

**Flood Plain Planning  
Policy Statement**

**Implementation Guidelines**

**October, 1988**



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Resources

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**DEPUTY MINISTERS'  
FOREWORD**

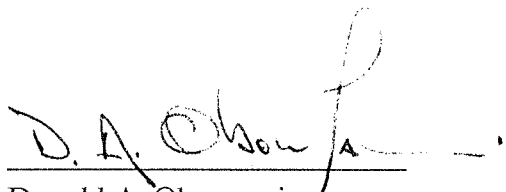
These Implementation Guidelines have been prepared to assist in further explaining the Provincial Policy Statement on Flood Plain Planning. They also present various options and approaches for incorporating flood plain management into the land use planning process.

The guidelines are not intended to be rigid procedures. A certain approach may be acceptable in one area under certain circumstances but may not be acceptable in a different area or under a different set of circumstances. The key is to ensure that the approach proposed has been developed with due consideration to local conditions and that it reflects the intent of the Provincial Policy Statement.

It is anticipated that the guidelines will be revised from time to time as new information becomes available or new approaches are developed.

These Implementation Guidelines, together with the companion Technical Guidelines designed to assist in the computation of flood flows and the delineation of flood plains, are key tools that will enable continued effective flood plain management in Ontario.

  
\_\_\_\_\_  
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Deputy Minister  
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\_\_\_\_\_  
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# **FLOOD PLAIN PLANNING POLICY STATEMENT**

## **IMPLEMENTATION GUIDELINES**

**OCTOBER, 1988**

**THESE GUIDELINES MUST BE READ TOGETHER  
WITH THE PROVINCIAL POLICY STATEMENT - FLOOD  
PLAIN PLANNING**

**ORDER IN COUNCIL NO. 1946-88  
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Prepared by  
Ministry of Natural Resources and the  
Ministry of Municipal Affairs

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## 1. INTRODUCTION

Guidelines contained in this document are designed to assist in the implementation of the Provincial Policy Statement on Flood Plain Planning. They replace the previous guidelines entitled "**Interim Guidelines for Flood Plain Management Policies in Ontario**", dated April, 1983.

The options and approaches identified in this document are not considered to be all inclusive. It is expected that innovative approaches which best suit specific flood plain problems will continue to be applied. It must be noted that flooding is a physical hazard, highly influenced by local conditions. As a result, a planning or management approach for one area may be totally unacceptable for another. The key is to ensure that the approach proposed has been developed with due consideration to local conditions and that it complies with the intent of the provincial policy statement.

Mapping and flood plain studies undertaken in Ontario use accepted 'state of the art' methods. However, various assumptions are sometimes included in certain methods so that results should not necessarily be considered as absolute. As well, flood plains and flood risk can vary in time and space. Changes to land use in the watershed, modification to channel geometry, and the construction of flood control works affect flood plain extent and degree of flood risk. It is expected that due consideration will be given to these factors by decision-makers.

Land use planning within the flood plain involves trade offs between flood risk and development. Some factors associated with flood risk (i.e. flow, velocity, potential for upstream or downstream impacts) may be severe and new development should therefore be prohibited or restricted. However, where conditions are not as severe, the potential may exist for development to safely occur. It is expected that flexibility will be exercised in planning and managing flood plain lands, particularly as it relates to minor encroachments.

## 2. BACKGROUND

### 2.1 Historical Perspective

The Hurricane Hazel disaster served as the major impetus for flood plain management in Ontario. To respond to this and other flood hazards, emphasis was placed on capital works programs in the 1950s and 1960s to construct major flood control dams and channels. Programs to acquire flood susceptible lands were also initiated. During the 1970s, efforts were made to have flood susceptibility recognized prior to new development occurring. Flood plains, and policies governing their use, were included in the official plans of municipalities. As well, many Conservation Authorities enacted regulations designed to regulate development in flood plains from the technical aspects of flood susceptibility. Today, efforts continue to be made to have flood plains recognized in all components of the municipal land use planning process.

Changing attitudes over the years has resulted in various reviews of Ontario's policy positions and approaches to flood plain management. A major review was undertaken in 1975/76. This resulted in the Government of Ontario adopting Objectives, Policy Principles and Flood Plain Management Policies in November, 1979. These policies were ultimately issued as a statement of policy entitled; **"Flood Plain Criteria - A Policy Statement of the Government of Ontario on Planning for Flood Plain Lands"**.

In 1983/84, a second major review was undertaken. An independent committee was established to examine flood plain policies and practices and obtain the views and opinions of the general public. The committee prepared a report and made recommendations to the Minister of Natural Resources. Opportunity was provided for the public review of the committee's report. In response to the committee's recommendations and comments received, the Minister

announced several future directions for flood plain management in October, 1984. These future directions have subsequently been incorporated into a provincial policy statement pursuant to section 3 of the Planning Act, 1983. In support of the policy statement, two guideline documents have been prepared. The first is this document which is intended to further explain the policies and assist in their implementation. The second, under separate cover, provides technical guidelines for the preparation of mapping and the calculation and delineation of flood lines in Ontario.

## 2.2 Public Agencies with Major Involvement in Flood Plain Management

### 2.2.1 Federal Government

The Federal Government has entered into agreement with a number of provinces for the carrying out of a Flood Damage Reduction Program. The program in Ontario was initiated in 1978. It is primarily geared to preventing the creation of new problems through the preparation of flood plain maps and the carrying out of flood studies.

The Federal Government has established flood plain policies and criteria. However, where provincial standards are higher, the provincial standards will prevail.

Over the years, the Federal Government has, on occasion, contributed financially to the construction of remedial works in Ontario. Also, the possibility exists for the Federal Government to become involved in disaster relief assistance, subject to certain conditions.

### 2.2.2 Provincial Government

The two key ministries involved in flood plain management are the Ministry of Natural Resources and the Ministry of Municipal Affairs.

The Ministry of Natural Resources has the provincial mandate for many of the aspects of flood plain management. It is responsible for overall policy direction, flood warning and forecasting, and the administration of the Conservation Authorities Act, R.S.O. 1980. It also undertakes flood plain responsibilities at the field level, where Conservation Authorities do not exist.

The Ministry of Municipal Affairs' mandate includes the administration of the Planning Act. It is responsible for the review and/or approval of various municipal land use planning documents and ensuring that these documents have satisfactory regard for the Flood Plain Planning Policy Statement. The administration of disaster relief programs, as may be approved by Cabinet from time to time, also falls within this Ministry's mandate.

At the provincial level, the Ministry of Natural Resources and the Ministry of Municipal Affairs are jointly responsible for the administration of the Flood Plain Planning Policy Statement.

At the Regional and District levels, the Ministry of Natural Resources and Conservation Authorities are responsible for ensuring that municipal land use planning documents have satisfactory regard for the Flood Plain Planning Policy Statement.

### 2.2.3 Conservation Authorities

One of the key mandates of Conservation Authorities is the implementation of various aspects of flood plain management at the field level. This includes carrying out protective and preventative programs, such as: remedial works, acquisition, and flood warning. Section 28 of the Conservation Authorities Act, R.S.O. 1980, also provides for what are commonly referred to as Fill, Construction and Alteration to Waterways Regulations.

Where such Regulations are in place, Conservation Authorities regulate the placing or dumping of fill in defined areas, the construction of buildings or structures in ponds, swamps or any area subject to flooding during a regional storm or the modification or alteration of the existing channels of watercourses. Conservation Authorities administer these Regulations from the perspective of water management and related hazards. The intent is to minimize the creation of new problems or the aggravation of existing problems both on site and off site (i.e. upstream or downstream).

Fill, Construction and Alteration to Waterways Regulations of Conservation Authorities do not regulate land use. This is the responsibility of the municipalities of Ontario. However, Conservation Authorities are also commenting agencies pursuant to applications submitted for approval under the Planning Act. In this regard, they are responsible for ensuring that the municipal documents have regard for the Flood Plain Planning Policy Statement notwithstanding the existence of a Regulation.

#### 2.2.4 Municipalities

Under the Planning Act, municipalities and planning boards where they exist are responsible for preparing official plans and other planning documents to guide and control land use activities within their areas of jurisdiction. They determine the types of land uses acceptable for specific areas in light of relevant social, economic and environmental matters.

Increasingly, municipalities, planning boards and Conservation Authorities or the Ministry of Natural Resources where Conservation Authorities do not exist, are co-operating to have flood plains recognized in land use documents and the land use planning process. The intent is to minimize the creation of new problems and to have such information available as early as possible in the planning process.

Municipalities are also responsible for preparing flood contingency plans. These plans outline the emergency actions to be taken by the municipalities in the event of, or potential for, a flood.

Section 3(5) of the Planning Act includes the provision that "in exercising any authority that affects any planning matter, the council of every municipality . . . shall have regard to policy statements issued under subsection (1)". "Ownership" of policy statements remain with the initiating provincial Ministry in cooperation with the Ministry of Municipal Affairs. While ownership of the Provincial Policy - Flood Plain Planning will remain with the Ministry of Natural Resources, implementation is the dual responsibility of municipalities where they exist or planning boards in unorganized territories and Conservation Authorities where they exist or the Ministry of Natural Resources District Office in areas where Conservation Authorities have not been established. In this regard it is incumbent on municipalities or planning boards to inform proponents of applications under the Planning Act of their location, in relation to the flood plain and any applicable restrictions under the Provincial Policy - Flood Plain Planning. Deferring land use planning decisions in flood prone areas to Conservation Authorities or the Ministry of Natural Resources District Office is not appropriate. These agencies will however, provide technical/consultative services to a municipality or planning board as well as administering associated legislation (i.e. Conservation Authorities Act, Lakes and Rivers Improvement Act).



### 3. PROVINCIAL POLICY STATEMENT

The Flood Plain Planning Policy Statement was prepared in accordance with section 3 of the Planning Act, 1983.

Section 3(1) of the Act states:

"The Minister (of Municipal Affairs), or the Minister together with any other minister of the Crown, may from time to time issue policy statements that have been approved by the Lieutenant Governor in Council on matters relating to municipal planning that in the opinion of the Minister are of provincial interest."

The Flood Plain Planning Policy Statement is co-signed by the Minister of Municipal Affairs and the Minister of Natural Resources.

Section 3(1) of the Planning Act, 1983, provides the Province with the formal means to declare provincial policy and bring it to the attention of all affected parties.

Section 3(5) of the Act states:

"In exercising any authority that affects any planning matter, the council of every municipality, every local board, every minister of the Crown and every ministry, board, commission or agency of the government, including the Municipal Board and Ontario Hydro, shall have regard to policy statements issued under subsection (1)."

The wording "shall have regard to" was specifically chosen to provide a degree of flexibility, as it is realized that a particular policy may not be totally applicable under all circumstances. This wording puts a definite onus on decision-makers to fully consider the policy but sufficient scope is provided to permit decision-makers to decide that in a specific case it would be unreasonable or inappropriate to apply the policy either in whole or in part.



The following serves to further explain the policies contained in the Flood Plain Planning Policy Statement and outlines options and procedures to implement various policies. The actual policies are identified by the darker type.

### 3.1 General

"It is the policy of the Province of Ontario that:

All land use planning and resource management bodies within the Province have regard to the implications of their actions respecting the creation of new or the aggravation of existing flood plain management problems.

Municipalities and planning boards recognize flood susceptibility at the various stages of the land use planning process for which they have jurisdiction."

#### 3.1.1 Explanation

In accordance with the Planning Act, 1983, all agencies and groups are expected to give due consideration to the implications of their actions on flood susceptibility.

Emphasis in the policy statement is placed on minimizing the creation of new problems. It is not intended to be applied retroactively. Other aspects of flood plain management such as remedial works, acquisition and flood warning and forecasting are more appropriately oriented to addressing existing flood related problems.

Over the long term, the preventative approach to flood plain management is the preferred approach. It is always more desirable to prevent the creation of new problems and to plan with potential hazards than to react to them at a later date.

One of the most effective mechanisms to help minimize the creation of new problems is the land use planning process.

Over the years, municipalities and planning boards have increasingly recognized flood plains in the planning process. Efforts in this regard have traditionally been geared to recognition in the official plan document. It is the intent of this policy statement that flood plains and flood risk be considered at all the various stages throughout the land use planning process. Inroads are expected to continue to be made so that flood plains are addressed at the zoning by-law/zoning order, subdivision control, site plan control consent granting and minor variance stages, to the extent possible and appropriate.

There is no standard approach to addressing flood plains in the land use planning process. As local conditions vary from area to area, so will the treatment of flood plains in planning documents. A particular approach may be considered acceptable in a rural area but may not be acceptable for more urban situations. As well, some approaches are more involved or complex than others, therefore, the ability of a municipality to implement a particular approach must also be considered. Variations in local conditions are discussed in section 4.

Section 5.1 of these guidelines identifies several different approaches and options. These are not considered to be all inclusive. It is expected that other approaches and options will be developed over time that meet the intent of the policy statement.

### 3.2 Regulatory Flood Standard

"It is the policy of the Province of Ontario that:

The flood standards used to define flood plain limits for regulatory purposes are:

- (a) the flood resulting from one of the following storm centred events:
  - . Hurricane Hazel storm (1954)
  - . Timmins storm (1961);
- (b) 100 year flood; and
- (c) an observed flood event, subject to the approval of the Minister of Natural Resources.

The 100 year flood is the minimum acceptable regulatory flood standard.

For those watersheds with a regulatory flood standard greater than the minimum acceptable (See Figure 1), the option exists for municipalities and planning boards to apply to the Minister of Natural Resources, in accordance with procedures established, to change the standard, subject to the following overriding conditions:

- (a) changes to the existing regulatory flood standard will only be considered with the support of a significant majority of municipalities and/or planning boards within the watershed, in consultation with the local Conservation Authority or Ministry of Natural Resources, where Conservation Authorities do not exist; and

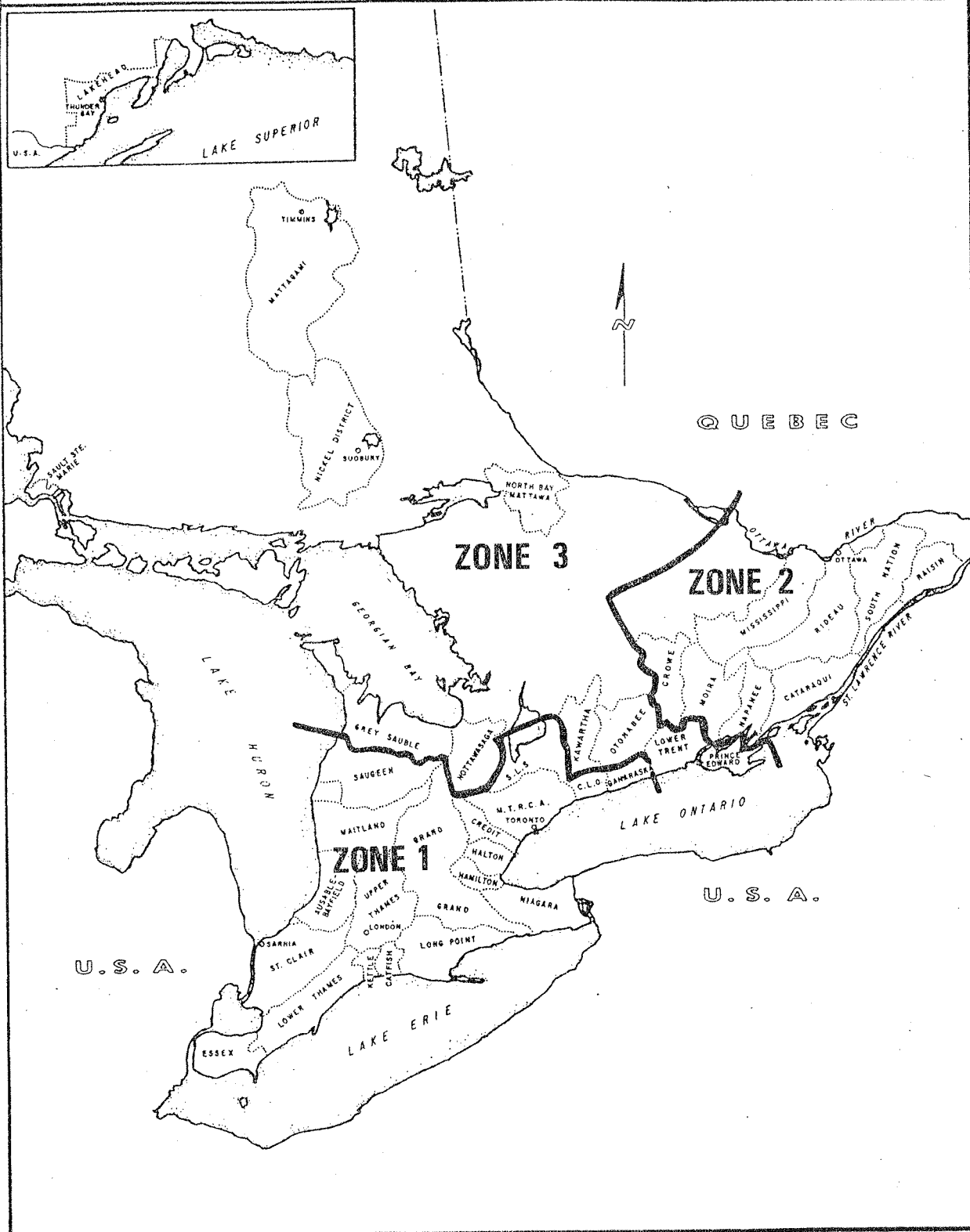
REGULATORY FLOOD — Figure 1

ZONE 1 — Flood Produced by Hurricane Hazel Storm or the 100 Year Flood, whichever is greater

ZONE 2 — The 100 Year Flood

ZONE 3 — Flood Produced by the Timmins Storm or the 100 Year Flood, whichever is greater

— Approximate boundaries of the Regulatory Floods



- (b) the lowering of the existing regulatory flood standard where the past history of flooding reveals a higher level is more appropriate will not be considered.

