

# Appendix B

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Desktop Analysis

### Watershed, Sub-watershed, and Stormwater Master Plans

Within these studies, information that may be relevant to scoping your residential LID retrofit program may include:

- Watersheds and Subwatershed delineation
- Sewershed delineation
- Areas of identified storm sewer capacity issues
- Area contributing to combined sewer overflows
- Areas of degraded water quality
- Areas prone to flooding (both urban and riverine)
- Water quality targets
- Flow targets
- Infiltration targets
- The impact of planned development on existing infrastructure and watershed health

After reviewing this information, you will have a better understanding of where LID practices on residential properties will provide the greatest benefits to municipal infrastructure and natural conditions.

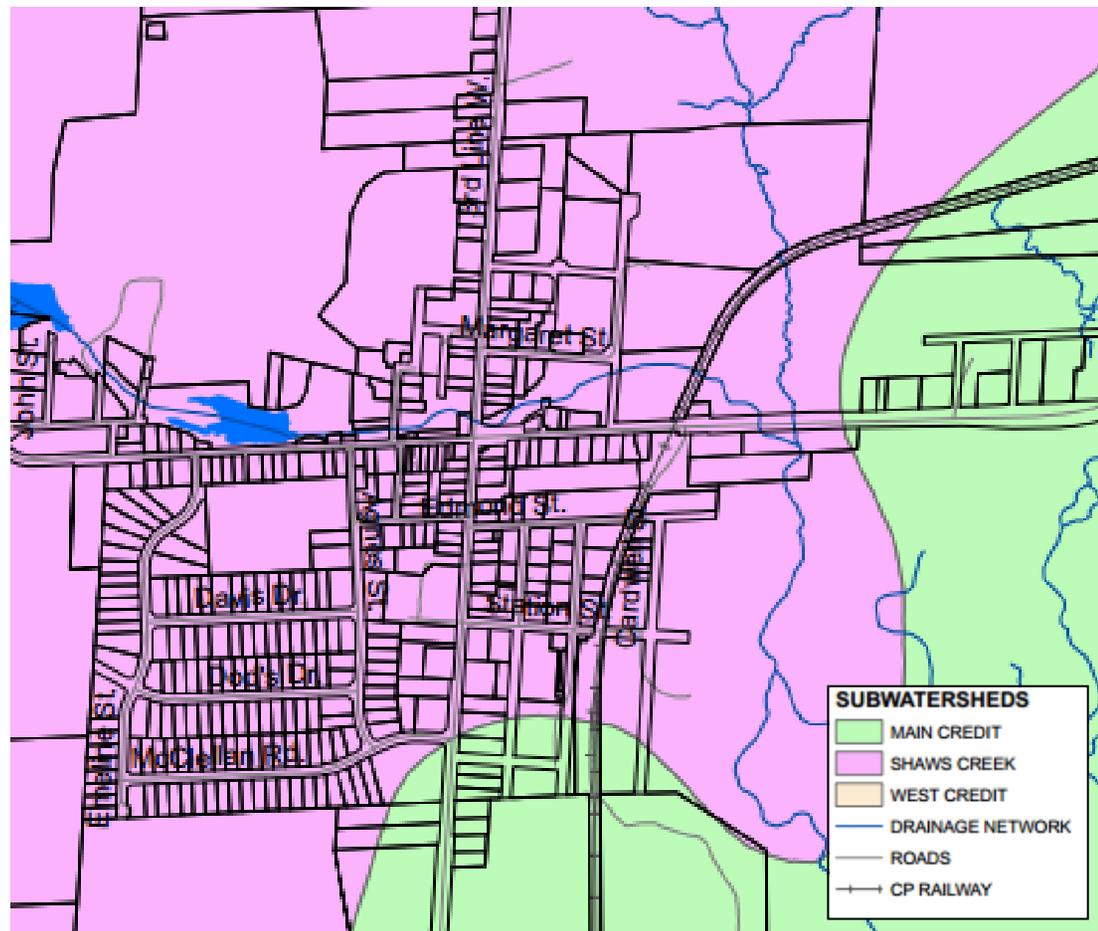


Figure 1: This figure shows subwatershed mapping produced for an environmental management plan for Alton Village. This mapping was used to better define target areas for residential LID implementation. (Source: Aquafor Beech)

