

**Environmental Reference Manual
for the Review of
Subdivisions in Alberta**



November 1996

**Standards and Guidelines Branch
Environmental Assessment Division
Environmental Regulatory Service**

This manual provides Subdivision Authorities, planners, planning consultants and development officers with tools that can assist them to screen for, avoid and/or resolve environmental concerns associated with subdivision applications.

Subdivision authorities are obliged to consider a variety of environmental factors in their decision as per the *Subdivision and Development Regulation*. In addition, users will find the Manual's advice helpful with respect to the environmental aspects of development reviews and as a reference document for the preparation of land use plans. Moreover, the Manual will assist users to pinpoint when a proposed development will likely require environmental approvals or authorizations pursuant to the *Environmental Protection and Enhancement Act* (APEA), the *Water Resources Act* and/or the *Public Lands Act*.

Questions or comments regarding the Environmental Reference Manual should be directed to:

George Murphy
Science and Technology
Alberta Environment
4th Floor, 9820 - 106 Street
Edmonton, AB T5K 2J6
Phone (403) 427-8472
Facsimile (403) 422-4192
Email george.murphy@gov.ab.ca

Additional copies of the Environmental Reference Manual may be obtained by contacting:

Information Centre - Alberta Environmental Protection
Main Floor, 9920 - 108 Street
Edmonton, AB T5K 2M4
Phone (403) 422-2079
Email infocent@env.gov.ab.ca

Regulatory Approvals Centre (RAC)
Alberta Environmental Protection
Main Floor, Oxbridge Place
9820 - 106 Street
Edmonton, AB T5K 2J6
Phone (403) 427-6311
Facsimile (403) 422-0154

Environmental Reference Manual

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CHAPTER 1 - HOW TO USE THE ENVIRONMENTAL REFERENCE MANUAL

A. *Origin and Development of the Manual*

The Standards and Guidelines Branch of Alberta Environmental Protection is committed to providing subdivision authorities (SAs) with tools that can assist them to screen for, avoid and/or resolve environmental aspects of proposed subdivision applications. The Branch, in consultation with other groups in the Department, other provincial Departments and an external stakeholder advisory group, has determined that this screening objective can be achieved by creating both this Manual and a closely related software program (Environmental Screening Process Questionnaire Program). The external stakeholder advisory group included representative from the Alberta Association of Municipal Districts and Counties (AAMD&C) and the Alberta Urban Municipalities Association (AUMA).

B. *Relationship of the Manual with the Municipal Government Act and the Subdivision and Development Regulation*

The *Municipal Government Act* provides that in deciding on a subdivision application, a SA must not approve an application unless the land is suitable for the purpose for which the subdivision is intended. Environmental concerns play a key role in determining the suitability of land for a particular use. This Manual provides SA planners, planning consultants and development officers with tools that can assist them to screen for, avoid and/or resolve environmental concerns in relation to subdivision applications. SAs are reminded that their decision must comply with the standards, setbacks and other requirements set forth in the *Subdivision and Development Regulation*.

C. *Other Uses of the Manual*

While the Manual focuses on the review of subdivision applications, users will find the Manual's advice helpful with respect to the environmental aspects of development reviews and as a reference document for the preparation of land use plans.

Furthermore, the Manual will assist users to pinpoint when a proposed development will likely require environmental approvals or authorizations pursuant to the *Environmental Protection and Enhancement Act* (APEA), the *Water Resources Act* and/or the *Public Lands Act*.

D. How to Use the Manual

Users are encouraged to read the entire Manual to become familiar with its contents. When reviewing a specific subdivision or development proposal, the first step is to map it. This topic is covered in Appendix D - *Guidelines for Mapping Proposed Subdivisions*. Good maps should show exactly what is proposed and its relationship with its natural and built (man-made) environment. With this environmental information in hand, the user can scan the Manual's table of contents for relevant chapters and sections. Upon reading these, the user may be prompted to ask new questions. Often an answer can be found by going to the end of a section, where, in many cases, links to other related parts of the Manual are identified.

The user will find that there is some repetition in parts of the Manual, particularly with respect to addresses. This has happened because each module has been designed to stand alone and be complete in itself. When working on a subdivision or development application, users may wish to photocopy parts of the Manual that are of interest and include them with the file.

Throughout the Manual reference is made to related documents that users may consult for additional detailed information (see Appendix C - References).

E. Referencing the Manual as a Source

Whenever any part of this Manual is used or referred to in a report or presentation, users are requested to acknowledge the Manual as the source.

F. Summary of Chapters and Appendices

The Manual is divided into a number of chapters and appendices to make it easier to find information. Where applicable, links to other relevant parts of the Manual are identified within the sections.

- Chapter 1 introduces and supplies instructions on how to use the Manual.
- Chapter 2 focuses on the potential environmental implications of a wide variety of developments.
- Chapter 3 gives advice on servicing arrangements for the proposed subdivision.
- Chapter 4 discusses the implications of environmental features such as hilly areas, valleys, mountains and water features.
- Chapter 5 considers the potential for land use conflicts that might arise when the proposed development is human oriented, for example residential or recreational, and a nearby development has public health, safety or quality of life concerns.
- Chapter 6 examines the opposite situation to that discussed in Chapter 5.
- Appendix A presents verbatim environmental references in the *Municipal Government Act*.
- Appendix B provides a glossary.
- Appendix C contains a list of references.
- Appendix D offers guidelines on how to create subdivision maps, especially for complex subdivision proposals.
- Appendix E presents guidelines for development adjacent to Alberta Environmental Protection's water supply reservoirs.
- Appendix F examines the Department's role in reviewing proposed golf course developments.

G. Understanding Proximity Distances in the Manual

There are many instances in the Manual where proximity distances are given. Essentially, there are two types. Firstly, there are minimum separation distances between land uses as identified in the *Subdivision and Development Regulation*. An example of this type is the 300 metre separation distance which must be maintained between a proposed residence and the working area of a nearby wastewater treatment plant. Secondly, there are proximity distances that are not stated in a regulation and are not necessarily recommended setback distances or buffers. Rather these proximity distances delineate an area of concern surrounding a proposed subdivision or development. If a specified natural feature or land use is within this area of concern, it is recommended that the potential for conflicts be examined carefully and resolved, perhaps by implementing a separation distance. Examples of this type are found in Chapter 4, section E. which explores conflicts that may arise when a proposed subdivision is within 100 metres of various environmental features.

H. Limitations

The Department of Environmental Protection does not accept any responsibility for the user's use or interpretation of this Manual. In the event of conflict between the Manual and any legislation, it is the user's responsibility to interpret and act in compliance with the legislation.

It is the user's responsibility to properly identify all relevant environmental factors associated with a specific subdivision application. The Manual may not necessarily address all relevant factors.

The statements contained in the Manual are advisory and general in nature. It is the user's responsibility to evaluate and act on the advice provided in the Manual.

CHAPTER 2 - PRIMARY LAND USES

A. *Introduction to Primary Land Uses*

This chapter discusses issues and concerns that may arise for subdivision and development proposals under each of the eleven major land use classes identified in sections B. through L.

B. *Agriculture*

i. Extensive Agriculture

If a significant water course, coulee or other natural feature traverses the common boundary between the proposed extensive agricultural lots, it is recommended that the proposed subdivision be redesigned taking into account this feature. Consideration should be given to possible future resubdivision of the agricultural parcels and the protection of the natural feature at that time by mechanisms including lot boundary setbacks or by dedicating environmental reserve.

Links to Other Relevant Parts of the Manual

Chapter 4 Environmental Features (Hazards, Constraints and Environmental Protection)

ii. Intensive Livestock Operation

The *Development Permitting Process for Intensive Livestock Operations (ILOs)* should be utilized as a guide for the review of both subdivision and development permit applications. This process requires the use of the document entitled *Development of Intensive Livestock Operations - Screening for Environmental Sensitivity Reference Manual* which is based on the *Code of Practice For the Safe and Economic Handling of Animal Manures*. All of these documents were prepared by Alberta Agriculture, Food and Rural Development in consultation with the livestock industry and may be obtained from the Policy Secretariat, Alberta Agriculture, Food and Rural Development (Edmonton, 427-5359).

Links to Other Relevant Parts of the Manual

Chapter 6 Section B. Commercial, Food Establishment, Institutional, Recreational and/or Residential Buildings in Close Proximity to a Proposed Development that has Public Health, Safety or Quality of Life Concerns - General

C. *Airport/Airstrip*

If the proposed airport or airstrip is situated within the built up area of a city or town and/or will have scheduled passenger carrying services, the applicant should apply for a Certificate from Aerodrome Standards and Certification, Transport Canada (Edmonton, 495-5181).

Links to Other Relevant Parts of the Manual

Chapter 6 Section B. Commercial, Food Establishment, Institutional, Recreational and/or Residential Buildings in Close Proximity to a Proposed Development that has Public Health, Safety or Quality of Life Concerns - General

D. Cemeteries, Crematories, Columbaria, Mausolea

Approvals pursuant to the *Cemetery Act* and its Regulations are required for cemeteries, crematories, columbaria and mausolea (columbarium means a structure designed for storing the ashes of dead human bodies or other human remains that have been cremated; mausoleum means a structure wholly or partly above the level of the ground and designed for the burial or storage of dead human bodies). Requests for an approval should be directed to Market Standards, Housing and Consumer Affairs Division, Alberta Municipal Affairs (Edmonton, 427-5210). For both cemetery and crematory applications the local Regional Health Authority is consulted with respect to environmental suitability and implications to human health, and the local municipality is asked for its position. An environmentally suitable site for a cemetery has low water table conditions (Appendix B - Glossary, Water Table) where there is not less than a 1.5 metre separation between the water table and the closest point of the grave. The site's water table conditions can be evaluated by utilizing Alberta Environmental Protection's *Interim Guidelines for the Evaluation of Water Table Conditions and Soil Percolation Rate for Unserviced Residential Subdivisions* available from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475).

E. Commercial Development - Use of Pesticides

The proposed commercial development may require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to Division 4, Part 2: Pesticides (b)(ii), *Activities Designation Regulation (110/93)* of the *Environmental Protection and Enhancement Act*).

Specific questions regarding the approvals process and requirements may be directed to the Pesticides Management Branch (Edmonton, 427-5855).

Applications for approval should be made in accordance with the *Approvals Procedure Regulation (113/93)*, *Environmental Protection and Enhancement Act* and should be submitted to:

Manager
Regulatory Approvals Centre (RAC)
Alberta Environmental Protection
Main Floor, Oxbridge Place
9820 - 106 Street
Edmonton, AB T5K 2J6 Phone 427-6311
..... Fax 422-0154

Links to Other Relevant Parts of the Manual

Chapter 2 Section I.i. Golf Course

F. Food Establishment

There are numerous references to setbacks associated with food establishment buildings and subdivisions in Sections 12 and 13 of the *Subdivision and Development Regulation, Municipal Government Act*. The definition of a food establishment is to be found in the *Food Regulation 240/85, Public Health Act* (Appendix B - Glossary).

H. Institutional

i. School or Hospital

There are numerous references to setbacks associated with school and hospital buildings and subdivisions in Sections 12 and 13 of the *Subdivision and Development Regulation, Municipal Government Act*.

Links to Other Relevant Parts of the Manual

Chapter 2	Section H.ii. Public Facility
Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)
Chapter 5	Potential Land Use Conflicts - Nearby Developments that have Public Health, Safety or Quality of Life Concerns

ii. Public Facility

In general terms, a public facility is a building such as a hospital or school, or a major recreational facility, for example a major campground, that the Alberta Energy and Utilities Board (AEUB) may designate as a public facility based upon the complexity of evacuation taking into consideration the number and characteristics of the people using the facility, and the frequency and duration of their use.

According to Sections 9(1) of the *Subdivision and Development Regulation, Municipal Government Act* "A subdivision authority must send a copy of a subdivision application and a development authority must send a copy of a development application for a development that results in permanent additional overnight accommodation or public facilities, as defined by the AEUB, to the AEUB if any of the land that is subject to the application is within 1.5 kilometres of a sour gas facility or a lesser distance agreed to, in writing, by the AEUB and the subdivision authority."

Referrals should be sent to:

Operations Department
Alberta Energy and Utilities Board
640 5th Avenue S.W.
Calgary, AB T2P 3G4 Phone 297-3714

Links to Other Relevant Parts of the Manual

Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)
Chapter 5	Section C. Setbacks from Gas and Oil Wells, Batteries, Processing Plants or Pipelines

I. Recreational

i. Golf Course

It is recommended that Appendix F - Role of Alberta Environmental Protection in Golf Course Development be utilized as a guide for both the subdivision application and development permit processes.

Links to Other Relevant Parts of the Manual

Chapter 2	Section E. Commercial Development - Use of Pesticides Section L.ix. Water Resources Related Works
Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)
Appendix F	Role of Alberta Environmental Protection in Golf Course Development

ii. Major Campground

A major campground may be considered to be a public facility by the Alberta Energy and Utilities Board (AEUB) if it is near a sour gas facility. It may have complex servicing requirements and be in the vicinity of or within sensitive environmental features.

Links to Other Relevant Parts of the Manual

Chapter 2	Section H.ii. Public Facility
Chapter 3	Servicing Arrangements
Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)
Chapter 5	Section C. Setbacks from Gas and Oil Wells, Batteries, Processing Plants or Pipelines

iii. Shooting/Archery Range

Refer to the *Shooting Range Guidelines for Province of Alberta* jointly produced by the Alberta Justice and Natural Resources Service, Alberta Environmental Protection. For more information contact the Office of the Chief Provincial Firearms Officer, Regulatory and Administrative Support Branch, Alberta Justice (Edmonton, 427-0437).

iv. Waterside Recreational Facility

A waterside recreational facility is a facility such as an amusement park, camp, campground, marina, lodge, recreational vehicle park or resort that is bounded by or containing the bed and shore of a water feature.

Links to Other Relevant Parts of the Manual

Chapter 2	Section L.ix. Water Resources Related Works
Chapter 3	Servicing Arrangements
Chapter 4	Section F. Proposed Subdivision Area Bounded by or Contains the Bed and Shore of a Water Feature Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion Section J. Significant Reduction in Native Vegetation Cover

J. Residential

i. Residential - Serviced

Each lot of a proposed serviced residential subdivision should have a Suitable Development Area (Appendix B - Glossary). This area is environmentally suitable for the construction and sustainable use of a residence, ancillary buildings and a driveway. Specifically, the Suitable Development Area of a serviced residential lot:

- (1) has low water table conditions (Appendix B - Glossary, Water Table);
- (2) is level or has slopes not exceeding a grade of 15% (8.53 degrees or 6.7 to 1);
- (3) can support a connection to a waterworks system that provides the residence with an adequate, long term supply of potable water;
- (4) can support a connection to a wastewater system where there is minimal, long term risk that the connection will malfunction and result in the contamination of surface and/or groundwater;
- (5) does not contain an Environmentally Significant Area (Appendix B - Glossary);
- (6) presents minimal risk to property, health or safety by natural environmental hazards such as flooding, erosion and slope instability; and
- (7) presents minimal risk to property, health, safety or quality of life by non operating, operating or proposed land uses within the area or its vicinity (Appendix B - Glossary - Public Health, Safety or Quality of Life Concerns).

With respect to (7) above, there are numerous references to setbacks associated with residential buildings and subdivisions in sections 12 and 13 of the *Subdivision and Development Regulation, Municipal Government Act*.

If river flooding and erosion, or slope instability is a concern then the following guidelines should be used.

- *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion*
- *Interim Guidelines for the Subdivision of Land Adjacent to Steep Valley Banks*

These guidelines may be obtained from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475).

Links to Other Relevant Parts of the Manual

Chapter 3	Section D. Connection to an Existing Approved or Proposed System or Facility
Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)
Chapter 5	Potential Land Use Conflicts - Nearby Developments that have Public Health, Safety or Quality of Life Concerns

ii. Residential - Unserviced

Each lot of a proposed unserviced residential subdivision should have a Suitable Development Area (Appendix B - Glossary). This area is environmentally suitable for the construction and sustainable use of a residence, ancillary buildings, an access road, a privately owned domestic water well and a private sewage disposal system. Specifically, the Suitable Development Area of an unserviced residential lot:

- (1) is at least 0.40 hectares (~1 acre) in size;
 - does not include any part of a lot that cannot be developed for non environmental reasons,

- for example, a lot boundary setback strip required by a municipality does not include any portion of an Environmentally Significant Area (Appendix B - Glossary)
 - does not include any part of a lot that will require significant modification such as regrading, filling or draining to satisfy conditions (2) to (5)
- (2) has low water table conditions (Appendix B - Glossary, Water Table);
 - (3) is level or has slopes not exceeding a grade of 15% (8.53 degrees or 6.7 to 1);
 - (4) can have a private sewage disposal system (Appendix B - Glossary) in which there is minimal, long term risk that it will malfunction and contaminate surface and/or groundwater;
 - (5) presents minimal risk to property, health or safety by natural environmental hazards such as flooding, erosion and slope instability;
 - (6) can have a privately owned domestic water well that provides an adequate, long term supply of potable water; and
 - (7) presents minimal risk to property, health, safety or quality of life by non operating, operating or proposed land uses within the area or its vicinity (Appendix B - Glossary - Public Health, Safety or Quality of Life Concerns).

With respect to (7) above, there are numerous references to setbacks associated with residential buildings and subdivisions in sections 12 and 13 of the *Subdivision and Development Regulation, Municipal Government Act*.

It is recommended that the following two guidelines be utilized to assist in the environmental review of this proposed unserviced subdivision.

- *Interim Guidelines for the Evaluation of Groundwater Supply for Unserved Residential Subdivisions using Privately Owned Domestic Water Wells*
- *Interim Guidelines for the Evaluation of Water Table Conditions and Soil Percolation Rate for Unserved Residential Subdivisions*

If river flooding and erosion, or slope instability is a concern then two other guidelines should be used.

- *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion*
- *Interim Guidelines for the Subdivision of Land Adjacent to Steep Valley Banks*

These guidelines may be obtained from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475).

Links to Other Relevant Parts of the Manual

- | | |
|-----------|--|
| Chapter 3 | Servicing Arrangements |
| Chapter 4 | Environmental Features (Hazards, Constraints and Environmental Protection) |
| Chapter 5 | Potential Land Use Conflicts - Nearby Developments that have Public Health, Safety or Quality of Life Concerns |

K. Resource Extraction

The proposed resource extraction development (mine, pit or quarry) will require the conservation of soil materials and the reclamation of the project when completed. Depending upon the specific characteristics of the project, it may require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to Division 3 - Conservation and Reclamation, *Activities Designation Regulation (110/93)* and the *Conservation and Reclamation Regulation (115/93)*, *Environmental Protection and Enhancement Act*) and possibly the *Water Resources Act* or *Public Lands Act*.

Specific questions regarding the approvals process and requirements may be directed to the Conservation and Reclamation Review Branch (Edmonton, 422-2636).

The following two guides may be relevant to this particular subdivision and are available from the Conservation and Reclamation Review Branch.

- *Guide for Pits 1995*
- *A User Guide to Pit & Quarry Reclamation in Alberta 1992*

Applications for approval should be made in accordance with the *Approvals Procedure Regulation (113/93)*, *Environmental Protection and Enhancement Act* and should be submitted to:

Manager
 Regulatory Approvals Centre (RAC)
 Alberta Environmental Protection
 Main Floor, Oxbridge Place
 9820 - 106 Street
 Edmonton, AB T5K 2J6 Phone 427-6311
 Fax 422-0154

Information on the distribution of resources such as sand, gravel, clay and marl may be obtained from the:

INFORMATION SALES - ALBERTA GEOLOGICAL SURVEY (AGS)
 Alberta Energy and Utilities Board
 7th Floor Petroleum Plaza, North Tower
 9945 - 108 Street
 Edmonton, AB T5K 2G6 Phone 422-3767
 Fax 422-1918
 Email protz@enr.gov.ab.ca
 Internet [Alberta Geological Survey Home Page]
 <http://www.energy.gov.ab.ca/ags/ags1/ags.html>

Links to Other Relevant Parts of the Manual

Chapter 6	Section B. Commercial, Food Establishment, Institutional, Recreational and/or Residential Buildings in Close Proximity to a Proposed Development that has Public Health, Safety or Quality of Life Concerns – General
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L. Utility Systems/Facilities

i. General Comments on Contacts and Applications

Unless otherwise noted, specific questions regarding Alberta Environmental Protection's approvals process and requirements may be directed to the following contacts (private callers within Alberta can phone the Regional Information Telephone Enquiry RITE Number 310-0000 to connect toll free to these numbers):

- Air and Water Approvals Division (Air Emissions Branch, Industrial Wastewater Branch, Municipal Water and Wastewater Branch (Edmonton, 427-5883))
- Industrial Waste Branch (Edmonton, 427-5847)
- Material Management Branch (Edmonton, 427-5842)
- Regional Directors, Environmental Regulatory Service
 - Northeast Boreal and Parkland Regions (Edmonton, 427-9562)
 - Northwest Boreal and Northern Slopes Regions (Edson, 723-8395)
 - Southern East Slopes and Prairie Regions (Calgary, 297-7605)
- Waste Minimization Branch (Edmonton, 422-2136)
- Water Management (Edmonton, 427-6111)

Applications for approval should be made in accordance with the *Approvals Procedure Regulation (113/93)*, *Environmental Protection and Enhancement Act* and should be submitted to:

Manager
 Regulatory Approvals Centre (RAC)
 Alberta Environmental Protection
 Main Floor, Oxbridge Place
 9820 - 106 Street
 Edmonton, AB T5K 2J6..... Phone 427-6311
 Fax 422-0154

ii. Industrial Runoff Control Facility

The proposed Industrial Runoff Control Facility will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to the *Industrial Plants Regulation (121/93)*, *Environmental Protection and Enhancement Act*) and possibly the *Water Resources Act* or *Public Lands Act*. Subsection i, of this section (L. Utility Systems/Facilities) contains a list of Department contacts that can provide specific information on the approvals process, requirements and submission of applications.

Links to Other Relevant Parts of the Manual

Chapter 3 Section D. Connection to an Existing Approved or Proposed System or Facility

iii. Industrial Wastewater Control Facility

The proposed Industrial Wastewater Control Facility will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* and possibly the *Water Resources Act* (refer to the *Industrial Plants Regulation (121/93)*, *Environmental Protection and Enhancement Act*).