Where flooding is experienced in excess of the existing regulatory flood standard, the Minister of Natural Resources may require the regulatory flood standard to be modified to reflect the observed flood event."

### 3.2.1 Explanation

Every watershed in Ontario has a regulatory flood standard used to define flood plain limits for regulatory purposes. Currently, the regulatory flood for Southern Ontario is that flood produced by the Hurricane Hazel storm or the 100 year flood, whichever is greater, for Northern Ontario it is that flood produced by the Timmins storm or the 100 year flood, whichever, is greater, and for Eastern Ontario it is the 100 year flood.

The policy statement also identifies an additional regulatory flood standard based on an observed flood event. Two options exist for applying this standard. It can be applied locally in a watershed for that area where the flood event actually occurred or flood plain limits for the entire watershed can be determined by transposing or extending the data derived from the observed flood event. The transposing of data is only considered acceptable where the evidence suggests that the flood event could have potentially occurred over other portions of the watershed.

Annually throughout Ontario, ice jams cause or contribute to flooding. However, while major flooding can be experienced because of ice jams, their formation is highly dependent on local conditions. Therefore, flooding experienced as a result

of ice jams may be used to define flood plain limits for the specific area of occurrence, but the data derived from such an event cannot be applied to the entire watershed because this type of flooding is very localized in nature.

Use of an observed flood event as the regulatory flood standard requires the approval of the Minister of Natural Resources. Also, sufficient technical documentation on the event must exist, i.e. surveyed high water marks, stream flow data. Further, any observed flood event proposed for use as the regulatory standard must be of a magnitude greater than the provincial minimum acceptable of the 100 year flood.

For any flood standard used for regulatory purposes, the possibility exists for a flood of greater magnitude to be experienced. Therefore, in such situations, the Minister of Natural Resources may require the regulatory flood standard for the watershed to be modified to reflect the observed flood event.

### 3.2.2 Procedures

As stated, all watersheds in Ontario are today governed by one of three regulatory flood standards. However, the option exists for municipalities and planning boards to apply to the Minister of Natural Resources for a lowering of the standard where the standard is presently in excess of the 100 year flood.

For the Minister of Natural Resources to consider such an application, a significant majority of municipalities and/or planning boards within the watershed must provide comments on the proposed change. In addition, the Minister will consider the technical comments of the Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists. Any change in the regulatory standard that may be approved by the Minister will be applied on a watershed basis. As identified in the policy statement,

watershed refers to all lands drained by a river or stream and its tributaries. It does not, for example, mean that portion of the watershed within the jurisdiction of one particular municipality, nor does it apply to the entire jurisdiction of a Conservation Authority where more than one watershed outlets to a lake or other waterbody.

For any request to change the regulatory flood standard, the past history of flooding must be taken into account. Generally, the lowering of the regulatory standard to a level below that experienced in the past will not be considered (or to below the level of the 100 year flood).

For those municipalities desirous of changing the regulatory flood standard for a watershed, procedures to be followed have been developed and distributed to all municipalities and planning boards in December, 1984. A copy of the procedures is contained in Appendix A of this document.

The procedures are designed to provide one consistent approach to be applied Province-wide. They also contain the requirement that the general public be afforded the opportunity to make its views known on the matter of a potential change in the regulatory flood standard.

### 3.3 Official Plans

**"It is the policy of the Province of Ontario that:**

**Municipalities and planning boards show or describe flood plain lands in their official plans and incorporate policies to address new development consistent with this policy statement.**

**Municipalities and planning boards, in consultation with the local Conservation Authority or Ministry of Natural Resources, where no Conservation Authority exists, include in their official plans:**

- (a) policies whereby uses permitted in flood plains are cognizant of flood susceptibility and flood risk;
- (b) policies whereby no new buildings or structures are permitted which are susceptible to flood related damages or will cause adverse impacts to existing upstream or downstream development or lands;
- (c) policies addressing additions or alterations to existing buildings or structures and replacement of buildings or structures located in flood plains; and
- (d) policies addressing such public and private works that must locate in flood plains by nature of their use.

Municipalities and planning boards identify in their official plans, the planning controls required to give effect to the policies identified in (3.2).

Where no official plan exists, the zoning document affecting the area contain provisions to reflect this policy statement."

### 3.3.1 Explanation

The primary function of official plans is to guide land use and to provide a broad policy framework within which this would take place.



Where engineered mapping exists, flood plains should be shown in an appropriate schedule to the official plan and adequately described in the text of the plan. Where mapping does not exist, flood plains should be described in the official plan, to the extent possible, (i.e. air photo interpreted lines, watercourse set-backs, maximum depth and velocity of flows etc.)

In general, uses that may be permitted in flood plains should be cognizant of flood susceptibility and the degree of flood risk. Open space, agriculture, aggregate extraction and similar uses with minimal formal structures are, in general, considered acceptable in flood plains because threat to life and property damage is low.

Where more intensive uses are contemplated for areas susceptible to flooding, official plans should contain policies ensuring that new development is adequately protected from flood susceptibility. In addition to addressing on site flood susceptibility, such policies should also address potential off site problems such as adverse impacts to existing upstream or downstream development.

As some buildings and structures are more prone to flood damage than others, more specific policies may be required in certain situations. For example, some buildings and structures are considered portable or mobile, as they are not permanently affixed to a foundation. As a result, the threat to life and potential for damage during flooding can be much more severe. Therefore, care should be exercised in permitting such buildings and structures in the flood plain. Special precautions (floodproofing measures) should be required for portable or mobile buildings and structures. These are discussed in Appendix D.

For most municipalities and planning areas, situations exist where development is presently located in flood plains. The extent of these situations varies widely from whole communities or major portions to a few individual buildings or

structures. In order to address the possibility of additions, alterations or replacement of existing buildings or structures, municipalities and planning boards should include appropriate policies in official plans. Such policies would address the issue of desirability and outline how flood susceptibility is to be taken into account, where additions, alterations or replacement may be permitted.

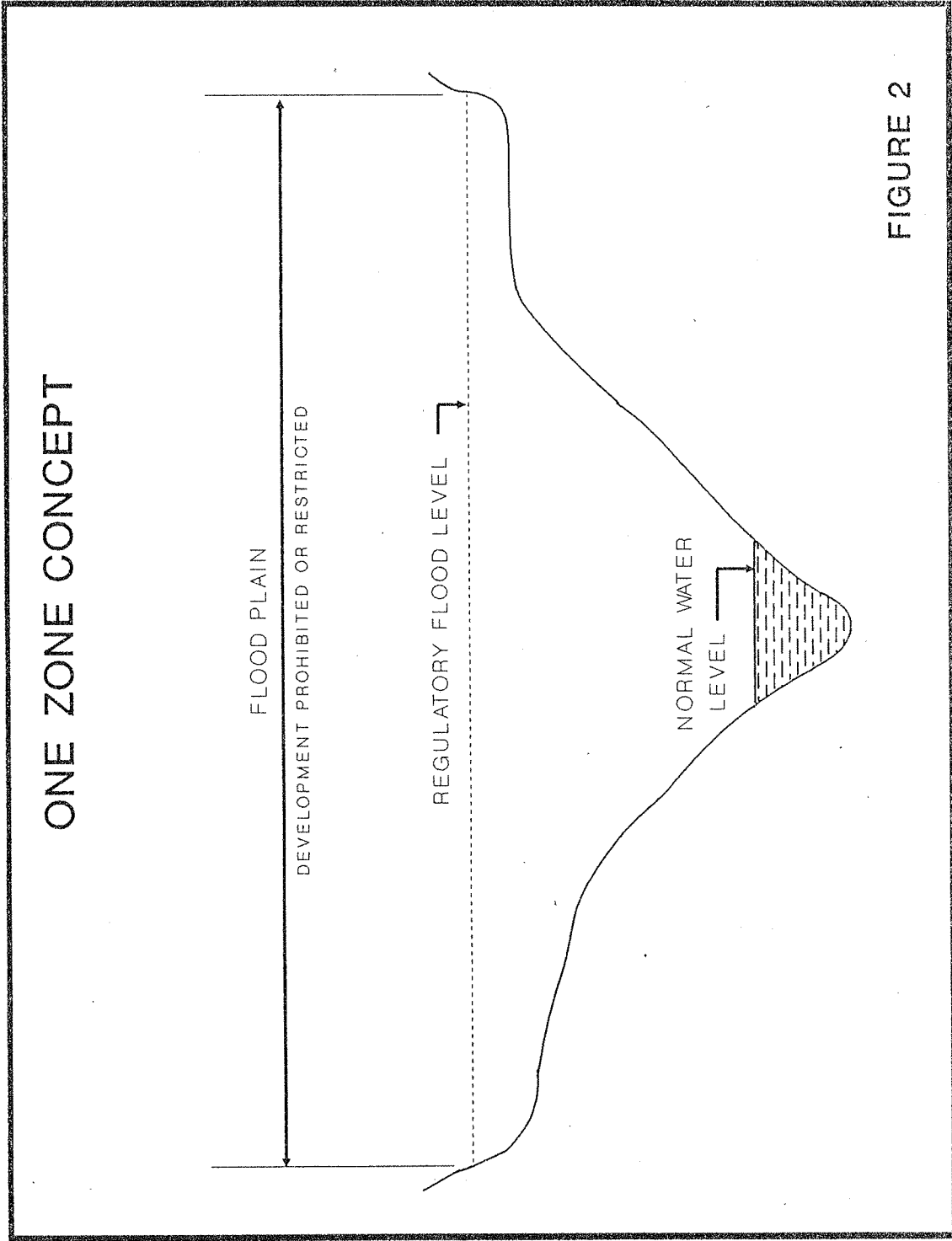
By nature of their use or function, certain works, buildings or structures, such as flood and erosion works, utilities, etc. may have to locate in flood plain areas. These should also be addressed in official plan policies.

It is recognized that official plan policies should be sufficiently flexible so that amendments are not constantly required to react to differing situations. It is, therefore, significant that official plan policies identify the mechanisms by which the various policies are to be implemented. Through the use of zoning by-laws/zoning orders, subdivision control, site plan control and other mechanisms, the detailed treatment of flood susceptibility, flood risk, potential for adverse impacts and conditions of development would be identified.

### 3.4 One Zone Concept

"It is the policy of the Province of Ontario that subject to policies (5) and (6):

- . The flood plain will consist of one zone, defined by the regulatory flood standard (see Figure 2).
- . New development in the flood plain is to be prohibited or restricted.
- . Where the one zone concept is applied, municipalities and planning boards include policies in their official plans that explain the intent of the one zone concept.



200

100

0

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0

Where the one zone concept is applied, the flood plain be appropriately zoned in conformity with the official plan designation to reflect its prohibitive or restrictive use.

3.4.1 Explanation:

Under the one zone concept new development is generally prohibited. However, certain buildings and structures must locate in flood plains by nature of their use. **Buildings and structures which can be located outside the flood plain are not permitted.**

Uses which may be permitted within the flood plain include:

- . open space for public or private recreation;
- . marinas and boathouses;
- . agricultural uses for cropland, livestock feeding and grazing, nurseries and forestry, buildings and structures directly related to agricultural production and of necessity close to farm operations. These may include barns, silos, farm residences, livestock-assembly centres, animal-husbandry services, storage for fresh produce, etc.;
- . on a site specific basis - storage yards and parking areas, aggregate extraction save and except buildings and structures, storage materials as long as they are not explosive, buoyant, corrosive, flammable, or a pollutant;
- . roads, bridges, railways and other public services of approved hydraulic design;
- . appurtenances which would not obstruct the passage of flood waters or debris;

approved structural works used for flood and erosion-sediment control.

It would be appropriate to establish all of the above as permitted uses in the official plan, something that could not be done as directly or simply in the zoning by-law except by way of site specific amendment.

### 3.5 Two Zone Concept

"It is the policy of the Province of Ontario that:

For portions of flood plains that could potentially be safely developed with no adverse impacts, the Conservation Authorities in Ontario, or where no Conservation Authorities exist, the Ministry of Natural Resources, in co-operation with the watershed municipalities have the option of selective application of the two-zone (floodway - flood fringe) concept (see Figure 3).

New development in the floodway is to be prohibited or restricted.

The extent of the floodway is to be determined based on local watershed conditions, such as critical flood depth and velocity, existing and proposed development, and the potential for upstream or downstream impacts.

New development that may be permitted in the flood fringe be protected to the level of the regulatory flood.

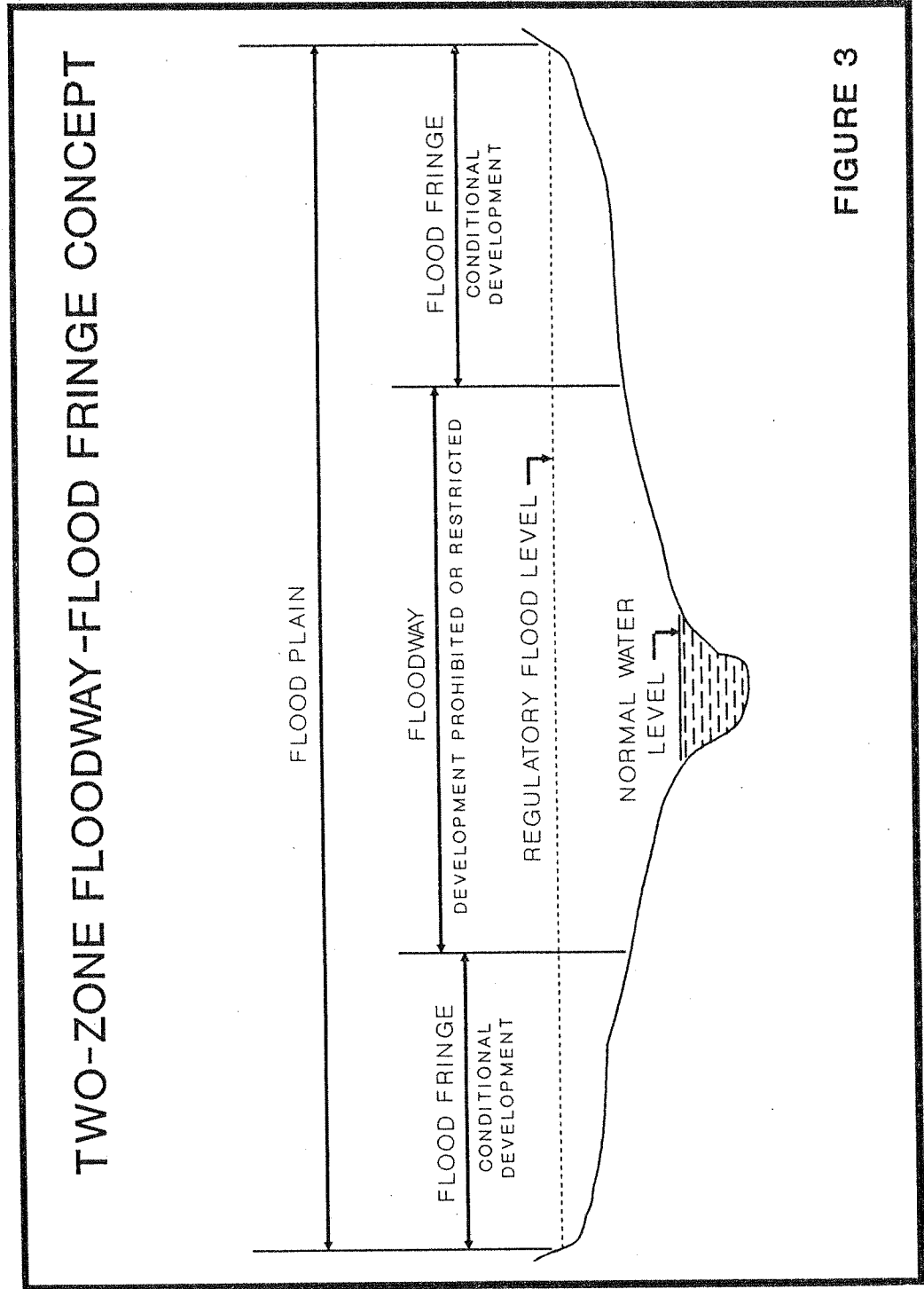


FIGURE 3

Where the two-zone concept is proposed to be applied or is considered to be a plausible option, municipalities include policies in their official plans that explain the intent of the two zone concept and the potential developability of the flood fringe versus the floodway.

