

Stormwater Management

What is the Issue?

Stormwater management is the responsibility of the Summer Village. If not done properly, it can result in flooding, erosion, and nutrient loading and contamination of the lake. Council should ensure that stormwater drainage systems are properly designed and maintained. In the interest of good lake stewardship, Council should carefully consider where stormwater will enter the lake and minimize the impacts of this water on the lake.

Background

The stormwater that a Summer Village will be required to manage may include water that is generated outside of its jurisdictional boundaries. Typically, Summer Villages are linear urban developments that follow the shoreline of lakes. Given this linear nature, Summer Villages may often have several small natural watercourses that drain through the municipality to the lake basin.

Summer Villages must maintain these natural drainage courses as well as manage stormwater coming off roads through a system of road ditches. The outlet for the stormwater from these road ditch systems will be small water bodies, watercourses, and/or the lake.

The Hazards of Bad Stormwater Management

Improperly designed or maintained stormwater management systems can result in flooding problems for upstream neighbouring lands, as well as for properties within Summer Village. The ditch carrying capacity and culvert/bridge crossings need to be sized large enough to comfortably pass the expected flow of water for the spring melt and major rains. Culvert systems must be maintained to allow the free flow of water – this will include ensuring that culverts are kept clear of growing vegetation and grasses, trash, and accumulations of silt. Culverts may also require “thawing” during the spring melt and freeze cycle, to ensure that they remain free of ice during the spring runoff.

Improperly designed or maintained stormwater management systems can also result in erosion problems within the ditch system itself and to adjacent properties. When the water velocity reaches a critical rate, erosion will occur, resulting in material being carried downstream to receiving water bodies, including the lake. This eroded material can increase the nutrient loading in the lake contributing to algal blooms and increased aquatic vegetation growth, and may adversely affect critical fish spawning beds by covering them with silt.

Pollutants in Stormwater

Excess fertilizers and other chemicals applied to properties for lawn development or other purposes can be carried by stormwater to the road ditch system and transported downstream to the receiving water body. These chemicals can increase the nutrient loading in the lake. (See the **Fertilizer Use** chapter of this guide).

Best Management Practices

There are methods of managing stormwater that provide flood control for the community while preventing, or at least minimizing, water quality and habitat degradation. These methods may be called Best Management Practices, or Best Practices. A new ditch that conveys stormwater to the lake without considering these practices may create environmental problems. Best Management Practices can be used at the source, on the lot, in the conveyance system (ditch), or at the outlet. A stormwater management system may consider several Best Management Practices such as reduced lot grading and grassed swales, with check dams to trap sediment.

What Does the Law Say?

Any activity affecting the land that will impact and/or alter surface water is subject to prior review and Water Act approval from Alberta Environment.

The *Water Act* and the *Water (Ministerial) Regulations* does allow activities that do not require an approval. These include the installation of small culverts in non-fish bearing streams and some minor landscaping of properties, provided that the activity does not affect adjacent properties.

Stormwater Management

The *Environmental Protection and Enhancement Act* (EPEA), administered by Alberta Environment, regulates the release of substances into the environment, including releases into water. Alberta Environment provides the approvals under the EPEA on issues that are related to runoff and contamination from activities that may affect lake environments. Summer Villages should obtain information from Alberta Environment to help develop and review community plans, and to find out what Best Management Practices they can use to reduce the effect of runoff or stormwater on the lake.

The deposit of a harmful substance of any type, into water or in a place where it may enter water frequented by fish, is contrary to the federal *Fisheries Act*. Environment Canada administers this section of the Act. This is usually not a problem with stormwater runoff, as long as proper guidelines are followed.

What Should I Do?

If the Summer Village is planning to construct a new road, they should consider engaging a professional engineer to design it, to ensure the road and associated road ditch system does not create flooding and/or erosion problems. The professional engineer can assist the village with any approval requirements related to the works.

If someone outside, or inside, the Summer Village is undertaking stormwater management work that you feel may adversely affect the operations of the Village's stormwater management system, and/or the receiving watercourses or water bodies, contact the local Alberta Environment office. Be ready to provide the legal land description of the location of the activity, and provide a brief description of the activity in progress.