Subsection i, of this section (L. Utility Systems/Facilities) contains a list of Department contacts that can provide specific information on the approvals process, requirements and submission of applications.

Links to Other Relevant Parts of the Manual

Chapter 3	Section D. Connection to an Existing Approved or Proposed System or Facility
Chapter 6	Section B. Commercial, Food Establishment, Institutional, Recreational and/or Residential Buildings in Close Proximity to a Proposed Development that has Public Health, Safety or Quality of Life Concerns - General

iv. Oil Field Waste Management Facility

An Oil Field Waste Management Facility may include building, disposal well, landfill, land treatment and incinerator components. Wastes associated with these facilities may be corrosive, flammable and/or toxic. An approval is required from the Alberta Energy and Utilities Board (AEUB) to construct this facility.

The document entitled *AEUB Oilfield Waste Management Requirements* is available upon request from AEUB Information Services Department (Calgary, 297-8190).

Links to Other Relevant Parts of the Manual

Chapter 5	Section D. Proposed Development within 450 Metres of a Nearby Oil Field Waste Management Facility
Chapter 6	Section C. Commercial, Food Establishment, Institutional, Recreational and/or Residential Buildings within 450 Metres of a Proposed Oil Field Waste Management Facility

v. Storm Drainage System

The proposed Storm Drainage System development will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to Division 2 - Part 7: Wastewater and Storm Drainage, *Activities Designation Regulation (110/93)* and the *Wastewater And Storm Drainage Regulation (120/93)*, *Environmental Protection and Enhancement Act*) and possibly the *Water Resources Act* or *Public Lands Act*. Subsection i, of this section (L. Utility Systems/Facilities) contains a list of Department contacts that can provide specific information on the approvals process, requirements and submission of applications.

The following two guidelines may be relevant to this particular subdivision and are available from the Municipal Water and Wastewater Branch.

- *Stormwater Management Guidelines (April 1988)* (currently under review)
- *Standards and Guidelines for Municipal Water Supply, Wastewater and Storm Drainage Facilities (March 1988)* (currently under review)

Links to Other Relevant Parts of the Manual

Chapter 3	Section D. Connection to an Existing Approved or Proposed System or Facility
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vi. Waste Management Facility

Alberta Environmental Protection is responsible for the approval and registration of various Waste Management Facilities that process, treat, store, recycle or landfill municipal, hazardous or industrial waste. Approvals or registration of these facilities is required pursuant to the *Environmental Protection and Enhancement Act* (refer to the *Activities Designation Regulation Amendment (211/96)* and the *Waste Control Regulation (192/1996)*). Subsection i, of this section (L. Utility Systems/Facilities) contains a list of Department contacts that can provide specific information on the approvals process, requirements and submission of applications.

Links to Other Relevant Parts of the Manual

Chapter 5	Section E. Proposed School, Hospital, Food Establishment or Residential Development Near a Wastewater Treatment Plant or Waste Management Facility
Chapter 6	Section D. Proposed Wastewater Treatment Plant or Waste Management Facility Near a School, Hospital, Food Establishment or Residential Development

vii. Wastewater Treatment Plant

The proposed Wastewater Treatment Plant will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to Division 2 - Part 7: Wastewater and Storm Drainage, *Activities Designation Regulation (110/93)* and the *Wastewater And Storm Drainage Regulation (120/93)*, *Environmental Protection and Enhancement Act*) and possibly the *Water Resources Act*. Subsection i, of this section (L. Utility Systems/Facilities) contains a list of Department contacts that can provide specific information on the approvals process, requirements and submission of applications.

The following guidelines may be relevant to this particular subdivision and are available from the Municipal Water and Wastewater Branch.

- *Standards and Guidelines for Municipal Water Supply, Wastewater and Storm Drainage Facilities (March 1988)* (currently under review)
- *Guidelines for the Design, Approval and Operation of Sewage Lagoon Systems For Small Municipal Developments (September 1986)* (currently under review)

Links to Other Relevant Parts of the Manual

Chapter 5	Section E. Proposed School, Hospital, Food Establishment or Residential Development Near a Wastewater Treatment Plant or Waste Management Facility
Chapter 6	Section D. Proposed Wastewater Treatment Plant or Waste Management Facility Near a School, Hospital, Food Establishment or Residential Development

viii. Waterworks System

The proposed Waterworks System will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act*, the *Water Resources Act* and possibly the *Public Lands Act* (refer to Division 5, Potable Water, *Activities Designation Regulation (110/93)*, *Environmental Protection and Enhancement Act*). Subsection i, of this section (L. Utility Systems/Facilities) contains a list of Department contacts that can provide specific information on the approvals process, requirements and submission of applications.

The following two guidelines may be relevant to this particular subdivision and are available from the Municipal Water and Wastewater Branch.

- *Standards and Guidelines for Municipal Water Supply, Wastewater and Storm drainage Facilities (March 1988)(Currently under review)*
- *Guidelines for the Design and Approval of Water Supply Systems For Small Municipal Developments (August 1986) (currently under review)*

Links to Other Relevant Parts of the Manual

Chapter 3 Section B. Privately Owned Domestic Water Supply Systems
 Section D. Connection to an Existing Approved or Proposed System or Facility

ix. **Water Resources Related Works**

Water Resources Related Works means works for the diversion and use of water; impoundment of water; diversion of water otherwise than impoundment; development in, over, under, on or adjacent to any water; removal or disturbance of the bed; shore or banks of any water, etc.). The proposed Water Resources Related Works will likely require approvals or authorization pursuant to the *Water Resources Act* and possibly the *Public Lands Act*.

Specific questions regarding the approvals process and requirements may be directed to the nearest Water Management Division.

- Calgary - 297-6582
- Edmonton - 427-5296
- Lethbridge - 381-5396
- Peace River - 624-6167
- Red Deer - 340-5310

If the proposed works are in or adjacent to navigable waters administered by the Canadian Coast Guard, approvals or authorization will likely be required pursuant to the *Canadian Navigable Waters Protection Act*.

Specific questions regarding the approvals process and requirements may be directed to:

Navigable Waters Protection Division
Canadian Coast Guard
Suite 703, 201 Northfront Street
Sarnia, ON N7T 8B1 Phone (519) 383-1862
..... Fax (519) 383-1995

Links to Other Relevant Parts of the Manual

Chapter 2 Section I.iv. Waterside Recreational Facility
Chapter 4 Section F. Proposed Subdivision Area Bounded By or Contains the Bed and Shore of a Natural Water Feature
 Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion
 Section J. Significant Reduction in Native Vegetation Cover

CHAPTER 3 - SERVICING ARRANGEMENTS

A. Introduction

This chapter provides advice on servicing arrangements for the proposed subdivision. Particularly in rural areas, each proposed parcel will likely have its own privately owned, domestic, water supply system and private sewage disposal system. In urban areas, proposed parcels will probably be connected to municipal wastewater, waterworks and storm drainage systems.

B. Privately Owned Domestic Water Supply Systems

Frequently it is unfeasible to connect a proposed residential subdivision to a municipal waterworks system. There remains a number of alternatives for supplying the subdivision with water including the development of a piped water supply system (based upon a central well and piped water distribution system) or the use of privately owned domestic water supply systems where each lot has its own system. A private system may be based upon a groundwater well, hauled water and a cistern or a surface water supply. Water for domestic purposes is utilized for household and domestic farm purposes, for human use in small industrial buildings and includes all water obtained from wells equipped with hand pumps. It excludes irrigation and feedlot operators.

For piped water supply systems, the August 1986 booklet entitled *Guidelines for the Design and Approval of Water Supply Systems for Small Municipal Developments* is available upon request from the Municipal and Wastewater Branch (Edmonton, 427-5883). Further information on hauled water/cistern systems may be obtained within the *Nuisance and General Sanitation Regulation, Alberta Regulation 242/85, Public Health Act* (Queen's Printer Bookstores, Edmonton, 427-4952; Calgary 297-6251).

Where it is unfeasible to connect to a municipal waterworks system, it is recommended that privately owned domestic wells be constructed wherever there is an adequate groundwater supply potential. An adequate groundwater supply is capable of meeting the domestic water needs of each parcel during peak demand periods and over the long term. Privately owned domestic wells:

- (1) are consistent with rural self-sufficiency;
- (2) promote water conservation;
- (3) likely will remain the complete responsibility of the individual lot owner and not the municipality;
- (4) likely have lower capital, operation and maintenance costs than alternative methods;
- (5) likely have the most predictable costs over the long term; and
- (6) likely are the most energy efficient.

If a subdivision authority wants, and/or the applicant proposes that a new residential subdivision will derive its water supply from privately owned domestic wells, the question remains whether there is an adequate groundwater supply potential. It is recommended that the groundwater potential be evaluated when:

- (1) the number of unserviced residential parcels per quarter section, both existing and proposed, utilizing the underlying groundwater resource is six or more; or

- (2) whenever there is a possibility that each proposed parcel will not have access to an adequate long term supply of potable groundwater using a privately owned domestic well (potable means suitable for drinking).

The evaluation report should be consistent with the *Interim Guidelines for the Evaluation of Groundwater Supply for Unserviced Residential Subdivisions using Privately Owned Domestic Water Wells* which is available from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475). As will be discussed in detail within the guidelines, evaluation of the groundwater supply will require professional assistance.

A subdivision authority is entitled to ask for a report on water supply. If a proposed subdivision is not to be served by a municipal waterworks system, then according to subsection 4(5)(b) of the *Subdivision and Development Regulation*, the *Municipal Government Act*, the subdivision authority may require an applicant for subdivision to submit "information supported by the report of a person qualified to make it, respecting the provision, availability and suitability of potable water on or to the land to be subdivided."

Links to Other Relevant Parts of the Manual

Chapter 2	Section J.ii. Residential - Unserviced Section L.viii.. Waterworks System
Chapter 3	Section D.iv. Connection to an Existing Approved or Proposed Municipal Waterworks System

C. Construction of Private Sewage Disposal Systems

Frequently it is unfeasible to connect a proposed residential subdivision to a municipal wastewater system. There remains a number of alternatives for disposing of the wastewater generated by the residences including the development of a wastewater collection system for the subdivision, or the use of private sewage disposal systems where each lot has its own system. Typically a private system consists of a septic tank and disposal field, or a septic tank and treatment mound or a sewage holding tank whose contents are pumped out and hauled away by tanker truck to an approved place of disposal.

For a subdivision wastewater collection system, the September 1986 booklet entitled *Guidelines for the Design, Approval and Operation of Sewage Lagoon Systems For Small Municipal Developments* (currently under review) is available upon request from the Municipal and Wastewater Branch (Edmonton, 427-5883).

Where it is unfeasible to connect to a municipal wastewater system and the conditions are appropriate, it is recommended that a septic tank and disposal field be the favoured method of sewage disposal on each lot. To effectively use a septic tank and disposal field, each parcel should have a Suitable Development Area (Appendix B - Glossary) of at least 0.40 hectares (~ 1 acre), low water table conditions (Appendix B - Glossary, Water Table), soils that are moderately permeable and a household water supply Sodium Adsorption Ratio (SAR; Appendix B - Glossary) that does not exceed 8. A properly designed, installed and operated septic tank and disposal field has a number of advantages over a wastewater collection system or sewage holding tanks. It:

- (1) is consistent with rural self sufficiency;
- (2) is a standard system;
- (3) likely will remain the complete responsibility of the individual lot owner and not the municipality;

- (4) likely has lower capital, operation and maintenance costs than alternative methods;
- (5) likely has the most predictable costs over the long term; and
- (6) likely is the most energy efficient.

There are a number of reasons why sewage holding tanks are not a preferred sewage disposal system. Problems with hauling effluent off site by truck include:

- (1) reduction in rural self sufficiency;
- (2) very high operating costs which are likely unpredictable and escalating over the long term;
- (3) considerable energy inefficiency;
- (4) increased heavy truck traffic within the subdivision and on adjoining roads resulting in increased noise, dust, risk of accidents and road wear;
- (5) pumping of sewage holding tank contents over the ground surface or into creeks and lakes by home owners frustrated by high hauling costs; and
- (6) discharge of sewage at unauthorized locations by haulers unwilling to take loads to a distant approved place of disposal.

Ultimately problems with operating a sewage holding tank system, including the great difficulty in preventing its abuse, may force the municipality to become responsible for it.

If a subdivision authority wants, and/or the applicant proposes that a new residential subdivision will use a septic tank and disposal field, or a septic tank and treatment mound, the question remains whether the conditions are appropriate. This may be evaluated by using the *Interim Guidelines for the Evaluation of Water Table Conditions and Soil Percolation Rate for Unserviced Residential Subdivisions* which is available from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475). As will be discussed in detail within these guidelines, evaluation of the suitability of the soils for on site sewage disposal and building construction may require professional assistance.

A subdivision authority is entitled to ask for a report on private sewage disposal systems. If a proposed subdivision is not to be served by a municipal wastewater system, then according to subsection 4(5)(c) and (e) of the *Subdivision and Development Regulation*, the *Municipal Government Act*, the subdivision authority may require an applicant for subdivision to submit:

- (c) "an assessment of subsurface characteristics of the land that is to be subdivided including but not limited to susceptibility to slumping or subsidence, depth to water table and suitability for any proposed on site sewage disposal system;
- (e) ... information supported by the report of a person qualified to make it, respecting the intended method of providing sewage disposal facilities to each lot in the proposed subdivision."

Links to Other Relevant Parts of the Manual

Chapter 2	Section J.ii. Residential - Unserviced Section L.vii. Wastewater Treatment Plant
Chapter 3	Section D.ii. Connection to an Existing Approved or Proposed Municipal Wastewater System
Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)

D. Connection to an Existing Approved or Proposed System or Facility

i. General Comments on Contacts and Applications

Unless otherwise noted, specific questions regarding Alberta Environmental Protection's approvals process and requirements may be directed to the following contacts (private callers within Alberta can phone the Regional Information Telephone Enquiry RITE Number 310-0000 to connect toll free to these numbers):

- Air and Water Approvals Division (Air Emissions Branch, Industrial Wastewater Branch, Municipal Water and Wastewater Branch (Edmonton, 427-5883))
- Regional Directors, Environmental Regulatory Service
 - Northeast Boreal and Parkland Regions (Edmonton, 427-9562)
 - Northwest Boreal and Northern Slopes Regions (Edson, 723-8395)
 - Southern East Slopes and Prairie Regions (Calgary, 297-7605)

Applications for approval should be made in accordance with the *Approvals Procedure Regulation (113/93)*, *Environmental Protection and Enhancement Act* and should be submitted to: Manager

Regulatory Approvals Centre (RAC)
Alberta Environmental Protection
Main Floor, Oxbridge Place
9820 - 106 Street
Edmonton, AB T5K 2J6..... Phone 427-6311
..... Fax 422-0154

Links to Other Relevant Parts of the Manual

Chapter 2	Section L. Utility Systems/Facilities
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ii. Connection to an Existing Approved or Proposed Municipal Wastewater System

Connection to a Municipal Wastewater System will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to Division 2 - Part 7: Wastewater and Storm Drainage, *Activities Designation Regulation (110/93)* and the *Wastewater And Storm Drainage Regulation (120/93)*, *Environmental Protection and Enhancement Act*).

Subsection i, of this section (Section D. Connection to an Existing Approved or Proposed System or Utility) contains a list of Alberta Environmental Protection contacts that can provide specific information on the department approvals process, requirements and submission of applications for approval.

iii. Connection to an Existing Approved or Proposed Municipal Storm Drainage System

Connection to a Storm Drainage System development will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to Division 2 - Part 7: Wastewater and Storm Drainage, *Activities Designation Regulation (110/93)* and the *Wastewater And Storm Drainage Regulation (120/93)*, *Environmental Protection and Enhancement Act*).

Subsection i, of this section (Section D. Connection to an Existing Approved or Proposed System or Utility) contains a list of Alberta Environmental Protection contacts that can provide specific information on the department approvals process, requirements and submission of applications for approval.

iv. Connection to an Existing Approved or Proposed Municipal Waterworks System

Connection to a Municipal Waterworks System will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to Division 5, Potable Water, *Activities Designation Regulation (110/93)*, *Environmental Protection and Enhancement Act*).

Subsection i, of this section (Section D. Connection to an Existing Approved or Proposed System or Utility) contains a list of Alberta Environmental Protection contacts that can provide specific information on the department approvals process, requirements and submission of applications for approval.

v. Connection to an Existing Approved or Proposed Industrial Runoff Control Facility

Connection to an Industrial Runoff Control Facility will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to the *Industrial Plants Regulation (121/93)*, *Environmental Protection and Enhancement Act*).

Subsection i, of this section (Section D. Connection to an Existing Approved or Proposed System or Utility) contains a list of Alberta Environmental Protection contacts that can provide specific information on the department approvals process, requirements and submission of applications for approval.

vi. Connection to an Existing Approved or Proposed Industrial Wastewater Control Facility

Connection to an Industrial Wastewater Control Facility will likely require approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* and possibly the *Water Resources Act* (refer to the *Industrial Plants Regulation (121/93)*, *Environmental Protection and Enhancement Act*).

Subsection i, of this section (Section D. Connection to an Existing Approved or Proposed System or Utility) contains a list of Alberta Environmental Protection contacts that can provide specific information on the department approvals process, requirements and submission of applications for approval.

CHAPTER 4 - ENVIRONMENTAL FEATURES (HAZARDS, CONSTRAINTS AND ENVIRONMENTAL PROTECTION)

A. Introduction

This chapter focuses on the environmental implications to a proposed subdivision of features such as hilly areas, valleys, mountains and natural and man-made water features. Not only can these features pose a hazard or major constraint to subdivision and development; but also, consideration should be given to protecting these features from development caused contamination, devegetation and recontouring.

B. Proposed Subdivision Area Contains Numerous Hills

i. Proposed Subdivision Area Contains Numerous Hills - General

At least a portion of the Proposed Subdivision Area is situated within an area that contains numerous hills. These hills may be ridge, mound or irregular in shape. In the Alberta prairies, these hills were likely formed by one or more glacial processes, or by post glacial land forming processes (wind, water, ice erosion and deposition). Glaciers disappeared from the prairies more than ten thousand years ago leaving a wide variety of deposits and landforms. Hilly glacial landforms include various types of moraine composed till, and ice-contact fluvial deposits (sediments deposited by running water in association with glacial ice). Fairly common, post glacial, hilly landforms in Alberta are longitudinal and parabolic sand dunes (eolian deposits).

Adverse topography and depressions with high water table conditions (Appendix B - Glossary, Water Table) between the hills may make road construction and lot development difficult. For unserviced residential subdivisions, each parcel should have a Suitable Development Area (Appendix B - Glossary) that has the potential for the development, among other things, of a private sewage disposal system where there is minimal long term risk that the system will malfunction and contaminate the surface and/or groundwater. The potential for sewage disposal malfunction is not only dependent upon water table conditions, but also the permeability of the materials underlying the disposal field. Soils which are relatively impermeable (example, glacial till with high clay component), or alternatively, are extremely permeable (sandy eolian deposits), may have percolation rates that are either too slow or too fast, respectively, for adequate disposal field function.

In hilly areas, adverse topography, highly variable water table conditions and unsuitable soils have tended to discourage agricultural and settlement activity, and therefore, these areas often contain remnant natural environments. These undisturbed areas contain a rich mosaic of wetland and upland wildlife habitats.

Development constraint and conservation concerns may be mitigated in some cases by setting back proposed lot boundaries from steeply sloping areas or wetlands, reducing the lot density or by dedicating environmental reserve.

Links to Other Relevant Parts of the Manual

Chapter 2	Section J.ii. Residential - Unserviced
Chapter 3	Section C. Construction of Private Sewage Disposal Systems

Chapter 4	Section J. Significant Reduction in Native Vegetation Cover
Appendix A	Environmental References in the <i>Municipal Government Act</i>
	Section D. Purpose of Part 17 - Planning and Development
	Section I. Suitability of Land for the Purpose for which the Subdivision is Intended
	Section J. Environmental Reserve
Appendix D	Guidelines for Mapping Proposed Subdivisions

ii. Proposed Subdivision Area Contains Numerous Hills - Sandy Soils

A portion of the Proposed Subdivision Area is situated within an area that has numerous hills. Sandy soils suggest that this site is an active or inactive sand dune area. Due to the very permeable nature of the sandy soils, problems may arise because there is inadequate contact time between effluent generated by private sewage disposal systems and soils for complete treatment. This may result in the contamination of shallow groundwater aquifers.

Adverse dune topography and depressions between hills may make road construction and lot development difficult. These concerns may be mitigated in some cases by setting back proposed lot boundaries from steeply sloping areas or depressions, reducing the lot density or by dedicating environmental reserve.

Links to Other Relevant Parts of the Manual

Chapter 3	Section B. Privately Owned Domestic Water Supply Systems
	Section C. Construction of Private Sewage Disposal Systems
Chapter 4	Section B. Proposed Subdivision Area Contains Numerous Hills
Appendix D	Guidelines for Mapping Proposed Subdivisions

C. *Proposed Subdivision Near or Within a Valley (also coulees, canyons, draws, gullies, ravines)*

i. Proposed Subdivision Near or Within a Valley - General

Valleys are sometimes referred to as coulees, canyons, draws, gullies and ravines depending upon their size, shape, evolution and locally preferred name. For example, the term coulee is used chiefly in the western U.S. and western Canada and applies to a ravine (a narrow, steep-sided valley), usually dry, that has been formed by running water. Valleys are almost always found in association with and formed by water courses and their channels (rills, brooks, creeks, streams, rivers, waterways, etc.). Examination of air photos reveals that channels and their associated valleys generally connect to one another in a treelike manner creating what is termed a drainage network. Water flows from the outermost branches of the network (tributaries) towards the innermost, finally entering the main stem channel.

The drainage network and the land area it drains of water are termed the drainage basin. The basin may contain one or more water bodies of varying size and shape that may be connected into the network. The water bodies may occupy depressions, for example sloughs, ponds, lakes, etc.; or they may be situated on a valley floor and formed by the natural or artificial obstruction of stream flow, for instance beaver ponds and reservoirs.

A portion of the valley floor may be floodprone and/or erosion prone. The floodprone area is referred to as a floodplain.

