilities are restricted to the Yukon and Northwest Territories and to small areas within the provinces. However, the Federal Government influences the use of land in all areas of Canada through its many programs and policies. As well, there are national concerns over the environmental consequences of the location of certain land uses, Canada's long range ability to feed itself,

and a positive balance of payments. Canada is very dependant on its land resources.

One of the areas of early investigation in the development of a land use monitoring program was the design of a new classification system. This report presents the rational for developing a new classification system, the criteria used in developing the new system, and the Land Cover and Land Activity components of the proposed system. Also the report shows how the Land Cover and Land Activity classifications can be related to the older Canada Land Inventory (CLI) Land Use Classification System. The appendices list the individual classes of the Land Cover and Land Activity classifications and provides definitions of selected classes.

## 2. REASONS FOR A NEW CLASSIFICATION SYSTEM

One of the first questions to ask is why develop a new classification system? Is not one of the major present systems adequate for the purposes of land use change monitoring? The answer is no. There is not one classification system which would satisfy the objectives of a land use monitoring program, which are threefold: a) to monitor land use trends in relation to national goals and objectives; b) to monitor the amount, location and type of land use change on a national, regional and provincial basis; and c) to monitor land use change in specific problem and special areas such as flood plains, urban centred regions, unique lands, federal lands, etc. The reasons for this conclusion will be discussed in the following paragraphs.

One of the major problems is the term 'Land Use' itself. 'Land Use' has been variously

defined, and these definitions can be radically different from one another. The reason is that 'Land Use' encompasses a complex of generically different aspects of man's relationship to land. These different aspects include cover, activity, ownership/tenure, and land quality. All of these aspects or variables are important in defining and facilitating an understanding of the 'Land Use' of a unit of land.

Most existing classification systems mix these variables of 'Land Use', some stressing particular variables more than others. The Michigan Land Use/Cover Classification System is a good example where cover, land activity, and economic activity are mixed. The result is a classification system which does not provide an adequate or complete typology for the individual variables. All variables have different conceptual origins, means of obtaining data, and end uses.

An examination of how these variables overlap with one another will indicate why they should be treated separately. Land cover is the vegetational and artificial construction covering the lands surface. One cover, for example trees, can encompass a variety of activities such as tapping of maple trees, producing fruit, logging, etc. This same cover can have a variety of ownership or tenure patterns such as public, private, leased, owner-operated, etc. Again this same cover can have different major economic activities or industries such as recreation, lumbering and dairying associated with it.

The following are two examples to further illustrate the need to separate land use activity from cover.

- a) Grazing of livestock as a land use activity can take place on land with a variety of covers, all of which can occur within the same farm. These covers could be mature trees, small trees and shrubs, unimproved grass, and improved grass. The combination of the activity of grazing with each of these covers has possible environmental implications such as erosion, tree regeneration, spreading of weeds, and water pollution.
- b) On land where agricultural activities take place these can possibly be the following land covers i) grasses and/or legumes; ii) close grown crops; and iii) row crops. The value of the crop increases from i) to iii). Likewise, the amount of pesticide, herbicide, and fertilizer use increases. The amount of bare soil and runoff also increases with related pollution and erosion implications.

Data gathering methods also influence greatly the type of classification system developed. Many classifications are based on remote sensing as a means of gathering 'Land Use'. Remote sensing is very good at determining the land cover. But for land activity, the interpreter uses cover as a surrogate for activity. This is quite satisfactory where activity and cover coincide. For example, 'close grown crops', a cover type, coincides with the activity 'growing small grains'. In many other cases however, cover does not adequately indicate activity. So again, data gathering methods can result in mixing the generically different variables of 'Land Use'.

In summary, the major problem with other existing 'Land Use' classification systems is their mixing of generically different

variables which comprise the 'Land Use' concept.

### 3. CRITERIA USED TO DEVELOP THE NEW CLASSIFICATION SYSTEMS

The following criteria were used to develop a new land use classification system.

- a) The classification system should be hierarchical; that is constructed of a number of levels. Each lower level should collapse to form fewer and fewer classes as one goes up the hierarchy. Each level is based on a different degree of detail. Each lower level should be a logical breakdown of the level above. Further breakdown of each class to a more detailed land activity or cover is therefore possible.
- b) Land use variables should form separate classification systems. Care should be taken to avoid mixing the variables though all are necessary in the complete understanding of land use.
- c) The system should be coded to allow easy computer manipulation. This coding should also be related to the hierarchy of the classification.
- d) The system should be independant of a particular data gathering method. Each data gathering method has its limits for gathering some classes of land information both in terms of identification and also in terms of accuracy. The system should be designed for user needs and the ability of a particular data gathering method should be measured against this ideal.
- e) The classification system should be comprehensive. It should be designed to take in all possible cover and land use activities existing in Canada.
- f) At some level or levels, the new classification system should be compatible with the CLI Land Use Classification system. This system is the only one which has been used across Canada and is the base data to which the data gathered using the new systems will initially be compared. Attempts should also be made to relate other classification systems to the new one.
- g) The classes should be pure. There should be one description for each class of land which differentiates that class from another class.
- h) There should be an attempt at some level to separate land use activities into two major classes based on whether the activity makes use of the land for productive purposes or is located (sited) on the land. For example both houses and greenhouses for growing vegetables are site uses of land. The greenhouse vegetable growing is an agricultural activity yet it is not dependant on the agricultural capability of the land at its site. This is a very important distinction to make if one wants to relate activity to capability in the future.

### 4. THE NEW LAND USE CLASSIFICATION SYSTEM

As mentioned earlier in this paper 'Land Use' is a mixture of generically different variables. The Lands Directorate is not



attempting to develop one 'Land Use' classification, but a classification system which incorporates each of the variables making up 'Land Use'. For the Canada Land Cover, Land Activity, Land Ownerships/Tenure, and Land Quality have been identified as the most important. As suggested in the Introduction, this report presents details of classification systems for Land Activity and Land Cover (see Appendices). Classification systems could be developed for Land Ownership/ Tenure and Land Quality sometime in the future.

Before discussing the classification systems for Land Cover and Land Activity these terms should be defined. Land Cover as defined previously, is the vegetational and artificial construction covering the land surface. Land Activity is the active use man makes of the land. The definition of Land Cover is relatively straightforward but the definition for Land Activity is not and, therefore, needs some further explanation. Land Activity is best explained by what it is not. For instance, a field is being cultivated but the owner, not a farmer, has rented the field to a farmer. The 'Land Activity' of this field would be "growing annual tillage crops". The owner's use or purpose (passive use) for the land is for speculation. Land Activity is distinct from Ownership. Land Activity is also not economic activity. For example a wooded area may be part of a farm whose 'economic activity' is dairying but this is not the Land Activity of that particular wooded area. Its Land Activity may be 'logging and cutting of trees' possibly for pulpwood.

There is more than one way of developing a hierarchial classification system or the logic framework of how each class of land

relates to another. In developing the Land Cover and Land Activity classifications described in this report two ways were attempted: standard and binary.

A binary classification system is based on the idea that the land surface would always break down in two distinct classes. At level one, for example, cover could be divided into 'Water' and 'Land' classes. At the second level the 'Land' class could be divided again into 'Vegetated Cover' and 'Bare'. This process continues for as many levels as needed, with each succeeding class being divided into two more classes at each level. This method works quite easily for Land Cover but is more difficult to apply to Land Activity. The major advantage of this system is that at each level there are always only two choices. If the land did not have one cover, it had to be the other. Mapping decisions are relatively easy to make. This appears to be the only advantage to this method. The disadvantages however, outweigh the one advantage. First, many more levels are needed in the binary hierarchy compared to the standard system to reach an equivalent class. For example, 'Air Transportation' as a Land Activity was at level nine in the binary system but emerged at level three in the standard system. Second, the higher number of levels means that many more computer bits would be required to digitize the same information in the binary system as compared to the standard. This, of course, would increase storage and user accessibility costs. For example, if one wanted to describe the binary coding for 'Air Transportation' on computer cards one would need 9 spaces while with the Standard system one would only need 4 spaces.

Because of the above disadvantages of the binary system it is recommended that the standard system be used for the Canada Land Use Monitoring Program. The standard system is one where each level in the classification can have as many distinct separate classes as needed. The resulting standard classification system components are outlined in Appendix I for Activity and Appendix III for Cover. Most of the major classes of Activity and Cover are broken down to the fourth level. It should not be necessary to go to lower hierarchical levels to monitor land use change for the CLI area of Canada. However, land use monitoring for more specific or specialized studies may require the development of the additional levels which would conform to the established higher levels. The description of selected classes in the first three levels of the classification systems is contained in Appendices II and IV for Activity and Cover respectively.

Another aspect of note of the Land Activity classification system outlined in Appendix I is the separation of resource based activities from site activities as mentioned in Section 3 on criteria. This separation is important if one is attempting to relate land activities to land capability. Site activities are not dependant on the land capability of the site location. For example a feed lot is included in the agricultural activity class 'Holding and Feeding Livestock', but its location or siting can be on Class 7 agricultural land. It can draw on quite distant productive-land activities on Class 1 land to supply feed.