*Neighbourhoods in areas where stormwater issues can be mitigated by implementation of LID practices should be targeted over areas that do not have significant stormwater issues.*

### Source Water Protection Plans

Source Water Protection Plans will provide the location of wellhead protection areas (WHPA). For WHPA, encouraging the infiltration of clean water via LID practices helps ensure aquifers are replenished for municipal usage. When determining which LID practices are most applicable across your target implementation area be sure to cross-reference wellhead protection mapping available from the source protection plan. The infiltration of water from clean sources such as front and rear yards and roofs could be encouraged within these areas. You may wish to avoid promoting the infiltration of driveway runoff due to the risk of groundwater contamination caused by leaks and spills of hydrocarbons, regular use of de-icing practices.

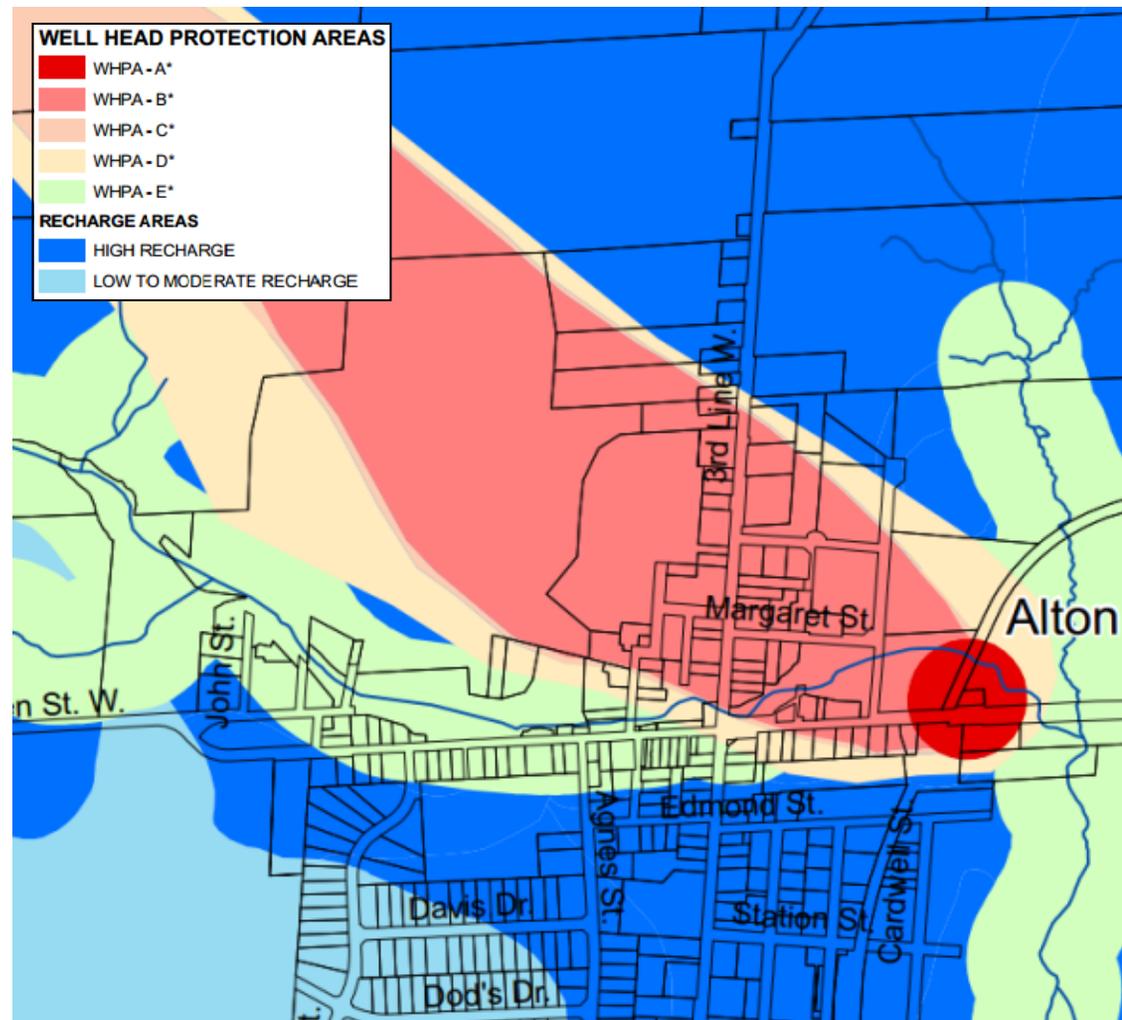


Figure 2: This figure shows the wellhead protection area mapping for Alton Village. The high recharge areas are ideal targets for infiltration practices. Infiltration from driveways should be avoided in the WHPA. (Source: Aquafor Beech)

### Surficial Geology

Most residential LID practices function well irrespective of surficial geologic conditions. Absorptive plantings still intercept water regardless of the soils and geological formations present below the property. Rain gardens still provide hydrologic benefits by detaining water in surface depressions even with slow draining soils such as clays below. Similarly, downspout disconnections still provide an extended flow time and allow for some infiltration to occur even when established on these soils.