A valley bank (may also be referred to as a valley wall, slope or side) may contain one or more terraces or benches at different elevations. The terraces are abandoned floodplain remnants that are flat, horizontal or gently inclined. Depending upon the circumstances, more steeply sloping valley bank areas may be prone to slope failure (slumping, sliding, etc.). The valley crest refers to the top of the valley bank or more specifically the transition line between the valley bank where grades exceed 15% and the adjacent upland area where slopes are less than 15%. Similarly, the toe of slope is defined as the transition line between the valley bank where grades exceed 15% and the adjacent valley floor or terrace where slopes are less than 15%.

Due to flooding, erosion and slope failure hazards, and major development constraints, valleys frequently have been avoided even in populated areas, and therefore contain remnant natural environments. These natural valley environments function as wildlife corridors and refuges, and sometimes as recreational corridors. However, despite the hazards, constraints and conservation concerns, there will continue to be ongoing pressure to subdivide land within valleys or in close proximity to them. Subdivision within flood prone areas, adjacent to the toe of slope, or even on the valley bank itself, often is the result of the expansion of an urban centre which originated on a floodplain or low level terrace adjacent to the river. High real estate values and scarce available space begin to favour the subdivision of this marginal land. In an urban setting, the motivation to develop along the valley crest may be identical to that of the toe and bank areas. In addition, especially for urban and rural residential development, the valley crest provides a prized scenic viewpoint and easy access to valley natural areas.

Competing against the economic, aesthetic and recreational reasons to develop adjacent to a water feature, within a floodplain, or on or very near a valley bank are a variety of counterbalancing concerns. These include the desire to maintain the integrity of the natural environment, prevent contamination of the downstream water courses and water bodies, and protect over the long term the subdivided land, and associated development, from the adverse effects of flooding, erosion and slope failure. The primary methods for addressing these concerns are setting back lot boundaries from hazard or sensitive areas, and/or dedicating environmental reserve. Secondly, certain development restrictions may be placed on a lot.

If the proposed subdivision is known or suspected to be prone to flooding and/or erosion, it is recommended that the *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion* be utilized to assist in the environmental review of this application. As will be discussed in detail within the guidelines, evaluation of the flooding and erosion potential of the site may require professional assistance.

Slope failure may be caused by natural factors or initiated or aggravated by development. If the proposed subdivision is situated on or in close proximity to a valley bank, it is recommended that the *Interim Guidelines for the Subdivision of Land Adjacent to Steep Valley Banks* be utilized to assist in the environmental review of this application. For the purpose of these guidelines, a proposed subdivision is considered to be in close proximity to the valley crest if it is separated from the crest a distance equal to two times the bank height (this height is the vertical distance from the crest to the toe of slope, the toe being located at the base of the slope, whether or not water is present). The proposed subdivision is considered to be in close proximity to the toe of slope of the bank if it is separated from the toe a distance equal to one half the bank height. As will be discussed in detail within the guidelines, evaluation of the potential for slope failure at this site may require professional assistance.

Both of the above mentioned guidelines may be obtained from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475).

A subdivision authority is entitled to ask for environmental information on valley related subdivisions. According to subsection 4(5)(c) and (d) of the *Subdivision and Development Regulation*, the *Municipal Government Act*, the subdivision authority may require an applicant for subdivision to submit:

- (c) "an assessment of subsurface characteristics of the land that is to be subdivided including but not limited to susceptibility to slumping or subsidence, depth to water table and suitability for any proposed on site sewage disposal system;
- (d) if the land that is the subject of an application is located in a potential flood plain and flood plain mapping is available, a map showing the 1:100 year flood."

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses
Chapter 4	Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion Section H.iii. Proposed Subdivision Area Known or Suspected to be Prone to Slope Failure Section J. Significant Reduction in Native Vegetation Cover
Appendix A	Environmental References in the <i>Municipal Government Act</i> Section D. Purpose of Part 17 - Planning and Development Section I. Suitability of Land for the Purpose for which the Subdivision is Intended Section J. Environmental Reserve
Appendix D	Guidelines for Mapping Proposed Subdivisions

ii. Proposed Subdivision Near or Within a Valley Containing Badlands

Badlands consist of an intensely dissected natural landscape where vegetation is sparse or absent due to extremely rapid soil erosion and slope retreat. Plant growth is also discouraged by aridity and the infertility of the soils. Badlands are restricted mainly to areas of arid to semi-arid climate in which relatively weak bedrock is horizontally layered.

In Alberta, badlands topography has developed along some of the river valleys within southeastern Alberta. The Red Deer River and many of its tributaries are especially well known for their badlands. Along this river, excellent examples of badlands are found from west of Big Valley downriver to east of Dinosaur Provincial Park. The Milk River is also acclaimed for its badlands. Other noteworthy badlands have also formed along the Lost River in the southeastern corner of the province, and in the Belly River Buttes northeast of Standoff.

As is the case with all valleys, potential environmental hazards include failure of the valley bank, and flooding and erosion adjacent to water courses or water bodies within the valley floor area. Slope failure may be caused by natural factors or initiated or exacerbated by development. These development hazards and constraints are further aggravated by rapid soil erosion.

Due to these hazards and constraints, badlands frequently have remained undisturbed even in populated areas, and therefore contain remnant natural environments. These natural badland environments

function as wildlife corridors and refuges, and sometimes as recreational corridors. Development within a badland area could interfere with these functions.

Links to Other Relevant Parts of the Manual

Chapter 4	Section C. Proposed Subdivision Near or Within a Valley Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion Section H.iii. Proposed Subdivision Area Known or Suspected to be Prone to Slope Failure Section J. Significant Reduction in Native Vegetation Cover
Appendix D	Guidelines for Mapping Proposed Subdivisions

D. Proposed Subdivision Near the Bed and Shore of a Natural Water Course (river, stream, etc.)

If the proposed subdivision is known or suspected to be prone to flooding and/or erosion, it is recommended that the *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion* be utilized to assist in the environmental review of this application. As will be discussed in detail within the guidelines, evaluation of the flooding and erosion potential of the site may require professional assistance. This guideline may be obtained from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475).

The proposed development also may impact adversely the water course through destruction of shoreline wildlife habitat, spawning areas, etc. and contamination by sewage effluent.

Links to Other Relevant Parts of the Manual

Chapter 2	Section L.ix. Water Resources Related Works
Chapter 3	Section C. Construction of Private Sewage Disposal Systems
Chapter 4	Section C. Proposed Subdivision Near or Within a Valley Section F. Proposed Subdivision Area Bounded by or Contains the Bed and Shore of a Natural Water Feature Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion Section J. Significant Reduction in Native Vegetation Cover
Appendix A	Environmental References in the <i>Municipal Government Act</i>
Appendix D	Guidelines for Mapping Proposed Subdivisions

E. Proposed Subdivision Within 100 Metres of an Environmental Feature

i. Proposed Subdivision Within 100 Metres of the Bed and Shore of a Natural Water Body (lake, slough, etc.)

Lots should be setback from the natural water body's banks by mechanisms including lot boundary setbacks or dedicating environmental reserve. Potential environmental hazards include wave and ice erosion, lengthy periods of flooding, and failure of escarpment banks. The proposed development may adversely impact the water body through destruction of shoreline wildlife habitat, spawning areas, etc. and contamination by sewage effluent.

Links to Other Relevant Parts of the Manual

Chapter 2	Section L.ix. Water Resources Related Works
Chapter 3	Section C. Construction of Private Sewage Disposal Systems
Chapter 4	Section C. Proposed Subdivision Near or Within a Valley
	Section F. Proposed Subdivision Area Bounded or Contains the Bed and Shore of a Natural Water Feature
	Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion
	Section J. Significant Reduction in Native Vegetation Cover
Appendix A	Environmental References in the <i>Municipal Government Act</i>
Appendix D	Guidelines for Mapping Proposed Subdivisions

ii. Proposed Subdivision Within 100 Metres of the Right of Way of a Reservoir or other Impoundment

Where any part of the Proposed Subdivision Area requires access to a reservoir or is within 100 metres of the right of way of a reservoir or other impoundment, the owner of the reservoir or impoundment should be contacted. Reservoirs have unique operational and maintenance characteristics compared to natural lakes. Relative to lakes, reservoirs tend to have severe water level fluctuations and a high potential for bank erosion and collapse. The developer, lot buyers and local authorities should be informed of these characteristics in order to avoid future conflicts with the reservoir's primary purpose.

If Alberta Environmental Protection is the owner the reservoir it is recommended that the *Guidelines for Development Adjacent to Alberta Environmental Protection Water Supply Reservoirs* (Appendix E) be utilized in the environmental review of this proposed subdivision application. If you have any questions, contact the Operations Branch, Water Management, Prairie Region (Lethbridge, 381-5300).

Links to Other Relevant Parts of the Manual

Chapter 3	Section C. Construction of Private Sewage Disposal Systems
Chapter 4	Section C. Proposed Subdivision Near or Within a Valley
	Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion
Appendix D	Guidelines for Mapping Proposed Subdivisions

iii. Proposed Subdivision Within 100 Metres of the Right of Way of a Canal or Drainage Ditch

Where any part of the Proposed Subdivision Area is within 100 metres of a canal or drainage ditch right of way, the owner of the canal or drainage ditch should be contacted. High water table conditions (Appendix B - Glossary, Water Table), seepage and access problems in close proximity to these structures may reduce the developability of land within these areas.

Links to Other Relevant Parts of the Manual

Chapter 3	Section C. Construction of Private Sewage Disposal Systems
Chapter 4	Section C. Proposed Subdivision Near or Within a Valley
	Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion

Appendix D Guidelines for Mapping Proposed Subdivisions

iv. Proposed Subdivision Within 100 Metres of an Extensive Wetland Feature (bog, fen, swamp, marsh)

Development within the wetland should be avoided due to its poor developability, its wildlife habitat values and hydrological function. Lots should be setback from the wetland by mechanisms including lot boundary setbacks or by dedicating environmental reserve.

A subdivision authority is entitled to ask for environmental information on subdivisions containing wetlands. According to subsection 4(5)(c) of the *Subdivision and Development Regulation*, the *Municipal Government Act*, the subdivision authority may require an applicant for subdivision to submit an assessment of the subsurface characteristics of the land including among other things information on the depth to water table.

Subsection 4(5) is complemented by section 7 of the Regulation. This section requires that a subdivision authority, in deciding whether or not to approve a subdivision application, must consider, various natural and man-made features of the subject land and nearby land use. Section 7(a) and (b) requires a subdivision authority to consider a site's topography and soil characteristics.

Subsection 664(1)(a) of the *Municipal Government Act* empowers a subdivision authority to require that a portion of the land that is subject of a proposed subdivision be dedicated as environmental reserve if it is a swamp (Appendix A, Section J.ii.).

Links to Other Relevant Parts of the Manual

Chapter 3	Section C. Construction of Private Sewage Disposal Systems
Chapter 4	Section J. Significant Reduction in Native Vegetation Cover
Appendix A	Environmental References in the <i>Municipal Government Act</i>
Appendix D	Guidelines for Mapping Proposed Subdivisions

F. *Proposed Subdivision Area Bounded By or Contains the Bed and Shore of a Natural Water Feature*

At least a part of the Proposed Subdivision Area is bounded by or is contained within the bed and shore of a natural water course or water body. Pursuant to the *Subdivision and Development Regulation* (section 5(3)(e)) the subdivision authority must send a copy of the subdivision application to the Deputy Minister of the Minister responsible for the administration of the *Public Lands Act*. In the case of lands in the White Area, applications should be sent to the:

Public Land Management Branch
Rural Development Division
Agriculture, Food and Rural Development
Rm. 200 J.G. O'Donoghue Building
7000 - 113 St.
Edmonton, AB T6H 5T6 Phone 427-5570

For the Green Area, applications should be referred to a Regional Land Manager:

- Northeast Boreal (Lac La Biche - 623-5240)

- Northern East Slopes (Whitecourt - 778-7165)
- Northwest Boreal (Peace River - 624-6221)
- Southern East Slopes (Rocky Mountain House - 845-8250)

The bed and shore of this water feature may be claimed under section 3 of the *Public Lands Act* (Appendix B - Glossary - Bed, Shore and Bank of a Naturally Occurring Body of Water).

Links to Other Relevant Parts of the Manual

Chapter 2	Section L.ix. Water Resources Related Works
Chapter 3	Section C. Construction of Private Sewage Disposal Systems
Chapter 4	Section H.ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion
Appendix A	Environmental References in the <i>Municipal Government Act</i>
Appendix D	Guidelines for Mapping Proposed Subdivisions

G. *Proposed Subdivision Within the Mountains*

Generally, development within mountain areas is very limited due to adverse topography. Development is concentrated in flat to moderately sloping areas within or near the valley floors. Although these areas are more amenable to development they are not without hazard or major constraint. There is a risk, however small, for failure of a nearby mountain side or snow avalanches. Mountain rivers are fast flowing and are prone to flash flooding. Alluvial fans, which are fan shaped features sometimes formed where a tributary valley enters the main mountain valley, are frequently targeted for development due to their moderate slopes. However, fans are very susceptible to flash flooding and channel shifting. Mountain valleys have also been the site of much underground coal mining. Areas which have been undermined are prone to subsidence and therefore, may be unsuitable for surface development.

Links to Other Relevant Parts of the Manual

Chapter 3	Section C. Construction of Private Sewage Disposal Systems
Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)
Appendix A	Environmental References in the <i>Municipal Government Act</i>
Appendix D	Guidelines for Mapping Proposed Subdivisions

H. *Proposed Subdivision Area Known or Suspected to have Environmental Hazards or Major Constraints*

i. Proposed Subdivision Area Known or Suspected to be Contaminated due to Man's Activities

Contamination due to man's activities may pose a threat to the proposed development. Specific questions regarding known or suspected site contamination may be directed to the Contaminated Sites and Decommissioning Branch (Edmonton, 427-6182).

With respect to the subject of contamination a number of documents may be of interest.

- *Alberta Tier 1 Criteria for Contaminated Soil Assessment and Remediation* - available upon request from the Soil Protection Branch (Edmonton, 427-6182)
- *Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites, Vols.*

- 1 and 2. CCME-EPC-NCS62E and NCS66E.
- *Interim Canadian Environmental Quality Criteria for Contaminated Sites. CCME-EPC-CS34.*
 - *Phase 1 Environmental Site Assessment - Environmental Technology - A CSA Information Product. 1994, Canadian Standards Association*
 - *Remediation Guidelines for Petroleum Storage Tank Sites -1994-Draft - available upon request from the Groundwater Protection Branch (Edmonton, 427-6333)*
 - *Subsurface Assessment Handbook for Contaminated Sites. CCME-EPC-NCSR-48E*

For information on contamination related Internet sites refer to Appendix C, References, Section D.ix., x. and xi.

Links to Other Relevant Parts of the Manual

Chapter 3	Section C. Construction of Private Sewage Disposal Systems
Chapter 5	Potential Land Use Conflicts - Nearby Developments that have Public Health, Safety or Quality of Life Concerns
Appendix C	References

ii. Proposed Subdivision Area Known or Suspected to be Prone to Flooding and/or Erosion

It is recommended that the *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion* be utilized to assist in the environmental review of this application. As will be discussed in detail within the guidelines, evaluation of the flooding and erosion potential of this site may require professional assistance. This document may be obtained from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475).

A subdivision authority is entitled to ask for environmental information on flood prone subdivisions. According to subsection 4(5)(d) of the *Subdivision and Development Regulation*, the *Municipal Government Act*, the subdivision authority may require an applicant for subdivision to submit a map showing the 1:100 year flood if the site is located in a potential floodplain and floodplain mapping is available.

Subsection 4(5) is complemented by section 7 of the Regulation. This section requires that a subdivision authority, in deciding whether or not to approve a subdivision application, must consider, various natural and man-made features of the subject land and nearby land use. Section 7(d) requires a subdivision authority to consider any potential for flooding.

Subsection 664(1)(b) of the *Municipal Government Act* empowers a subdivision authority to require that a portion of the land that is subject of a proposed subdivision be dedicated as environmental reserve if it is subject to flooding (Appendix A, Section J.ii.).

Specific questions regarding flooding and erosion for a particular site may be directed to the River Engineering Branch (Edmonton, 427-6280). The Branch has at its disposal numerous floodplain studies, maps and air photos, records of known erosion sites and hazards, and files on a variety of proposed developments situated in close proximity to water features.

If the proposed subdivision will entail the development of a Water Resources Related Work (Appendix B - Glossary), questions regarding the approvals process and requirements may be directed to the nearest Water Management Division (refer to Chapter 2, L.ix).

- Calgary - 297-6582
- Edmonton - 427-5296
- Lethbridge - 381-5396
- Peace River - 624-6167
- Red Deer - 340-5310

Links to Other Relevant Parts of the Manual

Chapter 2	Section L.ix. Water Resources Related Works
Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)
Appendix A	Environmental References in the <i>Municipal Government Act</i> Section B. Municipal Responsibility for Water Bodies Section D. Purpose of Part 17 - Planning and Development Section I. Suitability of Land for the Purpose for which the Subdivision is Intended Section J. Environmental Reserve
Appendix D	Guidelines for Mapping Proposed Subdivisions

iii. Proposed Subdivision Area Known or Suspected to be Prone to Slope Failure (slumping)

It is recommended that the *Interim Guidelines for the Subdivision of Land Adjacent to Steep Valley Banks* be utilized to assist in the environmental review of this application. As will be discussed in detail within the guidelines, evaluation of the potential for slope failure at this site may require professional assistance. This document may be obtained from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475).

A subdivision authority is entitled to ask for environmental information on proposed subdivisions which may be affected by slope failure. According to subsection 4(5)(c) of the *Subdivision and Development Regulation*, the *Municipal Government Act*, the subdivision authority may require an applicant for subdivision to submit an assessment of the subsurface characteristics of the land including among other things information on susceptibility to slumping or subsidence.

Subsection 4(5) is complemented by section 7 of the Regulation. This section requires that a subdivision authority, in deciding whether or not to approve a subdivision application, must consider, various natural and man-made features of the subject land and nearby land use. Section 7(d) requires a subdivision authority to consider any potential for subsidence.

Subsection 664(1)(b) of the *Municipal Government Act* empowers a subdivision authority to require that a portion of the land that is subject of a proposed subdivision be dedicated as environmental reserve if it is, in the opinion of the subdivision authority, unstable (Appendix A, Section J.ii.).

Links to Other Relevant Parts of the Manual

Chapter 4	Section C. Proposed Subdivision Near or Within a Valley Section H. Proposed Subdivision Within the Mountains
Appendix A	Environmental References in the <i>Municipal Government Act</i> Section D. Purpose of Part 17 - Planning and Development Section I. Suitability of Land for the Purpose for which the Subdivision is Intended Section J. Environmental Reserve
Appendix D	Guidelines for Mapping Proposed Subdivisions

iv. Proposed Subdivision Area Known or Suspected to be prone to Subsidence due to Underground Mining

An initial assessment of the extent of coal mining in a given area may be determined by reviewing the Energy Resources Conservation Board (ERCB) *Coal Mine Atlas - Operating and Abandoned Coal Mines in Alberta* ERCB 85-45.

If the resource extraction project is or was a coal mine, then refer to the *General Guidelines for the Development of Lands in the Vicinity of Coal Hazards in Alberta* to assist in the environmental review of this application. This document, which is still in draft form, may be obtained from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475).

A subdivision authority is entitled to ask for environmental information on proposed subdivisions which may be affected by subsidence. According to subsection 4(5)(c) of the *Subdivision and Development Regulation*, the *Municipal Government Act*, the subdivision authority may require an applicant for subdivision to submit an assessment of the subsurface characteristics of the land including among other things information on susceptibility to slumping or subsidence.

Subsection 4(5) is complemented by section 7 of the Regulation. This section requires that a subdivision authority, in deciding whether or not to approve a subdivision application, must consider, various natural and man-made features of the subject land and nearby land use. Section 7(d) requires a subdivision authority to consider any potential for subsidence.

Subsection 664(1)(b) of the *Municipal Government Act* empowers a subdivision authority to require that a portion of the land that is subject of a proposed subdivision be dedicated as environmental reserve if it is, in the opinion of the subdivision authority, unstable (Appendix A, Section J.ii.).

Links to Other Relevant Parts of the Manual

Chapter 5	Section B. Nearby Developments that have Public Health, Safety and Quality of Life Concerns - General
Appendix D	Guidelines for Mapping Proposed Subdivisions

I. *Proposed Subdivision Area Contains an Environmentally Significant Area or Hazard Area*

At least a portion of the Proposed Subdivision Area is within an Environmentally Significant Area (Appendix B - Glossary) or Hazard Area as identified in an Environmentally Significant Areas study prepared for the Resource Information Branch, Alberta Environmental Protection and the local municipality. Potential environmental hazards and major environmental constraints to development, as well as potential adverse impacts on Environmentally Significant Areas, may be mitigated in some cases by lot redesign and site specific environmental evaluations.

Links to Other Relevant Parts of the Manual

Chapter 4	Environmental Features (Hazards, Constraints, and Environmental Protection)
Appendix A	Environmental References in the <i>Municipal Government Act</i> Section B. Municipal Responsibility for Water Bodies

Section D. Purpose of Part 17 - Planning and Development
Section I. Suitability of Land for the Purpose for which the Subdivision is Intended
Section J. Environmental Reserve
Appendix D Guidelines for Mapping Proposed Subdivisions

J. Significant Reduction in the Native Vegetation Cover

The proposed subdivision will result in a significant reduction in the amount of the Proposed Subdivision Area that is covered in native vegetation. As a consequence, this development may:

- (1) impact the local and regional watershed by increasing the potential for surface runoff and flooding, gully and in-field water erosion, sedimentation and water quality degradation;
- (2) increase the risk of soil erosion by wind;
- (3) increase the risk of windthrow (blowing down of trees and other vegetation);
- (4) alter water table conditions (Appendix B - Glossary, Water Table);
- (5) reduce wildlife habitat;
- (6) reduce the integrity of natural ecosystems;
- (7) change the aesthetics of the local landscape; or
- (8) reduce the opportunity for wild land recreational pursuits.

These potential impacts and various possibilities for their mitigation are discussed in detail in the 1994 publication entitled *Conservation and Logging on Private Land in Alberta* which is available at the following locations.