#### 5. RELATIONSHIP BETWEEN THE LAND ACTIVITY AND LAND COVER CLASSIFICATION SYSTEMS AND THE CLI LAND USE CLASSIFICATION SYSTEM.

At present the only land use information for a significant area of Canada is based on the CLI Land Use Classification System. It is important that any new classification system be related to the CLI Land Use Classification to enable land use change measurements to occur during the initial inventory.

The CLI Land Use Classification System is a mixture of Land Activity and Land Cover and is a one level classification system. This makes it impossible to describe the Land Activity Classification System in terms of CLI classes. However, the reverse is possible. One can draw on both classification systems at whatever level of the hierarchy best describes the CLI class. Appendix V provides a description of the CLI classes in terms of the new Land Activity classes and the new Land Cover classes.

#### 6. OPERATIONAL USE OF THE LAND ACTIVITY AND LAND COVER CLASSIFICATION SYSTEMS

The classification system presented in this report is a logical framework of an ideal classification system of land phenomena. Such a system is not a mapping classification unless two basic criteria can be met: (a) the map scale and the means of depiction are sufficiently large to allow the mapping of all classes at a selected level of the hierarchy; and (b) the data gathering method or sources of data are sufficiently accurate to enable identification of all classes at a selected level of the hierarchy.

This ideal situation in an operational land use monitoring system is not likely to occur. If the suggested map scale at which the information will be mapped is 1:50,000, then the minimum size of mappable land unit is approximately 2.5 hectares. This is larger than the area occupied by most site activities in agriculture, wildlife, forestry, etc. and also bigger than an individual dwelling which may be non-farm. On a map at this scale for example, it would not be possible to provide definite statistics for scattered urbanized activities.

Another limitation to full use of the classification system is the data gathering method and/or source. If air photos are the source, not all classes can be determined by air photo interpretation. For example, none of the 'Production-Land Wildlife Activities' can be mapped. In addition, crops may not be easily separated, such as forage crops from annual tillage crops, unless conditions such as scale and season are favorable.

This means that in any given real situation the resulting operational classification will be smaller than the ideal classification system contained in this report. The particular operational subset will be dependent upon such factors as specific mapping scale, size of land units in an area, specific data sources, scale of source data, and recognition ability of a specific class.

To facilitate the use of the classification system in this report, a subsequent report is being produced to provide an operational manual for users of the Land Use

Classification System especially in terms of land use monitoring. This will aid the user to get the most benefit from the classification system in an operational situation. The operational manual will also demonstrate the means of mapping and the subsequent retrieval from a computer of information on land which may have multiple uses or covers. This will avoid the limitations of classifying land solely by its dominant use or cover.

## 7. CONCLUSIONS

The theoretical classification systems outlined in the appendices of this report should be seen as the ideal classifications for land use monitoring purposes. These classification systems have been designed to be as free as possible from a single disciplinary viewpoint, a particular organization's needs, and any one data gathering method. This is necessary to ensure that the results of a land use monitoring program will be useful to the broadest range of users.

The separation of cover and land activity from each other and from other aspects of the 'Land Use' concept will allow the incorporation of other classification systems based on generically different characteristics of land and land use. The information from all available classification systems can be assessed and compared using computer storage and manipulative capability to provide a complete description of land for land use monitoring or other purposes.

## APPENDIX 1

## LAND ACTIVITY CLASSIFICATION SYSTEM

## 01000 AGRICULTURAL ACTIVITIES

01100 Productive-Land Agricultural Activities

## 01110 Growing Annual Tillage Crops

01111 Growing Grain

01112 Growing Vegetables

01113 Growing Rootcrops and Tubers

01114 Growing Seed Crops

01115 Growing Leaf Crops

01116 Growing Flowers and Bulbs

01119 Other

## 01120 Growing Forage Crops and Grazing

01121 Growing Forage Crops

01122 Grazing

## 01130 Fruit and Berry Production

01131 Tree Fruit Production (Orchards)

01132 Grape Production (Vineyards)

01133 Berry Production

## 01140 Growing Ornamental Shrubs and Trees

## 01150 Sod Production

## 01190 Other

01200 Agricultural Site Activities

## 01210 Housing Animals

01211 Housing Livestock

01212 Housing Poultry

01213 Housing Fur-Bearing Animals

01219 Other

## 01220 Outside Animal Feeding and Holding Areas

01221 Livestock Feeding and Holding Areas

01222 Poultry Feeding and Holding Areas

01223 Horse Holding and Training Area (Non-commercial)

01229 Other

## 01230 Storing Crops

01231 Storing Forage and Grain

01232 Storing Fruit and Vegetables

## 01240 Growing Plants in Green Houses

01241 Growing Vegetables

01242 Growing Flowers and Ornamentals

01243 Starting Tobacco Plants

01249 Other

## 01250 Storing and Repairing Agricultural Machinery and Tools

## 01260 Tobacco Curing and Packing

01261 Tobacco Curing

01262 Tobacco Packing

## 01270 Mushroom Growing

## 01280 Beekeeping and Honey Making

## 01290 Other

## 02000 FORESTRY ACTIVITIES

02100 Productive - Land Forestry Activities

## 02110 Logging and Cutting of Trees

02111 Pulpwood Logging

02112 Cutting Sawtimber

02113 Cutting for Fuel

02119 Other

## 02120 Gathering Treeseed and Raising Seedlings

02121 Gathering Treeseed

02122 Raising Seedlings

02130 Forestry Research  
 02140 Tapping of Maple Trees (Sugar Bush)  
 02150 Growing Christmas Trees  
 02160 Holly Production  
 02190 Other

02200 Site Forestry Activities

02210 Site Activities Related to Logging and Cutting  
     02211 Managing  
     02212 Feeding of Personnel  
     02213 Storing of Cut Trees  
     02214 Storing of Tools and Equipment  
     02215 Preparing Cut Trees for Transport  
     02219 Other  
 02220 Managing and Preserving Forest Site Activities  
     02221 Watching for Fires  
     02222 Researching  
     02223 Managing and Dwelling  
     02224 Storing Equipment and Tools  
     02229 Other  
 02230 Maple Syrup Making  
 02290 Other

03000 WILDLIFE RELATED ACTIVITIES

03100 Productive-Land Wildlife Activities

03110 Hunting  
     03111 Sport Hunting  
     03112 Food Hunting  
     03119 Other  
 03120 Trapping  
     03121 Fur Trapping  
     03122 Food Trapping  
     03129 Other  
 03130 Preserving Wildlife  
     03131 Preserving Wildlife by Providing Critical Habitat  
     03132 Preserving Wildlife by Providing Protected  
         Breeding and Birthing Areas  
     03139 Other  
 03140 Commercial Fishing Lakes  
 03190 Other

03200 Wildlife-Related Site Activities

03210 Land-Animal Related Site Activities  
     03211 Camping for Hunting and Trapping  
     03212 Breeding Wildlife  
     03213 Managing  
     03219 Other  
 03220 Fishing-Related Site Activities  
     03221 Fishing  
     03222 Raising Fish for Transplant  
     03223 Aiding Fish Migration  
     03229 Other  
 03290 Other

04000 EXTRACTION ACTIVITIES

04100 Surface Extraction

04110 Extraction of Rock or Consolidated Material  
     04111 Quarrying Stone and Other Building Materials  
     04112 Quarrying Industrial Minerals  
     04113 Mining Iron Ore  
     04114 Mining Non-Ferrous Metals  
     04115 Coal Mining  
     04119 Other  
 04120 Extraction of Sand, Gravel, and Clay  
     04121 Building Material Extraction

- 04122 Tar Sand Extraction
- 04123 Industrial Minerals and Materials Extraction
- 04129 Other
- 04130 Peat Extraction
- 04140 Top Soil Removal
- 04190 Other
- 04200 Underground Extraction
  - 04210 Extraction of Oil and Gas
    - 04211 Extraction of Oil (Oil Field)
    - 04212 Extraction of Gas (Gas Field)
    - 04213 Extraction of Oil and Gas (Both)
  - 04220 Extraction of Water
  - 04230 Mining Coal, Radioactive Ores, and Other Solid Fuels
    - 04231 Mining Coal
    - 04232 Mining Radioactive Ores
    - 04239 Other
  - 04240 Mining Minerals for Building Materials
  - 04250 Mining Iron Ore
  - 04260 Mining Potash and Salts
    - 04261 Mining Potash
    - 04262 Mining Salts
  - 04270 Mining Non-Ferrous Metal Ores
    - 04271 Mining Base Metal Ores
    - 04272 Mining Precious Metal Ores
    - 04279 Other
  - 04280 Mining Industrial Materials
    - 04281 Mining Asbestos Ore
    - 04282 Mining Mineral and Industrial Chemical Ores
    - 04289 Other
  - 04290 Other
- 04300 Extraction Site Activities
  - 04310 Pumping
    - 04311 Pumping Gas
    - 04312 Pumping Oil
    - 04313 Pumping Water
    - 04314 Pumping Salt Brines
    - 04315 Pumping Potash Brines
    - 04319 Other
  - 04320 Transporting and Holdings of Wastes and Tailings
    - 04321 Transporting Waste and Tailings
    - 04322 Holding Waste and Tailings
  - 04330 Handling of Extracted Material
    - 04331 Moving
    - 04332 Crushing
    - 04333 Washing
    - 04339 Other
  - 04340 Placer Mining
    - 04341 Placer Gold
    - 04349 Other
  - 04390 Other