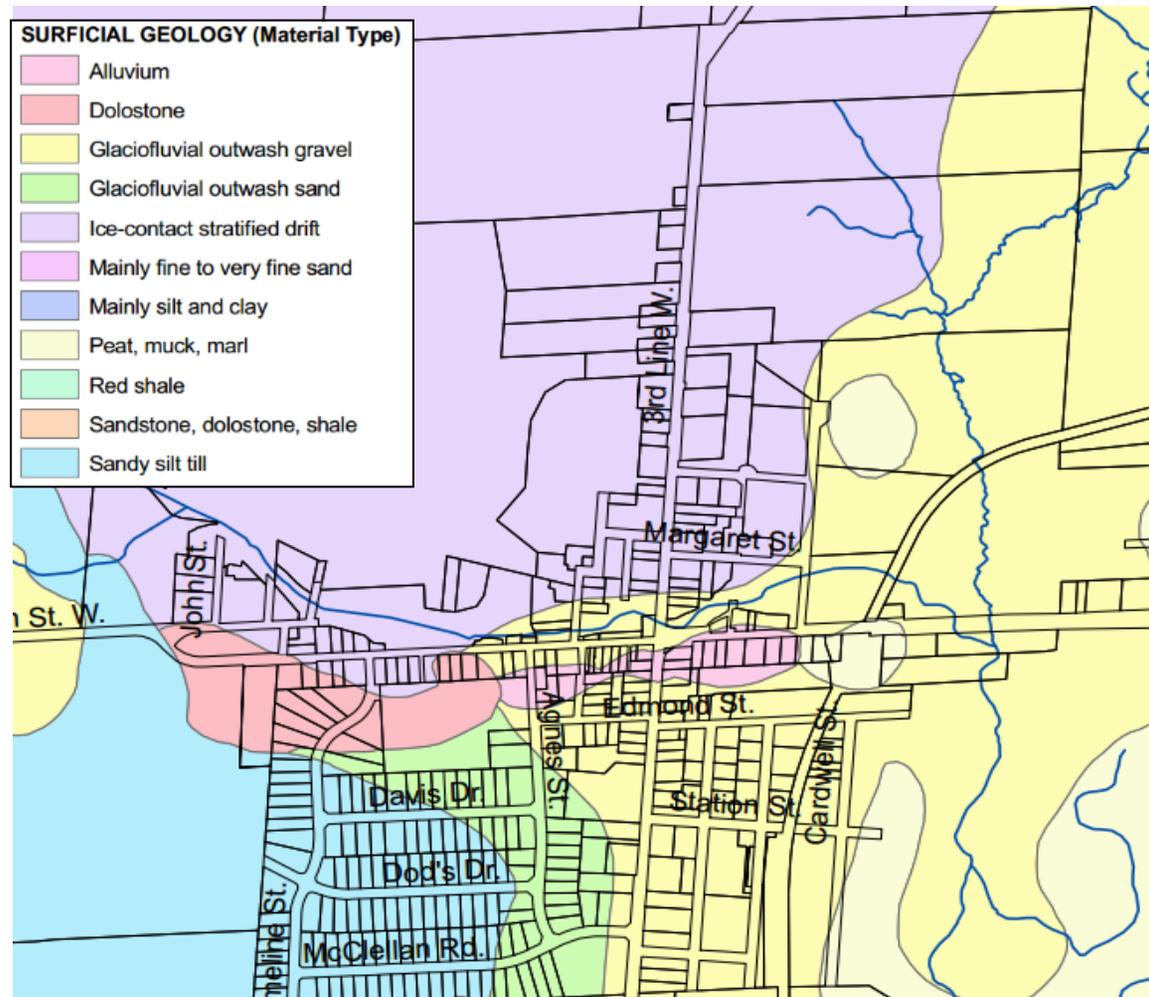


Figure 3: This figure shows surficial geologic conditions for Alton Village. Soils in the area allow for moderate to high recharge of groundwater. (Source Aquafor Beech)

## Applicable Bylaws

**Table 1: Typical by-laws to be reviewed**

Typical By-laws	General provisions may include	Impact on residential LID retrofits
<i>Nuisance weeds and tall grass by-law</i>	<ul style="list-style-type: none"> <li>• Designates tall grass and weeds as a public nuisance</li> <li>• Defines “tall grass” as grasses over a maximum height (typically 20 - 30 centimeters)</li> <li>• Requires tall grass to be cut to a height not exceeding the maximum</li> <li>• Requires all nuisance weeds and weed seeds to be removed from a property by the owner.</li> <li>• The municipality may carry out the work to bring properties into compliance and recover the cost from the land owner</li> </ul>	Vegetated LID practices (specifically those with prairie or ornamental grasses) an landscape naturalization may be in violation of this existing by-law
<i>Property standards by-laws</i>	<ul style="list-style-type: none"> <li>• Sets minimum requirements for privately owned properties</li> <li>• Restricts low lying areas including those that have been excavated that accumulate water, and directs them such that they be drained, filled and graded so that water drains to a storm sewer or ditch.</li> <li>• Requires that all landscaped areas be cut and maintained in a reasonable condition in relation to the neighboring environment</li> </ul>	<p>Can preclude the implementation LID practices such as bioretention facilities as they are designed be both low lying and include ‘shallow’ surface ponding.</p> <p>May be considered prohibitive for the implementation naturalized landscape approach</p>