Public Land Management Branch
Rural Development Division
Agriculture, Food and Rural Development
Rm. 200 J.G. O'Donoghue Building
7000 - 113 St.
Edmonton, AB T6H 5T6 Phone 427-5570

INFORMATION CENTRE - ALBERTA ENVIRONMENTAL PROTECTION
Main Floor, 9920 - 108 Street
Edmonton, AB T5K 2M4 Phone 422-2079
.....Email infocent@env.gov.ab.ca

Standards and Guidelines Branch, Alberta Environmental Protection

At the time of subdivision these adverse encroachment impacts can be mitigated through lot redesign and the dedication of environmental reserve. The developer should keep in mind that attractive natural spaces, such as that associated with a relatively undisturbed creek valley, could serve as a valuable selling feature of the development.

Links to Other Relevant Parts of the Manual

Chapter 4	Environmental Features (Hazards, Constraints and Environmental Protection)
Appendix D	Guidelines for Mapping Proposed Subdivisions

CHAPTER 5 - POTENTIAL LAND USE CONFLICTS - NEARBY DEVELOPMENTS THAT HAVE PUBLIC HEALTH, SAFETY OR QUALITY OF LIFE CONCERNS

A. Introduction

This chapter considers the potential for land use conflicts that might arise when the proposed development is human oriented, for example residential or recreational; and a nearby development has public health, safety or quality of life concerns, for instance a sour gas facility, wastewater treatment plant or waste management facility.

B. Nearby Developments that have Public Health, Safety or Quality of Life Concerns - General

Depending upon the specific circumstances, the working area of one or more operating developments that have public health, safety or quality of life concerns may be situated in close proximity to proposed commercial, food establishment, institutional, recreational or residential land uses (where close proximity means within:

- (1) 1.5 kilometres (~0.9 miles) of an airport/airstrip, industrial facility or intensive livestock operation
- (2) 800 metres (~ 0.5 miles) of a resource extraction project (mine, pit, quarry)
- (3) 450 metres (~ 1,500 feet) of a stationary bulk ammonia storage facility
- (4) 300 metres (~ 1,000 feet) of fuel storage tank, industrial wastewater control facility or pesticide storage facility).

An area that has been used and will not be used again by an operating or non operating development may also be in close proximity to the Proposed Subdivision Area. In this case, these areas may still pose a threat to a proposed human oriented development due to contamination or subsidence. An adequate setback buffer should be established to mitigate these concerns. If there is a risk of site contamination, specific questions may be directed to the:

Contaminated Sites and Decommissioning Branch (Edmonton, 427-6182)

With respect to the subject of contamination a number of documents may be of interest.

- *Alberta Tier 1 Criteria for Contaminated Soil Assessment and Remediation* - available upon request from the Soil Protection Branch (Edmonton, 427-6182)
- *Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites, Vols. 1 and 2. CCME-EPC-NCS62E and NCS66E.*
- *Interim Canadian Environmental Quality Criteria for Contaminated Sites. CCME-EPC-CS34.*
- *Phase 1 Environmental Site Assessment - Environmental Technology - A CSA Information Product. 1994, Canadian Standards Association*
- *Remediation Guidelines for Petroleum Storage Tank Sites -1994-Draft* - available upon request from the Groundwater Protection Branch (Edmonton, 427-6333)

Standards and Guidelines Branch, Alberta Environmental Protection

- *Subsurface Assessment Handbook for Contaminated Sites. CCME-EPC-NCSRP-48E*

For information on contamination related Internet sites refer to Appendix C, References Section D.

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses
Chapter 4	Section H.i. Contaminated due to Man's Activities
Appendix C	References
Appendix D	Guidelines for Mapping Proposed Subdivisions

C. *Setbacks from Gas or Oil Wells, Batteries, Processing Plants or Pipelines*

If a proposed subdivision or development is near a gas or oil well, battery, a gas processing plant, or a pipeline, there are a number of instances where the application should be referred by a Subdivision or Development Authority to the Alberta Energy and Utilities Board (AEUB). Referrals should be made in accordance with the requirements set forth in Sections 9 and 10 of the Subdivision and Development Regulation and the March 27, 1996 amendment of section 10(1) (the Subdivision and Development Amendment Regulation 53/96), and the document entitled *Subdivision and Development Regulation Requirements for Referrals to the Alberta Energy and Utilities Board (AEUB - IL 95-07)*.

As discussed in detail within the remainder of this section, there are three major application referral cases. Applications need not be referred to the AEUB if it is known that the recommended minimum setbacks are satisfied. If the head of an abandoned well is suspected or known to be within the Proposed Subdivision or Development Area but its exact location is unknown, the AEUB's Information Service Department should be contacted for the exact location of the well (Calgary, 297-8190).

It is important to know how proximity distances are measured from various types of facilities. For wells, distances are measured from the well head, and for pipelines, the centre line of the pipeline is used. For batteries and gas processing plants, the area of concern and recommended minimum setback is based upon the highest level of sour gas pipeline connected to them.

Case 1 (referral to the AEUB when the number of existing plus proposed permanent dwellings per quarter section is eight or less)

In a rural municipality, where the number of existing plus proposed permanent dwellings per quarter section is eight or less, a subdivision or development application should be sent to the AEUB:

- if a proposed building site is within 100 metres (~ 325 feet) of the centre line of a pipeline, battery or gas processing plant of unknown level of sourness.

The recommended minimum setbacks are as follows:

- no proposed building site should be within the right-of-way of a sweet or Level 1 sour pipeline
- no proposed building site should be within 100 metres (~ 325 feet) of a Level 2, 3 or 4 sour gas facility (pipeline, battery or gas processing plant)
- no proposed building site should be within 100 metres (~ 325 feet) of the head of a well (non abandoned).

Case 2 (referral to the AEUB when the number of existing plus proposed permanent dwellings per quarter section is more than eight)

In a rural municipality, where the number of existing plus proposed permanent dwellings per quarter section is more than eight, a subdivision or development application should be sent to the AEUB:

- if a proposed building site is within 500 metres (~ 1,640 feet) of the centre line of a pipeline, the head of a well (non abandoned), a battery or a gas processing plant of unknown level of sourness.

The recommended minimum setbacks are as follows:

- no proposed building site should be within the right-of-way of a sweet or Level 1 sour pipeline
- no proposed building site should be within 100 metres (~ 325 feet) of a Level 2 sour gas facility (pipeline, battery or gas processing plant)
- no proposed building site should be within 100 metres (~ 325 feet) of the head of a sweet or Level 1 or 2 sour well (non abandoned)
- no proposed building site should be within 500 metres (~1,640 feet) of a Level 3 or 4 sour gas well (non abandoned) or facility (pipeline, battery or gas processing plant).

Case 3 (referral to the AEUB - proposed development of public facilities at any location or permanent additional overnight accommodation within an urban centre)

In general terms, a public facility is a building such as a hospital or school, or a major recreational facility, for example a major campground, that the Board may designate as a public facility based upon the complexity of evacuation taking into consideration the number and characteristics of the people using the facility, and the frequency and duration of their use. An urban centre means a city, town, new town, village, summer village, hamlet or other incorporated centre, and includes any similar development.

A subdivision or development application that will result in the development of public facilities at any location or permanent additional overnight accommodation within an urban centre should be sent to the AEUB:

- if a proposed building site is within 1.5 kilometres of the centre line of a pipeline, the head of a well (non abandoned), a battery or a gas processing plant of unknown level of sourness.

The recommended minimum setbacks are as follows:

- no proposed building site should be within the right-of-way of a sweet or Level 1 sour pipeline
- no proposed building site should be within 100 metres (~ 325 feet) of the head of a sweet or Level 1 sour well (non abandoned)
- no proposed building site should be within 500 metres (~1,640 feet) of a Level 2 sour gas well (non abandoned) or facility (pipeline, battery or gas processing plant)
- no proposed building site should be within 1.5 kilometres of a Level 3 or 4 sour gas well (non abandoned) or facility (pipeline, battery or gas processing plant).

Referrals should be sent to:

Operations Department
Alberta Energy and Utilities Board
640 5th Avenue S.W.
Calgary, AB T2P 3G4 Phone 297-3714

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses Section H.ii. Public Facility Section J. Residential
Chapter 4	Section H.i. Contaminated due to Man's Activities
Appendix D	Guidelines for Mapping Proposed Subdivisions

D. *Proposed Development within 450 Metres (~ 1,500 feet) of a Nearby Oil Field Waste Management Facility*

Depending upon the specific circumstances, the working area of a Oil Field Waste Management Facility may be within 450 metres (~ 1,500 feet) of a proposed commercial, food establishment, institutional, recreational, or residential subdivision. This facility may include building, disposal well, landfill, land treatment and incinerator components. Wastes associated with these facilities may be corrosive, flammable and/or toxic. There could be conflicts with the proposed development. Decommissioned/reclaimed facilities do not require development setbacks.

The document entitled *AEUB Oilfield Waste Management Requirements* is available upon request from the AEUB Information Services Department (Calgary, 297-8190).

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses Section E. Commercial Development - Use of Pesticides Section F. Food Establishment Section H. Institutional Facility Section I. Recreational Section J. Residential Section L.iv. Oil Field Waste Management Facility
Chapter 4	Section H.i. Contaminated due to Man's Activities
Appendix D	Guidelines for Mapping Proposed Subdivisions

E. *Proposed School, Hospital, Food Establishment or Residential Development Near a Wastewater Treatment Plant or Waste Management Facility*

i. Request for Variance of Setback Standard

Pursuant to section 12(5) and 13(5) of the Regulation, a subdivision authority may vary the setback requirement of a school, hospital, food establishment or residence from a nearby wastewater treatment plant or waste management facility upon written consent of the Deputy Minister of the Department of Environmental Protection. The authority should be supportive of the proposal, that is, willing to grant approval to an application if the Department waives the standard setback requirement. The request for variance of the setback standard should clearly document the situation using both text and map(s). Requests should be sent to the Regional Director, Environmental Regulatory Service, Alberta Environmental Protection (private callers within Alberta can phone the Regional Information Telephone Enquiry RITE Number 310-0000 to connect toll free to the following numbers).

Standards and Guidelines Branch, Alberta Environmental Protection

- Regional Directors, Environmental Regulatory Service
 - Northeast Boreal and Parkland Regions (Edmonton, 427-9562)
 - Northwest Boreal and Northern Slopes Regions (Edson, 723-8395)
 - Southern East Slopes and Prairie Regions (Calgary, 297-7605)

ii. Development is Within 300 Metres (~ 1,000 feet) of an Wastewater Treatment Plant

This is an application to subdivide land for a school, hospital, food establishment or residence. The proposed parcel may already contain the subject building, or alternatively, the parcel is undeveloped. Depending upon the specific circumstances, the proposed subdivision may contravene section 12(2) of the *Subdivision and Development Regulation* in that the working area of a nearby operating wastewater treatment plant is within 300 metres of the existing building or proposed environmentally suitable building site (Appendix B - Glossary - Wastewater Treatment Plant; Working Area of a Wastewater Treatment Plant). Pursuant to section 12(5) of the Regulation, a subdivision authority may vary the 300 metre setback requirement upon written consent of the Deputy Minister of the Department of Environmental Protection (requests should be submitted to a Regional Director; refer to subsection i. of this section for list).

An information bulletin has been prepared jointly by Alberta Municipal Affairs and Alberta Environmental Protection on applying section 12 of the Regulation. Questions on the bulletin may be directed to Municipal Affairs at 427-2225 or to Municipal Water and Wastewater Branch at 427-5883 (bulletin has a very similar content to Appendix B - Glossary - Wastewater Treatment Plant; Working Area of a Wastewater Treatment Plant).

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses Section F. Food Establishment Section H.i. School or Hospital Section J. Residential Section L.vii. Wastewater Treatment Plant
Chapter 4	Section H.i. Contaminated due to Man's Activities
Chapter 6	Section D. Proposed Wastewater Treatment Plant or Waste Management Facility Near a School, Hospital, Food Establishment and or Residential Development
Appendix D	Guidelines for Mapping Proposed Subdivisions

iii. Development is Within 450 Metres (~ 1,500 feet) of an Waste Management Facility

This is an application to subdivide land for a school, hospital, food establishment or residence. The proposed parcel may already contain the subject building, or alternatively, the parcel is undeveloped. Depending upon the specific circumstances, the proposed subdivision may contravene section 13(2) of the *Subdivision and Development Regulation* in that the working area or disposal area of a nearby operating or non operating waste management facility is within 300 to 450 metres (depends on the type of facility) of the existing building or proposed environmentally suitable building site. Pursuant to section 13(5) of the Regulation, a subdivision authority may vary the setback requirement upon written consent of the Deputy Minister of the Department of Environmental Protection (requests should be submitted to a Regional Director; refer to subsection i. of this section for list).

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses Section F. Food Establishment Section H.i. School or Hospital Section J. Residential Section L.vi. Waste Management Facility
Chapter 4	Section H.i. Contaminated due to Man's Activities
Chapter 6	Section D. Proposed Wastewater Treatment Plant or Waste Management Facility Near a School, Hospital, Food Establishment and or Residential Development
Appendix D	Guidelines for Mapping Proposed Subdivisions

CHAPTER 6 - POTENTIAL LAND USE CONFLICTS - NEARBY HUMAN ORIENTED BUILDINGS

A. *Introduction*

This chapter considers the potential for land use conflicts that might arise when the proposed development has public health, safety or quality of life concerns, for instance a sour gas facility, wastewater treatment plant or waste management facility; and a nearby development is human oriented, for example residential or recreational.

B. *Commercial, Food Establishment, Institutional, Recreational and/or Residential Buildings in Close Proximity to a Proposed Development that has Public Health, Safety or Quality of Life Concerns - General*

One or more proposed or existing human oriented developments (commercial, food establishment, institutional, recreational or residential buildings) is situated in close proximity to a proposed airport/airstrip, industrial facility, intensive livestock operation, resource extraction project, stationary bulk ammonia storage facility, fuel storage tank, industrial wastewater control facility, or pesticide storage facility. An adequate setback buffer should be established to mitigate conflicts associated with public health, safety or quality of life between these land uses (where close proximity means within:

- (1) 1.5 kilometres (~0.9 miles) of an airport/airstrip, industrial facility or intensive livestock operation
- (2) 800 metres (~ 0.5 miles) of a resource extraction project (mine, pit, quarry)
- (3) 450 metres (~ 1,500 feet) of a stationary bulk ammonia storage facility
- (4) 300 metres (~ 1,000 feet) of fuel storage tank, industrial wastewater control facility or pesticide storage facility

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses
Chapter 4	Section H.i. Contaminated due to Man's Activities
Chapter 5	Potential Land Use Conflicts - Nearby Developments that have Public Health, Safety or Quality of Life Concerns
Appendix D	Guidelines for Mapping Proposed Subdivisions

C. *Commercial, Food Establishment, Institutional, Recreational and/or Residential Buildings within 450 Metres of a Proposed Oil Field Waste Management Facility*

Existing or proposed commercial, food establishment, institutional, recreational, or residential buildings are within 450 metres (~ 1,500 feet) of the proposed Oil Field Waste Management Facility subdivision. Wastes associated with these facilities may be corrosive, flammable and/or toxic. There could be conflicts between these two neighbouring land uses.

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses Section E. Commercial Development - Use of Pesticides Section F. Food Establishment Section H. Institutional Facility Section I. Recreational Section J. Residential Section L.iv. Oil Field Waste Management Facility
Chapter 5	Section D. Proposed Development within 450 Metres of a Nearby Oil Field Waste Management Facility
Appendix D	Guidelines for Mapping Proposed Subdivisions

D. *Proposed Wastewater Treatment Plant or Waste Management Facility Near a School, Hospital, Food Establishment or Residential Development*

i. Request for Variance of Setback Standard

Pursuant to section 12(5) and 13(5) of the Regulation, a subdivision authority may vary the setback requirement of a proposed wastewater treatment plant or waste management facility from a nearby school, hospital, food establishment or residence upon written consent of the Deputy Minister of the Department of Environmental Protection. The authority should be supportive of the proposal, that is, willing to grant approval to an application if the Department waives the standard setback requirement. The request for variance of the setback standard should clearly document the situation using both text and map(s). Requests should be sent to the Regional Director, Environmental Regulatory Service, Alberta Environmental Protection (private callers within Alberta can phone the Regional Information Telephone Enquiry RITE Number 310-0000 to connect toll free to the following numbers).

- Regional Directors, Environmental Regulatory Service
 - Northeast Boreal and Parkland Regions (Edmonton, 427-9562)
 - Northwest Boreal and Northern Slopes Regions (Edson, 723-8395)
 - Southern East Slopes and Prairie Regions (Calgary, 297-7605)

ii. Proposed Wastewater Treatment Plant is within 300 Metres of a School, Hospital, Food Establishment or Residential Development

This is an application to subdivide land for a wastewater treatment plant. The proposed subdivision may contravene section 12(4) of the *Subdivision and Development Regulation* in that the working area of a proposed wastewater treatment plant is within 300 metres of an existing school, hospital, food establishment or residential building or proposed school, hospital, food establishment or residential building site (Appendix B - Glossary - Wastewater Treatment Plant; Working Area of a Wastewater Treatment Plant). Pursuant to section 12(5) of the Regulation, a subdivision authority may vary the 300 metre setback requirement upon written consent of the Deputy Minister of the Department of Environmental Protection (requests should be submitted to a Regional Director; refer to subsection i. of this section for list).

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An information bulletin has been prepared jointly by Alberta Municipal Affairs and Alberta Environmental Protection on applying section 12 of the Regulation. Questions on the bulletin may be directed to Municipal Affairs at 427-2523 or to Environmental Protection at 427-5883.

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses Section F. Food Establishment Section H.i. School or Hospital Section J. Residential Section L.vii. Wastewater Treatment Plant
Chapter 5	Section E. Proposed School, Hospital, Food Establishment or Residential Development Near a Wastewater Treatment Plant or Waste Management Facility
Appendix D	Guidelines for Mapping Proposed Subdivisions

iii. Proposed Waste Management Facility is within 450 Metres of a School, Hospital, Food Establishment or Residential Development

This is an application to subdivide land for a waste management facility. This proposed subdivision may contravene section 13(4) of the *Subdivision and Development Regulation* in that the working area or disposal area of the facility is within 300 to 450 metres (depends on the type of facility) of an existing school, hospital, food establishment or residential building or proposed school, hospital, food establishment or residential building site. Pursuant to section 13(5) of the Regulation, a subdivision authority may vary the setback requirement upon written consent of the Deputy Minister of the Department of Environmental Protection (requests should be submitted to a Regional Director; refer to subsection i. of this section for list).

Links to Other Relevant Parts of the Manual

Chapter 2	Primary Land Uses Section F. Food Establishment Section H.i. School or Hospital Section J. Residential Section L.vi. Waste Management Facility
Chapter 5	Section E. Proposed School, Hospital, Food Establishment or Residential Development Near a Wastewater Treatment Plant or Waste Management Facility
Appendix D	Guidelines for Mapping Proposed Subdivisions

APPENDIX A - ENVIRONMENTAL REFERENCES IN THE MUNICIPAL GOVERNMENT ACT (Statutes of Alberta, 1994, Chapter M-26.1 - Consolidated October 2, 1995)

A. Introduction

This chapter presents verbatim major environmental references in the *Municipal Government Act*. References to the Act's *Subdivision and Development Regulation* may be found under specific subject headings throughout the Manual.

B. Municipal Responsibility for Water Bodies (excerpt from section 60)

60(1) Subject to any other enactment, a municipality has the direction, control and management of the rivers, streams, watercourses, lakes and other natural bodies of water within the municipality, including the air space above and the ground below.

C. Transfer of a Parcel to a Municipality

424(1) The municipality at whose request a tax recovery notification was endorsed on the certificate of title for a parcel of land may become the owner of a parcel after the public auction, if the parcel is not sold at the public auction.

D. Purpose of Part 17 - Planning and Development (refer in particular to 617(b))

617 The purpose of this Part and the regulations and bylaws under this Part is to provide means whereby plans and related matters may be prepared and adopted

- (a) to achieve the orderly, economical and beneficial development, use of land and patterns of human settlement, and
- (b) to maintain and improve the quality of the physical environment within which patterns of human settlement are situated in Alberta,

without infringing on the rights of individuals for any public interest except to the extent that is necessary for the overall greater public interest.

E. Non-application of Part 17 - Planning and Development - to Certain Types of Development (excerpt from section 618)

618(1) This Part and the regulations and bylaws under this Part do not apply when a development or a subdivision is effected only for the purpose of

- (a) a highway or road,
- (b) a well or battery within the meaning of the *Oil and Gas Conservation Act*, or

- (c) a pipeline or an installation or structure incidental to the operation of a pipeline.

F. Land Use Policies (contains environmental policies)

622(1) The Lieutenant Governor in Council may by order, on the recommendation of the Minister, establish land use policies.

(2) The *Regulations Act* does not apply to an order under subsection (1).

(3) Every statutory plan, land use bylaw and action undertaken pursuant to this Part by a municipality, municipal planning commission, subdivision authority, development authority or subdivision and development appeal board or the Municipal Government Board must be consistent with the land use policies.

..... 1995 c24 s95

G. Environmental Components of Statutory Plans

i. Intermunicipal Development Plan (excerpt from section 631)

631(2)(a)(iii) An intermunicipal development plan may provide for any other matter relating to the physical, social or economic development of the area that the councils consider necessary,

ii. Municipal Development Plan (excerpts from section 632)

632(3) A municipal development plan

(b)(iii) may address environmental matters within the municipality,

(c) may contain statements regarding the municipality's development constraints, including the results of any development studies and impact analysis, and goals, objectives, targets, planning policies and corporate strategies,

(d) must identify the location of sour gas facilities and contain policies related to them that are compatible with the subdivision and development regulations,

H. Environmental Components of Land Use Bylaws (excerpts from section 640)

640(1) A land use bylaw may prohibit or regulate and control the use and development of land and buildings in a municipality.