Where the two-zone concept is applied, the flood fringe be zoned in conformity with the official plan designation, and the flood hazard and requirements for floodproofing be recognized in the zoning document.

Where the two-zone concept is applied, the floodway be appropriately zoned to reflect its prohibitive or restrictive use."

#### 3.5.1 Explanation

Under certain circumstances, the application of the two-zone concept in flood plain areas is an option. It is not intended to be applied throughout the entire watershed but limited to selective areas. Use of the two-zone concept in the municipal planning process is dependent on the administrative capabilities of municipal organization. (See section 5.6)

Under the two zone concept, no one standard, applied Province wide, exists for defining the limit of the floodway. Watershed conditions vary extensively throughout the Province and in some instances, vary substantially within individual watersheds. As a result, the determination of the more hazardous portion of a flood plain should be based on an analysis of local conditions. A number of factors should be considered in defining the extent of the floodway; they include but are not limited to all of the following:

- critical flood depth and velocity, as they may pose a threat to life and property

- extent of existing and proposed development and its location in the watershed
- the potential for upstream or downstream impacts, if modification to and development in portions of the flood plain were permitted.

It is not the intent to have the floodway defined on a lot by lot basis. Rather, it should be defined on a sub-catchment or major reach basis after due consideration of local conditions. Interim use of the two-zone concept may be necessary in some cases but should be treated as exceptions to the policy. Because municipal official plans may require updating and/or inadequate flood plain studies to define all potential areas of application of the two-zone concept, amendments to municipal documents is not mandatory prior to its application.

Municipalities should include policies in official plans regarding the use or possible use of the two-zone concept. Where a Conservation Authority or the Ministry of Natural Resources; where no Conservation Authority exists, and the municipality have agreed to apply the two-zone concept in certain areas, then the official plan policies can be quite specific. The area where the two-zone concept is applied can be described in the text and/or shown on an appropriate schedule to the official plan. On the other hand, where technical data is not sufficient or an analysis of the use of the two-zone concept has not been undertaken, the official plan policies would be more general in nature. They would explain the concept and the requirement for floodproofing to the regulatory flood level and would indicate that it is a possible mechanism that may be applicable, subject to appropriate analysis.



As new development in the flood fringe is required to be floodproofed under the two-zone concept, zoning by-laws and other planning tools should identify the details and criteria for floodproofing, to the extent possible. As the extent of the floodway will be determined based on local conditions, including critical depth and velocity that may pose a threat to life and property damage, it should be designated in the official plan and zoned so that new development is prohibited or restricted.

In evaluating the feasibility of applying the two-zone concept, Conservation Authorities or the Ministry of Natural Resources, where Conservation Authorities do not exist, and watershed municipalities should consider various factors including the following:

- . flood susceptibility
- . physical characteristics
- . local need
- . impact of development in the flood plain
- . feasibility of floodproofing
- . constraints on the provision of services.

These factors are discussed in detail in Appendix B of this document.

### 3.5.2 Procedures

Use of the two-zone concept is optional requiring the approval of the Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists, and the municipality.

In most instances, the municipality would initiate discussions on the feasibility of applying the two-zone concept. Both parties would then examine the concept's suitability and possible impacts.

If agreement is reached, the municipality would undertake any necessary amendments to the official plan and/or zoning by-laws, individually or at the normal review/update period. These would be subject to normal procedures for circulation and review established by the Planning Act, and by the Ministry of Municipal Affairs. The municipality would ensure that any such amendments were circulated to the Conservation Authority or Ministry of Natural Resources, where no Conservation Authority exists, for comment. If amendments to the official plan and/or zoning by-laws are not required, both parties would proceed to administer the two-zone concept from their respective mandates.

Where the municipality cannot reach an agreement with the local Conservation Authority on the use of the two-zone concept, the matter will be referred to the Ministry of Natural Resources and the Ministry of Municipal Affairs.

NOTE:

When detailed consideration is given to criteria to be used to actually define the extent of the floodway, it is expected that Conservation Authorities or Ministry of Natural Resources District Offices will contact the appropriate Regional Office of the Ministry of Natural Resources and obtain their views and comments. The Regional Office will review the definition and application of a proposed two-zone concept and provide comments addressing the adequacy of:

- . existing background information/studies used to identify floodway-flood fringe areas, and
- . any new information/studies required, and
- . administration guidelines and/or procedures for application of the two-zone floodway-flood fringe concept (i.e. the establishment of watercourse reaches or subcatchments as opposed to site specific applications), and,

consistency in the definition/application of the two-zone floodway-flood fringe concept both within one watershed and between watersheds.

### 3.6 Special Policy Area Concept

"It is the policy of the Government of Ontario that:

Where strict adherence to policies (4) and/or (5) is not feasible, the concept of special policy area status is recognized as a possible option for flood prone communities or portions thereof. Municipalities may apply for special policy area status, in accordance with established procedures, and controlled development may be permitted once such status is obtained.

Municipalities delineate special policy areas in their official plans and include policies indicating the circumstances under which new development may be permitted and identifying the minimum acceptable level of protection required for new development."

#### 3.6.1 Explanation

While the provincial flood plain management objectives are clear, their achievement necessitates flexibility in some situations. Historic development of many villages, towns and cities on the flood plains of streams and rivers means their viability depends on a reasoned application of provincial standards. In certain cases, even the application of the two-zone concept to allow development of the flood fringe will not provide sufficient development capability to maintain community viability.

The concept of the special policy area provides additional flexibility in flood plain management. Special policy areas are those in which provincial standards for flood plain management are relaxed to recognize certain exceptional situations. Where no suitable alternative exists, a council may consider major development or redevelopment in a floodway or floodproofing that is below the regulatory flood level so as to provide sufficient development capability with a view to maintaining the community's social and economic viability. However, it must be stressed, the two-zone concept option is intended to provide flexibility in flood plain management and, therefore, special policy areas will be approved only in circumstances where the two-zone concept cannot reasonably be applied and all other requirements for special policy area designation can be met.

Although a community may qualify for special policy area status, not all of its flood plain lands would necessarily be subject to special policy provisions. Special policy area status provides for additions, alterations and replacement of existing buildings and structures and infilling (previously undeveloped lots within developed areas). In addition, it is recognized that peripheral areas, presently undeveloped, may be considered to be an integral part of a community. That is, a logical extension of the community to be developed in the near future. Such areas would tend to be small in size and may be included within the limits of the special policy area.

Special policy areas are intended to provide for the continued viability of existing uses, generally on a small scale (i.e. lot by lot) basis. This is in recognition of standard flood plain criteria physically not being achievable for an individual building or structure or the application of standard criteria would put the building, structure, addition, etc. out of character with the

surrounding area. However, where large scale, comprehensive redevelopment is proposed, more opportunity exists for achieving flood protection. Where such situations exist, standard flood plain requirements may be applied (i.e. development in the floodway restricted, floodproofing to the regulatory flood level), regardless of the special policy area status. As well, proposed changes in land use within a special policy area that require an official plan amendment may also require that standard flood plain requirements be met.

For special policy area status, a municipality must have an official plan which adequately discusses and addresses the special policy area situation. Engineered flood plain mapping and flood plain data is also required in sufficient detail to graphically display and describe precisely the area and the effects.

In all situations, special policy area statements in official plans must identify a minimum acceptable level of protection for new development. Although a minimum level of flood protection has not been established Province-wide, the 100 year flood level has been established as the minimum acceptable flood standard.

A proposed special policy area which establishes a minimum level of flood protection lower than the 100 year flood level will require the inclusion of the rationale/justification in the appendices of the proposed official plan/official plan amendment.

The adverse impacts on the municipality (social, economic, environmental etc.) of adopting a floodproofing level less than the 100 year flood level as the minimum level of flood protection shall be addressed for each of the floodproofing alternatives outlined in Appendix D, "Floodproofing in Ontario". In addition, a detailed rationale/justification will be required to support the minimum level of flood protection being proposed.

The Canada Mortgage and Housing Corporation has indicated that they will also require a detailed rationale/justification prior to reviewing funding applications for development proposals which include a minimum level of flood protection lower than the 100 year flood level. Each application will be reviewed individually, based on the information presented in support of a lower level of flood protection.

In determining whether or not a community or portion thereof potentially qualifies for special policy area status, the following factors, among others, are taken into account:

- . community related
  - . municipal commitment to area maintenance ✓
  - . area designated in official plan to continued growth ✓
  - . significant investment in infrastructure, i.e. services ✓
  - . alternative opportunities for development ✓
  
- . technical
  - . appropriateness of other flood plain management measures, i.e. remedial works, two-zone approach
  - . depth of flooding and velocity of flow
  - . frequency of flooding
  - . feasibility of floodproofing measures
  - . upstream and downstream effects
  - . frequency of ice jams and other obstructions.

These factors are discussed in detail in Appendix C of this document.

Municipalities should note that by permitting development in the floodway or where protection is not provided to the level of the regulatory flood, the special policy area concept places a greater level of risk upon land owners and increases the potential for loss of life and property damage.

### 3.6.2 Procedures

Procedures for approval of a special policy area have been developed. They consist of three major phases:

#### Phase

- I identification of need and preliminary approval in principle
- IIa background data collection and information for official plan policy
- IIb preparation and formal submission of the official plan document.
- III implementation and review/update.

All steps involved in seeking special policy area status are explained in Appendix C.

## 3.7 Floodproofing

**"It is the policy of the Province of Ontario that:**

**Any new development permitted in the flood plain, in accordance with this policy statement, be protected by acceptable floodproofing actions or measures.**

**Ingress/egress for new buildings be such that vehicular and pedestrian movement is not prevented during times of flooding."**

### 3.7.1 Explanation

The term 'floodproofing' is used to describe structural changes and/or adjustments incorporated into the basic design and/or construction or alteration of individual buildings, structures or properties to protect them from flood damage. However, it should be noted that this term can be somewhat misleading since total protection of buildings and structures from flood damage cannot always be assured.

It may be technically feasible to incorporate floodproofing measures into structures to any depth of water. However, in practice, the cost of floodproofing increases with depth and therefore may become the limiting factor in the construction of buildings where the potential of flood damage cannot be economically reduced or eliminated. Also, some floodproofing approaches involve contingency items which must be kept in a perfect state of readiness and be easily accessible at all times. They should undergo periodic inspections, testings and continual maintenance. The roles, responsibilities and schedule of timing should be established in a formal agreement between the Conservation Authority or where one has not been established, the Ministry of Natural Resources and the municipality. Furthermore, floodproofing should not be considered a panacea for all flooding problems, other approaches may be more appropriate under certain conditions.<sup>1</sup>

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Ontario Regulation 374/81 under the Ontario Water Resources Act states: "No person shall locate or cause or permit the location of the leaching bed (of a subsurface sewage disposal system) in or on an area subject to flooding that may be expected to cause damage to the leaching bed or a public health nuisance by impairing the operation of the leaching bed". Where a local health unit or the Ministry of Environment has determined that a subsurface sewage disposal system can locate in an area subject to flooding without causing damage to the leaching bed nor creating a public health nuisance, flood plain management considerations would be limited to the effects of the placing of any necessary fill in the flood plain. To avoid conflicts with the separate pieces of legislation it is recommended that a close working relationship be established and maintained between a Conservation Authority or the Ministry of Natural Resources and a health unit or the Ministry of Environment.



Floodproofing is applicable with certain limitations and only after certain prerequisite information is given to verify its feasibility. Since there are various types of floodproofing measures, selection of the most appropriate approach depends on the following conditions:

- . nature of the development and adjoining property under consideration, i.e. existing structure or proposed new structure, type of land use, impact on neighbouring properties;
- . physical characteristics of the river system, in order to evaluate the potential for upstream or downstream impacts;
- . local flood conditions and the level of the regulatory flood, in order to evaluate the type or degree of floodproofing required and the requirements for ingress and egress; and
- . cost-effectiveness of floodproofing.

There are two basic approaches to floodproofing which may be described as follows:

- . dry floodproofing
  - . the use of fill, columns, or design modifications to elevate openings in buildings or structures above the regulatory flood level
  - or
  - . the use of water tight doors, seals, berms/floodwalls to prevent water from entering openings below the regulatory flood level <sup>2</sup>

While dry floodproofing by closures and seals is an acceptable form of floodproofing, the average building is not water tight. Unless very special techniques are employed, in addition to seals, water tight doors, leakage into a building can still occur. Where such techniques are not proposed, wet floodproofing measures should also be considered.

- . wet floodproofing
  - . the use of materials, methods and design measures to maintain structural integrity and minimize water damage
  - . buildings or structures are designed to intentionally allow flood waters to enter.

There are two basic techniques to floodproofing which may be described as follows:

- . active floodproofing
  - . floodproofing techniques which require some action prior to any impending flood in order to make the flood protection operational, i.e. closing of water tight doors, installation of waterproof protective coverings over windows, etc.
- . passive floodproofing
  - . floodproofing techniques which are permanently in place and do not require advance warning and action in order to make the flood protection effective.

There are a number of technical factors to be considered in determining the most suitable floodproofing measures for individual situations. These are discussed in Appendix D. In addition, land use considerations could also influence the type of floodproofing measures to be applied. New development can be grouped into three major categories, as described in the following:

- . new multi-lot or large lot development
  - . structures proposed for previously undeveloped areas (large-scale).
- . infilling, replacement, major additions
  - . infilling - development on previously undeveloped lots, generally bounded by existing development on adjacent sides;
  - . replacement - existing structure removed and new structure erected;

- . major additions/alterations - construction is equal to or exceeds 50% of the market value or floor area of the existing structure or work.
- . minor additions/alterations
  - . construction that is less than 50% of the market value or floor area of the existing structure or work.

For these various development scenarios, different land use factors will influence each scenario to varying degrees. For example, the height of surrounding buildings will be a primary consideration in examining possible floodproofing measures for infilling, replacement buildings, and major additions/alterations. As a result, floodproofing through the use of fill or columns may be deemed undesirable in certain situations. However, for a large, multi-lot subdivision, conformity with surrounding areas is not necessarily as critical.

In keeping with the flood plain management objective of minimizing threat to life, certain floodproofing approaches may be less desirable for some land uses than others. For example, special consideration should be given to land uses such as residential where overnight accommodation exists. Wherever possible floodproofing should be to the Regulatory Flood level; however, lower levels of protection may be considered providing there is adequate rationale/justification. (See Section 3.6.1 bottom of page 28).