Sewer use by-laws	<ul style="list-style-type: none"> <li>• Although generally limited to sanitary sewers, many municipalities now include storm water within this by-law. It generally requires all storm water to be discharged to an approved outlet and regulates the constituents of the discharged water.</li> </ul>	May not permit direct discharge of roof water to the municipal storm sewer system. This may include overflow from rainwater harvesting tanks and other such devices.
Standing water by-law	<ul style="list-style-type: none"> <li>• Prevents accumulation of water on an individual property within any depression</li> <li>• Often in response to mosquito breeding and West Nile Virus concerns.</li> <li>• Accumulation is typically defined per a determined period of time (e.g. 48 hours).</li> </ul>	May be interpreted as prohibitive for soakaways subsurface storage facilities, bioretention, and bioswales.
Boulevard planting by-laws	<ul style="list-style-type: none"> <li>• Regulates the type of vegetation that can be planted within the boulevard area</li> </ul>	May inhibit bio-swales or vegetated swales due to plant type and height restrictions of planting along municipal boulevards.
Roof Leader policies (often as part of property standards by-laws)	<ul style="list-style-type: none"> <li>• Regulates the collection and allowable discharge location of roof drainage</li> <li>• May specify outlet distance from building foundation</li> <li>• May prohibit discharge to storm sewers, impervious surfaces and property boundaries</li> </ul>	Progressive roof leader policies can encourage the implementation of rain gardens, soakaways, rain barrels, and other LID practices.