(2) A land use bylaw

(a) must divide the municipality into districts of the number and area the council considers appropriate;

(4) Without restricting the generality of subsection (1), a land use bylaw may provide for one or more of the following matters, either generally or with respect to any district or part of a district established pursuant to subsection (2)(a):

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- (a) subdivision design standards;
- (b) the ground area, floor area, height, size and location of buildings;
- (c) the amount of land to be provided around or between buildings;
- (d) the landscaping of land or buildings;
- (h) the location and amount of access to lots from roads and ensuring that there is at least one means of access from each lot to a road;
- (j) the enlargement, alteration, repair, removal or relocation of buildings;
- (k) the excavation or filling in of land;
- (l) the development of buildings
 - (i) on land subject to flooding or subsidence or that is low lying, marshy or unstable,
 - (ii) on land adjacent to or within a specified distance of the bed and shore of any lake, river, stream or other body of water, or
 - (iii) subject to regulations made under section 693 or 694, within a specified area around an airport;
- (o) the density of population in any district or part of it;

I. Suitability of Land for the Purpose for which the Subdivision is Intended

654(1)(a) A subdivision authority must not approve an application for subdivision approval unless the land that is proposed to be subdivided is, in the opinion of the subdivision authority, suitable for the purpose for which the subdivision is intended,

J. Environmental Reserve

i. Reserves not required

663 A subdivision authority may not require the owner of a parcel of land that is the subject of a proposed subdivision to provide reserve land or money in place of municipal reserve, school reserve or municipal and school reserve if

- (a) one lot is to be created from a quarter section of land,
- (b) land is to be subdivided into lots of 16.0 hectares or more and is to be used for only agricultural purposes,
- (c) the land to be subdivided is 0.8 hectares or less, or
- (d) reserve land, environmental reserve easement or money in place of it was provided in respect of the land that is the subject of the proposed subdivision under this Part or the

former Act.

ii. Environmental Reserve

664(1) A subdivision authority may require the owner of a parcel of land that is the subject of a proposed subdivision to provide part of that parcel of land as environmental reserve if it consists of

- (a) a swamp, gully, ravine, coulee or natural drainage course,
- (b) land that is subject to flooding or is, in the opinion of the subdivision authority, unstable, or
- (c) a strip of land, not less than 6 metres in width, abutting the bed and shore of any lake, river, stream or other body of water for the purpose of
 - (i) preventing pollution, or
 - (ii) providing public access to and beside the bed and shore.

(2) If the owner of a parcel of land that is the subject of a proposed subdivision and the municipality agree that any or all of the land that is to be taken as environmental reserve is instead to be the subject of an environmental reserve easement, a caveat may be registered against the land in favour of the municipality at a land titles office.

(3) The environmental reserve easement must

- (a) identify which part of the parcel of land the easement applies to, and
- (b) require that land that is subject to the easement remain in a natural state as if it were owned by the municipality

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iii. Designation of Municipal Land (excerpt from section 665)

665(1) A council may, by bylaw, require that a parcel of land or a part of a parcel of land that it owns or that it is in the process of acquiring be designated as municipal reserve, school reserve, municipal and school reserve, environmental reserve or public utility lot.

(2) Subject to subsection (3), on receipt of a copy of a bylaw under this section and the applicable fees, the Registrar must do all things necessary to give effect to the order, including cancelling the existing certificate of title and issuing a new certificate of title for each newly created parcel of land with the designation of

- (c) environmental reserve, which must be identified by a number suffixed by the letters "ER",

(3) The certificate of title for a municipal reserve, school reserve, municipal and school reserve, environmental reserve or public utility lot under this section must be free of all encumbrances, as defined in the *Land Titles Act*.

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iv. Use of Reserve Land, Money (excerpt from Section 671)

671(1) Subject to section 676(1), environmental reserve must be left in its natural state or be used as a public park.

v. Changes to Environmental Reserves' Use or Boundaries

676(1) A council may, by bylaw, after giving notice in accordance with section 606 and holding a public hearing in accordance with section 230,

- (a) use an environmental reserve for a purpose not specified in section 671(1),
- (b) transfer an environmental reserve to the Crown or an agent of the Crown for consideration, as agreed,
- (c) lease or dispose of an environmental reserve other than by a sale for a term of not more than 3 years, and
- (d) change the boundaries of an environmental reserve or environmental reserve easement in order to correct an omission, error or other defect in the certificate of title, or to rectify an encroachment problem or other concern.

(2) A council may include terms and conditions in a bylaw under subsection (1).

(3) Any proceeds from a lease or other disposition under subsection (1) may be used only to provide land for any or all of the purposes referred to in section 671(2).

(4) On receipt of a bylaw under subsection (1)(b) or (d), the Registrar must cancel the existing certificates of title or amend an environmental reserve easement affected by the bylaw and issue any new certificates of title required by the bylaw.

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vi. Road, etc. over Reserve Land

677 Notwithstanding section 671, a municipality or a municipality and a school authority may authorize

- (a) the construction, installation and maintenance or any of them of a roadway, public utility, pipeline as defined in the *Oil and Gas Conservation Act* or transmission line as defined in the *Hydro and Electric Energy Act* on, in, over or under reserve land, or
- (b) the maintenance and protection of reserve land.

if the interests of the public will not be adversely affected.

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APPENDIX B - GLOSSARY

Alluvial Fan

An alluvial fan is a fan shaped feature sometimes formed where a tributary valley enters the main mountain valley.

Badlands

Badlands consist of an intensely dissected natural landscape where vegetation is sparse or absent due to extremely rapid soil erosion and slope retreat. Plant growth is also discouraged by aridity and the infertility of the soils. Badlands are restricted mainly to areas of arid to semi-arid climate in which relatively weak bedrock is horizontally layered.

In Alberta, badlands topography has developed along some of the river valleys within southeastern Alberta. The Red Deer River and many of its tributaries are especially well known for their badlands. Along this river, excellent examples of badlands are found from west of Big Valley downriver to east of Dinosaur Provincial Park. The Milk River is also acclaimed for its badlands. Other noteworthy badlands have also formed along the Lost River in the southeastern corner of the province, and in the Belly River Buttes northeast of Standoff.

Bed, Shore and Bank of a Naturally Occurring Body of Water

PART 1, section 17 of the *Surveys Act* deals with the subject of "Natural Boundary." Section 17(2) gives a definition of bank, and section 17(3) provides a definition of bed and shore.

17(1) A surveyor who needs to determine the position of a natural boundary when performing a survey under this Act may do so by any survey method that has the effect of accurately determining its location at the time of survey, relative to the surveyed boundaries of the affected parcel.

17(2) When surveying a natural boundary that is a body of water, the surveyor shall determine the position of the line where the bed and shore of the body of water cease and the line shall be referred to as the bank of the body of water.

17(3) For the purpose of this section, the bed and shore of a body of water shall be the land covered so long by water as to wrest it from vegetation or as to mark a distinct character on the vegetation where it extends into the water or on the soil itself.

The Crown's ownership of the bed and shore is specified under section 3 of the *Public Lands Act*. This section is entitled "Title to beds and shores, etc."

3(1) Subject to subsection (2) but notwithstanding any other law, the title to the beds and shores of

- (a) all permanently and naturally occurring bodies of water, and
- (b) all naturally occurring rivers, streams, watercourses and lakes,

is vested in the Crown in right of Alberta and a grant or certificate of title made or issued before or after the commencement of section 3 of the *Public Lands Amendment Act, 1984* does not convey title to those beds or shores.

(2) Section (1) does not operate

- (a) to affect a grant referred to in subsection (1) that specifically conveys by express description a bed or

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shore referred to in subsection (1) or a certificate of title founded on that grant,

- (b) to affect the rights of a grantee from the Crown or of a person claiming under him, when those rights have been determined by a court before June 18, 1931, or
- (c) to affect the title to land belonging to the Crown in right of Canada.

(3) For the purposes of subsection (1), a river, stream or watercourse does not cease to be naturally occurring by reason only that its water is diverted by human act.

RSA 1980 cP-30 s3; 1984 c34 s3

Cemetery

Cemetery means land that is set apart or used as a place for the burial of dead human bodies or other human remains or in which dead human bodies or other human remains are buried; (Definition 1(b), *Cemeteries Act*)

Close Proximity to a Bank

Close Proximity means either within 2 times the bank height from the bank crest, or within 1/2 times the bank height from the toe of slope of the bank. The bank crest refers to the top of the bank or more specifically the transition line between the bank where grades exceed 15% and the adjacent upland area where slopes are less than 15%. Similarly, the toe of slope is defined as the transition line between the bank where grades exceed 15% and the adjacent land where slopes are less than 15%.

Columbarium

Columbarium means a structure designed for storing the ashes of dead human bodies or other human remains that have been cremated; (Definition 1(c), *Cemeteries Act*)

Conservation Easement

A conservation easement is a legal agreement made between a landowner and a second party, such as a qualified conservation group, local municipality or provincial government agency. The agreement contains conditions that will ensure the easement will be used for conservation purposes. The agreement is registered against the land title and applies to future landowners.

All the legislative tools are now in place for the creation of conservation easements in Alberta. On September 1, 1996, Bill 39, the Environmental Protection and Enhancement Amendment Act, 1996, was proclaimed. The Act includes enabling provisions that allow landowners to create conservation easement. Furthermore, the Conservation Easement Registration Regulation (A/R 215/96) provides for registration of conservation easements.

Conversions: Metric to Imperial

1 metre =	3.280839895 feet
100 metres =	~ 325 feet
300 metres =	~ 1,000 feet
450 metres =	~ 1,500 feet
500 metres =	~ 1,640 feet
800 metres =	~ 0.5 miles

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1.5 kilometres = ~ 0.9 miles
1.609344 kilometres = 1 mile

0.40 hectares = ~ 1 acre
1 hectare = 2.471054 acres
64.750 hectares = 160 acres

Crematory

Crematory means a building fitted with proper appliances for the purpose of incineration or cremation of dead human bodies, and includes everything incidental or ancillary thereto; (Definition 1(d), *Cemeteries Act*)

Environment

Environment means the components of the earth and includes (Definition t, *Environmental Protection and Enhancement Act*):

- (i) air, land and water,
- (ii) all layers of the atmosphere,
- (iii) all organic and inorganic matter and living organisms, and
- (iv) the interacting natural systems that include components referred to in subclauses (i) to (iii).

Environmentally Significant Areas

Environmentally Significant Areas are identified in Environmentally Significant Areas studies prepared for the Resource Information Branch, Alberta Environmental Protection and local municipalities (now contact Resource Data Division, Alberta Environmental Protection, Edmonton, 427-7222). The characteristics of these areas are illustrated by the criteria for Environmentally Significant Areas set forth in the M.D. of Cypress Environmentally Significant Areas study.

- (1) "hazard" lands that are unsafe for development in their natural state such as floodplains and steep and unstable slopes; or that pose severe constraints on types of development such as aeolian surficial deposits and permanent wetlands;
- (2) areas that perform a vital environmental, ecological or hydrological function such as aquifer recharge;
- (3) areas that contain unique geological or physiographic features;
- (4) areas that contain significant, rare or endangered plant or animal species;
- (5) area that are unique habitats with limited representation in the region or are a small remnant of once large habitats that have virtually disappeared;
- (6) areas that contain an unusual diversity of plant and/or animal communities due to a variety of geomorphological features and microclimatic effects;
- (7) areas that contain large and relatively undisturbed habitats and provide sheltered habitat for species that are

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intolerant of human disturbance;

- (8) areas that provide an important linking function and permit the movement of wildlife over considerable distances, including migration corridors and migratory stopover points;
- (9) areas that are excellent representatives of one or more ecosystems or landscapes that characterize a natural region;
- (10) areas with intrinsic appeal due to widespread community interest or the presence of highly valued features or species such as game species or sport fish; and
- (11) areas with lengthy histories of scientific research.

Eolian

Eolian applies to the erosive action of the wind, and to deposits which are due to the transporting action of the wind.

Escarpment

Escarpment means a steep slope terminating high lands abruptly.

Food Establishment

Food Establishment means a place, premises, or vehicle where, in, on or from which food that is intended for consumption by the public is sold, offered for sale, supplied, distributed, displayed, manufactured, prepared, preserved, processed, packaged, served, stored, transported or handled, and includes a secondary meat processing plant; (definition 1.0(g) of the *Food Regulation 240/85, Public Health Act*)

Green Area and White Area

In general, the White Area coincides with the settled portion of Alberta. For the most part, provincially owned land within this area is managed by the Public Land Management Branch, of Agriculture, Food and Rural Development (Edmonton, 427-5570). Under certain circumstances this provincially owned land is available for disposition (sale or lease). Provincial Parks are administered by Alberta Environmental Protection and Special Areas by Alberta Municipal Affairs. Provincially owned land in the remainder of the province falls within the Green Area and is administered by the Land and Forest Service for the management of timber (Edmonton, 422-4738). Depending upon the situation, this provincially owned land is available for disposition (sale or lease).

Hazard Area - see Environmentally Significant Areas

Hectares - see Conversions: Metric to Imperial

Hills

Hills may be ridge, mound or irregular in shape. In the Alberta prairies, hills were likely formed by one or more glacial processes, or by post glacial land forming processes (wind, water, ice erosion and deposition). Glaciers disappeared from the prairies more than ten thousand years ago leaving a wide variety of deposits and landforms. Hilly glacial landforms include various types of moraine composed of till, and ice-contact fluvial deposits (sediments deposited by running water in association with glacial ice). Fairly common, post glacial, hilly landforms in Alberta are longitudinal and parabolic sand dunes (eolian deposits).

HSQL - see Public Health, Safety or Quality of Life Concerns (Public HSQL)

Human Oriented Development (HOD)

Human Oriented Development includes commercial, food establishment, institutional, recreational or residential development.

Industrial Runoff Control Facility

Industrial runoff control facility means any facility that is part of an industrial plant and is designed to collect, store or treat industrial runoff from the plant; (refer to section 1(1)(d) of the *Industrial Plants Regulation (121/93)*, *Environmental Protection and Enhancement Act*)

Industrial Wastewater Control Facility

Industrial wastewater control facility means any facility that is part of an industrial plant and is used for the physical, chemical, biological, radiological or other treatment of industrial wastewater or for the storage, distribution or collection of industrial wastewater from the industrial plant (refer to section 1(1)(f) of the *Industrial Plants Regulation (121/93)*, *Environmental Protection and Enhancement Act*).

Intensive Livestock Facility

Intensive Livestock Facility is defined in the *Code of Practice For the Safe and Economic Handling of Animal Manures* (refer to definition 2.8.3.). This document was prepared in consultation with the livestock industry by Alberta Agriculture, Food and Rural Development and may be obtained from the Policy Secretariat, Alberta Agriculture, Food and Rural Development (Edmonton, 427-5359).

An Intensive Livestock Facility is a feedlot or covered facility of significant investment or permanence, capable of confining a minimum number of livestock (see Table 1) at a housing density of more than 1 livestock manure unit per 184 square metres (2000 square feet) (approximately 54 cattle per hectare or 22 cattle per acre) for growing or finishing for market. An Intensive Livestock Facility does not include a seasonal feeding site confining livestock from November 1 to May 31, or livestock confined for branding, sorting, herd health management and market delivery with confinement not exceeding 30 consecutive days.

Table 1. Intensive Livestock Operations - Minimum Size

Livestock Type	Threshold #
Beef Feeder (500 - 1200 lb)	300
Dairy (milking)	All
Piggery (sows: farrow - finish)	30
Piggery (sows: farrow - wean)	50
Piggery (feeders only)	300
Veal	100
Horses (PMU)	75
Poultry (broilers)	10,000 square feet (920 cubic metres)
Poultry (breeders)	500
Poultry (layers)	5,000
Poultry (Turkey broilers)	3,000
Sheep (ewes)	650

Other

Discretionary

Mausoleum

Mausoleum means a structure wholly or partly above the level of the ground and designed for the burial or storage of dead human bodies; (Definition 1(g), *Cemeteries Act*)

Mine

Mine means any opening in, excavation in or working of the surface or subsurface for the purpose of working, recovering, opening up or proving coal, a coal bearing substance, oil sands or an oil sands bearing substance, and includes any associated infrastructure (Definition kk, *Environmental Protection and Enhancement Act*).

New Development

New development means new buildings or other structures.

Non Operating

Non Operating means a development is no longer operational and has either been mothballed, decommissioned, reclaimed, abandoned, or some combination.

Oil Field Waste Management Facility

An Oil Field Waste Management Facility may include building, disposal well, landfill, land treatment and incinerator components. Wastes associated with these facilities may be corrosive, flammable and/or toxic. An approval is required from the Alberta Energy and Utilities Board (AEUB) to construct this facility.

The document entitled *AEUB Oilfield Waste Management Requirements* is available upon request from AEUB Information Services Department (Calgary, 297-8190).

Pipeline

Pipeline means (Definition vv, *Environmental Protection and Enhancement Act*)

- (i) a pipe for the transmission of any substance and installations in connection with that pipe,
- (ii) a sewer or sewage system and installations in connection with that sewer or sewage system, or
- (iii) an underground pipe that contains telecommunication lines.

Pit

Pit means an excavation in the surface made for the purpose of removing, opening up or proving sand, gravel, clay, marl, peat or any other substance, and includes any associated infrastructure, but does not include a mine or quarry (Definition ww, *Environmental Protection and Enhancement Act*).

Potable Water

Potable Water means water that is supplied by a waterworks system and is used for drinking, cooking, bathing, dish washing or other domestic purposes (Definition yy, *Environmental Protection and Enhancement Act*).

Privately Owned Domestic Water Supply System

For privately owned domestic water supply systems, each lot has its own water supply system based on a groundwater well, hauled water and a cistern, or a surface water supply. Water for domestic purposes is utilized for household and domestic farm purposes, for human use in small industrial buildings and includes all water obtained from wells equipped with hand pumps. It excludes irrigation and feedlot operations. Further information on hauled water/cistern systems may be obtained within the *Nuisance and General Sanitation Regulation, Alberta Regulation 242/85, Public Health Act* (Queen's Printer Bookstores, Edmonton, 427-4952; Calgary 297-6251).

Where it is unfeasible to connect to a municipal waterworks system, it is recommended that privately owned domestic wells be constructed wherever there is an adequate groundwater supply potential. An adequate groundwater supply is capable of meeting the domestic water needs of each parcel during peak demand periods and over the long term. Privately owned domestic wells:

- (1) are consistent with rural self-sufficiency;
- (2) promote water conservation;
- (3) likely will remain the complete responsibility of the individual lot owner and not the municipality;
- (4) likely have lower capital, operation and maintenance costs than alternative methods;
- (5) likely have the most predictable costs over the long term; and
- (6) likely are the most energy efficient.

Private Sewage Disposal System

Private sewage disposal system means a privately owned system for the treatment and disposal of sewage. The system may consist of a septic tank and subsurface disposal field, a septic tank and treatment mound, a sewage holding tank whose contents are pumped out and hauled away by tanker truck to an approved place of disposal, or other approved means of disposal. Private sewage disposal systems are regulated pursuant to the *Plumbing Code Regulation (Alta. Reg. 211/92)*.

Where it is unfeasible to connect to a municipal wastewater system and the conditions are appropriate, it is recommended that a septic tank and disposal field be the favoured method of sewage disposal on each lot. To effectively use a septic tank and disposal field, each lot should have a Suitable Development Area (Glossary) of at least 0.40 hectares (~ 1 acre), low water table conditions (Glossary, Water Table), soils that are moderately permeable and a household water supply Sodium Adsorption Ratio (SAR; Glossary) that does not exceed 8. A properly designed, installed and operated septic tank and disposal field has a number of advantages over a wastewater collection system or sewage holding tanks. It:

- (1) is consistent with rural self sufficiency;
- (2) is a standard system;
- (3) likely will remain the complete responsibility of the individual lot owner and not the municipality;
- (4) likely has lower capital, operation and maintenance costs than alternative methods;

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- (5) likely has the most predictable costs over the long term; and
- (6) likely is the most energy efficient.

There are a number of reasons why sewage holding tanks are not a preferred sewage disposal system. Problems with hauling effluent off site by truck include:

- (1) reduction in rural self sufficiency;
- (2) very high operating costs which are likely unpredictable and escalating over the long term;
- (3) considerable energy inefficiency;
- (4) increased heavy truck traffic within the subdivision and on adjoining roads resulting in increased noise, dust, risk of accidents and road wear;
- (5) pumping of sewage holding tank contents over the ground surface or into creeks and lakes by home owners frustrated by high hauling costs; and
- (6) discharge of sewage at unauthorized locations by haulers unwilling to take loads to a distant approved place of disposal.

Ultimately problems with operating a sewage holding tank system, including the great difficulty in preventing its abuse, may force the municipality to become responsible for it.

Proposed Subdivision Area

Proposed Subdivision Area is that portion of the Titled Area which is to be subdivided to produce additional lots, adjust lot boundaries or consolidate existing lots. The Proposed Subdivision Area may either coincide with the Titled Area, or as is the case of a "first parcel out" in a quarter section, be only a part of the quarter.

Public Facility

In general terms, a public facility is a building such as a hospital or school, or a major recreational facility, for example a major campground, that the Alberta Energy and Utilities Board (AEUB) may designate as a public facility based upon the complexity of evacuation taking into consideration the number and characteristics of the people using the facility, and the frequency and duration of their use.

According to Sections 9(1) of the *Subdivision and Development Regulation, Municipal Government Act* "A subdivision authority must send a copy of a subdivision application and a development authority must send a copy of a development application for a development that results in permanent additional overnight accommodation or public facilities, as defined by the AEUB, to the AEUB if any of the land that is subject to the application is within 1.5 kilometres of a sour gas facility or a lesser distance agreed to, in writing, by the AEUB and the subdivision authority."

Public Health, Safety or Quality of Life Concerns (Public HSQL)

Developments that have Public Health, Safety or Quality of Life Concerns include airports, industrial facilities, intensive livestock operations, oil and gas wells, pipelines, reservoirs, sour gas facilities (well, pipeline, etc.), resource extraction (mines, pits and quarries), fuel storage tanks, waste management facilities and wastewater systems. These developments potentially have one or more of the following problems:

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- (1) accidents (explosion, fire, smoke, spillage and release of toxic gases)
- (2) contamination of air, water or soil
- (3) nuisance (dust, foul odour, negative visual impact, noise, traffic)
- (4) subsidence
- (5) water related (non contamination related adverse changes to water courses, water bodies, water tables, aquifers)

Quarry

Quarry means any opening in, excavation in or working of the surface or subsurface for the purpose of working, recovering, opening up or proving any mineral other than coal, a coal bearing substance, oil sands or an oil sands bearing substance, and includes any associated infrastructure (*Definition bbb, Environmental Protection and Enhancement Act*).