## 05000 RECREATION ACTIVITIES

- 05100 Land Dependent Recreational Activities
  - 05110 Golfing and Associated Activities
    - 05111 Golfing
    - 05112 Associated Activities
  - 05120 Skiing and Associated Activities
    - 05121 Down Hill Skiing
    - 05122 Cross-Country Skiing
    - 05123 Associated Activities
  - 05130 Trail Using Activities
    - 05131 Cycling
    - 05132 Snowmobiling

- 05133 Walking
- 05134 Horseback Riding
- 05135 Associated Activities
- 05139 Other
- 05140 Viewing of Nature, Historical, and Archeological Sites
  - 05142 Viewing Natural Sites
  - 05143 Viewing Historic Sites
  - 05144 Associated Activities
- 05150 Land Activities Related to Water
  - 05151 Swimming Activities
  - 05152 Boating and Canoeing Related Shore Activities
  - 05153 Associated Activities
  - 05159 Other
- 05160 Recreational Hunting and Fishing
  - 05161 Hunting and Fishing Camps
  - 05169 Other
- 05170 Recreational Open Space
- 05190 Other
- 05200 Indoor and Outdoor Recreational, and Cultural Site Activities
  - 05210 Outdoor Recreational and Cultural Site Activities
    - 05212 Viewing of Animals (Zoo and Game Farms)
    - 05213 Visiting of Botanical Gardens, Arboretums, and Similar Displays
    - 05214 Outdoor Public Assembly for Entertainment
    - 05215 Sport Activities
    - 05216 Picnicing
    - 05219 Other
  - 05220 Indoor Recreational and Cultural Activities
    - 05221 Indoor Cultural Activities
    - 05222 Indoor Sport and Fitness Activities
    - 05229 Other

## 06000 DWELLING ACTIVITIES

- 06100 Housekeeping Activities
  - 06110 Permanent Housekeeping
    - 06111 Homes
    - 06112 Apartments
    - 06113 Rooming
  - 06120 Seasonal Housekeeping
    - 06121 Cottaging
    - 06122 Camping and Trailer Parking
    - 06129 Other
- 06200 Other Dwelling Activities
  - 06210 Non-Housekeeping Dwelling on a Permanent Basis
    - 06211 Group Dwelling for Senior Citizens and Orphans
    - 06212 Dwelling in Residence Halls and Dormitories
    - 06219 Other
  - 06220 Dwelling in Hotels, Motels, and Lodges
  - 06290 Other

## 07000 TRANSPORTATION &amp; COMMUNICATION ACTIVITIES

- 07100 Transporting Activities
  - 07110 Transporting by Roads
    - 07111 Transporting by Expressways (Limited Access)
    - 07112 Provincial Highways
    - 07113 Lower Order Rural Roads
    - 07114 Urban Roads and Streets
    - 07115 Other Roads
    - 07116 Associated Building and Maintaining
    - 07117 Bus Terminals
    - 07118 Parking
    - 07119 Other
  - 07120 Transporting by Rail
    - 07121 Transporting by Rail

- 07122 Activities Associated with Maintaining and Building Rail Lines
- 07123 Rail Terminals
- 07124 Switching and Storing of Transportation Equipment
- 07129 Other
- 07130 Transporting by Air
  - 07131 Landing and Taking off (Runways) International
  - 07132 Landing and Taking off (Runways) Domestic
  - 07133 Landing and Taking off (Both)
  - 07134 Other Landing and Taking off
  - 07135 Guiding Airplanes
  - 07136 Storing Runway Maintenance Equipment
  - 07137 Air Terminals
  - 07138 Aircraft Maintenance
  - 07139 Other
- 07140 Transporting by Water
  - 07141 Portaging
  - 07142 Travelling by Canal
  - 07143 Related Activities
  - 07144 Docks and Wharfs
  - 07149 Other
- 07150 Transporting by Pipeline
  - 07151 Transporting Gas
  - 07152 Transporting Oil
  - 07153 Transporting Water
- 07160 Transporting of Electricity
  - 07161 Transmission Lines and Towers
  - 07162 Switching and Boosting Power
  - 07163 Related Activities
- 07190 Other
- 07200 Communicating Activities
  - 07210 Telegraphing
  - 07220 Telephoning
  - 07230 Broadcasting
  - 07240 Postal Service Terminal Activities
  - 07290 Other

## 08000 MANUFACTURING AND STORING ACTIVITIES

- 08100 Electric Energy and Heat Generation
  - 08110 Energy Conversion from the Wind
  - 08120 Energy Conversion from the Sun
  - 08130 Energy Conversion from Water
  - 08140 Energy Conversion from Fossil Fuels
  - 08150 Energy Conversion from Atomic Fission
  - 08190 Other
- 08200 Raw Material Processing
  - 08210 Purifying Water
  - 08220 Processing Food and Tobacco
  - 08230 Processing Natural Fibre, Felt, and Leather
  - 08240 Processing Rock, Stone, Clay, Sand, and Gravel
  - 08250 Processing Ores and Metals
  - 08260 Processing Coal and Refining Petroleum
  - 08270 Processing Chemicals
  - 08280 Processing Wood
  - 08290 Other
- 08300 Processing Processed Goods
  - 08310 Making Processed Food and Tobacco Products
  - 08320 Making Textiles
  - 08330 Woodworking and Making Wood Products
  - 08340 Making Chemical Products
  - 08350 Printing and Publishing
  - 08360 Making Structural Materials
  - 08390 Other



08400 Assembling Products

- 08410 Making Clothes and other Textile Products
- 08420 Making Building Components, Furniture, and Fixtures Predominately of Wood
- 08430 Making Containers, Structural Components, Furniture, Fixtures and Fittings Predominately of Metal
- 08440 Making Scientific Equipment and Precision Instruments
- 08450 Making Machinery, Mechanical Equipment, and Hardware
- 08460 Making General Equipment Including Household Appliances
- 08470 Making and Assembling Automobiles, Aircraft, Rail, and Marine Products
- 08490 Other

08500 Storage Activities

- 08510 Storing in Reservoirs and Tanks
  - 08511 Storing Oil and Oil Products
  - 08512 Storing Gas and Gas Products
  - 08513 Storing Other Toxic and Volatile Liquids
  - 08514 Storing Water
  - 08519 Storing Other Liquids
- 08520 Storing Vehicles
  - 08521 Storing of Cars and Trucks
  - 08522 Storing of Construction Vehicles and Equipment
  - 08523 Storing of Aircraft
  - 08529 Other
- 08530 Warehousing
- 08540 Storing in an Enclosed Structure other than Buildings or Tanks
- 08550 Open Air Storage
- 08590 Other

08600 Treating and Disposal of Wastes

- 08610 Treating and Disposal of Liquid Wastes
  - 08611 Treating and Disposal of General Domestic Sewage Wastes
  - 08612 Treating and Disposal of Industrial and Toxic Liquid Wastes
  - 08619 Other
- 08620 Treating and Disposal of Gaseous Wastes
  - 08621 Treatment and Disposal of Toxic Gases
  - 08629 Other
- 08630 Treating and Disposal of Solid Wastes
  - 08631 Treatment and Disposal of Domestic Solid Wastes
  - 08632 Treatment and Disposal of Toxic Solid Wastes
  - 08633 Treatment and Disposal of Motor Vehicles and other Metal Wastes
  - 08639 Other
- 08640 Treatment and Disposal of Radioactive Wastes

08900 Undifferentiated Manufacturing and Storage Activities09000 COMMERCIAL ACTIVITIES09100 Wholesaling

- 09110 Wholesaling of Farm Products, Foods, and Tobacco Products
- 09120 Wholesaling of Coal, Coke, and Petroleum Products
- 09130 Wholesaling of Paper and Paper Products, Lumber, and Building Supplies and other Wood Products
- 09140 Wholesaling of Motor Vehicles and Accessories
- 09150 Wholesaling Apparel and Dry Goods
- 09160 Wholesaling of Drugs and Toilet Preparations
- 09170 Wholesaling of Machinery and Hardware, Plumbing, and Heating Equipment
- 09180 Wholesaling of Metal and Metal Products
- 09190 Other Wholesaling