Based on all of the foregoing, the following will serve to guide floodproofing in Ontario:

- . in general, dry passive flood protection is the most desirable approach for all types of development;

- . new multi-lot or large lot residential development and the habitable portions<sup>3</sup> of any other new buildings should incorporate dry passive floodproofing measures. Wet floodproofing should not be considered acceptable;
- . it is recognized that the proximity to water is a key consideration in the use and enjoyment of recreational facilities such as marinas, campgrounds, cottages, etc. Dry passive floodproofing may not be achievable or practical in all instances but should, however, be implemented to the fullest extent possible;
- . Wet floodproofing could be considered for new development earmarked for non-residential/non-habitable use and for buildings accessory to residential/habitable uses (i.e. garages). Dry active floodproofing could also be considered where a minimum of six (6) hours flood warning is available;
- . minor additions/alterations to an existing building is the only development permitting floodproofing to less than the regulatory flood level;
- . minor additions/alterations should incorporate floodproofing measures to the extent and level possible, based on site-specific conditions. As a minimum, the addition/alteration should not be more flood vulnerable than the existing structure.

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Habitable portion of a building means rooms or spaces required and intended for overnight occupancy, and includes facilities for storage, heating, air-conditioning, electrical, hot water supplies, plumbing, waste connections, etc. which are necessary to maintain the habitable condition. In addition to residential, habitable buildings include, hotels/motels, hospitals, nursing homes, and any other building involving overnight occupancy.

- . infilling, replacement or major additions for residential/habitable use, should require dry passive floodproofing to the regulatory flood level. However, where such a requirement impacts on or is significantly out of context with neighbouring properties, other flood reduction approaches, such as dry active or wet floodproofing may have to be considered. Any acceptable floodproofing approach could be considered for infilling, replacement or major additions for non-residential/non-habitable use;
- . as a minimum, ingress and egress should be considered "safe" for all new buildings, such that velocities and depths do not hinder safe pedestrian and vehicular movement during times of flooding. Ingress and egress should remain "dry" at all times for new institutional buildings servicing the sick, the elderly, the disabled or the young. It is however recognized that in some situations this may be difficult if not impossible to achieve. Therefore, some exceptions may be permitted in special situations. As well, ingress and egress should remain "dry" at all times for new buildings housing essential services such as police, fire and ambulance;

With increases in flood depths and velocities, design considerations for floodproofing buildings and structures generally become more complex and costly. Also increasing flood depths and velocities pose greater risks to loss of life. Further, different buildings and structures can withstand flooding and associated loadings better than others and will thus influence the selection of appropriate floodproofing measures.

The following criteria will also assist in addressing floodproofing matters.

#### Depth (Threat to Life)

- . in stagnant backwater areas (zero velocity), depths in excess of about 1 m (3.3 ft.) are sufficient to float young children, and depths above 1.4 m (4.5 ft.) are sufficient to float teenage children and many adults;

Velocity (Threat to Life)

- . in shallow areas, velocities in excess of about 1.8 m/s (6 ft./s) pose a threat to the stability of many individuals;

Depth and Velocity (Threat to Life)

- . the hazards of depth and velocity are closely linked as they combine to effect instability through an upward buoyant force and a lateral force. A reasonable approximation of the combined hazard of depth and flood velocity can be made with the product of depth and velocity. A product of depth and velocity less than or equal to  $0.4 \text{ m}^2/\text{s}$  ( $4 \text{ ft.}^2/\text{s}$ ) defines a low risk hazard providing that the depth does not exceed 0.8 m (2.6 ft.) and the velocity does not exceed 1.7 m/s (5.5 ft./s);

Vehicular Access

- . ingress and egress from a floodproofed area by most "typical" automobiles will be halted by flood depths above 0.3 - 0.5 m (1 - 1.5 ft.). A maximum flood velocity of 3 m/s (10 ft./s) would be permissible, providing that flood depths are less than 0.3 m (1 foot);
- . a depth in the range of 0.9 - 1.2 m (3 - 4 ft.) is the approximate maximum depth for rapid access of large emergency vehicles;

Structural Integrity (Above Ground)

- . 0.8 m depth (2.6 ft.) is the safe upper limit for floodproofing the above ground/superstructure of conventional brick, brick veneer and concrete block buildings using closures and seals. Beyond this, structural integrity is threatened/certain;
- . the structural integrity of elevated structures is more a function of flood velocities (which may erode foundations, or footings or fill) rather than depth. The maximum permissible velocity depends on soil type, vegetation cover and slope but ranges between 0.8 - 1.5 m/s (2.6 - 5 ft./s);

- . NOTE: sub-surface conditions can also pose a threat to structural integrity. The build up of groundwater (hydrostatic pressure) around the foundation of a building may cause basement floors to uplift and walls to buckle. In addition, surcharging may cause the back up of water into basements through floor drains.

Standards that may exist in local building by-laws should be consulted in addressing such matters.

#### Fill

- . floodproofing by elevation on fill is less complex than techniques involving piles, columns and posts. However, complexity does increase at flood depths beyond about 1.8 - 2.4 m (6 - 8 ft.);

#### Berms and Floodwalls

- . floodproofing by berms and floodwalls is considerably more complex than would first appear. Complexity is as much related to foundation, seepage and drainage conditions, as it is to height.

It is suggested that designs for the following be carried out by a professional engineer or architect skilled in floodproofing measures:<sup>4</sup>

- . where the product of flood depth and velocity is equal to or greater than 0.4 m<sup>2</sup>/s (4 ft.<sup>2</sup>/s) or where depth exceeds 0.8 m (2.6 ft.) or where velocity exceeds 1.7 m/s (5.5 ft/s);
- . where wet floodproofing is proposed;
- . where flood depth is in excess of 0.8 m (2.6 ft.) and floodproofing involves the use of closures and seals;

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The Ontario Building Code (Ontario Regulation 419/86) contains provisions for requiring "special investigations" to assess such matters as; dynamic loading (Article 4.2.4.9), hydrostatic uplift (Article 4.2.4.10) and waterproofing (Article 5.5.21).

- . where floodproofing through the use of fill exceeds depths of 1.8 m (6 ft.) or velocities between 0.8 - 1.5 m/s (2.6 - 5 ft./s), depending on soil type, vegetation cover and slope;
- . where berms and floodwalls in excess of 1 m (3.3 ft.) in height are proposed;
- . where piles, columns and posts are proposed.

Where the two-zone concept, the special policy area concept, or minor additions, infilling, replacement or major additions in the flood plain are contemplated, floodproofing should be addressed in the land use planning documents. Such policies would identify the types of floodproofing deemed acceptable for various land uses, i.e. dry passive floodproofing for new residential buildings and the habitable portions of other new buildings. As well, the policies would indicate the planning mechanisms that would implement floodproofing requirements, i.e. zoning by-laws/zoning orders, subdivision agreements, site plan control by-laws, etc.

### 3.8 Public Safety

"It is the policy of the Province of Ontario that, notwithstanding Policies (3) to (7) inclusive:

**New development not be permitted to locate in the flood plain where the use is:**

- . associated with the manufacture, storage, disposal and/or consumption of hazardous substances or the treatment, collection and disposal of sewage, which would pose an unacceptable threat to public safety if they were to escape their normal containment/use as a result of flooding or failure of floodproofing measures;



- . associated with institutional services, such as hospitals, nursing homes and schools, which would pose a significant threat to the safety of the inhabitants (e.g. the sick, the elderly, the disabled or the young), if involved in an emergency evacuation situation as a result of flooding or failure of floodproofing measures; and
  
- . associated with services such as those provided by fire, police and ambulance stations and electrical sub-stations, which would be impaired during a flood emergency as a result of flooding or failure of floodproofing measures.

Where new development identified in Policy 8.1 is not considered to pose an unacceptable risk to public safety, a higher level of flood protection and/or additional floodproofing precautions above the regulatory flood level, may still be required due to the sensitive nature of the development.

### 3.8.1 Explanation

There are some types of development which could pose an unacceptable threat to public safety if damaged by flooding and, as such, should generally not be permitted to locate in the flood plain. Throughout the land use planning process, municipalities and planning boards should be cognizant of development associated with hazardous or toxic substances, institutions or essential services.

### Hazardous Substances/Sewage Disposal

The threat to life could escalate to a critical level if the containment of hazardous substances or sewage is undermined as a result of flood damage or the failure of floodproofing measures. As a result, development, including the manufacture, storage, disposal or consumption of hazardous substances or the treatment, collection or disposal of sewage, is to be prohibited in the flood plain where the threat is considered to be unacceptable.

There are no established criteria which can be applied province-wide to specifically define the types of development or the levels of hazardous substances to be prohibited since the degree of hazard is influenced by local conditions. In the absence of such criteria, if there is uncertainty as to whether a proposed development falls within this classification, a decision will be made on a case by case basis through discussion between the Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists, and the municipality or planning board.

The decision should be made with consideration of such factors as the nature of the development, local conditions, and the potential effects of flooding on the containment of hazardous substances and the threat to public safety if released. Examples of hazardous substances would include but are not limited to chemical manufacturing, and/or formulating, fertilizer manufacturing and/or formulating, waste processing, storage and/or disposal.

### Institutional Uses

In the case of new development associated with institutional uses, the intent of the policy is to prevent placing unnecessary risk on the inhabitants of institutions such as hospitals, nursing homes, pre-schools/nurseries, day care centres and primary schools. The threat to life could be particularly severe for these inhabitants (e.g. sick, elderly, young) if a flooding event necessitates an emergency evacuation. Ancillary facilities such as parking lots, playing fields, etc. may be permitted in the flood plain providing they are not subject to flood damage and will not exacerbate flood related damages to existing development.

Portable classrooms associated with school facilities should not be permitted to locate within the flood plain. If after due consideration of the implications, portable classrooms are not considered to pose an unacceptable risk to public safety, these structures should, as a minimum be provided with anti-flotation devices and dry land access.

### Emergency Services

Finally, the restriction on new development associated with emergency services may be necessary to ensure that the delivery of these services is not impaired in the event of flooding. Services provided by facilities such as police, fire and ambulance stations may be required to respond in a flood emergency, while these and other service facilities such as electrical sub-stations are relied upon for uninterrupted service on a continual basis.

Circumstances may arise where a proposed new development, as described in policy 8.1 may be permitted to locate in the flood plain, provided it is proven that public safety would not be compromised. It may be necessary to clarify whether a proposed new development falls within one of the three classifications outlined; or local conditions may be such that the new development is not expected to pose an

unacceptable threat to public safety. In these cases, an assessment of the implications of the proposed development would be necessary. It is recommended that this be carried out through discussion between the municipality or planning board, the Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists, and any other ministry or agency which could assist in the decision-making process, depending upon the nature of the proposed development (e.g. Ministry of the Environment, Ministry of Health).

There are a number of factors which should be considered in assessing new development proposals in the interest of public safety and local need, which may include the following:

- . the nature of the development
- . local need
- . flood susceptibility
- . degree of flood risk
- . implications of flooding on:
  - . the proposed development and its inhabitants
  - . the containment of hazardous/toxic substances
  - . the provision of essential services
  - . the creation of off-site problems (e.g. contamination of water supplies/health hazard, restriction of flow etc.)
- . ability of enhanced floodproofing measures to reduce risk to acceptable levels
- . feasibility of higher level of flood protection.

If after due consideration of the implications, such a development is deemed acceptable in principle, a higher level of flood protection and/or extra floodproofing measures may be considered appropriate. In such instances, consideration should be given to establishing a minimum level of flood protection. Over an assumed life of 75 - 100 years for a structure. The probability of the 100 year flood occurring or being exceeded should not be greater than 53 - 63% respectively.

Where development associated with hazardous or toxic substances, institutional uses or essential services is permitted, the zoning document and other planning tools should clearly specify the level of flood protection required and any additional floodproofing measures that may be required. It is also advised that municipalities and planning boards identify the details and criteria for this enhanced level of floodproofing, to the extent possible, in zoning by-laws and other planning tools.

#### 4. LOCAL CONDITIONS

Inherent in the provincial policy statement is the principle that its application must be geared to the local conditions of an area. These local conditions will influence the options available and the actions that will be taken through the land use planning process to meet the intent of the policy statement.

The wide variety of planning approaches available to enable a municipality or planning board to address flood plain planning concerns has been alluded to already. They will also be further elaborated in section 5. The selection of the appropriate approach or combination of approaches will be a task to be performed in recognition of the opportunities and limitations that are created by local circumstances. Since these circumstances will vary from municipality to municipality and from watershed to watershed, there is no single preferred approach to flood plain planning. Similarly, there is probably not one approach that can be applied directly from one municipality or planning area to another.

Efforts must then focus on solving a local problem with the methods and measures available to and compatible with the local situation.

Local situations can vary in several ways:

- . jurisdictional issues;
- . physical characteristics;
- . availability of technical information;
- . the nature of development;
- . existing water management program.

The variations possible within each of these circumstances will greatly affect the options available for dealing with a flood plain planning concern.

##### 4.1 Jurisdiction

A principle consideration in identifying an appropriate flood plain planning approach is who has the authority, responsibility and/or capability to implement policies and regulations. There are many variables in this regard:

- . Is the flood plain area in a municipality or in an area without municipal organization?

Many planning tools require direct municipal council control, decisions or actions in order to be used, e.g. site plan control, building permits. Areas without municipal organization would not have these tools available in their repertoire of responses. Similarly, the variations in financial and staff resources likely inherent in these two systems would also greatly affect the approaches that could be adopted. (See section 5.6)

- . What is the nature of the municipal organization? Is it large, small, urban, rural, with or without planning staff?

The availability of staff and financial resources would again be a variable factor among different types and sizes of municipalities. With limited staff and other resources, there would likely be a resulting limitation on the complexity of the flood plain planning approach that could be adopted. In addition, the development demands within an urban municipality would differ significantly from those in a rural municipality resulting in different needs, hence different approaches to be adopted.

- . Is there a Conservation Authority?

As indicated in section 5.2, most Conservation Authorities administer Fill, Construction and Alteration to Waterways Regulations. These regulations would likely be part of a comprehensive approach adopted by a municipality or planning board to deal with flood plain management. Where there is no Conservation Authority or where the Conservation Authority does not have regulations in place, this control provision obviously cannot exist. Therefore, there will have to be greater reliance on the more standard planning mechanisms (i.e. official plans, zoning by-laws).

- . Is the area within a one-tier or two-tier planning system?

In view of the variation in planning responsibilities resting with upper and lower tier governments in Ontario, it is important to understand which planning mechanisms are available to the respective levels for achieving flood plain planning objectives. For example, site plan control can only be implemented by the local municipality although the authorizing official plan policy can be in either an upper tier or lower tier plan. Therefore, there must be assurance that the local municipality is not only willing but able to undertake the responsibilities if called upon to do so in an upper tier planning document.

In the same regard, only broad flood plain policy objectives and/or delineations on land use schedules will be possible in the upper tier plan due to limitations in scope and scale. These policies and/or land use delineations would then be refined in the lower tier plans.

#### 4.2 Physical Characteristics of the Flood Plain

The topographical variations of a flood plain directly affect the nature and characteristics of a flood. The geomorphology, i.e. shape of the basin, affects the water velocity or speed, as well as the peak volumes (or amount of water at its highest point). Soil and geological factors affect water infiltration (absorption) capabilities and ground water movement. The gradient of the flood plain, i.e. whether it is steep or flat, also affects the water flow. The antecedent moisture conditions (or the general ability of the ground to absorb moisture) affects whether the water gets absorbed or whether it runs off over adjacent areas. These are some of the many characteristics that affect the way in which water will behave in a flood situation. Therefore, the planning decisions that will be made must be extremely cognizant of them.

In Ontario, these characteristics translate into three general types of areas:

- . rolling (moraine) topography.
- . flat topography.
- . shield topography.



In areas characterized by rolling topography created by glacial moraines (i.e. much of South-Central Ontario), flood plains tend to be well defined. Areas subject to flooding are generally distinguishable from areas that are not subject to flooding or subject to minimal flooding. The resulting floods in these well-defined valleys are usually deeper, with higher velocity flows. The concern in these areas is risk to life.

In areas characterized by flat topography (i.e. Southwestern Ontario), the flood plain can be extensive. The severely hazardous areas are not as clearly definable. In these areas, the resulting flood is usually shallow with low velocity flows. The concern in these areas is more a risk to property than to life. These areas may offer more opportunity for development providing flood susceptibility is minimized through appropriate floodproofing and problems upstream or downstream are not created.