Sodium Adsorption Ratio (SAR)

Based on experience gained in the area of irrigation water quality, it is recommended that the Sodium Adsorption Ratio (SAR) of the household water supply not exceed 8. If the SAR is greater than 8 there is the potential that the permeability of disposal field soils will be reduced causing system failure. The SAR of a water supply may be calculated by using the ionic concentrations (in mg/litre) of sodium (Na), calcium (Ca) and magnesium (Mg) using the equation below:

$$\text{SAR} = \frac{\text{Na}/23}{\text{Square Root}(((\text{Ca}/20)+(\text{Mg}/12))/2)}$$

Storm Drainage System

Storm Drainage System means any system for collecting, storing and disposing of storm drainage, and includes (*Definition jjj, Environmental Protection and Enhancement Act*)

- (i) the sewers and pumping stations that make up the storm drainage collection system,
- (ii) the storm drainage storage, management and treatment facilities that buffer the effects of the peak runoff or improve the quality of the storm water,
- (iii) the sewers and pumping stations that transport storm drainage to the location where it is treated or disposed of, and
- (iv) the storm drainage outfall structures.

Suitable Development Area of a Serviced Residential Lot

The Suitable Development Area of a serviced residential lot is an area that is environmentally suitable for the construction and sustainable use of a residence, ancillary buildings and a driveway. Specifically, the Suitable Development Area of a serviced residential lot:

- (1) has low water table conditions (*Glossary, Water Table*);

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- (2) is level or has slopes not exceeding a grade of 15% (8.53 degrees or 6.7 to 1);
- (3) can support a connection to a waterworks system that provides the residence with an adequate, long term supply of potable water;
- (4) can support a connection to a wastewater system where there is minimal, long term risk that the connection will malfunction and result in the contamination of surface and/or groundwater;
- (5) does not contain an Environmentally Significant Area (Glossary);
- (6) presents minimal risk to property, health or safety by natural environmental hazards such as flooding, erosion and slope instability; and
- (7) has minimal Public Health, Safety or Quality of Life Concerns (Glossary) associated with nearby non operating, operating or proposed land uses.

Suitable Development Area of an Unserviced Residential Lot

The Suitable Development Area of an unserviced residential lot is an area that is environmentally suitable for the construction and sustainable use of a residence, ancillary buildings, an access road, a privately owned domestic water well and a private sewage disposal system. Specifically, the Suitable Development Area of an unserviced residential lot:

- (1) is at least 0.40 hectares (~1 acre) in size;
 - does not include any part of a lot that cannot be developed for non environmental reasons, for example, a lot boundary setback strip required by a municipality
 - does not include any portion of an Environmentally Significant Area (Glossary)
 - does not include any part of a lot that will require significant modification such as regrading, filling or draining to satisfy conditions (2) to (5)
- (2) has low water table conditions (Glossary, Water Table);
- (3) is level or has slopes not exceeding a grade of 15% (8.53 degrees or 6.7 to 1);
- (4) can have a private sewage disposal system (Glossary) in which there is minimal, long term risk that it will malfunction and contaminate surface and/or groundwater;
- (5) presents minimal risk to property, health or safety by natural environmental hazards such as flooding, erosion and slope instability;
- (6) can have a privately owned domestic water well that provides an adequate, long term supply of potable water; and
- (7) has minimal Public Health, Safety or Quality of Life Concerns (Glossary) associated with nearby non operating, operating or proposed land uses.

Titled Area

The Titled Area consists of one or more titles within which the proposed subdivision is to take place.

Unserviced Lot

An unserviced lot is one which is not connected to either a waterworks system or a wastewater system.

Valley

Valleys are sometimes referred to as coulees, canyons, draws, gullies and ravines depending upon their size, shape, evolution and locally preferred name. For example, the term coulee is used chiefly in the western U.S. and western Canada and applies to a ravine (a narrow, steep-sided valley), usually dry, that has been formed by running water.

Valleys are almost always found in association with and formed by water courses and their channels (rills, brooks, creeks, streams, rivers, waterways, etc.). Examination of air photos reveals that channels and their associated valleys generally connect to one another in a treelike manner creating what is termed a drainage network. Water flows from the outermost branches of the network (tributaries) towards the innermost, finally entering the main stem channel. The land area drained by a drainage network is termed the drainage basin. The basin may contain one or more water bodies of varying size and shape that may be connected into the network. The water bodies may occupy depressions, for example sloughs, ponds, lakes, etc.; or they may be situated on a valley floor and formed by the natural or artificial obstruction of stream flow, for instance beaver ponds and reservoirs.

A portion of the valley floor may be floodprone and/or erosion prone. The floodprone area is referred to as a floodplain.

A valley bank (may also be referred to as a valley wall, slope or side) may contain one or more terraces or benches at different elevations. The terraces are abandoned floodplain remnants that are flat, horizontal or gently inclined. Depending upon the circumstances, more steeply sloping valley bank areas may be prone to slope failure (slumping, sliding, etc.). The valley crest refers to the top of the valley bank or more specifically the transition line between the valley bank where grades exceed 15% and the adjacent upland area where slopes are less than 15%. Similarly, the toe of slope is defined as the transition line between the valley bank where grades exceed 15% and the adjacent valley floor or terrace where slopes are less than 15%.

Due to flooding, erosion and slope failure hazards, and major development constraints, valleys frequently have been avoided even in populated areas, and therefore contain remnant natural environments. These natural valley environments function as wildlife corridors and refuges, and sometimes as recreational corridors. However, despite the hazards, constraints and conservation concerns, there will continue to be ongoing pressure to subdivide land within valleys or in close proximity to them. Subdivision within flood prone areas, adjacent to the toe of slope, or even on the valley bank itself, often is the result of the expansion of an urban centre which originated on a floodplain or low level terrace adjacent to the river. High real estate values and scarce available space begin to favour the subdivision of this marginal land. In an urban setting, the motivation to develop along the valley crest may be identical to that of the toe and bank areas. In addition, especially for urban and rural residential development, the valley crest provides a prized scenic viewpoint and easy access to valley natural areas.

Competing against the economic, aesthetic and recreational reasons to develop adjacent to a water feature, within a floodplain, or on or very near a valley bank are a variety of counterbalancing concerns. These include the desire to maintain the integrity of the natural environment, prevent contamination of the downstream water courses and water bodies, and protect over the long term the subdivided land, and associated development, from the adverse effects of flooding, erosion and slope failure. The primary methods for addressing these concerns are setting back lot boundaries from hazard or sensitive areas, and/or dedicating environmental reserve. Secondly, certain development restrictions may be placed on a lot.

Waste Management Facility

Waste Management Facility means a facility for the collection, storage, treatment or disposal of waste (Definition rrr, *Environmental Protection and Enhancement Act*).

Wastewater System

Wastewater System means a system for collecting, treating and disposing of wastewater and includes (Definition sss, *Environmental Protection and Enhancement Act*);

- (i) sewers and pumping stations that make up a wastewater collection system,
- (ii) sewers and pumping stations that transport untreated wastewater from a wastewater collection system to a wastewater treatment plant,
- (iii) wastewater treatment plants,
- (iv) facilities that provide storage for treated wastewater,
- (v) wastewater sludge treatment and disposal facilities,
- (vi) sewers that transport treated wastewater from a wastewater treatment plant to the place where it is disposed of, and
- (vii) treated wastewater outfall facilities, including the outfall structures to a watercourse or any appurtenances for disposal of treated wastewater to land or to wetlands;

For a subdivision wastewater collection system, the September 1986 booklet entitled *Guidelines for the Design, Approval and Operation of Sewage Lagoon Systems For Small Municipal Developments* is available upon request from the Municipal and Wastewater Branch (Edmonton, 427-5883).

Wastewater Treatment Plant

Wastewater treatment plant means any structure or thing used for physical, chemical, biological or radiological treatment of municipal wastewater, and includes wastewater storage facilities and sludge treatment, storage and disposal facilities. (Definition 1(t) of the *Wastewater and Storm Drainage Regulation 119/93* of the *Environmental Protection and Enhancement Act*.) The Act pertains to wastewater treatment plants that discharge wastewater off the site of the development and are designed to generate more than 50 cubic metres of wastewater per day.

Water Resources Related Works

Water Resources Related Works means works for the diversion and use of water; impoundment of water; diversion of water otherwise than impoundment; development in, over, under, on or adjacent to any water; removal or disturbance of the bed; shore or banks of any water, etc.

Waterside Recreational Facility

A waterside recreational facility is a facility such as an amusement park, camp, campground, marina, lodge, recreational vehicle park or resort that is bounded by or contained within the bed and shore of a water feature.

Water Table

The water table corresponds to the surface of standing water in a shallow observation well that has had time to stabilize. Repeated measurement of the water level in this well over a year or so will likely reveal that the water level fluctuates, perhaps by a metre or more. The water table to ground surface separation may also vary considerably over small distances as revealed by simultaneous measurement of water levels in neighbouring wells. The water table level in a well is influenced by such factors as weather, season, water levels of nearby water bodies or water courses, groundwater discharge, surficial stratigraphy and topography.

Low water table conditions are present where the water table is 1.8 metres (6 feet) or more below the ground surface during the frost free period up until the end of August, and 2.4 metres (8 feet) or more below the ground surface during the remainder of the year. This definition recognizes that the water table will probably be elevated in the spring due to the infiltration of snowmelt and during the summer rainy season. High water table levels can:

- (1) adversely affect the functioning of a sewage disposal system, which could lead to shallow groundwater and/or surface water contamination;
- (2) render the area unsuitable for residential basement construction, interfere with the construction of roads, etc.

Waterworks System

Waterworks System means any system providing potable water to a municipality, municipal development, industrial development, privately owned development or private utility, and includes (Definition xxx, *Environmental Protection and Enhancement Act*)

- (i) water wells, surface water intakes or infiltration galleries that constitute the water supply,
- (ii) water supply lines,
- (iii) on-stream and off-stream water storage facilities,
- (iv) water pumphouses,
- (v) water treatment plants,
- (vi) potable water transmission mains,
- (vii) potable water storage facilities,
- (viii) potable water pumping facilities; and
- (ix) water distribution systems;

For piped water supply systems, the August 1986 booklet entitled *Guidelines for the Design and Approval of Water Supply Systems for Small Municipal Developments* is available upon request from the Municipal and Wastewater Branch (Edmonton, 427-5883).

Working Area of a Wastewater Treatment Plant

The working area of a wastewater treatment plant includes that portion of a parcel that is currently being used or will be used by an operating wastewater treatment plant. Specifically the working area of a particular plant is composed

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of one or more of the following:

- (1) the high water level surface of the cells forming a wastewater stabilization pond (lagoon system);
- (2) the outside edge of a mechanical wastewater treatment plant building;
- (3) the high water level surface of the cells forming an aerated lagoon system associated with a mechanical wastewater treatment plant;
- (4) the operating water level surface of process units or open storage components associated with a mechanical wastewater treatment plant;
- (5) "area" where a wastewater stabilization pond is planned;
- (6) "area" where a mechanical treatment plant building is planned;
- (7) "area" where an aerated lagoon system associated with a mechanical wastewater treatment plant is planned; or
- (8) "area" where process units or open storage components associated with a mechanical wastewater treatment plant are planned.

The working area does not include any vacant land within a parcel unless it will be used for an "area" as outlined above nor does it include that portion of a parcel that is currently being used or will be used by:

- (1) access roads;
- (2) ancillary buildings (eg. equipment storage);
- (3) easements for pipelines into or out of the facility; or
- (4) parking lots

Upon receipt of an application the subdivision and development authority must determine whether or not there will be less than 300 metres between the working area of a proposed or existing wastewater treatment plant and any proposed or existing school, hospital, food establishment or residence.

Air photos may be scaled to roughly establish the separation distance. If more precise measurements are required, drawings showing as built and future development areas may be available from the plant operator. If the precise location of a proposed school, hospital, food establishment or residence is not known, the subdivision authority must determine whether at least part of the proposed parcel containing a suitable building site is at least 300 metres or more from the working area of the plant.

If the setback distance cannot be met, a request for approval to vary can be submitted to Alberta Environmental Protection by the subdivision or development authority. The authority should be supportive of the proposal, that is, willing to grant approval to an application if the Department waives the standard setback requirement. The request for variance of the 300 metre setback standard should clearly document the situation using both text and map(s). Requests should be sent to the Regional Director, Environmental Regulatory Service, Alberta Environmental Protection (private callers within Alberta can phone the Regional Information Telephone Enquiry RITE Number 310-0000 to connect toll free to the following numbers).

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- Regional Directors, Environmental Regulatory Service
 - Northeast Boreal and Parkland Regions (Edmonton, 427-9562)
 - Northwest Boreal and Northern Slopes Regions (Edson, 723-8395)
 - Southern East Slopes and Prairie Regions (Calgary, 297-7605)

White Area - see Green Area and White Area (Glossary)

APPENDIX C - REFERENCES

NOTE: TOLL FREE CONNECTION TO PROVINCIAL GOVERNMENT OFFICES

For information and assistance in completing calls to provincial government offices, private callers within Alberta can phone toll free the Regional Information Telephone Enquiry RITE Number 310-0000.

A. *Acts and Regulations*

- (1) *Canadian Navigable Waters Protection Act*
- (2) *Cemetery Act*
- (3) *Environmental Protection and Enhancement Act*
 - Activities Designation Regulation (Alta. Reg. 110/93)*
 - Activities Designation Regulation Amendment (Alta. Reg. 211/96)*
 - Approvals Procedure Regulation (Alta. Reg. 113/93)*
 - Conservation and Reclamation Regulation (Alta. Reg. 115/93)*
 - Industrial Plants Regulation (Alta. Reg. 121/93)*
 - Waste Control Regulation (Alta. Reg. 192/96)*
 - Wastewater And Storm Drainage Regulation (Alta. Reg. 120/93)*
- (4) *Environmental Protection and Enhancement Amendment Act, 1996 (SA 1996 c17)*
 - Conservation Easement Registration Regulation (Alta. Reg. 215/96)*
- (5) *Land Titles Act*
- (6) *Municipal Government Act*
 - Subdivision and Development Regulation (Alta. Reg. 212/95)*
 - Subdivision and Development Amendment Regulation (Alta. Reg. 53/96)*
- (7) *Oil and Gas Conservation Act*
- (8) *Public Health Act*
 - Nuisance and General Sanitation Regulation (Alta. Reg. 242/85)*
- (9) *Public Lands Act*
- (10) *Safety Codes Act*
 - Plumbing Code Regulation (Alta. Reg. 211/92)*
- (11) *Surveys Act*
- (12) *Water Resources Act*

Standards and Guidelines Branch, Alberta Environmental Protection

Note: The Queen's Printer Bookstores publish Alberta acts, regulations, the Alberta Gazette and selected departmental publications.

11510 Kingsway Avenue
Edmonton, AB T5G 2Y5 Phone 427-4952
..... Fax 452-0668

Main Floor, McDougall Centre
455 - 6th Street SW
Calgary, AB T2P 4E8 Phone 297-6251
..... Fax 297-8450

The Queen's Printer Catalogue can be viewed in paper form or on the Internet.

Internet - [Queen's Printer Bookstore Home Page]
..... <http://www.gov.ab.ca:80/~pab/qp/>
Internet - [Queen's Printer Bookstore Department Publications Catalogue]
..... <http://www.gov.ab.ca:80/~pab/qp/deptpub.html>

B. Guidelines and Criteria

- (1) *Alberta Tier 1 Criteria for Contaminated Soil Assessment and Remediation* - available from the Contaminated Sites and Decommissioning Branch (Edmonton, 427-6182)
- (2) *A User Guide to Pit & Quarry Reclamation in Alberta* 1992 available from the Conservation and Reclamation Review Branch (Edmonton, 422-2636)
- (3) *Design Guidelines and Specifications - Pesticide Container Collection Sites* December, 1988 available from the Pesticides Management Branch (Edmonton, 427-5855)
- (4) *General Guidelines for the Development of Lands in the Vicinity of Coal Hazards in Alberta* (draft) available from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475)
- (5) *Guidelines for Canadian Drinking Water Quality*, Health Canada
- (6) *Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites, Vols. 1 and 2*. CCME-EPC-NCS62E and NCS66E.
- (7) *Guide for Pits* 1995 available from the Conservation and Reclamation Review Branch (Edmonton, 422-2636)
- (8) *Guidelines for Industrial Landfills* June, 1987 available from the Industrial Waste Branch (Edmonton, 427-5847)
- (9) *Guidelines for the Design, Approval and Operation of Sewage Lagoon Systems For Small Municipal Developments* (September 1986) (currently under review) available from the Municipal Water and Wastewater Branch (Edmonton, 4427-58835877)

Standards and Guidelines Branch, Alberta Environmental Protection

- (10) *Guidelines for the Design and Approval of Water Supply Systems For Small Municipal Developments* (August 1986) available from the Municipal Water and Wastewater Branch (Edmonton, 427-5883)
- (11) *Guidelines for the Location of Stationary Bulk Ammonia Storage Facilities* available from the Air Emissions Branch, Alberta Environmental Protection (Edmonton, 427-5872)
- (12) *Guidelines for Development Adjacent to Alberta Environmental Protection Water Supply Reservoirs* available from the Operations Branch, Water Management Prairie Region (Lethbridge, 381-5300)
- (13) *Hazardous Waste Storage Guidelines* June, 1988 available from the Industrial Waste Branch (Edmonton, 427-5847)
- (14) *Interim Canadian Environmental Quality Criteria for Contaminated Sites*. CCME-EPC-CS34.
- (15) *Interim Guidelines for the Evaluation of Groundwater Supply for Unserviced Residential Subdivisions using Privately Owned Domestic Water Wells* 1994 available from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475)
- (16) *Interim Guidelines for the Evaluation of Water Table Conditions and Soil Percolation Rate for Unserviced Residential Subdivisions* 1994 available from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475)
- (17) *Interim Guidelines for the Subdivision of Land Adjacent to Steep Valley Banks* 1994 available from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475)
- (18) *Interim Guidelines for the Subdivision of Land in Areas Adversely Affected by River Flooding and Erosion* 1994 available from the Standards and Guidelines Branch, Alberta Environmental Protection (Edmonton, 427-8475)
- (19) *Remediation Guidelines for Petroleum Storage Tank Sites -1994-Draft -* available upon request from the Groundwater Protection Branch (Edmonton, 427-6333)
- (20) *Shooting Range Guidelines for Province of Alberta* jointly produced by Alberta Justice and Natural Resources Service, Alberta Environmental Protection; available from the Office of the Chief Provincial Firearms Officer, Regulatory and Administrative Support Branch, Alberta Justice (Edmonton, 427-0437)
- (21) *Standards and Guidelines for Municipal Water Supply, Wastewater and Storm Drainage Facilities* (March 1988) (currently under review) available from the Municipal Water and Wastewater Branch (Edmonton, 427-5883)
- (22) *Stormwater Management Guidelines* (April 1988) available from the Municipal Water and Wastewater Branch (Edmonton, 427-5883)

C. Other Publications

- (1) *AEUB Oilfield Waste Management Requirements* available upon request from Alberta Energy and Utilities Board (AEUB) Information Services Department (Calgary, 297-8190)

Standards and Guidelines Branch, Alberta Environmental Protection

- (2) *Code of Practice For the Safe and Economic Handling of Animal Manures* prepared in consultation with the livestock industry by Alberta Agriculture, Food and Rural Development and may be obtained from the Policy Secretariat, Alberta Agriculture, Food and Rural Development (Edmonton, 427-5359)
- (3) *Conservation and Logging on Private Land in Alberta* 1994 available from Alberta Agriculture, Food and Rural Development (Edmonton, 427-5570)
- (4) *Development Permitting Process for Intensive Livestock Operations (ILOs)* prepared in consultation with the livestock industry by Alberta Agriculture, Food and Rural Development and may be obtained from the Policy Secretariat, Alberta Agriculture, Food and Rural Development (Edmonton, 427-5359)
- (5) *Development of Intensive Livestock Operations - Screening for Environmental Sensitivity Reference Manual* prepared in consultation with the livestock industry by Alberta Agriculture, Food and Rural Development and may be obtained from the Policy Secretariat, Alberta Agriculture, Food and Rural Development (Edmonton, 427-5359)
- (6) *Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products* August 1994 CCME-EPC-LST-71E
- (7) *ERCB Coal Mine Atlas - Operating and Abandoned Coal Mines in Alberta ERCB 85-45* [ERCB is now the AEUB - Alberta Energy and Utilities Board]
- (8) *Municipal Environmental Assessment A Land Use Planning Tool* April 1996 - A Discussion Paper prepared by the Alberta Association, Canadian Institute of Planners
- (9) *Phase 1 Environmental Site Assessment - Environmental Technology - A CSA Information Product.* 1994, Canadian Standards Association
- (10) *Subdivision and Development Regulation Requirements for Referrals to the Alberta Energy and Utilities Board* (AEUB - IL 95-07) Alberta Energy and Utilities Board
- (11) *Subsurface Assessment Handbook for Contaminated Sites.* CCME-EPC-NCSRP-48E
- (12) *Water Wells that last for generations* 1996 available from Alberta Agriculture, Food and Rural Development (Edmonton, 427-2181), PFRA - Prairie Farm Rehabilitation Administration (Edmonton, 495-3307), Alberta Environmental Protection (Edmonton, 427-6230)

D. Internet Sites

i. Environment: Internet Starting Points

- (1) Amazing Environmental Organization Web Directory
.....<http://webdirectory.com/>
- (2) Best Environmental Directories..... <http://www.ulb.ac.be/ceese/cds.html>
- (3) EcoNet Environmental Issues Resource Center
.....<http://www.econet.apc.org/econet/en.issues.html>