- 09200 Retailing
  - 09210 Food Retailing
  - 09220 Clothing, Shoes, and General Merchandise Retailing
  - 09230 Motor Vehicle and Related Products Retailing
  - 09240 Household Furniture and Appliance Retailing
  - 09250 Hardware and Building Supply Retailing
  - 09260 Drug Retailing
  - 09270 Book and Stationary Retailing
  - 09280 Flower, Jewellery, Watches, Alcoholic Beverage, and Tobacco Retailing
  - 09290 Other Retailing
- 09300 Providing Commercial Services
  - 09310 Providing Financial, Insurance, and Real Estate Services
  - 09320 Providing Personal Services
  - 09330 Providing Repair and Rental Services
  - 09340 Providing Service to Business
  - 09350 Providing Professional Services
  - 09390 Other
- 09900 Undifferentiated Commercial Activities
- 10000 PROVIDING INSTITUTIONAL SERVICES
  - 10100 Providing Legislative, Judicial, and Legal Services
    - 10110 Governing
    - 10120 Providing Judicial Services
    - 10130 Providing Legal Services
    - 10190 Other
  - 10200 Providing Protective and Custodial Services
    - 10210 Policing and Guarding
    - 10220 Fire-fighting
    - 10230 Detaining
    - 10240 Providing National Defense
    - 10290 Other
  - 10300 Providing Education Services
    - 10310 Providing Primary and Secondary Education
    - 10320 Providing Post Secondary Education
    - 10390 Other
  - 10400 Providing Health, Medical, and Care Services
    - 10410 Providing Health and Medical Services
    - 10420 Providing Non-Medical Care Services
    - 10490 Other
  - 10500 Providing Welfare, Philanthropic, and Charitable Services
  - 10600 Religious and Associated Activities
    - 10610 Worshipping
    - 10620 Burying (Cemeteries)
    - 10690 Other
  - 10700 Providing a Place for Communication and Assembly
  - 10900 Undifferentiated Institutional Services
- 11000 OTHER
  - 11100 Land for Research and Conservation
    - 11110 Land for Ecological Research
    - 11120 Land for Preservation and Conservation
      - 11121 Land for Controlling Erosion
      - 11122 Land for Conserving Water
    - 11190 Other
  - 11900 Other
- 12000 UNUSED LAND-IDLE LAND
  - 12100 Former Agricultural Activities
  - 12200 Former Forestry Activities
  - 12300 Former Extraction Activities
  - 12400 Former Recreational Activities
  - 12500 Former Dwelling Activities

12600 Former Transportation and Communications  
Activities  
12700 Former Manufacturing and Storage Activities  
12800 Former Commercial Activities  
12900 Former Institutional and Commercial Services

13000 NO PERCEIVED ACTIVITY

14000 LAND IN TRANSITION

## APPENDIX II

LAND ACTIVITY CLASSIFICATION SYSTEM  
DEFINITIONS OF SELECTED CLASSES

## 01000 AGRICULTURAL ACTIVITIES

All activities or active uses of land which are agricultural in nature.

01100 Productive-Land Agricultural Activities

All agricultural activities which use land as a producing medium. The ability of the land to produce may be increased by various means such as fertilizing, irrigating, draining, seeding, etc.

## 01110 Growing Annual Tillage Crops

Land on which the activity is growing crops that are replanted annually. Such activities are growing grains, vegetables, root crops, tubers, seed crops, leaf crops, flowers, bulbs, etc.

## 01120 Growing Forage Crops and Grazing

Land on which the activities are growing forage crops such as grasses and legumes for cutting or pasture. Also included is all land where the activity is grazing. Grazing can take place on land with a variety of cover and may or may not be improved.

## 01130 Fruit and Berry Production

Land on which the activity is the production of fruit and berries. Includes active orchards, vineyards, bush berry and strawberry patches, and fields.

## 01140 Growing Ornamental Shrubs and Trees

Land on which the activity is the growing of ornamental trees, shrubs, and vines which will be transplanted. Does not include possible associated greenhouse part of a nursery operation.

## 01150 Sod Production

Land on which the activity is the growing of lawn grasses for transplant.

## 01190 Other

Includes all land where the activities are related to the productive capability of the land and which are agricultural in nature. Fallowing and plowed fields are included in this class where it is unknown what future use will be made of them.

01200 Site Agricultural Activities

Includes all agricultural activities which use land as a site and not as a production medium. The capability of the land to produce crops is not important.

## 01210 Housing Animals

All land on which the activity is the provision of shelter for animals. Feeding and production of specific animal products may also be included. Includes housing for beef and dairy cattle, pigs, sheeps, horses, poultry, and fur bearing animals, etc.

**01220 Outside Animal Feeding and Holding Areas**

Includes land on which the activity is the feeding and holding of animals in a confined open-air area. Where feeding takes place the land in the holding area is not the source of food. Includes feedlot areas for all animals as well as confined holding areas near barns. Shipping corrals would also be included. This class includes non-commercial race tracks for training horses.

**01230 Storing Crops**

Includes all land used for storing grain, forage, fruit, and vegetables. Storage facilities included are hay barns, silos, corn cribs, etc. These storage areas may or may not be enclosed.

**01240 Growing Plants in Greenhouses**

Includes all land which has greenhouses for growing vegetables such as tomatoes, etc. growing flowers and ornamental plants and for starting plants, either vegetables or flowers, for transplant.

**01250 Storing and Repairing Agricultural Machinery and Tools**

Includes all land on which the activity is the storing and/or repairing of farm machinery and tools.

**01260 Tobacco Curing and Packing**

Includes all land on which the activity is the curing and/or packing of tobacco. Includes tobacco kilns & packing barns.

**01270 Mushroom Growing**

Includes all land on which the activity is growing mushrooms. Growing of mushrooms usually takes place in special buildings called mushroom houses.

**01280 Beekeeping and Honey Making**

Includes all land on which the activity is beekeeping and honey making. Included are the hives, extraction, and canning or bottling of the honey.

**01290 Other**

Includes all land which is not covered by the above classes but are agriculture site activities. Included are temporary storage of farm wastes, etc.

**02000 FORESTRY ACTIVITIES**

All activities on land which are related to the use of trees. This does not include treed land which has been included in agricultural or recreational activities.

**02100 Productive-Land Forestry Activities**

Includes all forestry activities which use land as a producing medium. Includes land which is actively being cut and is designated for cutting, for producing new trees for transplant, and is being restocked for forestry uses. Does not include forested land on which only recreation and/or wildlife land activities occur. Does not include land which has the potential for forestry and is not designated for those purposes.

**02110 Logging and Cutting of Trees**

Includes all land where the cutting, logging, felling, and bucking of trees is presently active or

designated. A large number of forest products may be produced such as saw logs, veneer logs, fenceposts, fuelwood, and telephone poles.

02120 Gathering Treeseed and Raising Seedlings  
Includes all land where treeseed is gathered.  
It also includes land where the raising of seedlings for transplant for reforestation purposes takes place. The raising of seedlings, etc. must be for forestry activities.

02130 Forestry Research  
Includes all land used for forestry research except for those related site uses of land.

02140 Tapping of Maple Trees (Sugar Bush)  
Land on which the activity is the tapping of maple trees to produce maple syrup.

02150 Growing Christmas Trees  
Land on which the activity is the growing of Christmas trees.

02160 Holly Production  
Land on which the activity is the production of holly.

02300 Site Forestry Activities

All forestry activities which use land as a site rather than a production medium. Lumber camps and forest management stations are usual names for these areas. Maple Syrup making is also included.

02310 Site Activities Related to Logging & Cutting  
These are those activities on a site associated with logging and cutting, such as managing the operation, feeding of the workers, storing of cut trees, and the storing and repairing of forestry tools and equipment. It is usually called a logging camp.

02320 Managing and Preserving Forest Site Activities  
This includes all forestry site activities concerned with managing and protecting forests such as watching for fires (fire towers), researching, managing and dwelling activities, storing of equipment and tools. Such areas are forest fire stations and other forestry services.

02330 Maple Syrup Making  
Includes all land on which the activity is maple syrup making such as evaporator houses and directly related site activities.

03000 WILDLIFE RELATED ACTIVITIES

Includes all land where activities related to wildlife occur.

03100 Productive-Land Wildlife Activities

All activities related to wildlife where land is the wildlife production medium. This includes those wildlife activities where the wildlife resource is cropped for food and fur or is being protected.

## 03110 Hunting

All land where the activity of hunting animals for food and/or furs takes place.

## 03120 Trapping

All land where the activity is trapping of animals for furs or food. Trapline area is the usual name of the area where this activity takes place.

## 03130 Preserving Wildlife

All land which has been designated for the preserving of wildlife or for its protection during a specific time of the year. Such areas are usually called Game Preserves, Wildlife Preserves, Game Sanctuaries, etc.

## 03140 Commercial Fishing Lakes

Includes all lakes which are used for commercial fishing.

03200 Wildlife-Related Site Activities

Includes wildlife related activities which use land as a site rather than as a production medium.

## 03210 Land-Animal Related Site Activities

Includes all site activities related to land-animals. Such activities are hunting and trapping camps, breeding wildlife and managing.

## 03220 Fishing-Related Site Activities

Includes all site activities, related to fishing. Such activities are fishing (from land), raising fish for transplant (fish hatcheries) and the aiding of fish migrations (fish runs and ladders).

## 04000 EXTRACTION ACTIVITIES

All activities related to the extraction of non-renewable resources (includes underground water).

04100 Surface Extraction

This includes all extraction activities which take place on the surface such as quarrying, open pit mining, strip mining, gravel/sand and clay pits, top soil removal, etc.

## 04110 Extraction of Rock or Consolidated Material

Includes surface extraction activities of consolidated material. Such activities are quarrying, open pit mining, and strip mining in bedrock.