In shield topography areas (i.e. Muskoka), the rock base and formations have poor absorption capacity and result in extensive surface runoff. In addition, the flood characteristics are much more variable because of the many differences in topography. In these areas, there are also many interconnected lakes and watercourses. Therefore, the water characteristics of the watercourses may be linked to the lake levels. In view of this variability, it may be difficult to differentiate areas that can be developed from those that cannot (because of excessive risk) without careful scrutiny of the detailed local conditions.

The physical characteristics will have to be examined in order to determine such factors as the degree and focus of risk (i.e. life, property, or both); and whether detailed information is available about the flood characteristics. Based on that information, there could be some assessment as to the amount of land where development may take place subject to conditions and the areas where development should be restricted or prohibited.

Clarification of these issues will then assist a decision-maker in determining the planning options available.

### 4.3 Technical Information

The availability of information on a variety of factors relating to the flood plain will dictate the planning options available.

Of primary importance to sound flood plain planning is flood plain mapping. For various areas in Ontario, engineered mapping exists which identifies the limits of the flood plain. In other areas, the mapping used to define the flood plain is based on interpretations of photographs (referred to as "airphoto interpreted lines") taken from the air. The lines delineated on the photographs represent the best flood-related information for the area. In many instances, flood related information is combined with erosion and unstable slope information and collectively referred to as a "hazard line". In some cases, even aerial photograph information is not available and other methods such as setbacks from watercourses, or elevations, are used to identify possible flood areas.

With increased accuracy in information available, there can be an increase in the precision of planning policies and options related to where development can or cannot take place in a flood plain. For example, engineered lines are a prerequisite to using the approaches identified to achieve more flexibility, i.e. two-zone concept, special policy area concept.

Other technical information that may also vary in terms of availability, therefore in terms of planning options possible, include:

- . definition of the floodway based on the criteria discussed in section 3;
- . Conservation Authority regulations (with respect to construction and floodproofing provisions that could be provided for);
- . floodproofing methodologies (with respect to implementation ability);

- general planning expertise or experience (in terms of dealing with flood plain planning issues).

#### 4.4 Nature of Development

Development pressures and availability of land for development differ significantly in urban and rural areas. Therefore, it is clear that the approach to be taken in addressing flood plain planning concerns will vary, likewise.

For example, in an urban area where demand for development is continuous and where desirable land for such development is in relatively short supply, there will be a greater need for information that is as accurate and precise as possible. It is much more critical to know exactly where development can occur, even with floodproofing, and where it cannot.

In a rural area where the intensity of development is far less than in an urban area, and where lots are generally significantly larger, there may be somewhat more flexibility with respect to where development can or must take place. A flood plain may only affect part of a larger rural lot. In addition, there may be far fewer applications for development in flood plain areas.

The planning document policies and provisions would have to be prepared accordingly, recognizing the local variations in development conditions.

Other development issues that will come into play in different areas and that must be recognized in preparing a local planning strategy are:

- Is the main focus of development infilling, replacement, additions or new large scale, multi-lot development?

The policy statement (as indicated) calls for official plan policies to be developed to deal with this issue. Their importance could vary from one area to another, depending on local circumstances.

Is the pressure for development focussed on seasonal residential (including related development such as boat houses, moorings and marinas) as opposed to permanent residential?

Generally, seasonal residential development should be subject to the same rules as permanent because the risk to life and property is the same. This issue will be very important in some areas and therefore policies may have to be developed (in accordance with local circumstances).

Are there many lots of record affected by the flood plain?

While existing lots of record may require special consideration due to real or inferred development rights, the technical information and subsequent policies change over time. Because development rights may have been conferred on individual properties at one point in time, there should be no inferred property owner entitlement to development rights in perpetuity.

#### 4.5 Nature of Flood Control Works

In certain instances, flood control capital works have and will be carried out to address flooding problems. Works such as channels, dams and dykes undertaken by Conservation Authorities or the Ministry of Natural Resources are intended to address existing problems in total or in part. They are not intended to enhance the developability of flood plain land, although it is recognized that some redevelopment or infilling may be more readily achieved with flood control works in place.

Flood control works can be grouped into two major categories - those that modify the flood plain through channelization (either through the lowering of the bed of a watercourse or the filling of land adjacent to a watercourse) and those that hold back flood waters (e.g. dykes and dams). The actual type of flood control work to be proposed would be dependent on an assessment of local conditions including such factors as benefit-cost analysis, and upstream, downstream and on-site implications.

The potential exists for any flood control work to be overtopped or fail under extreme flood conditions. However, proper design, construction, maintenance and operation should minimize such potential.

If a channel failed, the major concern would be for erosion. If a channel is overtopped, the excess flood water would spill on to the adjacent lands. The depth of flooding would be dependent on the extent of the excess flood waters and the nature of the surrounding topography. Where flood waters are held back by dykes or dams, failure of a structure could result in far greater impacts. Therefore, in considering new development behind dykes or downstream of dams, the following is to be taken into account.

#### 4.5.1 Dykes

Where a dyke has been properly designed and constructed to the regulatory flood level, and a suitable maintenance program is in place, the area behind the dyke can be considered as flood fringe. As such, new development would be required to be floodproofed to the regulatory flood level.

The floodway would be considered to be contained within the dyke area. If new development cannot be floodproofed to the regulatory flood level, then special policy area status may be requested, subject to the appropriate requirements.

As a precaution, certain areas immediately behind a dyke may be considered too hazardous for any or certain types of uses, if failure of the dyke was ever to occur. Also, the area immediately behind the dyke may be required for maintenance purposes.

The establishment of no or limited development zones behind a dyke will be dependent on local conditions (e.g. flood depth and velocity) and local approaches to flood plain management.

#### 4.5.2 Dams

Various types and designs of flood control dams can be found. Some are passive in that there is no means of controlling discharge (e.g. earthen dams), some have basic means of control such as stop logs, and others have electrically operated flood gates with full time operators. Some dams are considered multi-purpose providing recreational use, irrigation or flow augmentation, in addition to flood control. Some are designed to regulatory flood criteria and others to higher levels (e.g. maximum probable).

The extent to which the operation of a dam is taken into account in the calculation of downstream flood lines, the extent to which new development may or may not occur in downstream areas, and the extent to which floodproofing for new development may or may not be required, are all dependent on the type and design standard of the dam and local watershed conditions. For example, small or steep watersheds offer limited or no advance warning making dam operation more difficult and providing little time for evacuation or other emergency measures. In larger watersheds, with wide and shallow flood plains, more advance warning is available thus providing more time for precautionary measures to be taken through the operation of the dam prior to the flood actually hitting.

It must be remembered that the function of a flood control dam is to hold back upstream flood waters. When a flood occurs below a dam, the dam is of limited or no use. Whatever the type or design of dam, these structures are not a floodproofing option and the provisions of section 5.1 apply to any proposed development.

The local Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists, will have to be consulted as to their treatment of flood control dams within their overall approach to flood plain management.

#### 4.6 Flood Plain Management Approach

As watershed conditions vary across the Province, so do the approaches to flood plain management.

The policies and programs (i.e. prevention, protection, and emergency response) collectively represent the local approach to flood plain management. This approach will influence how future development is addressed within a specific watershed or area. Therefore, land use planning policies and programs should be prepared in accordance with decisions made about the overall approach to flood plain management.

## 5. IMPLEMENTATION OF PROVINCIAL POLICIES

### 5.1 The Planning Act

#### 5.1.1 Planning Overview

In general, municipalities and planning boards should review their planning documents and practices as they relate to flood plain matters. It is fair to suggest that those municipalities and planning boards that already have comprehensive flood plain policies will not see the need to make changes to their existing official plans. However, upon review of the provincial policy statement, some determination regarding the applicability of the new policy options should be made by the respective authorities.

The clear focus and intent of the policy statement is that land use planning and the regulation of development provides a preventative approach which is very important to the overall success of flood plain management.

The policy statement encourages municipalities and planning boards to use their official plans as a means of comprehensively planning for all flood susceptible areas. In an official plan, broad policy objectives can be established either prohibiting all flood plain development or setting out policies addressing conditions to permit development in flood plains. Therefore, it is important that municipalities and planning boards consciously set out their basic approach(s) in dealing with flood plain management.



Zoning by-laws represent the primary means for municipalities to control the use of land. By-laws by their very nature are precise and non-discretionary. It is imperative that zoning by-laws conform to official plans as required under the Planning Act. These two documents must complement each other in order to obtain a consistent and comprehensive approach. Many municipalities in Ontario have excellent official plan policies in place, but have not properly implemented them with the appropriate zoning provisions.

Subdivision control and site plan control are two other planning instruments which can be utilized as part of the implementation of an overall flood plain strategy. It is at these levels that the most practical and effective approaches and measures are determined for a specific development proposal.

#### 5.1.2 Official Plans

The official plan will include a provincial perspective or framework within which informed decisions and adjustments for localized conditions, as identified in official plan policies are made.

Municipalities and planning boards must consider what approach best suits their own particular situation and formulate policies which will address their own needs. Policies should include goals and objectives, and implementation techniques which together reflect a comprehensive approach to flood plain management.

Once a basic philosophy on flood plain management has been agreed upon in the context of the policy statement, a municipality or planning board should review its existing planning documents and procedures in order to determine their adequacy. It is the combination of planning controls and mechanisms which will enable a successful approach to flood plain management.

As a minimum, the official plan should contain provisions which:

- . provide background information regarding the flood plain lands within the municipality and Council recognition of the need for flood plain management policies in relation to the health and safety of the population (Planning Act Section 2(h)) and,
- \* . addresses all identifiable flood plain lands within the municipality either as a separate designation on the land use schedule or written descriptions in the text or a combination of both and
- . describes the types of land uses which are generally permitted or prohibited within flood plain areas and,
- . outlines alternative implementation mechanisms to address flood plains in the comprehensive zoning by-law.

The following sections attempt to describe the different approaches that can be taken and some of the techniques which can be used. The applicability of these approaches should be weighed carefully as flood plain management can be a complicated matter. As discussed in section 4, each flood plain can have vastly different characteristics even within its own watershed. For a municipality or planning board with several different watercourses draining it, several different approaches may be required.

For the purposes of the following sections, rural relates to predominantly 36.5 hectare parcels of land where the predominant land use includes such activities as animal husbandry, row crops, forestry, poultry operations etc. Urban relates to areas where development is actively proceeding and includes the lands within the corporate boundaries of cities, towns, villages, hamlets, settlements and areas of strip development along a roadway or waterbody.

\*\*

### 1) No Development Concept

This concept is the most restrictive in that development is not permitted or very limited in any part of the flood plain. The official plan could specifically designate the flood plain as "hazard land", "flood plain", "open space", "valleyland" or other similar non-development designation. This is referred to as the "one zone approach". Other general designations which could be used include "agricultural" or "rural" as long as the policies in the official plan specifically restrict or limit buildings or structures in the flood plain. Normally, the only structures permitted within the flood plain then are those required for flood and/or erosion control. Municipalities and planning boards are encouraged to establish the various permitted uses within these designations in their official plan.

Under this concept, existing buildings and structures in the flood plain would generally not be permitted to expand and/or redevelop. Their status in terms of maintenance of existing use should be dealt with as part of the municipalities' zoning by-law or through a Minister's zoning order.

### 2) Possible Development Concept

This concept recognizes that certain portions of the flood plain may be developed under certain circumstances. The underlying principles to this concept include the following:

- . development would not be permitted in the more hazardous portions of the flood plain (floodway);
- . any development that is permitted be protected to the regulatory flood level;

- . flood susceptible areas should be recognized in the official plan schedule including any existing or proposed areas for development;
- . recognition of upstream/downstream effects.

Three approaches that may be used to permit development in a flood plain are:

- . flexible hazard land;
- . development constraint;
- . two-zone;

Special Policy Areas also permit development in a flood plain but are treated as exceptions to the Provincial Policy for Flood Plain Planning.

There are advantages and disadvantages to using each approach and each approach is more appropriately used in some situations than in others.

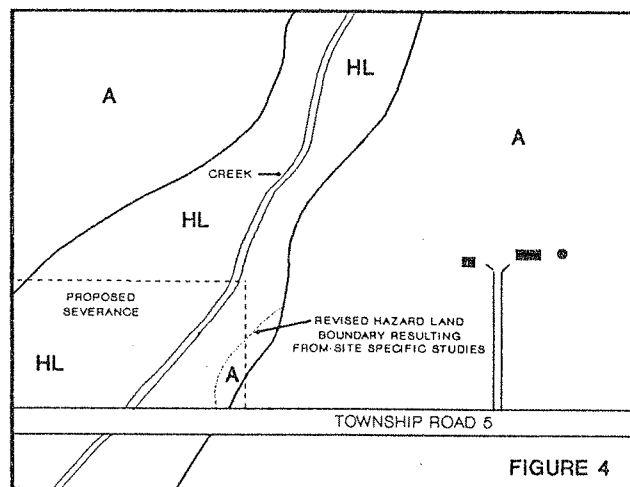
- (a) The Flexible Hazard Approach (No or restricted development)

This alternative approach deals with hazard land areas designated in official plans which are delineated on the basis of air photo interpretation. In many cases, the scale of mapping is so general that the official plan does not accurately reflect the actual extent of the hazard. Changes to the peripheral boundary of the hazard area is permitted when sufficient information is provided, subject to the approval of the Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists (i.e. new flood plain or fill line

mapping, site specific studies etc.). In order to provide for flexibility, an official plan amendment is not necessarily required for a boundary change. However, an amendment is required where the intent is to change from "hazard land" to a land use category other than the abutting category.

Hazard land policies should be incorporated into the text of the official plan explaining the basis for defining the hazard land areas, the uses to be permitted and how the policies are to be implemented. Permitted uses within the hazard land designation should be very limited and usually include only agriculture, conservation and recreation. All buildings and structures, unless used for flood or erosion control purposes, should be prohibited.

This approach is more commonly used in rural/agricultural areas where engineered flood lines are not available and little development pressure exists in the flood plain. It is not considered to be acceptable for situations where development is actively proceeding. The overall thrust of this approach is no or restricted development in the flood plain. (See Figure 4)



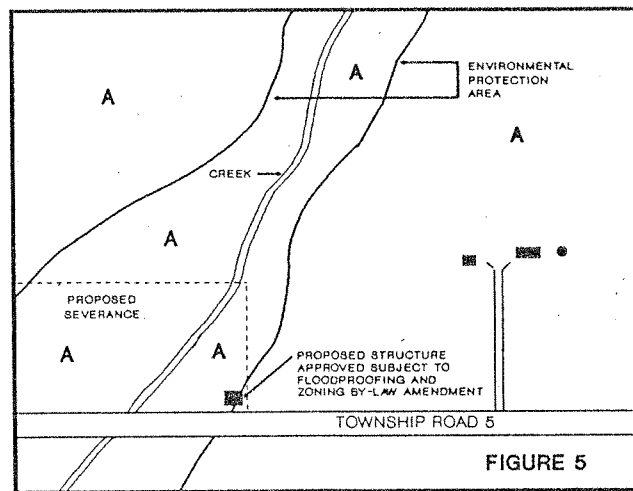
(b) Development Constraint Approach (Development permitted)

The development constraint approach is designed for use by municipalities and planning boards who prefer an alternative approach to the traditional hazard land designation. This approach proposes the use of an overlay on the official plan land use schedule which highlights a possible flood hazard.

Official plan policies would state that the underlying land use designation could only be implemented if and when the constraint shown can be overcome. They would also indicate that prior to considering approval of development proposals within constraint areas, municipalities would consult with the local Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists.

If and when development is proposed in accordance with the underlying designation, shown on the official plan schedule, the actual extent of the flood plain and/or floodproofing measures required will be determined. The zoning by-law amendment, required to change the restrictive zoning to that in conformity with the underlying official plan designation, will appropriately reflect the floodproofing requirements.

This approach is <sup>only</sup> ~~more~~ acceptable in rural/agricultural areas where detailed engineered flood lines do not exist. The constraint overlay implies that further study must be carried out and there is an onus to show the hazard being overcome. The pressure for development in these areas is also less intense, therefore, the demand for specific pre-designated unencumbered sites is not as great. (See Figure 5).