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- (4) EcoWeb<http://community.web.net/ecoweb/index.html>
- (5) Environmental Information Sources (EIS) Project - Environmental Data Sources around the World (University of Waterloo)
.....<http://bordeaux.uwaterloo.ca/enviro.html>
- (6) Environmental Sites on the Internet (Royal Institute of Technology Library - Stockholm, Sweden)
.....<http://www.lib.kth.se/~lg/envsite.htm>
- (7) Environment Sources on the World Wide Web (The Institute of Earth Studies, University of Wales)
.....<http://www.aber.ac.uk/~ieswww/geores/environ.html>
- (8) Environment Web Resources (Library and Media Services University of Hertfordshire)
<http://www.herts.ac.uk/Library/inf/internet/natsci/pages/envhpg.htm>
- (9) Galaxy - Environment
<http://www.einet.net/galaxy/Community/Environment.html>
- (10) Geodata Information Sources (University of Iowa Center for Global and Regional Environmental Research)
.....http://www.cgrer.uiowa.edu/servers/servers_geodata.html
- (11) Internet Resources For The Environmental Scientist
.....<http://www.imt.net/~dcouncil/env.html>
- (12) The Argus Clearinghouse: Environment
.....<http://www.clearinghouse.net/tree/envir.html>
- (13) The Canadian Green Page<http://www.cdngreenpage.com/>
- (14) The Climate/Weather/Earth Hotlist<http://space.rice.edu/~rss/hotlist.html>
- (15) The Green Lane on the Information Highway (Environment Canada)
.....<http://www.doe.ca/envhome.html>
- (16) World Wide Web Virtual Library -
Biodiversity, Ecology and the Environment<http://conbio.bio.uci.edu/link>
Environment<http://ecosys.drdr.virginia.edu/Environment.html>
- (17) Yahoo - Environment and Nature
http://www.yahoo.com/Society_and_Culture/Environment_and_Nature/

ii. World

- (1) The International Local Government Home Page
.....<http://world.localgov.org/>
North America<http://world.localgov.org/northam.html>

Standards and Guidelines Branch, Alberta Environmental Protection

- (2) The United Nations Environment Programme (UNEP)
.....<http://unep.unep.no/>
- (3) World Meteorological Organization (WMO) <http://www.wmo.ch/>
- (4) World Health Organization (WHO) <http://www.who.ch/>

iii. U.S. Sites

- (1) Montana Natural Resource Information System
..... <http://nris.mt.gov/>
- (2) U.S. Environmental Protection Agency (EPA)..... <http://www.epa.gov/>
- (3) U.S. Geological Survey (USGS).....<http://www.usgs.gov/>
Earth and Environmental Science
..... <http://www.usgs.gov/network/science/earth/earth.html>
USGS by Themes (hazards, resources, environment, information management)
<http://www.usgs.gov/themes/>
- (4) U.S. National Geophysical Data Centre (NGDC).....
.....<http://www.ngdc.noaa.gov/>
- (5) U.S. National Oceanic and Atmospheric Administration (NOAA)
..... <http://www.esdim.noaa.gov/>

iv Canada

- (1) Canadian Council of Ministers of the Environment (CCME)
..... <http://www.mbnet.mb.ca/ccme/>
- (2) Canadian Universities
<http://gong.snu.ac.kr/www-service/can-univ.html>
- (3) Canadian Institute of Planners (CIP) <http://www.cip-icu.ca/>
- (4) Environment Canada <http://www.doe.ca/envhome.html>
Contact List
<http://yvrwww1.pwc.bc.doe.ca/corp/press/eweek/contacts.html>
- (5) Great Outdoor Recreation Pages (GORP) - Canada
.....<http://www.gorp.com/gorp/location/canada/canada.htm>
- (6) Government of Canada..... <http://canada.gc.ca/>
- (7) Intergovernmental Committee on Urban and Regional Research (ICURR)
..... <http://www.web.net/icurr/>

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- (8) Natural Resources Canada (NRCan)
 - <http://www.nrcan.gc.ca/home/nrcanhpe.htm>
 - Canadian Centre for Remote Sensing (CCRS) Home Page
 -<http://www.ccrs.nrcan.gc.ca/ccrs/homepg.pl?e>
 - Canada's official geographical names Web site [English]
 -<http://www-nais.ccm.NRCan.gc.ca/cgndb/geonames.html>
 - Geological Survey of Canada (GSC)
 - <http://www.nrcan.gc.ca/gsc/gschp.html>
 - Terrain Sciences Division..... <http://sts.gsc.nrcan.gc.ca/tsd.htm>
 - Geomatics Canada..... <http://www.geocan.NRCan.gc.ca/>
 - Geomatics Canada National Atlas Information Service
 - <http://www-nais.ccm.NRCan.gc.ca/>
 - National Atlas on SchoolNet
 -<http://www-nais.ccm.emr.ca:80/schoolnet/>
- (9) Parks Canada <http://parkscanada.pch.gc.ca/parks/main-e.htm>

v. Other Provinces and Territories

- (1) British Columbia Ministry of Environment, Lands and Parks
 - <http://www.env.gov.bc.ca/>
- (2) Manitoba Environment..... <http://www.gov.mb.ca/environ/>
- (3) New Brunswick Environment Department
 - <http://www.gov.nb.ca/environm/index.htm>
- (4) Newfoundland and Labrador - Environment and Labour
 - <http://www.gov.nf.ca/env/home.html>
- (5) Northwest Territories - Department of Renewable Resources Phone Book
 -<http://pingo.gov.nt.ca/Phone/Dept/dept0018.htm#11>
- (6) Nova Scotia Department of The Environment
 - <http://www.gov.ns.ca/envi/>
- (7) Ontario Ministry of Environment and Energy
 - <http://www.ene.gov.on.ca/>
- (8) Prince Edward Island Environmental Resources
 -<http://www.gov.pe.ca/env/index.html>
- (9) Quebec - Ministere de l'Environnement et de la Faune
 -<http://www.mef.gouv.qc.ca/en/>
- (10) Saskatchewan Environmental Resource Management
 -<http://www.gov.sk.ca/govt/environ/>

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(11) Yukon Renewable Resources (no Web site established yet)

vi Alberta

- (1) Alberta Association of Municipal Districts & Counties (AAMD&C)
 <http://www.health-in-action.org/arpa/recalta.htmls/aamdc.html>
- (2) Alberta Energy and Utilities Board (AEUB) Home Page
 <http://www.eub.gov.ab.ca>
- (3) Alberta Environmental Protection Home Page
 <http://www.gov.ab.ca/~env/index.html>
- (4) Alberta Geological Survey (AGS) Home Page
 <http://www.energy.gov.ab.ca/ags/ags1/ags.html>
- (5) Alberta Law Centre<http://www.web.net/~elc/>
- (6) Alberta Urban Municipalities Association (AUMA) Home Page
 <http://www.auma.ab.ca/>
- (7) Government of Alberta.....<http://www.gov.ab.ca/>
- (8) Queen's Printer Bookstore Home Page
 <http://www.gov.ab.ca:80/~pab/qp/>
- (9) Recreation Alberta On Line.....<http://www.health-in-action.org/arpa/>
- (10) Services and Programs Electronic Retrieval for Government (SPERG)
 <http://itsd-s3.agric.gov.ab.ca/sperg/>
- (11) The GATE - NEOS Libraries' Catalogue
 <http://gate.library.ualberta.ca>
- (12) University of Calgary Library
 <http://www.ucalgary.ca/UofC/departments/INFO/library/>

vii. Geohazards

- (1) Geohazards - Selected References
 <http://www.aber.ac.uk/~jpg/hazards/hazsourc.html>
- (2) Geological Survey of Canada - Geohazards
 <http://sts.gsc.emr.page1.geoh/>
- (3) Natural Disaster Reference Database (Earth Sciences Directorate, NASA, Goddard Space Flight Center)

Standards and Guidelines Branch, Alberta Environmental Protection

..... <http://ltpwww.gsfc.nasa.gov/ndrd/ndrd1.html>

- (4) U.S. Geological Survey -
Geologic Hazards Team [http://gldage.cr.usgs.gov/
Hazards Theme Page](http://gldage.cr.usgs.gov/Hazards Theme Page) <http://www.usgs.gov/themes/hazard.html>

viii. Sustainable Development

- (1) Centre for Excellence for Sustainable Development
..... <http://www.sustainable.doe.gov/>
- (2) International Institute for Sustainable Development..... <http://iisd1.iisd.ca/>
- (3) Solstice Internet Information Service of the Center for Renewable Energy and Sustainable
Technology <http://solstice.crest.org/index.html>

ix. Contamination - General

- (1) Canadian Council of Ministers of the Environment
..... <http://www.mbnet.mb.ca/ccme/>
- (2) Criteria for Managing Contaminated Sites In BC
<http://www.env.gov.bc.ca/epd/cpr/criteria/cfmc/sibc.html>
- (3) Global Network of Environment and Technology
..... <http://www.gnet.org/GNET/>

x. Toxicology

- (1) Agency for Toxic Substances and Disease Registry (ATSDR) including access to the Hazardous
Substance Release/Health Effects Database (HazDat)
..... <http://atsdr1.atsdr.cdc.gov:8080/atsdrhome.html>
- (2) Environmental Toxicology (Medical Applications and Practice)
[http://galaxy.einet.net/galaxy/Medicine/Medical-Applications-and-Practice/
Environmental-Toxicology.html](http://galaxy.einet.net/galaxy/Medicine/Medical-Applications-and-Practice/
Environmental-Toxicology.html)
- (3) Toxic Hazard Identification and Toxicity Testing in DHHS (U.S. Department of Human Health
and Human Services)
..... <http://www.os.dhhs.gov/toxic.html>
- (4) U.S. National Library of Medicine (NLM) Medlars and Toxnet Systems
..... <http://www.nlm.nih.gov/databases/medlars.html>

xi. Chemical Databases

- (1) Sheffield Chemdex (list of Chemistry Internet Sites including WebElements)
<http://www.shef.ac.uk/~chem/chemdex/>

Standards and Guidelines Branch, Alberta Environmental Protection

- (2) Utah Material Safety Data Sheet
..... gopher://atlas.chem.utah.edu/11/MSDS
- (3) Virginia Chemical Factsheets
.....gopher://ecosys.drdr.virginia.edu/11/library/gen/toxics

APPENDIX D - GUIDELINES FOR MAPPING PROPOSED SUBDIVISIONS

A. Introduction

When reviewing a specific subdivision or development proposal, the first step is to map it. Good maps should show exactly what is proposed and its relationship with its natural and built (man-made) environment. This guideline offers practical advice on how to create subdivision maps, especially for more complex cases.

B. Requirements for Mapping - Subdivision and Development Regulation

Sketches, plans and maps assist the subdivision authority to determine whether the land that is proposed to be subdivided is suitable for the purpose for which the subdivision is intended (refer to 654(1)(a) of the *Municipal Government Act*; refer also to Appendix A, section I. of this Manual).

Subsection 4(4) of the *Subdivision and Development Regulation, Municipal Government Act* describes minimum mapping requirements for subdivision applications. For most subdivision applications these requirements will likely be sufficient.

4(4) The applicant must submit the number of sketches or plans of the proposed subdivision drawn to the scale that the subdivision authority requires

- (a) showing the location, dimensions and boundaries of the land to be subdivided,
- (b) clearly outlining the land that the applicant wishes to register in a land titles office,
- (c) showing the location, dimensions and boundaries of
 - (i) each new lot to be created, and any reserve land, and
 - (ii) existing rights of way of each public utility, or other rights of way,
- (d) showing the location, use and dimensions of buildings on the land that is the subject of the application and specifying those buildings that are proposed to be demolished or moved,
- (e) showing the approximate location and boundaries of the bed and shore of any river, stream, watercourse, lake or other body of water that is contained within or bounds the proposed parcel of land,
- (f) describing the use or uses proposed for the land that is the subject of the application,
- (g) if the proposed lots are to be served by individual wells and private sewage disposal systems, showing the location of any existing or proposed wells, the location and type of any private sewage disposal systems and the distance from these to existing or proposed buildings and property lines, and
- (h) showing the existing and proposed access to the proposed parcels and the remainder of the titled area.

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Subsection 4(5) of the *Subdivision and Development Regulation* states as follows "The subdivision authority may require an applicant for subdivision to submit, in addition to a complete application for subdivision, all or any of the following:" and then lists nine items (4(5)(a) to 4(5)(i)). Most of these items have a mapping component. Subsection 4(5) is complemented by section 7 of the Regulation. This section requires that a subdivision authority, in deciding whether or not to approve a subdivision application, must consider, various natural and man-made features of the subject land and the use of land in the vicinity of the subject land. In general, a subdivision authority will likely require reports and mapping specified in subsection 4(5) only in more complex subdivision proposals.

C. Purpose of these Guidelines - Mapping Complex Subdivision Proposals..

The purpose of these guidelines is to provide practical advice to subdivision authorities as to how to fulfil mapping requirements, especially those contained in Subsection 4(5). These mapping guidelines describe the production of several Environmental Feature Maps that display for planning purposes the proposed subdivision plan superimposed on the significant natural and man-made features within and in close proximity to the site.

In most cases Environmental Feature Maps for subdivision plans do not have to be prepared to engineering standards which would entail considerably greater accuracy and expense.

D. Overview of Map Types and Resources Available for Map Preparation

Four Environmental Feature Maps are described: the Regional Context Map, the Nearby Land Use Map, the Tentative Plan Map and the Topographic Tentative Plan Map. The first two maps are of relatively small scale (shows a relatively large area) and provide a context for the Tentative Plan. For each map type, map scales associated with urban and rural areas are discussed.

A detailed list of mapping resources is presented in section J. of this appendix - Sources of Information for Mapping. Additional information may be obtained from municipal maps, existing subdivision plans, and site inspections.

E. Standard Map Attributes

Maps prepared for subdivision applications should have the following attributes:

- (1) contain a north arrow;
- (2) be oriented such that north is at the top of the page except when the shape of the area may favour other orientations;
- (3) display all section numbers; and
- (4) have a legend which includes:
 - the legal description of the Titled Area (quarter section, township, range, meridian, and if applicable, lot, block and plan)
 - municipality name
 - map scale (e.g. 1:2,000)
 - if applicable, information on air photos used to derive information (date, scale, AS number and photo numbers)

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- subdivision authority (SA) and SA file number
- date drawn and name of persons or group that prepared the map.

F. Regional Context Maps

i. Purpose of Regional Context Maps

The primary purpose of the Regional Context Map is to clearly show where the Proposed Subdivision Area is located within a municipality.

ii. Rural Regional Context Map

A suitable Rural Regional Context Map consists of a photocopy of the relevant portion of a 1:100,000 scale municipal land ownership map. This map typically shows major physical features such as lakes and rivers, major man-made features for example roadways and railways, and boundaries associated with urban municipalities and rural subdivisions. The Proposed Subdivision Area can be indicated by means of an arrow.

iii. Urban Regional Context Map

An Urban Regional Context Map consists of a photocopy of a map showing the entire urban area. It would be preferable if the map fit easily within an 8 1/2" x 11" page. The Proposed Subdivision Area can be indicated by means of an arrow.

G. Nearby Land Use Maps

i. Purpose of Nearby Land Use Maps

The purpose of the Nearby Land Use Maps is to identify components of the natural and built environment in the vicinity of the Proposed Subdivision Area that potentially may have a significant positive or negative relationship with the proposed development.

Significant positive relationships refer to useful resources in the vicinity of the proposed subdivision, for example water features (important recreational resource), roads, power, sewer and water services.

Significant negative relationships refer to hazards or constraints associated with either the nearby natural or built environment, or the prospective development within the Proposed Subdivision Area, or both.

Examples of hazards or constraints originating in the nearby natural or built environment that may threaten the Proposed Subdivision Area include:

- (1) natural hazards/constraints - nearby areas that are naturally prone to flooding, erosion, high water table conditions (Appendix B - Glossary, Water Table), slope instability, etc.;
- (2) man-made hazards/constraints - nearby existing developments that have public health, safety or quality of life concerns; and
- (3) man caused hazards/constraints - nearby areas that are prone or more prone to flooding, erosion, high water table conditions (Appendix B - Glossary, Water Table), slope instability, subsidence, contamination, etc. due to existing or past development activities.

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On the other hand, the proposed development may pose the same hazards or constraints to the nearby natural or built environment.

ii. Rural Nearby Land Use Map

A Rural Nearby Land Use Map should:

- (1) have a scale in the 1:25,000 to 1:50,000 range (could use a photocopy of a NTS map as a base map; this would provide general contour information);
- (2) encompass all land within 1.6 kilometres (1 mile) of the Proposed Subdivision Area; and
- (3) fit easily within an 8 1/2" x 11" page.

iii. Urban Nearby Land Use Map

An Urban Nearby Land Use Map should:

- (1) consist of a photocopy of the relevant portion of an urban map (likely in the 1:2,000 to 1:10,000 range); and
- (2) encompass all land within 1.6 kilometres (1 mile) of the Proposed Subdivision Area.

iv. Nearby Land Use Maps - General Properties

In general, a Nearby Land Use Map should:

- (1) delineate and label the Titled Area and Proposed Subdivision Area;
- (2) for a proposed commercial, food establishment, institutional (school, hospital, etc.), recreational or residential subdivision:
 - delineate and label the working areas of all operating developments in close proximity that have public health, safety or quality of life concerns, (where close proximity is in relation to the Proposed Subdivision Area and means within:

<u>1.5 kilometres</u> (~0.9 miles)	if an airport/airstrip, battery, gas or oil well, industrial facility, intensive livestock operation, pipeline or gas processing plant
<u>800 metres</u> (~ 0.5 miles)	if a resource extraction project (mine, pit, quarry)
<u>450 metres</u> (~ 1,500 feet)	if a stationary bulk ammonia storage facility, oil field waste management facility, or waste management facility (sanitary landfill, hazardous waste management facility or dry waste site)
<u>300 metres</u> (~ 1,000 feet)	if a fuel storage tank, industrial wastewater control facility, pesticide storage facility, wastewater treatment plant or waste management facility (waste processing site, waste storage site, waste sorting station or waste transfer station)).
 - delineate and label any portions of developments in close proximity that have public health,

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safety or quality of life concerns and that have been used and will not be used again, (where close proximity is in relation to the Proposed Subdivision Area and means within:

<u>450 metres</u> (~ 1,500 feet)	if a disposal area of an operating or non-operating hazardous waste management facility
<u>300 metres</u> (~ 1,000 feet)	if a disposal area of an operating or non-operating sanitary landfill, modified sanitary landfill or dry waste site
<u>300 metres</u> (~ 1,000 feet)	if an area that has been used and will not be used again by a fuel storage tank, industrial facility, intensive livestock operation, resource extraction project (mine, pit, quarry))

- (3) for a proposed subdivision whose development has public health, safety or quality of life concerns delineate and label all existing and proposed commercial, food establishment, institutional (school, hospital, etc.), recreational or residential buildings in close proximity to this proposed development, where close proximity is defined by using the preceding subsection (proximity distances are reciprocal);
- (4) delineate and label all major linear developments including railways, roadways and transmission lines (> 69 kv) within the map area;
- (5) delineate and label water features within the map area; and
 - natural water bodies (lakes, sloughs)
 - reservoirs or other impoundments
 - natural water courses (creeks, streams, rivers, etc.)
 - canals or drainage ditches
 - flood protection dykes
- (6) delineate and label other natural features;
 - all mountain sides within the map area
 - the crest and toe of slope of banks within the Proposed Subdivision Area and within 450 metres (~ 1,500 feet) of them
 - extensive wetlands overlapping onto and adjacent to the Proposed Subdivision Area (example, Organic Soils areas on C.L.I. Soil Capability for Agriculture maps, bogs, fens, low lying water body margins, etc.)
 - Environmentally Significant Areas (Appendix B - Glossary) as identified in existing municipal Environmentally Significant Areas studies (differentiate between Environmentally Significant Areas and Hazard Areas) within, overlapping onto and adjacent to the Proposed Subdivision Area.

H. Tentative Plan Maps

i. Purpose of Tentative Plan Maps

The purpose of the Tentative Plan Maps is to identify components of the natural and built environment within the Proposed Subdivision Area that potentially may have a significant positive or negative relationship with the proposed development.

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ii. Rural Tentative Plan Map

A Rural Tentative Plan Map should:

- (1) have a map scale of approximately 1:5,000 for simple rural subdivisions (a quarter section will fit easily within an 8 1/2" x 11" page);
- (2) have a map scale of approximately 1:2,000 for complex, multiparcel, rural subdivisions; and
- (3) encompass the one or more quarter sections containing the Proposed Subdivision Area.

iii. Urban Tentative Plan Map

An Urban Tentative Plan Map should:

- (1) have a map scale in the 1:1,000 to 1:2,000 range; and
- (2) encompass the Proposed Subdivision Area.

iv. Tentative Plan Maps - General Properties

The Tentative Plan Map should include all those features specified under subsection 4(4) of the *Subdivision and Development Regulation, Municipal Government Act* (refer to section B. of this appendix). In addition, it should show the following features:

- (1) the working areas of all operating developments that have public health, safety or quality of life concerns;
- (2) any portions of developments that have public health, safety or quality of life concerns and that have been used and will not be used again;
- (3) all major linear developments including railways, roadways and transmission lines (> 69 kv);
- (4) flood protection dykes;
- (5) areas that have numerous hills;
- (6) mountain sides;
- (7) the crest and toe of slope of banks and initial setback lines;
 - Initial Bank Crest Setback Line - a line running parallel to the valley or escarpment crest and separated from the crest a distance equal to two times the bank height (this height is the vertical distance from the crest to the toe of slope, the toe being located at the base of the slope, whether or not water is present)
 - Initial Toe of Slope Setback Line - a line running parallel to the toe of slope of a valley or escarpment bank and separated from the toe a distance equal to one half the bank height (to be shown only if the proposed development is within a valley or near the toe of an escarpment and the bank does not enter the water)
- (8) wetlands (example, Organic Soils areas on C.L.I. Soil Capability for Agriculture maps, bogs, fens,

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low lying water body margins, etc.);

- (9) Environmentally Significant Areas (Appendix B - Glossary) as identified in existing municipal Environmentally Significant Areas studies (differentiate between Environmentally Significant Areas and Hazard Areas);
- (10) C.L.I. Soil Capability for Agriculture or farmland assessment; and
- (11) vegetational boundaries associated with forests, forest clearings, grasslands, cultivated field and wetlands, etc.

I. Topographic Tentative Plan Maps

A Topographic Tentative Plan Map should be used for more complex multiparcel subdivisions where the site exhibits physical variability, especially with respect to topography and water table conditions (Appendix B - Glossary, Water Table). The plan should be prepared in an identical manner to the Tentative Plan Map except for the following changes and additions.