## 04120 Extraction of Sand, Gravel, and Clay

This includes all unconsolidated material, other than peat and top soil, which is extracted from the surface.

## 04130 Peat Extraction

This includes all land on which the activity is the extraction of peat.

## 04140 Top Soil Removal

Land on which the activity taking place is the removal of top soil. This activity may or may not also occur before other activities such as building or other extractive activities take place.

**04200 Underground Extraction**

Includes all land under which the underground extraction of oil, gas, water, minerals, coal, etc. is taking place. Includes the surface under which the underground extraction is taking place such as actively pumped oil and gas fields, and ore bodies being mined. Usually other activities, other than extractive, take place on the surface. If the boundary is unknown only the extraction site should be indicated by a site activity class.

**04210 Extraction of Oil and Gas**

Includes all land which is underlain by a gas and/or oil fields whose extent is relatively known. This includes actively used fields and fields which are being held in reserve for future uses.

**04220 Extraction of Water**

Includes all land which is underlain by actively used underground reservoirs of water. Only ground water reservoirs where major pumping operations are taking place should be included. If the boundary is unknown only the extraction site should be indicated by 04310.

**04230 Mining Coal, Radioactive Ores, and Other Solid Fuels**

Includes all land underlain by ore bodies actively being exploited by underground means. The ores may be directly used or processed to be used as fuel.

**04240 Mining Minerals for Building Materials**

This includes all land underlain by actively exploited ore bodies whose ores are used directly or processed for building materials. This includes mining for gypsum, plaster, building stone, limestone for cement, and asphalt.

**04250 Mining Iron Ore**

This includes all land underlain by iron ore mines.

**04260 Mining Potash and Salts**

This includes all land underlain by potash and salt mines. These mines could be exploited by underground hard rock mining or by solution mining.

**04270 Mining Non-Ferrous Metal Ores**

Includes all land under which Non-ferrous metal ores are mined.

**04280 Mining Industrial Materials**

Includes all land under which mining of industrial materials takes place. Such industrial materials are asbestos, grindstone, mica, talc, etc.

**04300 Extraction Site Activities**

All land on which site activities related to extraction take place. This does not include processing of extracted material.

**04310 Pumping**

Includes pumping gas, oil, water, and soluble minerals, etc. These are usually the wellheads and pumphouses.

**04320 Transporting and Holding of Wastes and Tailings**

This activity includes the transporting of the



wastes resulting from extraction and the holding and dumping of these wastes in settling ponds or dumps.

04330 Handling of Extracted Material

This includes all land where the activities such as mining, crushing, screening, washing, etc. of the extracted material take place.

04340 Placer Mining

This includes the site at which active placer mining is taking place. The most common is gold but others such as tin and some heavy metals may be extracted this way.

05000 RECREATIONAL ACTIVITIES

Includes all land on which all activities are recreational in nature. This class also includes cultural activities.

05100 Land Dependent Recreational Activities

Includes all recreational activities which cover relatively large areas and usually are dependant on the natural capability of the land for that activity. Parks are included if their natural conditions are the source of recreation.

05110 Golfing and Associated Activities

Includes all the land on which golfing takes place and includes associated activities such as maintenance, lodges and storing of equipment, etc. Golf courses and driving ranges are covered by this class. Parking is not included in this class though associated.

05120 Skiing and Associated Activities

Includes all land where such activities as downhill skiing and cross-country skiing takes place. Includes associated activities such as skilifts, rest areas and lodges, etc. Does not include parking.

05130 Trail Using Activities

This includes all land where trail using activities (excluding skiing) occur. Such activities are cycling, snowmobiling, walking (recreational only), horseback riding, and associated activities except parking.

05140 Viewing of Nature, Historical, and Archeological Sites

This includes all land where the activity is the viewing of nature, historical, and archeological sites. Includes lookout points, nature trails, and historic sites such as forts, plaques, battlefields, etc.

05150 Land Activities related to Water

Includes all land activities which are associated with water activities such as swimming, boating, etc. This includes beaches, marinas, docks, piers, boat storage, yacht clubs, change areas, etc.

05160 Recreational Hunting and Fishing

Includes all land on which the activities of hunting and fishing for recreation take place. Includes both areas designated by government and private hunting and fishing areas. Trout ponds would be included. The activity is

usually seasonal.

05170 Recreational Open Space

Includes any open space which is used for recreation but no particular recreation activity is indicated. Most have been modified by man. Examples are most city parks, and some parts of parks which contain other activities.

05200 Indoor and Outdoor Recreational, and Cultural Site Activities

Includes all indoor and outdoor recreational, and cultural activities which occur on man-made sites and therefore are not dependant on the natural capability of the land for that activity.

05210 Outdoor Recreational and Cultural Site Activities

Includes activities such as viewing of animals and land-scaped vegetated areas. Includes activities such as outdoor assembly for entertainment. Includes outdoor sports activities and picnicing. The names of some of these sites are zoo, game farm, botanical garden, arboretum, amphitheater, drive-in theater, stadium, racetrack, fairground, amusement park, playing field, outdoor shooting, rifle range, bandshell, etc.

05220 Indoor Recreational and Cultural Activities

Includes all indoor cultural, recreational, entertainment, and sports activities. The names of such areas, are legitimate theatre, motion picture theatre, auditorium, exhibition and exposition hall, art gallery, museum, planetarium, library, bowling ally, indoor skating, YMCA and YWCA, health spa, indoor swimming pool, pool and billards, curling, gymnasium, etc.

06000 DWELLING ACTIVITIES

Dwelling is a site activity. It includes all land where dwelling occurs either as a permanent, as a temporary, or as a seasonal activity.

06100 Housekeeping Activities

Includes all land where the full range of housekeeping activities occur. Such activities are sleeping, cooking, cleaning & eating, etc. either on a permanent or seasonal basis.

06110 Permanent Housekeeping

All land where housekeeping activities occur on a year round basis. Also included in this class are trailer parks or an individual trailer where the owner or renter occupies the trailer at some point for longer than one season.

06120 Seasonal Housekeeping

All land on which seasonal housekeeping occurs. This would include cottaging, camping and trailer parking. Names of some areas are campgrounds and campsites, and tourist trailer parks.

06200 Other Dwelling Activities

Includes land on which dwelling occurs but whose prime function is to provide shelter and sleeping areas. the occupants are not responsible for cooking and cleaning. Such places are hotels, dormitories, retirements homes, etc.

06210 Non-Housekeeping Dwelling on a Permanent Basis  
Such activities are rooming and group dwelling by senior citizens, orphans, religious groups, etc. This also includes all residence halls at universities and dormitories such as at military camps and lumber camps.

06220 Dwelling in Hotels, Motels, and Lodges  
Dwelling by an occupant occurs on the average for a very short period. Most often it is for one night only.

07000 TRANSPORTATION AND COMMUNICATION ACTIVITIES

This class includes all land where the activity is the transferring of goods, people and information from one place to another. It includes terminal or storage activities which may be associated.

07100 Transporting Activities

Includes all land on which the activity is the transporting of goods and people. This also includes power transmission.

07110 Transporting by road

This includes all roads and road interchanges. Includes all activities related to maintaining and building roads. It includes bus terminals and parking. Parking may be public or private or associated with other activities.

07120 Transporting by Rail

Included in transporting by rail are such areas as the rail right-of-way, switching and storing of rail transporting equipment as in a rail yard, rail terminals or stations, and all activities associated with the maintenance and building of rail lines.

07130 Transporting by Air

Includes land where planes use it for landing, taking off, taxiing, and those areas immediately adjacent. Includes land used for guiding planes such as land occupied by air guidance towers, control towers, wind and radar towers, etc. Includes air terminals, aircraft maintenance buildings, and the storing of runway maintenance equipment.

07140 Transporting by Water

Includes all land used for portaging and structures to aid water travel such as canals, locks and associated dams. Includes activities related to maintaining water routes and assisting navigation such as water navigation radio towers and lighthouses. Also includes docks and wharfs associated with travel but not those strictly associated with fishing alone.

07150 Transporting by Pipeline

Transporting by pipeline includes the pipeline right-of-ways and pumping stations and all activities related to building and maintaining of pipelines.

07160 Transporting of Electricity

Transporting of electricity includes the right-of-ways for above or below ground transmission as well as switching and sub-stations, and all activities related to maintaining and building transmission lines.

**07200 Communicating Activities**

Includes all land where the activity is the transferring of information. This class includes the transmitting and receiving facility.

**07210 Telegraphing**

Includes land occupied by telegraph offices, telegraph lines, and associated line maintenance facilities.

**07220 Telephoning**

Includes all land occupied by telephone lines, associated maintenance areas, microwave towers, radio towers, and related satellite ground transmitting and receiving stations, and telephone exchanges.

**07230 Broadcasting**

Includes all land occupied by broadcasting towers, microwave towers, satellite ground transmitting and receiving stations, and associated maintenance areas, radio broadcasting stations, and television stations.

**07240 Postal Service Terminal Activities**

Includes all land where post office stations, sorting, and storage areas for mail are located.

