City of Calgary Environmental Reserve Setback Guidelines

Discussion Draft (June 2006)

Purpose

Develop recommendations for site-specific Environmental Reserve (ER) setback widths for prevention of pollution of adjacent waterbodies.

Background

Calgary City Council has directed the Administration to prepare guidelines for determining appropriate ER setbacks to prevent pollution of adjacent water bodies in accordance with the *Municipal Government Act* (MGA). These guidelines must specifically address the ability of a subdividing authority to dedicate ER strips (setbacks) in excess of 6 metres when is can be demonstrated that such takings are required to prevent non-point-source pollution in adjacent waterbodies.

The MGA defines Environmental Reserve as follows:

> 664(1) Subject to section 663, a subdivision authority may require the owner of a parcel of land that is the subject of a proposed subdivision to provide part of that parcel of land as environmental reserve if it consists of
>
> *(a) a swamp, gully, ravine, coulee or natural drainage course,*
> *(b) land that is subject to flooding or is, in the opinion of the subdivision authority, unstable, or*
> ***(c) a strip of land, not less than 6 metres in width, abutting the bed and shore of any lake, river, stream or other body of water for the purpose of***
> ***(i) preventing pollution, or***
> ***(ii) providing public access to and beside the bed and shore.*** [emphasis added]

The definition of Environmental Reserve in sec. 664(1c) allows for a fairly narrow interpretation of the conditions under which a setback of six metres or more would be permitted. Specifically, it would be necessary to demonstrate that such a setback will prevent pollution or is needed to ensure public access.

A healthy, intact riparian zone adjacent to streams, rivers and wetlands has several net benefits that will help prevent the pollution of the adjacent waterbody:

- reduce pollutants in watercourses by filtering, settling, transforming and adsorbing pollutants before they enter the watercourse
- help stabilise the banks of watercourses and serve to reduce bank erosion and the consequent downstream transport of eroded sediments
- reduce pollutants in watercourses during periods of high flows by filtering, settling and transforming pollutants already present in watercourses
- reduce thermal pollution of watercourses by providing shade
- help maintain good quality drinking water sources for Albertans

Protection of riparian areas is also generally recognised to have numerous other incidental benefits that are not the subject of any taking as ER. These benefits have tremendous value, but cannot influence any decision regarding ER setback widths:

- Reduction of flood impacts by absorbing peak flows, slowing flood velocities and regulating base flows
- Provide shade and food and riparian habitats
- Provide habitat for a wide variety of aquatic organisms and wildlife
- Protect the stream's physical, chemical, and biological characteristics to maintain healthy stream functions.

Appropriate protection of Environmental Reserve setbacks will have several broad economic benefits, for example:

- Protection of the natural drainage characteristics of a drainage system within development will minimise the need the construct, repair and replace enclosed storm drainage systems.
- Help protect and maintain natural infiltration and groundwater recharge, thus maintaining subsurface flows that replenish water resources, wetlands and wells.
- Provides for the natural meandering and lateral movement of stream channels
- Reduce the need for maintenance for roads, pathways, embankments, and other infrastructure associated with waterbodies and streams.
- Reduce the long-term expense associated with retrofitting projects as a result of improper stormwater control.

Definitions/Notes:

Waterbody: As defined in the *Municipal Government Act*

Pollution. 'Pollution' is not defined in the *Municipal Government Act*. For the purposes of interpreting this policy, 'pollution' of a water body will be consistent with the definition of a as per the definition of a deleterious substance in the *Fisheries Act*.

Legal Bank. The top of bank as defined by the *Surveys Act*. Environmental Reserve setback (as per sec. 664(1)(c) will be determined from this point)

Subdivision Policy

Setback zones will vary according to the following factors:

Waterbody

A base setback width will be applied to lands qualifying as Environmental Reserve that fit into the following categories:

- Stream (1st order and above)
    1. 1st order – typically a vegetated 'draw' that conveys flow primarily during periods of moderate to heavy rainfall and may not convey flow during other periods.
    2. 2nd order – Can be permanent or intermittent. Formed when two first order streams meet, e.g. West Nose Creek
    3. 3rd order – tributary of two 2nd order streams (e.g. Nose Creek)
    4. 4th order – tributary of two 3rd order streams (e.g. Bow River, Elbow River)
- permanent waterbody (as defined by the *Public Lands Act*)
- isolated wetlands (other waterbody as defined by the *Water Act*)

A base setback width will modified on a site-specific basis according to the following factors:

Slope

- No adjustment for slopes between 0 and 5%
- Setback distance will increase by a factor of 1.5 metres for every per cent slope increase above 5%. *e.g.* a 15% slope would result in an additional setback of 10 metres.

Cover type

- Manicured or disturbed habitat is generally less effective than intact riparian cover in reducing the movement of pollutants and sediments into a watercourse. Compensation factors for this type of riparian buffers can be reduced through appropriate design of filter strips and restoration of riparian buffers.

Hydraulic connectivity

- As determined by Alberta Environment. This applies to areas deemed to have groundwater 'under the influence' (as per the *Water Act*), namely there is hydraulic connectivity between groundwater and surface water (*e.g.* the alluvial aquifer of streams, groundwater recharge areas), these areas will be taken as Environmental Reserve.

Setback type	**Base setback**	Adjustment Factors		
		Slope adjustment	Hydraulic connectivity to groundwater*	Cover type
1st order stream	6m	+1.5m/% slope over 5%	n/a	n/a
2nd order stream	30m	"	All areas where there is demonstrated connectivity between groundwater and surface water (i.e alluvial aquifer, groundwater recharge areas) are protected as ER.	Double base setback width to provide for better buffering of waterbody **or** restoration of riparian lands to provide for proper riparian function
3rd–4th order stream	50m	"	"	"
Other perm. streams (as per *PLA)*, irrigation canals, *etc.*	30m	"	"	"
Lacustrine, palustrine (Class III-VI wetlands)	30m	"	"	"
Isolated wetlands	30m	"	"	"

Management Policy

Note: this zoning system is a land use management tool to be applied after the land has been subdivided and dedicated as Environmental Reserve. It has no bearing on the type or extent of lands to be dedicated as ER under sec. 664 of the *Municipal Government Act*.

For lands that are dedicated as Environmental Reserve adjacent to waterbodies as per the MGA (sec. 664(1c)), the following policies shall apply:

The lands shall be managed as zoned as Natural Environment Park lands, with a three zone system of management:

1. Inner Zone. This zone is intended to maintain the integrity of the banks and adjacent aquatic habitat. Minimal development will be permitted in this zone. Paved trails, pathways or other amenities should not be built in this area. Non-hardened point access trails and other features to be allowed on a site-specific basis. Primary activities will be natural area protection, habitat restoration and provision of nature appreciation facilities. Typically 6m or less in width

2. Middle Zone. Provides for spatial separation between the inner zone and adjacent development. Improvements or development within this zone should be minimised and supporting park amenity or open space needs, e.g. regional pathway alignment, passive recreational developments.

Setback width will be dependent upon stream order, slope and floodplain width – typically 15-30m

3. Outer Zone. Intended to minimise encroachment of adjacent development and provide initial filtering of runoff. This zone should accommodate a transitional area between ER lands and adjacent Municipal Reserve and/or privately held lands.
Native vegetation cover is preferred, but a variety of cover types may be acceptable including manicured turf. Breaks in use type should be achieved through transition – e.g. pathway alignment, shrub beds, etc..
This zone would have the greatest ability to trap sediments and pollutants entering the riparian zone.