The positive aspect of the development constraint approach is that the intended land use is clearly shown. This avoids the common perception that the lands are being sterilized. However, there are negative aspects to this approach which include:

- . designation for an intended land use presupposes that development can occur; that is, the constraint can be overcome. A false expectation of development approval may be given, especially if the limits of the floodway are unknown.
- . the presupposition of development can imply that the Conservation Authority or the Ministry of Natural Resources have to demonstrate that a site is unsuitable for development instead of the proponent demonstrating that development is suitable and the constraint can be overcome.

### (c) Two-Zone Approach

In urban or developing areas where greater certainty is required to show potentially developable and non-developable or the restricted portion of the flood plain, the two-zone approach is a possibility. Flood related data and/or engineered flood lines are required to implement this approach.

As development may be permitted in the flood fringe and prohibited or restricted in the floodway, the treatment of these two portions of the flood plain in official plans will differ.

On the land use schedule, the floodway would be designated as "hazard land", "open space", "environmental protection area", etc. The official plan policies would indicate that development in the floodway is prohibited or restricted to such uses (non-structural) as park/open space, agriculture, etc., in addition to flood and erosion control works being permitted.

The flood fringe would be designated for the intended land use, i.e. "industrial", "commercial", "residential", etc. In addition to outlining policies for such land use designations, the official plan would also indicate that for any new development that may be permitted in the flood fringe, floodproofing to the level of the regulatory flood is required.

Where the two-zone approach is applied, the floodway should be zoned in conformity with the official plan designation. As well, the flood fringe should be zoned in conformity with the official plan, ideally, with floodproofing requirements specified. (See Figure 6).

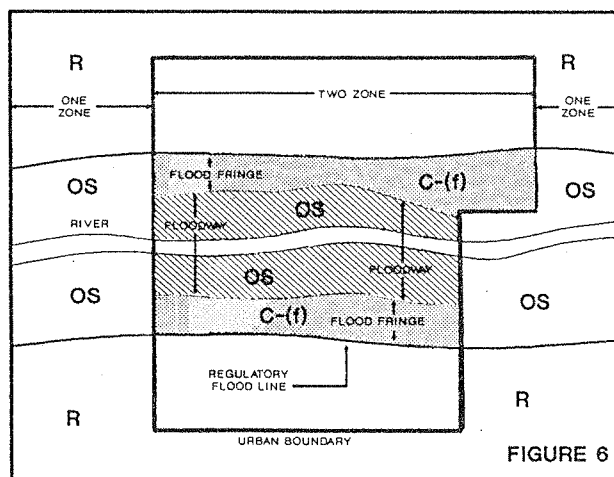


FIGURE 6



It is recognized that certain flood fringe areas may already be zoned for the intended uses with no indication of floodproofing requirements. For such situations, where a Conservation Authority exists, the floodproofing requirements may be specified through the permit process under Fill, Construction and Alteration to Waterways Regulation (where in place). This should be discussed by both parties when the feasibility of applying the two-zone approach is being considered. Where Conservation Authorities do not exist, the Ministry of Natural Resources District Office should make every effort to have floodproofing requirements identified in the zoning by-law.

Similar to the development constraint approach, designation of the flood fringe for the intended use under the two-zone approach, presupposes that development can occur. However, the application of the two-zone approach requires the support of sufficient background flood data. This is not necessarily true for the development constraint approach. As a result, development in the flood fringe can usually occur, provided floodproofing is undertaken.

(d) Special Policy Area Approach

The special policy area approach recognizes that due to historical circumstances in some communities, additional development may have been permitted which is located in the floodway or is not fully floodproofed to the regulatory flood level. These situations are considered to be limited within the Province.

As this approach is intended for 'special' situations only, a municipality requires prior approval in principle as to its possible use.

Engineered flood plain mapping and flood data, sufficiently detailed to graphically indicate the special policy area on the land use schedule of an official plan and precisely describe the area in the policies, is required.

Similarities can exist in the actual treatment of the special policy area approach and the two-zone approach in official plans and related zoning. Both provide for development in the flood plain subject to floodproofing requirements. The major difference is the level of protection to which floodproofing must be carried out and/or the location of the proposed development within the flood plain.

However, as stated, the special policy area approach is the 'exception to the rule', whereas the two-zone approach was specifically devised to provide flexibility in flood plain management.

In contemplating use of the special policy area approach, reference should be made to Appendix C of this document.

### 5.1.3 Minister's Zoning Orders

In areas of the Province without municipal organization, the Minister of Municipal Affairs may enact a Minister's Zoning Order (Planning Act, Section 46(1)). Such orders may also be used any where in northern Ontario where a provincial interest such as flood plain planning is involved.

When a zoning order is imposed, the usual zoning requirements for notice, public information and a public meeting do not apply. But, within 30 days of putting on an order, the Minister of Municipal Affairs is required to give public notice and makes a copy of the order available at the appropriate land registry office.

Zoning orders take precedence over any existing local land use controls, and define:

- . areas where development can take place;
- . specific controls to protect against such proposed development as within flood prone areas;
- . standards for land development, such as lot size, building envelopes, floor space and/or floodproofing requirements within each zone

No utility nor hydro hook-up can be made without a letter of conformity which certifies that a proposal conforms to the Minister's zoning order. The letter is issued by the agency responsible for administering the order.

#### 5.1.4 Zoning By-Laws

There are numerous ways zoning can address the matter of flood susceptible lands. In determining a suitable approach, three major issues should be considered. The first issue is how the undeveloped flood plain lands are to be treated in the zoning by-law. The second issue is the treatment of existing development within flood susceptible areas.

The third issue is that no matter what zoning approach is chosen, the zoning by-law must be in conformity with and implement the official plan. The official plan policies can be rendered virtually useless if the zoning permits incompatible uses from those provided for in the official plan. This is particularly true for flood plain planning where, for example, no development may be the objective in the official plan, but is superseded by pro-development zoning. If a landowner

applies for a building permit and is in full compliance with existing permissive zoning, a municipality cannot refuse a permit at that stage without facing court action. Both the official plan and zoning must reflect complementary objectives in order to be successful.

Zoning provides clear directions in terms of permitted uses and development parameters. For flood plain planning, the traditional components of zoning such as permitted uses, setbacks, coverage, developable areas and openings for floodproofing can be effectively used to adequately control what happens in flood plains. Used properly, they can be a tremendous advantage because they are precise and certain.

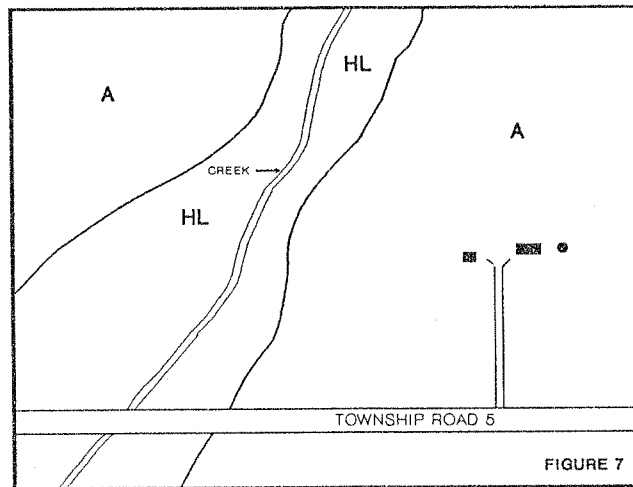
Similar to official plan approaches, the options for zoning vary widely. A zoning approach for a particular area will have to be examined on its own merits and tailored accordingly.

Several possible zoning options are discussed in the following.

#### 1) Use of a Specific Zoning Category

This approach is used where the intent is to prohibit new development in the flood plain. In this case, the simplest way of zoning the flood plain is to establish a separate zoning category. This zoning category could be called "flood plain" or "hazard land" although other categories such as "valleyland", "open space", or "environmental protection" could also be used. It is also possible to use more general categories such as "rural" or "agricultural", particularly in less developed areas of the Province. The intent in these categories, however, would have to be clear that new development would not be located in the flood plain or would be limited.

The zoning category should specifically indicate in the text which uses are permitted in the flood plain and under what conditions. It is important that the zoning boundary be clearly defined on zoning schedules. Even more general categories such as "rural" or "agricultural" could delineate the regulatory floodline on a schedule for information purposes where such information is available. In this way, the public can easily see which areas are restricted or limited for development. (See Figure 7).

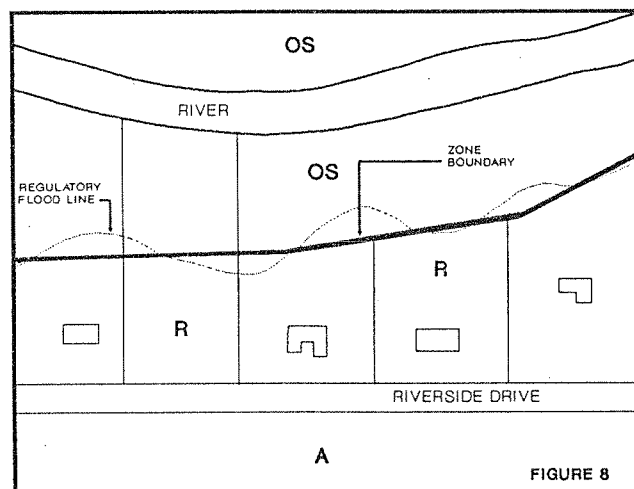


The mapping of this zoning category should correspond as closely as possible to the applicable designation in the official plan. The text of the zoning category should clearly address whether or not existing buildings or structures are legal conforming or legal non-conforming.

In order to prohibit new development, but at the same time recognize existing buildings and structures, a notwithstanding clause could be included in the text of the zoning by-law/zoning order. This clause would state that buildings and structures existing at the time of the by-law/order come into force are legal conforming uses. If the buildings are recognized as such, the by-law/order should also state that there can be no enlargements or extensions without an amendment to the zoning by-law/zoning order, for major additions and approval of the Committee of Adjustment for minor additions.

The only other options available to recognize existing buildings or structures would be to zone the specific properties in another category or through a site specific by-law.

The advantage to this approach is that the flood plain is clearly delineated and new development is prohibited. Even the use of a term such as "flood plain" or "hazard land" denotes a hazard or risk to persons or property. The main disadvantage is that in attempting to seek approval there may be significant objections from property owners. This option generally requires extensive mapping which can be expensive if not already available. (See Figure 8).



## 2) Site Specific Provisions in Zoning By-Law

This approach can be used where the desire is to zone a certain portion of the flood plain for possible development.

In preparing such provisions, specific regard is had to the flood plain (site) characteristics of an area. The by-law would identify the requirements with which development must comply. As a result, use of this approach requires detailed flood plain mapping and related flood data.

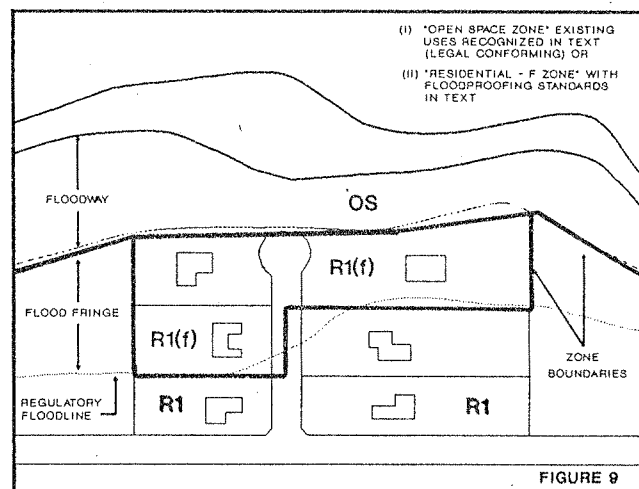
There are a number of different ways to consider the flood plain in site specific zoning provisions; several are discussed in the following:

(a) Special Sub-category

The special sub-category approach would indicate the requirements to be met for development to proceed. For example, if the main issue is floodproofing, the sub-category would specify the minimum elevation for doors, windows or other openings.

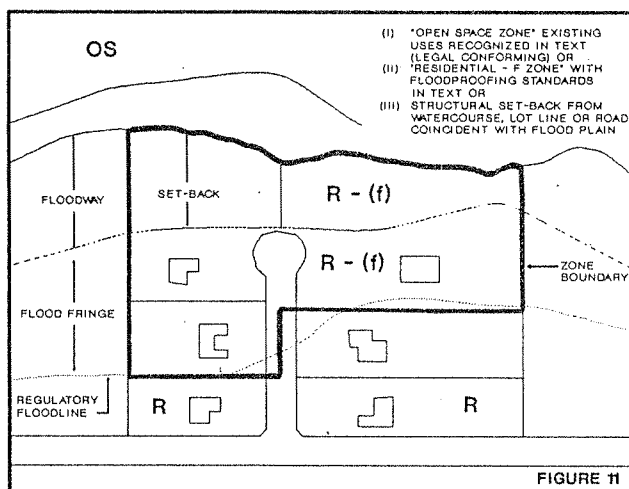
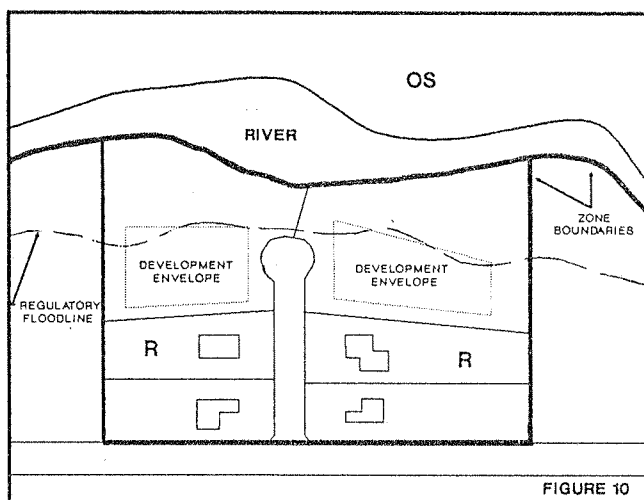
In all other matters the zoning requirements can be similar to those for non flood plain areas. For example, two low density residential developments in different parts of a municipality can have the same zoning requirements with the added floodproofing requirement for the development located in the flood plain.

The special sub-category is usually denoted by F or f for flood plain [i.e. R1 vs R1(f)]. In this way the existence of a flood plain and that special requirements exist is made clear. (See Figure 9).



## (b) Establishment of a Development Envelope

A site specific by-law could clearly establish the limits (e.g. setbacks) within which development could occur. Such an approach would be particularly effective for lots that include both flood plain and non flood plain land. It would avoid two different zonings on the same property. (See Figures 10 and 11).



Any desire to expand the limits of the development envelope would require a by-law amendment if the building envelope line is coincident with the flood line or minor variance if the building envelope line does not involve a flood line. If such changes involve the flood plain portion of the lot, the Conservation Authority or Ministry of Natural Resources, where no Conservation Authority exists, should be consulted.



(c) Restricted Lot Coverage/Floor Area

For this option, the by-law would specify the maximum lot coverage or floor area for development in a flood plain area. Similar to the development envelope approach, any proposed expansion to the lot coverage or floor area would require a by-law amendment for major additions or a minor variance, for minor additions.

This option would be effective in controlling additions to existing buildings in the flood plain. The by-law would specify the existing floor area as the maximum. Therefore, any desire to increase floor area would require the appropriate approvals.

In addition, the use of flood plain lands to help meet lot coverage requirements may be deemed acceptable in certain situations. In exchange, development would be kept out of the flood plain portion of the site.

The advantage of the site specific zoning by-law approach is that certain portions of the flood plain can be recognized for development in a controlled manner, while development is prohibited in other parts of it. It is also an effective means of providing for existing development and its possible expansion.

The major drawback to use of this approach is the availability of flood plain data, staff and time, as the flood plain requirements included in the zoning by-law can be quite specific.

In addition, there is the danger that this approach can become a piece meal mechanism for development of the flood plain, if a comprehensive examination of the treatment of all flood plain land is not first carried out.

### 3) Zoning Schedules and Information Notes

Certain situations may exist where flood plains can only be identified in the zoning by-law/zoning order as an information item. In this approach, flood plain or hazard limits would be graphically shown on the schedule. As well, by way of a note, the schedule could indicate that the local Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists, should be contacted to determine what requirements may exist under their legislation, i.e. Fill, Construction and Alteration to Waterways Regulation, Lakes and Rivers Improvement Act.