**08000 MANUFACTURING AND STORING ACTIVITIES**

All land where physical conversion of materials take place through processing or combination with other materials so as to improve or to preserve its usefulness. Also includes all land used or occupied by facilities used for storing. Excludes agriculture site storage activities.

**08100 Electric Energy and Heat Generation**

All land which is occupied by facilities to convert energy and heat from various sources.

**08110 Energy Conversion from the Wind**

Includes all land occupied by facilities to convert energy from the wind. Such facilities as windmills would be included.

**08120 Energy Conversion from the Sun**

Includes all land occupied by facilities to convert energy from the sun. Such facilities are solar collector systems.

**08130 Energy Conversion from Water**

Includes all land occupied by facilities to convert energy from water such as hydro-electric dams, associated control dams and power houses.

**08140 Energy Conversion from Fossil Fuels**

Includes all land occupied by facilities to convert energy from fossil fuels such as thermal energy plants and diesel electricity generators.

**08150 Energy Conversion from Atomic Fission**

Includes all land that has facilities which convert energy through fission to electricity or heat. Such a facility is a nuclear power plant.

**08190 Other**

Includes energy generation from garbage or waste material.

Energy generation from geo-thermal sources  
would also be included.

**08200 Raw Material Processing**

Processing of raw materials so as to make them useful as is, or make them useful for further processing or combination with other materials.

**08210 Purifying Water**

All land occupied by facilities for the purification of water. Such facilities are water treatment and filtration plants, etc.

**08220 Processing Food and Tobacco**

Includes all land occupied by facilities for basic processing of food and tobacco. Such facilities are abattoir operations, meat packing, killing, dressing, packaging and canning poultry, canning facilities, freezing, curing fish and other food, fish meal or oil, processing fruits and vegetables, processing raw milk and cream, milling-wheat and other grains, cereal grains cooked and uncooked, feed for animals, processing leaf tobacco (grading, redrying and packing), etc.

**08230 Processing Natural Fibre, Felt, and Leather**

Includes all land occupied by facilities for tanning, curing, currying and finishing leather; spinning cotton and wool yarn; making man-made fibre, yarns, threads; making ropes cable, cordage, net, and twine; making felt and threads for sewing, etc.

**08240 Processing Rock, Stone, Clay, Sand, and Gravel**

Includes all land occupied by facilities for processing rock, stone, clay, sand, and gravel. Such facilities make clay products, cement, stone and concrete products, ready mix cement, abrasives, lime, glass and glass products, refractories, etc.

**08250 Processing Ores and Metals**

Includes all land occupied by facilities processing ores and metals. Included are facilities for dressing, beneficiating of ore, production of bullion, milling, recovering, iron and steel mills, steel pipe and tube mills, foundries, smelting, refining, rolling, casting and extruding all metals.

**08260 Processing Coal and Refining Petroleum**

Includes all land occupied by facilities for the processing of coal and the refining of petroleum. Some facilities are refineries for refining crude petroleum and producing gasoline, etc.

**08270 Processing Chemicals**

Includes all land occupied by facilities processing chemicals. Such activities are making fertilizers, making synthetic resins into moulding compounds, plastic sheet or resins, making drugs and medicine, and producing basic industrial chemicals.

**08280 Processing Wood**

Includes all land occupied by facilities processing wood. Such facilities are sawmills, planing mills,

shingle mills, veneer and plywood mills, pulp and paper mills.

**08300 Processing Processed Goods**

Processing of processed goods so as to make them useful as is or for combination with other materials.

**08310 Making Processed Foods and Tobacco Products**

Includes land occupied by facilities making processed foods and tobacco products such as soups, pickles, jams, jellies, marmalade, sauces, vinegars, processed breakfast cereals, bakery products, and other processed foods. Includes facilities for making cigarettes, cigars, tobacco, and beverages.

**08320 Making Textiles**

Includes land occupied by facilities where such activities as weaving fabrics, making batting, padding, wadding, and upholstery filler, carpets, rugs, canvas and bags take place.

**08330 Woodworking and Making Wood Products**

Includes land occupied by facilities making sash, door and other millwork, wooden boxes, coffins, caskets, asphalt roofing, paper bags, and boxes.

**08340 Making Chemical Products**

Includes land occupied by facilities making chemical products such as paint and varnish, soaps and cleaning compounds, toilet preparatories and other chemicals, rubber and plastics.

**08350 Printing and Publishing**

Includes all land occupied by facilities where such activities as printing, platemaking, typesetting, binding, and publishing occur.

**08360 Making Structural Materials**

Includes all land occupied by facilities for making structural materials made of wood, cement, and metal.

**08400 Assembling Products**

Manufacturing products by assembling processed materials.

**08410 Making Clothes and other Textile Products**

Includes land occupied by facilities making clothes and other textile products such as hosiery and other knitting products, clothing, fur goods, foundation garments, shoes, leather gloves, luggage, etc.

**08420 Making Building Components, Furniture, and Fixtures  
Predominantly of Wood**

Includes all land occupied by facilities for making wood furniture and fixtures, prefab houses, and house parts.

**08430 Making Containers, Structural Components, Furniture,  
Fixtures and Fittings Predominantly of Metal**

Includes all land occupied by facilities for making metal fabrications, metal furniture, etc.

**08440 Making Scientific Equipment and Precision Instruments**

Includes all land occupied by facilities for making

scientific and professional equipment, jewelry, and silverware.

08450 Making Machinery, Mechanical Equipment, and Hardware  
Includes all land occupied by facilities making wire and wire products, hardware, tools and cutlery, heating equipment, machine shops, commercial refrigeration, and air conditioning machinery and equipment, agricultural implements and machinery.

08460 Making General Equipment Including Household Appliances  
Includes all land occupied by facilities making refrigerators, stoves, small household appliances, etc.

08470 Making and Assembling Automobiles, Aircraft, Rail, and Marine Products  
Includes all land occupied by facilities making transportation equipment, tractors, and construction equipment such as bulldozers, etc.

08500 Storage Activities

Includes all land which is used for or occupied by facilities used for storing. Excludes land used for storage immediately associated with agricultural, forestry, and extraction activities.

08510 Storing in Reservoirs and Tanks  
Includes all land used for storing liquids and gasses either in reservoirs or tanks and the immediate associated facilities.

08520 Storing Vehicles  
Includes all land used for storing vehicles. Includes storing associated with the manufacturing, selling, and use of vehicles. Excludes parking. Storage may be in buildings or in the open air.

08530 Warehousing  
Includes all land used for warehousing. Does not include structures used for storing dry bulk material. Usually used for storing manufactured and packaged material.

08540 Storing in Enclosed Structures other than Buildings and Tanks.  
Such structures are grain elevators, wood teepees for salt, sand mixes, and other bulk material which has to be protected from the elements.

08550 Open Air Storage  
Includes all land used for storing materials either raw (such as logs stored at a pulp mill) or manufactured such as cement products, metal ingots, etc. which do not have to be protected from the weather.

08600 Treating and Disposal of Wastes

Processing of waste into useful products or before it can be released into the environment. This includes the disposal of waste.

08610 Treating and Disposal of Liquid Wastes  
Includes all land occupied by facilities for treating and disposal of liquid wastes such as sewage treatment

plants, special toxic liquid reprocessing plants, and disposal areas.

08620 Treating and Disposal of Gaseous Wastes  
Includes all land occupied by facilities for treating of gaseous wastes.

08630 Treating and Disposal of Solid Wastes  
Includes all land occupied by facilities for treating or processing solid wastes such as incinerators; disposal areas; paper, can, and bottle collecting areas; scrap metal and automobile wrecking and crushing yards; etc. Energy generation from wastes should be included in 08190.

08640 Treatment and Disposal of Radioactive Wastes  
Includes all land occupied by facilities for the processing or disposal of radioactive wastes.

08900 Undifferentiated Manufacturing and Storage Activities  
Includes all land which is being used for manufacturing and/or storage activities but cannot be separated into a specific subactivity or where the more than one subactivities are so mixed as to be inseparable.

#### 09000 COMMERCIAL ACTIVITIES

Land on which the activities are buying and selling of merchandise.

09100 Wholesaling  
Land on which the activities are buying merchandise for resale to retailers, to industry, commercial, institutional or professional users; to other wholesalers; or in acting as agents in connection with such transactions.

09200 Retailing  
Land on which the activities are buying commodities for resale to the general public for personal or household consumption and in providing related services such as installation and repair.

09300 Providing Commercial Services  
All land on which the activity is to provide commercial services. Most activities are not provided by government or institutions.

09310 Providing Financial, Insurance, and Real Estate Services  
Includes all land which is occupied by facilities providing financial services such as banking, lending and saving, investing underwriting, insuring, accounting, and real estate, etc.

09320 Providing Personal Services  
Includes all land occupied by facilities retailing personal service such as barbers, hairdressers, laundries, cleaners, pressers, self service laundries, dry cleaners, funeral services, etc.

09330 Providing Repair and Rental Services  
Includes all land occupied by facilities providing repair service such as motor vehicle repair, shoe repair, watch and jewellery repair, appliance repair, service stations, car rental, etc.