Landscaping and Site Restoration

Preventing contamination and pollution of the lake from stormwater runoff when building roads, developing drainage ditches, or installing culverts should be a priority. After that, site restoration of disturbed areas should be done immediately to prevent soil erosion. This would usually involve seeding the exposed earth with various fast growing plants (e.g., clover). It is generally wise to plant only native species, so as to prevent future problems with aggressive plants. Alberta Environment has information on which mixes of seed work best for this work.

Everything is Connected

Everything we do within the watershed affects the ecosystem of the lake. Making sure the Summer Village drainage system is operating efficiently is good, but drainage systems carry things besides water to their point of discharge. Runoff from lawns picks up fertilizers; runoff from roads carries soil particles, etc.

Councillors can practice good lake stewardship by considering all aspects of what living by a lake means. Bylaws banning fertilizer use within the Summer Village will mean no extra fertilizer can get into the lake with runoff. Protecting the vegetation in environmental reserves and around the shoreline leaves a zone of plants that can help take up any nutrients carried to the lake by runoff. If a Summer Village is lucky enough to have a marshland within its boundaries, perhaps stormwater runoff could be routed to it. The plants in the marsh will filter out nutrients and other pollutants, keeping them out of the lake.

Who Can I contact?

For more information on stormwater management contact your regional Alberta Environment office. Dial 310-0000 first, for a toll free call.

Are There Any Resources Available?

- **Stormwater Management Guidelines for the Province of Alberta – 1999, January** at: <http://www3.gov.ab.ca/env/protenf/publications/StormwaterMGNTGuidelines.pdf>
- **Wastewater and Storm Drainage Regulation Fact Sheets - 1997, January** at: <http://www3.gov.ab.ca/env/protenf/legislation/factsheets/wastewat.html>
- To access the Alberta Environment Information Center visit their web-site at: <http://environment.gov.ab.ca/info/topics.asp>
<http://www3.gov.ab.ca/env/info/infocentre/PubDtl.cfm?ID=126>
- **Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems** - published by Alberta Environment and available at the Queens Printer, or online at their web-site at: http://www3.gov.ab.ca/env/protenf/publications/SandG_MuniWater.pdf
- **Stormwater Management Planning** at the National Guide to Sustainable Municipal Infrastructure web-site at: http://www.infraguide.ca/bestPractices/PublishedBP_e.asp#sw
- **Road Drainage, Design Alternative, and Maintenance** at the National Guide to Sustainable Municipal Infrastructure web-site at: http://www.infraguide.ca/bestPractices/PublishedBP_e.asp#sw
- Transportation Association of Canada, (TAC) web-site at: <http://www.tac-atc.ca/english/index.cfm> has a series of Best Practices including:
- **Drainage and Stormwater Management** at: <http://www.tac-atc.ca/english/information/services/readingroom.cfm#syntheses>

Ross Haven Changes Policy on Stormwater Management

The Summer Village of Ross Haven is a small Village on the north shore of Lac Ste. Anne, in the County of Lac Ste. Anne. The Village population is approximately 109 year-round residents and three times that during the summer months. Like many lakes in Alberta, Lac Ste. Anne is very productive and subject to “blooms.” In the past, several of the drainage ditches in the Village were kept clean and mowed close to the ground to allow runoff water to go into the lake as fast as possible. This was done to alleviate chances of water back-up. Today, the Village has reversed this practice, allowing grass and other natural plants to grow back, in order to slow down the rate of stormwater moving through the ditches. This vegetation also acts as a filtering system, taking up nutrients being carried by the water to the lake. The Village also planted trees along the edge of the waterways, and reforested park areas where trees had died as the result of age and drought conditions.

This change of thinking came about, in part, due to information provided by speakers at Town Hall meetings. This project ties in with other good stewardship projects, such as shoreline restoration, that the residents of Ross Haven are endorsing. The result has been a dramatic improvement in the water quality of the lake, at the Village.