Alternatively or in addition, this information could be included in the preamble to the zoning by-law/zoning order. The preamble to a by-law/order is for information purposes and is not considered to be a formal part of the actual by-law/order.

This approach is not constraint or conditional zoning as the intent is to simply "red flag" the existence of the flood plain or hazard area.

In this approach, development is presupposed as the land is zoned for its intended use. As a result, problems may arise where the zoning provides for development and an application to a Conservation Authority under its legislation is turned down because a particular site is too hazardous.

Use of this approach is most appropriate in rural/agricultural areas where development pressure is low and larger lots tend to provide greater flexibility in the actual siting of buildings. It may be possible to use this approach in urban areas where flood plain information

previously did not exist, i.e. zoning pre-dates flood plain information. However, other more suitable approaches for urban areas should be investigated first.

Again, it must be stressed that this approach simply provides information. The zoning by-law/zoning order does not formally address the matter of flood susceptibility.

#### 4) General Provisions Section of a Comprehensive Zoning By-law

Where flood plain data is limited or non existent, the issue of flood susceptibility can still be addressed through the general provisions section of the comprehensive zoning by-law, to a certain degree. For example, the general provisions could include a minimum set back from watercourses to provide some margin of safety and to recognize flood susceptibility. This provision could be applied generally, regardless of the actual zoning for individual areas.

This approach is more appropriate for rural/agricultural areas than urban areas, as development pressure is lower and lot sizes are usually larger providing more flexibility for the actual location of buildings and structures.

#### 5) Other Zoning Mechanisms

A number of new land use control provisions were introduced in the Planning Act, 1983. These include holding by-laws, interim control by-laws and bonus (increased height and density) by-laws.

These tools may prove useful in some flood plain planning situations.

(a) Holding By-laws

Section 35 of the Planning Act authorizes a municipality to pass a by-law to zone lands for a particular use but to provide for a delay in that use proceeding by adding the holding symbol H or h to the zone category rather than the full procedure associated with a zoning amendment. When identified conditions are met, the holding provision would be removed using a special (shorter) procedure. Prior to using this system, the municipality must have approved policies in its official plan setting out the circumstances in which the provision would be used as well as the conditions that would have to be met in order for the hold to be removed.

An important principle in using this system is that the principle of development is clearly established at the time the holding zone is put in place. The conditions would have to be such that their satisfaction would not jeopardize that principle of development.

Therefore, use of the holding provision for flood plain planning purposes would be limited to those situations where the municipality has sufficient information about where development can take place. What may be unknown at the time is the detailed floodproofing requirements or certain siting considerations. As such, a condition of the removal of the hold could be related to council and the Conservation Authority or Ministry of Natural Resources, where no Conservation Authority exists,

being satisfied that appropriate floodproofing measures would be incorporated into the building/development design, and/or the entering into of a site plan control agreement. In this way, the municipality and the Conservation Authority or Ministry of Natural Resources would be allowed some additional control with respect to the satisfaction of these conditions.

The limitations to the use of the holding provision are:

- . it can only be used when the principle of development has been clearly established (i.e. it cannot be used as a "development control" method, where a site is first zoned for development and after some engineering studies are done, the site is found not to be developable).
- . once approval has been granted for a structure the (H) is removed from the entire parcel and no further approvals are necessary for future works (i.e.: garages)
- . the system cannot be used in areas without municipal organization;

(b) Bonus (Increased Height or Density) Provisions

Section 36 of the Planning Act, 1983 authorizes a municipality to pass a by-law allowing increases in height or density in return for certain facilities, services or matters being provided.

Again, the municipality must have approved official plan policies discussing the circumstances in which the provisions would be used.

The intent of this section is to enable a development proponent to obtain the "bonus" in return for providing a specific public or social amenity. Therefore, widespread use of this section to achieve certain flood plain objectives is not strictly in keeping with this intent. However, there may be flood plain planning situations where the principle represented by this provision would be adhered to. For example, certain flood plain lands could conceivably be provided as additional parkland (above and beyond the normal requirements) in return for a bonus in development on the same site or on another site owned by the proponent. Implementation of the bonus provision in these ways should be very cautiously proceeded with and in consultation with the local solicitor.

(c) Interim Control By-Laws

Section 37 of the Planning Act, 1983 authorizes a municipality to pass a by-law restricting development and the use of land, buildings or structures except for such purposes as are set out in the by-law. The intent of an interim control by-law is to provide a municipality with the time required to carry out a review or study of land use within the municipality or part thereof.

An interim control by-law can be in effect for a period of up to one year, with the option to extend the time period up to the maximum of an additional year. Once an interim control by-law ceases to be in effect, a municipality may not pass a further interim control by-law for any part of the area previously covered for a period of three years.

Where a flood plain study (e.g. mapping, hydrology) is currently under way, an interim control by-law may prove useful in providing time to complete the study prior to new development occurring.

#### 5.1.5 Subdivision of Land

Subdivision of land is another planning tool which can assist in addressing flood plain management objectives. When combined with zoning and in certain cases site plan control, it can be particularly effective in regulating development in the flood plain.

Subdivision involves the division of land into two or more parcels and requires the permission of the Minister of Municipal Affairs or a municipality that has been delegated the Minister's approval powers.

Section 50(4) of the Planning Act outlines the matters to be regarded in considering a draft plan of subdivision, which includes the conservation of natural resources and flood control.

Where flood plain areas are contained within subdivision proposals, the extent of development can be controlled. Certain conditions can be applied if necessary to protect the development from flooding.

An application for consent (severance) is the authorized separation of a piece of land to form two new adjoining properties. The approval of severances can rest with one of a number of governing bodies. Depending on the area, severance approval authority may be carried out by the

county or regional council, which may delegate the function to a committee or an official. In Northern Ontario, outside of the five major urban centres, the Minister of Municipal Affairs grants consents, although this power is often delegated to a planning board or local council (where they exist). Most municipalities with an approved official plan in place have specific policies and requirements for land severance.

If several severances are intended in the same area, a plan of subdivision may be more appropriate. It's up to the severance granting authority in the area to decide whether a consent is the best approach, or if a plan of subdivision is necessary for the proper and orderly development of the community.

Section 52(2) of the Planning Act indicates that matters to be regarded under section 50(4) are also to be considered concerning applications for consents. (conservation of natural resources and flood control)

The "Rules of Procedure-Consent Applications" (Ontario Regulation 406/83) is included in the back of the Planning Act, together with a standardized application form. If a Conservation Authority or Ministry of Natural Resources District Office is not receiving consent applications, a written request should be made to the municipality. If subsequent consents are not being circulated in accordance with Ontario Regulation 406/83, the Ministry of Municipal Affairs should be notified.

**NOTE:** Conservation Authorities and the Ministry of Natural Resources are listed as agencies which must receive copies of proposed applications for consent unless the approval authority has been notified in writing that circulation is not required. (Ontario Regulation 406/83, Sections 6 and 6(a)).



Where a Conservation Authority or the Ministry of Natural Resources has recommended that conditions be attached to any approval of an application for consent, it is necessary that the approval authority be requested to forward your agency a copy of the decision to ensure that satisfactory conditions have been included. (Section 52(5)). The request may be made with each application or may request copies of the decision for all applications. If the recommended conditions of approval have not been included to the satisfaction of the Conservation Authority or the Ministry of Natural Resources an appeal to the Ontario Municipal Board may be made within thirty days of the making of the decision (Section 52(8)).

Where a subdivision is circulated to agencies for comment and the intent is to restrict flood plain use, it may be required that no part of the subdivision encroach on the flood plain or that buildings or structures be excluded from the flood plain portion. Section 50(5) of the Planning Act outlines the park dedication requirement which is not to exceed 2% of the land for commercial and industrial subdivisions and 5% in all other cases. This dedication is primarily intended for municipal parkland and facilities but, with the approval of the municipality, may be combined with flood plain lands which are not suitable for development.

Where development may be allowed in the flood fringe, flood susceptibility can be addressed through grading or minimum elevation of building openings. During the processing of a plan of subdivision or consent, the proponent may be required to provide additional information to address flood susceptibility. Such conditions of development would be set out in the conditions of approval. Any conditions of approval recommended for either a plan of subdivision or a consent must be attainable. It is therefore not appropriate to impose a condition requiring the issuance of a permit (i.e. Section 28(1), Conservation Authorities Act) if there is a reasonable possibility that the application would not be issued.

For subdivisions, Section 50(6) of the Planning Act permits a municipality or the Minister of Municipal Affairs to enter into a "subdivision agreement" if such agreements have been imposed as a condition of draft approval. It is a two party agreement between the developer and the municipality or Minister of Municipal Affairs and may be registered on title to the lands. A Conservation Authority or the Ministry of Natural Resources may request that provisions relating to flood plain matters be included in the subdivider's agreement. However, the Agreement is usually used to ensure that works are completed in accordance with previously approved plans/reports. Since the Agreement is signed at the time of the registration of the plan, there are no additional reviews/approvals by a Conservation Authority or the Ministry of Natural Resources under the Planning Act. In addition, since a Conservation Authority or the Ministry of Natural Resources is not a party to the Agreement any enforcement measures are at the sole discretion of the municipality. It is therefore necessary to ensure that any conditions of approval are satisfied prior to registration of the plan. If recommended in the conditions of draft approval a clause may then be added to the subdivision Agreement requiring that the developer complete the works in accordance with the approved plans and/or reports noted in the other conditions.

It should be noted that a consent or subdivision control can only be applied when a proponent proposes a plan of subdivision or applies for a consent, and therefore flood plain controls can not be required until an application is submitted under the Planning Act.

#### 5.1.6 Site Plan Control

Under section 40 of the Planning Act, site plan control is available to municipalities as an additional means of regulating development within the flood plain.

It can be an effective tool for use by a municipality in conjunction with zoning. It does not replace or supersede zoning. In addition, site plan control cannot result in the loss of any development rights established under

zoning. Within the overall framework of a zoning by-law, it allows for detailed site specific review of actual development plans. Site plan control addresses such matters as building location, access, parking, walkways, landscaping and grading. Site plan control does not regulate building height, density, architecture or set-backs.

In order to apply site plan control, the areas to be covered must be shown or described in the official plan.

Examples of how site plan control can be applied in flood plain areas include:

- . detailed grading plans may be required by the municipality prior to the issuance of a building permit. The plans could show the final elevations of buildings and/or grades reflecting floodproofing efforts;
- . a site plan control agreement can address flood plain planning concerns by requiring:
  - . posting of a financial bond to ensure completion of works satisfactory to the municipality;
  - . erection of a construction boarding to protect certain areas of the site;
  - . removal of surplus excavated material;

In summary, it must be remembered that site plan control used in conjunction with zoning is available to municipalities to control development in flood prone areas, only after the principle of development has been established. It is restricted by existing legal limitations as a means of regulating flood plains, although it achieves other development requirements. Ideally, site plan control is applied once detailed development plans are known and it can be most effective during actual construction.

Site plan control is not applicable for areas without municipal organizations as the means for implementation does not exist in such areas. Also, it is not applicable for areas without an official plan, as the site plan control areas must be shown or described in that document.

If a condition of draft approval requires that the subdivider's agreement include a clause requiring that the developer agree to site plan control, then the provisions of site plan control can also be applied through the subdivision procedure.

#### 5.1.7 Minor Variance

A minor variance is intended to be a minor exception to a by-law. Section 44 of the Planning Act provides for the granting of a minor variance provided the general intent and purpose of the by-law and the official plan, if one exists, are maintained.

To assist in flood plain planning, the requirement for a minor variance from set back, lot coverage or floor area requirements, provides an opportunity to review the development proposal and assess any impacts.

This approach is particularly effective for controlling minor additions to existing buildings in the flood plain.

Where flood plain provisions have been included in zoning by-laws, care must be taken in granting a variance. For example, if a by-law specifies an elevation to which floodproofing is required, a variance should not be granted for a lowering of this requirement. In order to provide guidance, the official plan should contain a policy specifying that changes to floodproofing requirements (e.g. elevation of openings) are not considered to be minor variances.

Where applications for minor variances involve flood plain lands, comments should be obtained from the local Conservation Authority or the Ministry of Natural Resources where no Conservation Authority exists.

## 5.2 Roles and Responsibilities of Conservation Authorities

### 5.2.1 Introduction

There are many different facets to water management in Ontario and as a result, different aspects fall within the mandates of various government ministries and agencies. With reference to water quantity and related hazards such as flooding and erosion, responsibility for implementation lies with the Conservation Authorities of Ontario where they exist and the Ministry of Natural Resources where they do not.

Conservation Authorities are autonomous agencies established, for the most part, on watershed boundaries as opposed to man-made boundaries. They are established as a result of local initiatives. Conservation Authorities are considered to be provincial-municipal partnerships and as such are supported financially by both partners. At present there are 38 Conservation Authorities in Ontario.

### 5.2.2 Mandate and Powers of a Conservation Authority

The mandate of a Conservation Authority is quite broad; it is:

"...to establish and undertake, in an area over which it has jurisdiction, a program designed to further the conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals."

In exercising this mandate, Conservation Authorities can be involved in various aspects of resource management. It is recognized that the Province is not uniform physically, economically or socially. Therefore, the problems, programs and resource management emphasis proposed by individual Conservation Authorities can and will vary throughout Ontario.

Although their mandate is broad, Conservation Authorities are considered to have prime responsibility for water management (water quantity and related hazards).

To assist in undertaking their water management responsibilities, Conservation Authorities have two major types of powers - administrative and regulatory.

#### 1) Administrative

The administrative powers are contained in section 21 of the Conservation Authorities Act, R.S.O. 1980, and include the following:

- . to study and investigate the watershed and to determine a program whereby the natural resources of the watershed may be conserved, restored, developed and managed;
- . to acquire by purchase, lease or otherwise and to expropriate any land that it may require, and, subject to the approval of the Lieutenant Governor in Council, to sell, lease or otherwise dispose of land so acquired;
- . to erect works and structures and create reservoirs by the construction of dams or otherwise;
- . to control the flow of surface waters in order to prevent floods or pollution or to reduce the adverse effects thereof.

## 2) Regulatory

Under section 28(1) of the Conservation Authorities Act, R.S.O. 1980, Conservation Authorities may make regulations, subject to the approval of the Lieutenant Governor in Council:

- . prohibiting or regulating or requiring the permission of the Conservation Authority for the straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse;
- . prohibiting or regulating or requiring the permission of the Conservation Authority for the construction of any building or structure in or on a pond or swamp or in any area susceptible to flooding during a regional storm;
- . prohibiting or regulating or requiring the permission of the Conservation Authority for the placing or dumping of fill of any kind in any defined part of the area over which the Conservation Authority has jurisdiction in which in the opinion of the Conservation Authority the control of flooding or pollution or the conservation of land may be affected by the placing or dumping of fill.

Commonly referred to as Fill, Construction and Alteration to Waterways Regulations, these regulations control activities in and near watercourses in a comprehensive yet permissive fashion. The regulations do not prescribe what can or cannot be done. Instead each proposal is assessed according to its individual hydrologic and hydraulic effect, and the ultimate flood risks to the applicant, as well as Conservation Authority water management programs and third parties.

It must be stressed that Fill, Construction and Alteration to Waterways Regulations do not control land use. This is the responsibility of the municipalities and planning boards of Ontario. Conservation Authority regulations examine the technical feasibility of proposed activities from a water management perspective. The municipal land use planning process examines proposals from the point of view of relevant social, economic and environmental matters.

While it is highly desirable to have a development application under a Conservation Authority's regulation be in conformity with municipal official plans and/or zoning by-laws, they are not matters that can be legally considered under such a regulation.

If an application is controversial, or will be recommended for refusal, the Conservation Authority will hold a hearing at which the applicant will be provided the opportunity to present his or her case. Where an applicant has been refused a permit under a Conservation Authority regulation, an appeal may be made to the Minister of Natural Resources. Appeals are heard by the Mining and Lands Commissioner on behalf of the Minister.

Conservation Authority regulations can assist in implementing the Provincial Flood Plain Planning Policy Statement. As these regulations are of a permissive nature, discretion by Conservation Authorities can and should be expected, provided the regulations are administered having regard to the provincial policy statement.