09340 Providing Service to Business  
This includes all land used to provide services to business and



sometimes to governments. Such services are cleaning services, research and development banks, promoting and advertising services, photographic services, information data processing, etc.

09350 Providing Professional Services

Includes all land which is occupied by facilities providing professional services to business and government management. Such professional services are consulting, architecture services, engineering and scientific services, contractors, etc.

10000 PROVIDING INSTITUTIONAL SERVICES

Includes all land providing services. These services can be provided by government agencies, private institutions, or private enterprises. Some activities are exclusively government, others are not.

10100 Providing Legislative, Judicial, and Legal Service

Includes all land occupied by facilities which provide legislative, judicial, and legal services.

10110 Governing

Includes all land occupied by facilities involved in government such as city halls and associated municipal offices, Parliament buildings, and all buildings occupied by government offices. Excludes crown corporations.

10120 Providing Judicial Services

Includes all land occupied by facilities providing judicial services. Such facilities are court houses.

10130 Providing Legal Services

Includes all land occupied by facilities providing legal services. Such facilities are lawyer's offices, etc. Includes legal aid offices.

10200 Providing Protective and Custodial Services

Includes all activities which provide protective and custodial services.

10210 Policing and Guarding

Includes all land occupied by facilities providing policing and guarding services such as police stations, commissionaire, and security guard offices, etc.

10220 Fire-fighting

Includes all land occupied by facilities for fire-fighting such as fire halls or stations.

10230 Detaining

Included all land occupied by facilities for detaining people. Such places are detention centres, prisons, jails, etc.

10240 Providing National Defence

Includes all land which is used for national defence bases and training areas. Includes radar bases and exclusively military air bases.

10300 Providing Educational Services

Includes all land occupied by facilities providing educational services. Such facilities are schools, universities, technical colleges, driving schools, language training centres, etc.

10400 Providing Health, Medical, and Care Service

Includes all activities involved in providing health, medical, and care services.

10410 Providing Health and Medical Services

Includes all land occupied by facilities providing health and medical services. Such services are doctor's offices, medical buildings, medical diagnosis and treatment centres, auxiliary services, hospitals, convalescent homes, etc.

10420 Providing Non-medical Care Services

Includes all land occupied by facilities providing non-medical care services. Such facilities are homes for retarded children, physically handicapped, counselling places, homes for blind, etc.

10500 Providing Welfare, Philanthropic, and Charitable Services

Includes all land occupied by facilities providing welfare, philanthropic, and charitable services. Such facilities are charity organizations, charitable institutions or societies, welfare centres, welfare organizations, etc.

10600 Religious and Associated Activities

Includes all land occupied by facilities for worshipping and burying.

10610 Worshipping

Includes all land occupied by facilities for worshipping. Such facilities are churches, mosques, synagogues, etc.

10620 Burying (Cemetaries)

Includes all land occupied by cemetaries.

10700 Providing a Place for Communication and Assembly

Includes all land occupied by facilities providing a place for communication and assembly. Such facilities are meeting halls, community centre, convention halls.

11000 OTHER

Includes all land which does have an activity taking place on it, but these activities cannot be placed in any one of the above classes.

11100 Land for Research and Conservation

Land on which the activity or use of land is for ecological research, preservation of soil, or conservation of water.

12000 UNUSED LAND-IDLE LAND

Includes all land on which there is at present no activity taking place but on which there is perceived to have been activity in the past. The stress is on the fact that past activity must be evident either by abandoned or derelict buildings or structures or by other visible evidence.

13000 NO PERCEIVED ACTIVITY

Includes all land on which there is no perceived activity taking place by whatever data source is used in mapping. Also there should be no visible evidence of former activities. This does not mean that no activity is taking place on the land but by whatever means or combination of means is used to gather the data no activity is perceived to be taking place.

**14000 LAND IN TRANSITION**

Includes all land on which there is evidence that at some future date there may be a land use activity on the land. The stress here is on the may because the land cover or surface may be disturbed or changed by human activity in preparation or testing for the future activity but may not proceed to the future activity. An example is land being disturbed for future residential development but the process never proceeds to actual development due to economic or political reasons.

## APPENDIX III

## LAND COVER CLASSIFICATION SYSTEM

## 01000 WOODY VEGETATION

01100 Mature Trees01110 Regular Spaced (Planted)

01111 Fruit and Nut Trees

01112 Other Deciduous Trees

01113 Coniferous Trees

01120 Irregular Spaced

01121 Deciduous Trees

01122 Coniferous Trees

01200 Small Trees, Shrubs, Bushes, Dwarf Trees01210 Regular Spaced (Planted)

01211 Small Trees and Dwarf Trees

01212 Shrubs and Bushes

01220 Irregular Spaced

01221 Small Trees

01222 Dwarf Trees

01223 Shrubs and Bushes

01300 Vines

## 02000 GRASSES AND OTHER NON-WOODY PLANTS

02100 Annually Cultivated Crops02110 Row Crops

02111 Corn

02112 Vegetables

02113 Root Crops and Tubers

02114 Beans and Peas

02115 Sunflowers

02117 Tobacco

02118 Flowers and Bulbs

02119 Other

02120 Close Grown Crops

02121 Wheat

02122 Oats

02123 Barley

02124 Buckwheat

02125 Millets

02126 Mixed Grain

02129 Other

02190 Other02200 Grasses and/or Legumes, Sedges, and Reeds02210 Improved Grass and/or Legume Cover

02211 Improved Grass

02212 Legumes

02213 Mixed

02220 Unimproved Grassland, Reeds, and Sedges

02221 Grasses with Very Few Weeds

02222 Grasses and Many Weeds

02223 Reeds and Grasses

02229 Other

02300 Mosses and/or Lichens

02310 Mosses Dominant

02320 Lichens Dominant

02330 Mixed

02400 Other Non-Woody Plants

## 03000 DENUDED (BARE) SURFACES

03100 Rock Surfaces

- 03110 Natural
- 03120 Man-Made
- 03200 Unconsolidated Material Surfaces
  - 03210 Natural
  - 03220 Man-Made
- 04000 CONSTRUCTED COVER
  - 04100 Structures
    - 04110 Buildings
    - 04120 Other Structures
      - 04121 Solid or Enclosing Structures (Other than Buildings)
      - 04122 Open Structures
      - 04123 Other
  - 04200 Surfaces
    - 04210 Hard Surfaces
    - 04220 Unconsolidated Surfaces
- 05000 WATER
  - 05100 Permanent and Solid
    - 05110 Snow
    - 05120 Ice
  - 05200 Liquid
    - 05210 Streams, Rivers, and Canals
      - 05211 Streams and Rivers
      - 05212 Canals
    - 05220 Ponds, Lakes, and Reservoirs
      - 05221 Lakes and Ponds
      - 05222 Reservoirs and Other Artificial Water Surfaces

## APPENDIX IV

LAND USE COVER CLASSIFICATION SYSTEM  
DEFINITION OF SELECTED CLASSES

## 01000 WOODY VEGETATION

Includes all land on which woody vegetation forms the dominant cover or at least 25 percent of a mapping unit with mixed cover.

01100 Mature Trees

Includes all land on which mature trees are one of the dominant covers according to the above criteria. Most mature trees are usually 6-9 metres in height.

## 01110 Regular Spaced (Planted)

Includes all land on which mature trees are one of the dominant covers according to the above criteria of spacing and height, and show evidence of being planted by usually being regularly spaced. Usually these trees will show groupings of trees of equal height.

## 01111 Fruit and Nut Trees

Includes all land on which the mature trees are fruit or nut trees according to the above criteria. In this class the height of the trees may be on or below the height criteria. Mature orchards usually fall in this category. Because of spacing there is usually another cover between the trees which occupies more than 25 percent of the area.

## 01112 Other Deciduous Trees

Includes all land covered by broadleaved trees which fit the above criteria. Fruit and nut trees are excluded.

## 01113 Coniferous Trees

Includes all land covered by needleleaved trees and fits above criteria.

## 01120 Irregular Spaced

Includes all land on which mature trees are one of the dominant covers according to the above criteria, but which are irregular in their spacing.

## 01121 Deciduous Trees

Includes all land covered by broadleaved trees which fit the above criteria.

## 01122 Coniferous Trees

Includes all land covered by needleleaved trees which fit the above criteria.

01200 Small Trees, Shrubs, Bushes, Dwarf Trees

Includes all land on which immature trees, shrubs, bushes, and naturally short trees (dwarf) are the dominant cover; or are one of the dominant covers with 25 percent or more crown cover. This vegetation cover is under the 6-9 metre height limit.

## 01210 Regular Spaced (Planted)

Includes all land on which small trees, shrubs, bushes and dwarf trees which satisfy the above height and density criteria, and which have some regular spacing indicating planting. Includes naturally small and dwarf trees, immature trees, ornamental shrubs and bushes, and berry bushes.

01211 Small Trees and Dwarf Trees

Includes all land following the above criteria which is covered by naturally small dwarf trees, trees pruned small, and immature trees. Includes dwarf fruit trees.

01212 Shrubs and Bushes

Includes all land following the above criteria which is covered by shrubs and bushes. Includes ornamental shrubs and bushes, and berry bushes.