In general, a Topographic Tentative Plan Map should:

- (1) have a scale in the 1:1,000 to 1:2,000 range;
- (2) depict the relief by means of topographic contours at not greater than 1.5 metre (5 foot) intervals derived from air photos or ground surveys and tied into a geodetic datum where practicable (photos should be the most recent available of appropriate scale);
- (3) depict hand measured ground surface slopes at numerous locations within forest covered portions of the site (Making accurate contour maps is difficult in forested areas. Using stereo air photos, the photogrammetrist can only see the upper surface of the tree canopy and not the underlying ground surface. Since the canopy surface is a subdued reflection of the underlying ground surface small valleys literally disappear and valley sides appear less steep. As a consequence, to increase the accuracy and usefulness of the map a surveyor should physically travel the forested portion of the site with the contour map in hand measuring the ground surface slopes at numerous locations with a hand held clinometer. These slope measurements should then be superimposed on the map.);
- (4) delineate all areas within the site with slopes exceeding 15% using information gathered above; and
- (5) in cases where the site exhibits substantial physical variability (topography, water table conditions, hydrography, vegetation, etc.) and the proposed subdivision is complex, the map should have an uncorrected air photo background enlarged to the approximate scale of the map (since this map is for planning purposes an orthophoto, which is a geocorrected image true to scale, is not necessary; the background should normally be composed of the same photographs used to generate the contours).

J. Sources of Information for Mapping

NOTE: TOLL FREE CONNECTION TO PROVINCIAL GOVERNMENT OFFICES

For information and assistance in completing calls to provincial government offices, private callers within Alberta can phone toll free the Regional Information Telephone Enquiry RITE Number 310-0000.

INDEX OF PRODUCTS AND SERVICES

Type of Product	Possible Sources (see next pages)
• Air Photos	8, 11, 13
• Atlases	
Alberta	2, 11
Atlas of Alberta Lakes	2, 11
ERCB Coal Mine Atlas (ERCB 85-45)	1, 2
• Digital Products	
geodetic survey markers	4, 6
cadastral mapping	4
provincial digital base maps	4
remote sensing	6
thematic mapping	6
topographic information	4, 6
• Land Titles	18
• Maps and/or Reports	
aggregate resources	2, 10
bedrock geology	1, 2, 10
Canada Land Inventory (CLI)	2, 11
coal	1, 2, 10
electricity, gas, oil and pipeline	1, 2
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oil sands	1, 2, 10
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silica sands	2, 10
soils	2, 5
surficial geology	2, 10
topography (NTS)	3, 6, 8, 11
• Publications Catalogue/Lists	1, 2, 5, 9, 10
• Satellite Images	6, 14, 17

Standards and Guidelines Branch, Alberta Environmental Protection

- (1) AEUB DISTRIBUTION CENTRE
Information Services Department
Alberta Energy and Utilities Board (AEUB)
640 - 5th Ave S.W.
Calgary AB T2P 3G4 Phone 297-8190
..... Fax 297-7040
Internet - [AEUB Home Page]
.....<http://www.eub.gov.ab.ca>

Products -

- AEUB maps and charts (oil, gas and pipeline maps, coal maps, electricity maps, geological maps and charts, regional maps)
- Reports, Information Letters (ILs), Interim Directives (IDs), and General Bulletins (GBs)

- (2) ALBERTA ENVIRONMENTAL PROTECTION LIBRARY
Alberta Environmental Protection
6th Floor, 9920 - 108 Street
Edmonton, AB T5K 2M4..... Phone 427-5870
..... Fax 422-0170
..... Email library@env.gov.ab.ca
Internet - [The GATE - NEOS Libraries' Catalogue]
.....<http://gate.library.ualberta.ca>

Products -

- The library contains over 50,000 books and reports and subscribes to 700 journals and newsletters. The library lends its materials to consultants, students and the general public.
- The collection covers a wide range of scientific and technical subjects including: environmental impact assessment, pollution, fisheries, forestry, wildlife, water resources, waste management, environmental law, soil science, civil and chemical engineering, oil sands, parks, natural areas, biological diversity, geology and geography.
- The collection is the depository of all released department reports.

- (3) CANADA MAP OFFICE
130 Bentley Road
Ottawa, Ontario K1A 0E9.....Phone toll free 1-800-465-6277
..... Email info@GeoCan.NRCAN.gc.ca
Internet - [Canada Map Office Home Page]
<http://www.GeoCan.NRCAN.gc.ca/busdev/serv/cmoe.html>

Products -

- National Topographic Series (NTS) Maps

Standards and Guidelines Branch, Alberta Environmental Protection

- (4) CLIENT SERVICES BRANCH - RESOURCE DATA DIVISION
Alberta Environmental Protection
12th Floor, Oxbridge Place
9820 - 106 Street NW
Edmonton, AB T5K 2J6 Phone 427-7374
..... Fax 422-0973

Products -

- Alberta digital products data distribution (wide variety of surveying and mapping products)

- (5) CONSERVATION AND DEVELOPMENT BRANCH
Alberta Agriculture, Food and Rural Development
206, JG O'Donoghue Building
7000 - 113 Street
Edmonton AB T6H 5T6..... Phone 422-4385
..... Fax 422-0474

Products -

- Soils Survey Maps and Reports (produced by Alberta Research Council)
- publications list

- (6) GEOMATICS INFORMATION CENTRE
615 Booth Street
Ottawa, Ontario KIA 0E9..... Phone (613) 995-4321
..... Fax (613) 943- 1549
..... Email info@GeoCan.NRCan.gc.ca
Internet [Geomatics Canada Home Page]
..... <http://www.geocan.NRCan.gc.ca/>

Products and Services -

- Digital Products (aeronautical charts, geodetic survey, remote sensing, thematic mapping, topographic information)
- Conventional Products (aeronautical charts, remote sensing, thematic maps, topographic information)
- Services, Publications and Software
- Geomatics Canada - Main Information Desk

- (7) GROUNDWATER INFORMATION CENTRE (GIC)
Alberta Environmental Protection
14th Floor, Standard Life Centre
10405 Jasper Avenue,
Edmonton, AB T5J 3N4..... Phone 427-2770
..... Fax 427-1214

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Products and Services -

- aquifer test reports prepared by groundwater consulting companies for the evaluation of specific projects
- geophysical logs
- "How to Shock Chlorinate Your Water Well" pamphlet by Alberta Environmental Protection
- provincial observation well network information
- Reconnaissance Lists (list of water wells in the vicinity of a specific location)
- water well chemistries
- Water Well Driller's Reports
- "Water Wells That Last For Generations" Joint publication by Agriculture Canada, Alberta Agriculture, Food and Rural Development, and Alberta Environmental Protection

(8) INFORMATION CENTRE - AIR PHOTO SERVICES

Alberta Environmental Protection

Main Floor, 9920 - 108 Street

Edmonton, AB T5K 2M4..... Phone 427-3520

..... Fax 422-9683

Products -

- diazo (black and white) provincial maps
- provincial air photos

(9) INFORMATION CENTRE - ALBERTA ENVIRONMENTAL PROTECTION

Main Floor, 9920 - 108 Street

Edmonton, AB T5K 2M4..... Phone 422-2079

..... Email infocent@env.gov.ab.ca

Products -

- distributes departmental publications
- publications list

(10) INFORMATION SALES - ALBERTA GEOLOGICAL SURVEY (AGS)

Alberta Energy and Utilities Board

7th Floor Petroleum Plaza, North Tower

9945 - 108 Street

Edmonton, AB T5K 2G6 Phone 422-3767

..... Fax 422-1918

..... Email protz@enr.gov.ab.ca

Internet [Alberta Geological Survey Home Page]

..... <http://www.energy.gov.ab.ca/ags/ags1/ags.html>

Products -

- Geological Maps and Reports (aggregate resources, bedrock geology and topography, drift thickness, glacial geology, hydrogeology, mineral resources, oil sands, regional coal mapping,

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- silica sands, surficial geology)
- publications list

(11) LOCAL AUTHORIZED MAP DEALERS - look under Maps in your Yellow Pages

Products -

- air photos
- map accessories such as grid overlays
- Selection of maps varies with individual dealer but may include National Topographic Series (NTS) Maps, lithographed and diazo provincial maps.

(12) MANITOBA REMOTE SENSING CENTRE (MRSC)

Land Information Division

Manitoba Natural Resources

1007 Century Street

Winnipeg, MB R3H 0W4Phone (204) 945-6597

.....Fax (204) 945-1365

Products and Services -

- conducts digital image processing of satellite data for resource studies, inventorying, and environmental monitoring
- consulting, research and development, education, technology transfer, provision of satellite imagery, thematic land cover maps, joint venture opportunities, and rental of equipment

(13) NATIONAL AIR PHOTO LIBRARY (NAPL)

615 Booth Street

Ottawa, Ontario KIA 0E9.....Phone 1-800-230-6275

.....Fax (613) 995-4568

Products -

- NAPL has over 4.5 million air photos covering all of Canada, some dating as far back as the 1920's.

(14) RADARSAT INTERNATIONAL INC. (RSI)

Building D, Suite 200

3851 Shell Road

Richmond, BC V6X 2W2Phone (604) 244-0400

.....Fax (604) 244-0404

Internet http://www.ccrs.emr.ca/gcnet/query/lstat_od_e.html

Satellite Imagery Products for Commercial Clients -

- LANDSAT (MSS/TM)
- SPOT (PLA/MLA)
- radar products - ERS-1 SAR, J-RES - 1, RADARSAT

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- (15) RESOURCE DATA DIVISION
Alberta Environmental Protection
4th Floor, North Tower Petroleum Plaza
9945 - 108 Street
Edmonton AB T5K 2G6 Phone 427-7222
..... Fax 422-0712

Products -

- Environmentally Significant Areas Studies

- (16) RIVER ENGINEERING BRANCH
Alberta Environmental Protection
10th Floor, Oxbridge Place
9820 - 106 Street NW
Edmonton, AB T5K 2J6..... Phone 427-6280
..... Fax 422-6712

Products -

- floodplain studies

- (17) SATELLITE OPERATIONS CENTRE, CLIENT SERVICES
Canadian Centre for Remote Sensing (CCRS)
588 Booth Street
Ottawa, Ontario K1A 0Y7Phone (613) 990-8033
.....Fax (613) 991-5538
.....Email orderdesk@nrcan.ccrs.nrcan.gc.ca
Internet - [Canadian Centre for Remote Sensing Home Page]
.....<http://www.ccrs.nrcan.gc.ca/ccrs/homepg.pl?e>

Services -

- Alberta companies offering remote sensing services - refer to CCRS Home Page under "The Remote Sensing Community": [companies](#)
- Commercial clients such as municipalities and consultants can purchase satellite imagery products from Radarsat International Inc.
- General information on remote sensing, products and companies

- (18) SURVEYS
Alberta Registries - Land Titles Office
Mezzanine and 3rd fl, John E. Brownlee Building
10365 - 97 Street
Edmonton, AB T5J 3W7..... Phone 427-7005
..... Fax 429- 4885

Alberta Registries - Land Titles Office

Standards and Guidelines Branch, Alberta Environmental Protection

Main fl, John J. Bowlen Building

620 - 7 Avenue SW

Calgary, AB T2P 0Y8 Phone 297-5099

..... Fax 297-6528

Product and Services

- land titles information

APPENDIX E - GUIDELINES FOR DEVELOPMENT ADJACENT TO ALBERTA ENVIRONMENTAL PROTECTION WATER SUPPLY RESERVOIRS

July 25, 1995

Water Supply Reservoirs are defined as having water supply as the primary purpose. It is possible that the reservoir could have other purposes but those would be of lesser priority or secondary.

- (1) The proposed development shall not, in the Department's opinion, conflict with the primary function of the Department's reservoir, which is water supply.
- (2) It is recommended that a 30 meter buffer zone be maintained between the lot lines and the Department's right-of-way boundary. The buffer zone may be used for placement of a roadway and/or a utility corridor.
- (3) It is the applicant's responsibility to undertake a geotechnical study by a qualified professional engineer to determine the effects of the proposed development activities on shoreline stability.
- (4) The applicant may be required to conduct an environmental impact assessment which should address the effects of such a development on the operations of the reservoir.
- (5) If it is determined by the Department, that the adjacent development will adversely affect the reservoir right-of-way, the applicant shall take such remedial steps to correct the situation at its sole expense, as directed by the Department.
- (6) Construction within the reservoir right-of-way will not be permitted without prior written approval from the Department. The applicant shall provide a construction schedule for all works proposed within the reservoir right-of-way. The schedule shall outline construction start and completion dates of all proposed facilities and construction methods to be utilized.
- (7) Private development is not permitted within the right-of-way. All approved facilities located within the reservoir right-of-way area shall be available for use by the general public.
- (8) Unauthorized vehicles will not be permitted within the reservoir right-of-way.
- (9) Pedestrian access along the right-of-way shall not be restricted.
- (10) The applicant shall install a fence, approved by the Department, on the right-of-way to demarcate the boundary and restrict vehicular access.
- (11) All facilities located below top of dam elevation are to be flood resistant.
- (12) All proposed utilities shall be located outside the right-of-way.
- (13) The applicant shall reclaim all disturbed areas so as to preclude eroded soil being transported into the reservoir. Reclamation shall be to the satisfaction of the Department.
- (14) The applicant shall maintain all facilities or improvements within the reservoir right-of-way lease area in a diligent and proper manner to ensure that the area is kept neat and clean. The applicant shall not allow

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accumulation of any kind of refuse on the reservoir right-of-way.

- (15) Should the applicant cease to operate or maintain any facility or improvement, all works within the reservoir right-of-way shall be removed by the applicant, at its expense and to the satisfaction of the Department.
- (16) The applicant shall not create or permit a nuisance or unruly behaviour on the reservoir right-of-way lease area.
- (17) The Department staff or its agents may enter the reservoir right-of-way lease area any time, at no cost, for the purpose of examining the area and to undertake operation and/or maintenance work.
- (18) The applicant must include, in any sale or lease agreement, a clause stating:

"The reservoir is owned and operated by Alberta Environmental Protection for the purpose of water supply. As such, it can be subject to severe water level fluctuations. There is no guarantee of a high or stable water level. In some years the reservoir may not be suitable for recreational activity."
- (19) Sewage treatment and pumping out facilities may require prior approval under the *Environmental Protection and Enhancement Act*.
- (20) Diversion of water from the reservoir requires prior approval under the *Water Resources Act*.
- (21) The applicant must include with any sale or lease agreement, a copy of these guidelines.

APPENDIX F - ROLE OF ALBERTA ENVIRONMENTAL PROTECTION IN GOLF COURSE DEVELOPMENT

September 27, 1996

A. Background

Municipalities are the primary approving agencies for subdivision and development pursuant to the *Municipal Government Act* and associated *Subdivision and Development Regulation*. Golf course development and operations may require additional approvals from Alberta Environmental Protection. A municipality should refer golf course proposals to the Department for regulatory review if the project will entail development of water resources related works, use of pesticides, construction of services or will take place in a Restricted Development Area.

This paper outlines environmental concerns with golf courses, provides details on the Department's regulatory review process and referral contacts, and presents the results of Department golf course pesticide studies.

B. Environmental Concerns

i. Adverse Effects on the Environment:

Golf course construction and operation may have a number of adverse effects on the environment, both on-site and off-site. On-site impacts are particularly pronounced if the proposed development area is in its natural state.

During the relatively brief development stage much of the existing vegetation is removed and the land surface may be substantially recontoured. This clearing eliminates wildlife habitat and exposes large areas of soil to wind and water erosion. Recontouring including cutting and filling in the vicinity of channel, lake and valley banks may result in the destabilization of these features and further erosion and reduction in habitat. Erosion often results in deleterious siltation off-site within water bodies and streams. Especially in Environmentally Significant Areas this type of development may be viewed by the public as an unnecessary intrusion.

During the prolonged operational stage wildlife activity will continue to be suppressed relative to predevelopment times due to the simplified nature of the fairway/green grass ecosystem. Retention or enhancement of natural "roughs" and tree planting may help to mitigate this problem. Concerns are often raised with regard to the potential for surface and groundwater contamination due to the improper handling, storage or application of agricultural chemicals including fertilizers and pesticides (includes herbicides, fungicides and other chemicals). The risk of contamination depends upon many factors such as chemical type, application procedures and volumes, storage, treatment of runoff, as well as the characteristics of the local geology. A groundwater quality monitoring and protection plan will determine whether these chemicals are a threat to the environment. Human wastes can also have adverse on-site and off-site impacts. For this reason sewage and potable water service to the clubhouse and other structures needs to be planned to protect human and environmental health.

ii. Natural Environmental Hazards:

Natural environmental hazards may pose a threat to the development and operation of a proposed golf course. Depending upon the nature of the hazard certain areas might have to remain undeveloped, or alternatively it may be feasible to reduce or eliminate the hazard. River and lake flooding is a commonly faced problem. Inundation threatens buildings and causes siltation of fairways and greens. Wave and current erosion can cause bank collapse. Under certain circumstances a water course may shift its course. Potential damages can be lessened by placing buildings above the 1 in 100 year flood level, recontouring floodprone areas to facilitate fast draining and thus minimum deposition of silt, and maintaining or enhancing natural vegetation cover along and beside erosion prone banks.

Channel and valley banks may be naturally failure prone, however, they may also be destabilized by development impacts such as vegetation clearing, cutting and filling and poor on-site water management. For this reason it is advised that bank development be minimized and development be set back from the slope.

Subsidence is also a concern for golf course development in the vicinity of underground mining works.

C. *Regulatory Approvals*

i. Water Resources Act and Public Lands Act

Approvals under the Alberta *Water Resources Act* and possibly the *Public Lands Act* may be required for various water resources related works including surface or groundwater withdrawals, water storage facilities, irrigation systems, and other structures for water use. Riverbank stabilization works, flood protection works, berms, retaining walls, bridges and any other facilities located within the 1:100 year floodplain of a river may also require approvals.

Specific questions regarding the approvals process and requirements may be directed to the nearest Water Management Division.

- Calgary, 297-6582
- Edmonton, 427-5296
- Lethbridge, 381-5396
- Peace River, 624-6167
- Red Deer, 340-5310

If the proposed works are in or adjacent to navigable waters administered by the Canadian Coast Guard, approvals or authorization will likely be required pursuant to the *Canadian Navigable Waters Protection Act*.

Specific questions regarding the approvals process and requirements may be directed to:

Navigable Waters Protection Division
Canadian Coast Guard
Suite 703, 201 Northfront Street
Sarnia, ON N7T 8B1 Phone (519) 383-1862

..... Fax (519) 383-1995

ii. Environmental Protection and Enhancement Act - Pesticides

The golf course development may require operational pesticide use approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* (refer to Division 4, Part 2: Pesticides (b)(ii), *Activities Designation Regulation (110/93)* of the *Environmental Protection and Enhancement Act*). For example, an operational approval would be required if there will be pesticide application within 30 horizontal metres of a water course or water body.

Specific questions regarding the approvals process and requirements may be directed to one of the Pesticide Management Branch Offices

- Calgary Regional Office, 297-8262
- Edmonton Regional Office, 427-5855
- Grande Prairie Regional Office, 538-5460
- Lethbridge Regional Office, 381-5511
- Red Deer Regional Office, 340-5310

Applications for approval should be made in accordance with the *Approvals Procedure Regulation (113/93)*, *Environmental Protection and Enhancement Act* and should be submitted to:

Manager
Regulatory Approvals Centre (RAC)
Alberta Environmental Protection
Main Floor, Oxbridge Place
9820 - 106 Street
Edmonton, AB T5K 2J6..... Phone 427-6311
..... Fax 422-0154

iii. Servicing Arrangements

Approvals or authorization pursuant to the *Environmental Protection and Enhancement Act* may be required for the waterworks system and for the treatment and disposal of sewage for the clubhouse, maintenance and other buildings. For further information in this regard contact the Regional Director, Environmental Regulatory Service, Alberta Environmental Protection (private callers within Alberta can phone the Regional Information Telephone Enquiry RITE Number 310-0000 to connect toll free to the following numbers).

- Regional Directors, Environmental Regulatory Service
 - Northeast Boreal and Parkland Regions (Edmonton, 427-9562)
 - Northwest Boreal and Northern Slopes Regions (Edson, 723-8395)
 - Southern East Slopes and Prairie Regions (Calgary, 297-7605)

iv. Possible Ministerial Consent - Land in a Restricted Development Area (RDA)

Where land is in a Restricted Development Area (Edmonton-Devon RDA, Edmonton Transportation and Utility Corridor (TUC), Calgary TUC) all surface disturbing activity requires an approval directly from the Department as well as any local approval. Within the Edmonton-Devon RDA, Ministerial Consents often contain conditions that provide for a higher level of environmental protection than can be applied outside an RDA. For example, the Department may require that developers leave a buffer

to protect wildlife, outdoor recreation and other environmentally sensitive features.

For further information on the RDA program contact:

Standards and Guidelines Branch
Environmental Assessment Division
Alberta Environmental Protection
6th Floor, Oxbridge Place
9820 - 106 Street
Edmonton, AB T5K 2J6..... Phone 427-6102
..... Fax 422-9714
..... Email tuc@env.gov.ab.ca

D. *Pesticide Studies*

Public concern is frequently expressed about chemical use on golf courses. The Department's Pesticide Management Branch conducted three studies to gather information on pesticide use.

(1) Pesticide Usage Survey

A survey was conducted of golf course superintendents on their pesticide usage in the 1990 season. Preliminary results indicated that Alberta golf courses use, on average, about 13 to 17 percent of the pesticides used by American golf courses. Higher volumes of pesticides are used on agricultural and residential areas than on golf courses.

(2) River Sampling

Four golf courses adjacent to rivers in the Banff-Calgary corridor have been sampled for pesticides in 1991 and 1992. Trace amounts of four pesticides were detected infrequently in the river water samples at levels up to 1/100 of the Canadian Drinking Water Guideline. These detections have not been conclusively associated with the golf course operations.

(3) Groundwater Sampling

A network of shallow monitoring wells was established at five courses in 1991. From samples collected during 1992 and 1993, pesticides appear to have minimal impact on shallow groundwater quality. In groundwater average nitrate levels associated with fertilizer application were well below the Canadian Drinking Water Guideline.

Alberta Environmental Protection has also taken an active role in addressing environmental problems before they appear. In the Calgary area, the Department initiated two task force groups to study water quality issues on the Bow River and Elbow River. Concern about new golf course developments up stream of Calgary contributed to the decision to establish these studies.