### 5.2.3 Technical Data

To assist in implementing their responsibility for flood plain management, Conservation Authorities carry out flood studies and undertake flood plain mapping for problem or high priority areas.



The preparation of flood plain maps is based on technical requirements set by the Province. Since 1978, most flood plain mapping has been carried out under the Canada/Ontario Flood Damage Reduction Program. This program has provided a consistent approach in the preparation of topographic mapping. It also has strict requirements for hydrologic/hydraulic procedures in engineering and delineating floodlines. Alternatively, where they exist, topographic maps from the Ontario Basic Mapping Program could be utilized for the delineation of flood lines.

In addition to assisting Conservation Authorities in their work, flood plain mapping is very useful in having flood plains recognized in official plans, zoning by-laws and other planning documents. As well, flood plain mapping can be used by landowners contemplating development. There is no requirement for proponents to use flood plain information generated by or on behalf of Conservation Authorities. Proponents may wish to undertake additional flood studies or undertake to have floodlines determined by their own consultants. The Policy Statement addresses both the technical criteria for flood plain management and the municipal land use planning requirements. When reviewing or entertaining applications for permits pursuant to the Fill, Construction and Alteration to Waterways Regulation, a Conservation Authority while not legally bound by the Provincial Policy Statement, must certainly "have regard" for it. By the same token, the Mining and Lands Commissioner, in hearing appeals and Ontario Municipal Board appeals affecting flood plains, should also "have regard" to the Policy Statement in their deliberations. Obviously it is anticipated that tribunals such as the Mining and Lands Commissioner, would give major significance to an approved Policy Statement and any deviations would therefore have to be very well substantiated and justified. It is not appropriate for Conservation Authorities to rely solely on their Regulations for flood plain management matters. It is also not acceptable for a Conservation Authority to rely on a narrow legal interpretation of its Regulation as its sole response to the Provincial Policy requirements.

### 5.3 Building Code

The Ontario Building Code, Ontario Regulation 419/86, is administered by the Ontario Buildings Branch of the Ministry of Housing and administered by the Chief Building Officials appointed by the local municipality. The provisions of the Code apply to virtually all new buildings in the Province. Municipalities may pass "building by-laws" (Section 210, paragraphs 162-174, Municipal Act) however, they may not be more restrictive nor lenient than the Building Code.

The Building Code is a regulation consisting of building requirements to minimize the risk of injury and property damage from structural failure and fire and health hazards.

#### 5.3.1 Building Code and Floodproofing

Two major parts of the Code may have some relevance to floodproofing measures:

##### Part 4: Design

This part of the Code describes design requirements to minimize the hazard of structural failure in buildings. The provisions in this section deal mainly with the types and designs of materials to be used in construction under normal circumstances.

Although to date, the Code makes no special provision for flood susceptibility, it does indicate where dynamic loading conditions apply, allowable loads or allowable bearing pressures shall be assessed by a special investigation of these conditions and where a foundation or any part of a building is subject to hydrostatic uplift, the effects shall be assessed by a special investigation of these conditions.

## Part 9: Housing and Small Buildings

This section contains the detailed requirements for the construction of houses and small buildings with a height of three storeys or less and with a building area of less than 557 square metres. It applies to all buildings with occupants, except those used for assembly, institutional and high hazard industrial.

The sections within Part 9 dealing with waterproofing, excavations, foundations, footings and surface and subsurface drainage are handled strictly from a construction and materials perspective. The Code does not, however, deal with these matters from a flood plain management (floodproofing) point of view. Specifically, it does not address issues such as the potential for damage to buildings, location of a structure on a lot or other site design features. (The location and site design issues would, in fact, fall under the zoning and site plan control provisions of the Planning Act, 1983.)

The Building Code also requires that under certain circumstances, a building would have to be designed by an architect or professional engineer or both.

### 5.3.2 Building Permits

Section 6(1)(a) of the Building Code Act, R.S.O. 1983, requires the chief official to "issue a permit except where the proposed building or the proposed construction or demolition will not comply with this Act, or the building code or will contravene any other applicable law." Therefore, the proposed building must comply with the provisions of a zoning by-law. In addition, this provision would also apply where a Conservation Authority has a regulation in place pursuant to section 28(1)(e) of the Conservation Authorities Act, R.S.O. 1980.

In other words, a building permit cannot be issued until the proposal is addressed by the Conservation Authority under its regulation and can only be approved or refused. Building permits cannot be approved subject to conditions.

An important point to note in considering reliance on the building permit system to assist in achieving floodproofing measures is that the system is not operative in areas without municipal organization, does not apply to farm buildings, mining structures and does not apply until the principle of development has been established.

To ensure satisfactory administration and coordination between flood plain planning and the issuance of building permits, it is beneficial to establish and maintain a close working relationship between the municipal building department and a Conservation Authority or the Ministry of Natural Resources where Conservation Authorities do not exist.

#### **5.4 Federal Legislation**

Under federal legislation, the Canada Water Act, proclaimed on September 30, 1970, provides a framework for joint federal/provincial management of Canada's water resources. Under Part I of the Act, agreements for the development and implementation of plans for the management of water resources can be made.

The National Flood Damage Reduction Program was established in 1976 under this legislation. On March 31, 1978, Canada and Ontario signed a Flood Damage Reduction Program Agreement.

There are two main objectives to the program:

- . to identify flood risk areas and reduce the risk of loss of life and property damage by discouraging new development vulnerable to flood damage in these areas; and
- . to find feasible ways of reducing future flood damages to existing development.

To assist in meeting these objectives, the program provides funds for flood plain mapping and related flood studies. In addition, the program operates under certain policies designed to discourage new development vulnerable to flood damage. Where a one-zone approach is used, the following policies are applied under the program:

- . no future federal or provincial government buildings or structures that are vulnerable to flood damage will be placed in the flood risk area;
- . funds from government sources, such as the Canada Mortgage and Housing Corporation, will no longer be available for new development vulnerable to flood damage in flood risk areas;
- . any development vulnerable to flood damage placed in the flood risk area after identification will not be eligible for flood disaster assistance; and
- . the two governments will encourage local municipalities to appropriately recognize flood risk areas in their planning documents and the planning process so that future development is not susceptible to flood damage.

Where a two-zone flood risk area has been identified (floodway/flood fringe), the above policies will apply to the floodway portion only. Development would be allowed within the flood fringe provided it is adequately protected from flood damage. Additions or enlargements to existing buildings in the flood fringe would similarly require adequate floodproofing.

Existing development in identified flood risk areas will continue to be eligible for government flood disaster assistance and the government-funded programs. This program is geared to new development.

In particular, the Flood Damage Reduction Program policies apply to funding assistance from the Canada Mortgage and Housing Corporation (CMHC). The CMHC Bulletin T-5, dated 1983-11-30, and the CMHC NHA Loan Insurance Handbook set forth the lending policy of the Corporation and other requirements for construction in flood risk areas. The minimum level of flood protection required to be eligible for financial assistance from the Federal Government is the 100 year flood standard. However, the policy also states that, where provincial requirements are more restrictive, they shall apply.

Special policy areas where the proposed level of flood protection is less than the regulatory flood (e.g. Hurricane Hazel, Timmins storm) but equal to or greater than the 100 year flood, will be recognized under the Flood Damage Reduction Program. Where the proposed level of protection for a special policy area is less than the 100 year level, the Province would enter into discussions with the Federal government as to whether or not the special policy area would be recognized. However, it will be necessary to provide substantial rationale/justification, indicating the reasons why the 100 year level can not be achieved.

## 5.5 Co-operation

Conservation Authorities, the Ministry of Natural Resources, municipalities and planning boards have in the past and will continue in the future to liaise with respect to flood plains and related hazards and will work together to recognize and incorporate these matters into the municipal land use planning process. This is in keeping with one of the basic objectives of the provincial policy statement; "to encourage a co-ordinated approach to the use of land and the management of water".

There are many aspects of flood plain management that do not relate to land use matters per se; however, for those aspects that do, recognition of flood plains in planning documents such as official plans and zoning by-laws provides landowners with a consistent statement of what land uses are permitted and the types of conditions required for development to occur.

While flood plain management and land use planning are distinct and separate processes and fall within the mandates of different public agencies, the principle of overall co-ordination has been firmly established in the provincial policy statement.

## 5.6 Unorganized Territories

In northern Ontario, some of the steps involved in land use planning differ from those in the rest of the province because some areas lack municipal structure.

These areas are referred to as "unorganized territories". In unorganized territories planning boards may assume some of the planning roles of council. They develop policies on land use planning that reflect the interests of the planning area over which they have jurisdiction. Where the authority is delegated, planning boards carry out such functions as the granting of consents and the administration of zoning orders. (See section 5.1.3)

Where no Conservation Authority exists, Ministry of Natural Resources District Offices perform the flood plain management function by relying on standard planning mechanisms under the Planning Act, (i.e. Official Plans, Zoning By-laws). In unorganized territories many of these mechanisms are not available and therefore the flood plain planning options noted in Section 5.1 will not apply. Since there is no mechanism available to enforce conditions of development within the flood plain, proposed development should occur totally outside areas subject to flooding.



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## 6. EVALUATING YOUR FLOOD PLAIN PLANNING STRATEGY <sup>5</sup>

The focus of this guideline has been to provide all the facts and information that must be considered in developing a planning strategy for implementing flood plain management objectives. Since every strategy developed will likely be unique to the municipality or planning area for which it has been prepared, this guideline has not attempted to identify the various combinations and permutations available. They are innumerable.

Alternatively, this chapter will identify as comprehensively as possible the key principles and considerations that should be recognized, to create a sound and workable implementation strategy.

The key principles are:

- (1) the strategy should reflect a clear expression of the municipality's or planning area's objectives with respect to flood plain planning that are in keeping with the provincial policy statement;
- (2) the strategy should provide the features that clearly establish the principles of development affecting the flood plain;
- (3) appropriate and workable planning and regulatory mechanisms should be identified to implement the policies developed;
- (4) the strategy should be reasonable and realistic;
- (5) the strategy must provide the public with a clear understanding of what can or cannot be developed in the flood plain and the circumstances under which development can or cannot take place;

The discussion of each principle will identify questions and considerations against which a proposed strategy can be tested or evaluated as to whether it meets the intent of the provincial policy statement.

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The term as used herein refers to the set of policies, regulations and programs prepared and identified within a planning framework to deal with the flood plain planning issue, in a particular municipality or planning area.

## 6.1 Municipal (or Planning Area) Objectives

A flood plain planning strategy must clearly identify the municipality's or planning area's objectives with respect to flood plain planning.

- . Are these objectives and the overall strategy package adopted to meet these objectives, in keeping with the intent of the provincial policy statement?
- . By reading the official plan policies, zoning document and other mechanisms used, will the public know and understand what can or cannot happen in the flood plain?
- . Are the steps or actions to be taken in order to meet the intent of the strategy clearly explained and put in place?

## 6.2 Principle of Development

The principle of development as it applies to flood plains must be clearly established and respected.

- . Do the official plan policies identify what development can or cannot take place in the flood plain?
- . Do the official plan policies identify how decisions will be made regarding development in the flood plain?
- . Does/will the zoning clearly describe or identify the lands where development cannot take place?
- . Does/will the zoning identify the uses that will be permitted in the flood plain area, as well as the provisions relating to such uses?
- . Do all the statements in a zoning document serve to safeguard the integrity of the land use provisions of that document? (i.e. by-laws should not contain notes that transfer the ultimate land use decision to another medium, e.g. Conservation Authority Regulation, site plan control agreement).

- . Implementation mechanisms such as holding by-laws and site plan control presuppose that a commitment to development has been agreed upon by the municipality in cooperation with a Conservation Authority or the Ministry of Natural Resources. Therefore, in using these mechanisms as part of the flood plain strategy, a key question is whether the principle has been clearly established for the areas wherein these provisions will be used. Also, can or will the conditions either relating to the removal of the holding provision or contained in the site plan control policies and agreement, result in a required change to the principle of development. If yes, then a different approach should be taken.
- . Similarly, Fill, Construction and Alteration to Waterways Regulations can be relied upon in those situations where the principle of development can be established first with some confidence. Since they deal only with the construction details of a particular development, the principle of that development as established in the planning documents should generally not be jeopardized by the denial of a Conservation Authority permit. Therefore, a key question to consider is whether the approach adopted could result in decisions being made at the Conservation Authority Regulation stage that would render a zoning by-law's provisions inoperative or unimplementable?

### 6.3 Implementation Mechanisms

Appropriate and workable measures should be identified to properly and accurately put into effect the identified flood plain policies.

- . Do the implementation mechanisms (e.g. zoning provisions, site plan control provisions, etc.) conform to the official plan policies?
- . In the various "possible development approaches", does the zoning provide the proper controls required to ensure the official plan policies will work? For example:
  - . In the development constraint approach, the restrictive nature of the underlying zoning provides the real control.

- . In the two-zone approach, the zoning must clearly describe or identify the no-development area (i.e. floodway).
- . Are all the mechanisms identified in the strategy to be used in a manner that accurately reflects their legislative basis, e.g. site plan control provisions should not be used to regulate land use; they should be used to regulate site specific details for uses that are permitted by the zoning by-law.
- . Would the measures (as well as the overall approach) be reasonably defensible at the Ontario Municipal Board?
- . Do the implementation measures fit the local situation? e.g. in areas where land is not uniform, minimum elevations may not be as useful a measure for identifying the flood plain area or floodproofing requirements.
- . Are there adequate mechanisms in place to ensure that required floodproofing measures are implemented?
- . Does the jurisdiction exist to implement all components of the strategy?
- . If the Building Code permit system is to be relied upon to assist in implementing floodproofing provisions, are the following available:
  - . administrative capability?
  - . staff to issue building permits?
  - . staff to monitor construction?
  - . technical expertise about floodproofing measures?
- . If remedial works are part of the planning strategy, are they in keeping with the policies of the Ministry of Natural Resources and the Conservation Authorities? Also, is there clear statement of responsibilities with respect to maintenance, etc.?

#### 6.4 Reasonable and Realistic Approach

The approach identified should be reasonable in terms of its expectations and impacts, as well as realistic in terms of its implementability and suitability.

- . Is the approach compatible with the level of development activity characteristic of the area?
- . Are all the provisions in the official plan implementable? i.e. are there mechanisms available in the balance of the strategy (and in the community) to put the policies into place?
- . Are there the resources (manpower, administrative, financial) to ensure the implementation of the measures identified?
- . Is there the legislative basis for doing what is proposed in the strategy?
- . Can information be obtained with the requirements of the strategy, e.g. if studies must be done is the required information available?
- . If the flexible hazard approach is used, is there technical information available or can it be made available to determine whether a development can go ahead?
- . If floodproofing is a prerequisite to development, are the requirements within reason and/or compatible with the adjacent area. If not, reconsideration of the policy relating to the development may be required.
- . Will the policies and other provisions result in excessive document amendments?
- . Do the policies allow careful reason in their implementation, e.g. allowing minor infilling without requiring the full Special Policy Area process, or allowing minor exceptions to certain rules?

## 6.5 Public Awareness

The policies and regulations of a flood plain strategy should provide the public with enough information to be aware of what type of development can or cannot take place in the flood plain, as well as the conditions under which development can or cannot take place.

- . Will the public understand the policies?
- . Do the policies provide a landowner with a clear enough guide as to what is permitted on his or her land in the flood plain?
- . Do the policies tell the public/landowner what must be done in order to determine whether development can or cannot take place? Is the information relating to what has to be done available to the public/landowner?
- . Do the policies provide the public with enough guidance about from whom more information might be obtained?
- . Does the policy give information about the status of any lands that are deemed to be in the flood plain (e.g. with respect to public obligation to purchase, etc.)?
- . Would someone owning a lot of record know what policies (etc.) apply to his/her lot?
- . Is there a clear indication of where development applications would not be entertained, i.e. an absolute restriction, e.g. floodway?

### What About Existing Policies?

Many municipalities and planning areas already have comprehensive flood plain planning policies in place. These policies may also be evaluated on the basis of this section. When it comes time to do a major update (e.g. 5 year review), it would be appropriate to fill in any gaps that may exist in the overall strategy.

**APPENDIX A**

**APPLYING TO CHANGE THE REGULATORY  
FLOOD STANDARD  
WITHIN A WATERSHED**

**PROCEDURES**



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