01220 Irregular Spaced

Includes all land covered by small trees, shrubs, bushes, and dwarf trees which, following the rules of density and height, are irregularly spaced. Includes trees stunted by climatic and soil conditions.

01221 Small Trees

Following the above criteria, includes all land covered by trees which are naturally small under optimum conditions and also immature trees under the height limit.

01222 Dwarf Trees

Following the above criteria, includes all land covered by trees which under optimum conditions would be much taller, but are dwarfed due to adverse climate and/or soil conditions.

01223 Shrubs and Bushes

Following the above criteria, includes all land covered by shrubs and bushes.

01300 Vines

Includes all land whose dominant cover is vines. Very seldom do vines form the dominant cover naturally.

02000 GRASSES AND OTHER NON-WOODY PLANTS

02100 Annually Cultivated Crops

Includes all land which is planted in crops. This land is tilled annually. Normally there is only one crop forming the land cover but there can be exceptions. Cropland planted to legumes and grasses are not included. Land which has been ploughed should not be included as this does not indicate at all times that annually cultivated crops will be grown.

02110 Row Crops

Land which has crops planted in rows a distinguishable distance apart. Included are corn, vegetables, sugar beets, potatoes, most seed crops, tobacco, flowers and bulbs, etc.

02120 Close Grown Crops

Land which is covered by close grown crops but still has much bare soil between close rows. Included are all the small grains such as wheat, oats, barley, rye, buckwheat, millets, and mixed grains.

02200 Grass and/or Legumes, Sedges, and Reeds

Land which is covered by vegetation such as grasses and/or legumes, sedges, and reeds. Where the cover is mixed this class must occupy at least 25 percent of cover.

02210 Improved Grass and/or Legume Cover

Land which grows grasses and/or legumes. This includes land which produces grasses and legumes which are harvested mechanically; land which is planted in legumes and grasses and grazed by animals, but for only a few years and then used for cultivated crops; and permanent pasture which is tilled only to reestablish the grasses and legumes. This also includes large grass areas which are kept closely cut. Such cover occurs on turf or sod farms, lawns and special playing fields. Normally a large area has one uniform cover.

02220 Unimproved Grassland, Reeds, and Sedges

Includes all land dominated by grass, reeds, or sedges but not improved. These areas may be subjected to continuous disturbance such as mowing and grazing. Some grasslands are natural and will remain so. Others are the early stages of plant succession on abandoned farmland or former forested land. These will revert to forest cover if left undisturbed. Grass covered wetland and tundra areas are included. Land areas in this category may range from mostly grass cover to where grass forms only a part of the cover. Where other covers are mixed with this class the 25 percent cover rule applies.

02300 Mosses and/or Lichens

Includes all land where mosses and/or lichens form at least 25 percent of the cover. Such an example is the spruce-lichen forests.

02400 Other Non-Woody Plants

Includes all land which is covered by non-woody plants which do not fit into the above classes.

03000 DENUDED (BARE) SURFACES

Land covered by bare surfaces which are naturally occurring or result from man's activities.

03100 Rock Surfaces

Land covered by exposures of bedrock. These rock surfaces can be either naturally occurring or due to man's activities. Rock knobs, cliffs, and quarries are examples.

03200 Unconsolidated Material Surfaces

Land covered by unconsolidated material due to natural or man's activities. These materials may be clay, salt, sand, gravel, etc. Some examples are gravel pits, sand dunes, beaches, talus, top soil removal.

04000 CONSTRUCTED COVERS

Land covered by constructed cover such as building structures and constructed surfaces. Excludes land where material is removed such as quarries, gravel pits, or top soil.

04100 Structures

Land covered by structures including buildings; solid structures such as dams; enclosing structures other than buildings such as tanks, cooling towers, etc.; and open



structures such as radio towers, transmission towers, etc.

04200 Surfaces

Includes all land covered by constructed surfaces. These surfaces can be hard surfaces such as paved roads and areas. Such surfaces can be constructed of cement, asphalt, metal, etc. These surfaces can also be unconsolidated constructed surfaces, though in some cases these may be compacted such as dirt and gravel roads, railway beds, etc.

05000 WATER

All surfaces which are covered by water either as a liquid or a solid. Ocean areas are excluded.

05100 Permanent and Solid

Includes all land covered by ice and snow on a relatively permanent basis. This includes valley glaciers, icecaps, and perennial snow.

05200 Liquid

Includes all surface covered by water in the liquid form. The area covered can be flowing such as in canals, streams, and rivers or relatively still such as in lakes, ponds, or reservoirs. Some water channels and areas are man-made. If a canal forms part of a drainage system only the man-made section should be mapped in the canal class. If reservoirs are created, only the flooded land should be classified as such. Sewage Lagoons are included.

## APPENDIX V

## COVER AND ACTIVITY CLASS EQUIVALENTS TO THE CLI LAND USE CLASSES

| CLI Land Use Class                          | Activity and/or Cover Equivalent   | Comments   |
|---|--|--|
| B - Built-up Area                           | Cover 04000 - Constructed Surface  | The CLI Built-up Area class is best described by a cover. This CLI category in operational terms included much non-urban land especially where this land was surrounded by urban land. |
| E - Mines, Quarries Sand and Gravel Pits    | Activity 04100 - Surface   | Almost equivalent classes with minor exceptions.   |
| O - Outdoor Recreation                      | Activity 05100 - Land Dependent Activities<br>+<br>Activity 05210 - Outdoor Recreational and Cultural Site Activities<br>+<br>Activity 06120 - Seasonal Housekeeping<br><br>Excluding:<br>Activity 05160 - Recreational Hunting and Fishing  | The only part of 'O' not covered by new classes are drive-in theatres which fall in another class.   |
| H - Horticulture Poultry and Fur Operations | Activity 01112 - Growing Vegetables<br>+<br>Activity 01113 - Berry Production<br>+<br>Activity 01116 - Growing Flowers and Bulbs<br>+<br>Activity 01140 - Growing Ornamental Shrubs and Trees<br>+<br>Activity 01150 - Sod Production<br>+<br>Activity 01212 - Housing Poultry<br>+<br>Activity 01213 - Housing Fur - bearing Animals<br>+<br>Activity 01222 - Poultry Feeding and Holding Areas | This class can best be described by combining Activity classes drawn primarily from level 4.   |

| CLI Land Use Class                             | Activity and/or Cover<br>Equivalent   | Comments  |
|--|---|---|
| H - Continued                                  | Activity 01240 - Growing Plants<br>+                  in Greenhouses<br>Activity 01270 - Mushroom Growing<br>+<br>Activity 01280 - Beekeeping and<br>Honey Making   |   |
| G - Orchards and<br>Vineyards                  | Activity 01131 - Tree Fruit<br>+                  Production<br>Activity 01132 - Grape<br>Production  | This class can only be directly<br>described by fourth level Activities |
| A - Cropland                                   | Activity 01110 - Growing Annual<br>+                  Tillage Crops<br>Activity 01260 - Tobacco Curing<br>and Packing<br>Excluding:<br>Activity 01112 - Growing Vegetables<br>Activity 01116 - Growing Flowers<br>and Bulbs |   |
| P - Improved<br>Pasture<br>and Forage<br>Crops | Cover 02210 - Improved Grass<br>+                  and/or Legumes<br>Activity 01211 - Housing Livestock<br>+<br>Activity 01221 - Livestock<br>Feeding and<br>Holding Areas  | Mainly a Cover type except for<br>specific site activities              |
| K - Rough Grazing<br>and Rangeland             | Cover 02220 - Unimproved<br>+                  Grassland,<br>Reed, and Sedges<br>Activity 01122 - Grazing   | Primarily a Cover type  |
| T - Productive<br>Woodland                     | Cover 01100 - Mature Trees<br>Excluding:<br>Activity 03130 - Preserving<br>Wildlife<br>Activity 01122 - Grazing<br>Activity 01131 - Tree Fruit<br>Production<br>Activity 05000 - Recreational<br>Activities                 | Primarily a Cover type  |

| CLI Land Use Class                      | Activity and/or Cover Equivalent |   | Comments               |
|---|----------------------------------|---|------------------------|
| U - Unproductive Forest                 | Cover 01220                      | - Irregular Spaced Small Trees, Shrubs, Bushes, Dwarf Trees | Primarily a Cover type |
|   | Excluding:<br>Activity 03130     | - Preserving Wildlife                                       |                        |
|   | Activity 01122                   | - Grazing   |                        |
|   | Activity 05000                   | - Recreational Activities                                   |                        |
| M - Swamp, Marsh, and Bog               | 01000/05200<br>+                 | - Woody Vegetation/<br>Water Combination                    | Primarily a Cover type |
|   | 02220/05200                      | - Unimproved Grassland, Reeds, and Sedges/Water Combination |                        |
| S - Sand Flats, Dunes, and Beaches      | Cover 03000                      | - Denuded (Bare) Surfaces                                   | Cover type             |
| and;                                    |                                  |   |                        |
| L - Rock and Other Unvegetated Surfaces | Excluding:<br>Activity 04100     | - Surface Extraction  |                        |
| Z - Water                               | Cover 05200                      | - Liquid Water  | Cover type             |

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