



City of Guelph Outside Water Use By-law Dust Suppression Fact Sheet

This fact sheet looks at water use by:

- mobile dust suppression at road building sites or unpaved roads using water tanker trucks;
- static site dust suppression using water cannons or other irrigation systems at industrial operations (e.g. demolition sites, recycling facilities, material depots, landfills, etc.); and,
- other dust suppression using water (at building construction sites, landscaping, truck wheel washing, etc.).

Extent of End Use in City of Guelph

Dust suppression using water is carried out to reduce the generation of airborne particulate matter from construction, roads, fields, vehicles and industrial applications. Applying water to control dust is often the preferred method because it is highly effective, economical and implementation is typically fast and straightforward.

City staff are not aware of any large scale *static site* dust suppression carried out as a regular and ongoing activity at any industrial locations. Any use of this kind is ad hoc and intermittent, or involves small quantities of water.

With respect to *mobile tanker trucks*, there is only one bulk filling station in the City, located at Clair Road at the south end. This station is fully metered and anyone using it must have an account with the City's Water Services Department. Tankers draw from it for a variety of purpose including construction purposes, landscape maintenance and supplying potable water to homes not connected to the municipal system. Analysis completed by City staff in 2013 shows that this filling station only accounts for 0.05 per cent of Guelph's total water use, of which dust suppression is only a portion. We can conclude that water used in this way is a very small part of total demand.

Tanker trucks engaged in dust suppression are specifically configured for this task. They typically have rear fantail sprayers and spray bars at front or sides. Some may also use tank mounted water cannons. They discharge at various rates, depending on prevailing conditions (wind, recent rainfall, frequency of traffic, soil type, etc.). Tankers may have capacities of ~3,800 litres (1,000 gallons) up to 20,000 litres.

Consumption by dust suppression around Guelph will vary depending on how much roadwork and other construction is taking place at any given time.

Typical Dust Suppression Tanker Configuration



Source: Calder Brothers Corporation

Best Management Practices for Efficient Use

Dust suppression is a technical and situation-specific matter. As well, issues around water use in construction more broadly have not been well explored in Canada to date, although there is some useful guidance available from the United Kingdom and elsewhere.

The Waste and Resources Action Programme (WRAP) is an independent not-for-profit company in the UK. In 2001, WRAP completed a scoping investigation into water use at construction sites that included a number of fieldwork audits. This study identified dust suppression as a high priority activity for potential savings. It also found that there was little consistency throughout the construction sector in relation to water management. The dust suppression systems that were observed were inefficient in many cases, and significant improvements could be made. When used, these systems will generally account for a significant portion of a site's water consumption. However, the study also noted that further work is required to accurately quantify the municipal water demands associated with the activities (WRAP, 2001).

Alternatives to using water for dust control include the following:

- installation of site fences covered in cloth material to trap dust;
- retaining existing vegetation wherever possible;
- covering truck loads when transporting material;
- planning topsoil stripping or grading on days when wind conditions are calm;
- ceasing work during high wind conditions;
- minimizing the time between stripping topsoil and commencing excavation;
- limiting vehicle speeds and/or using crushed rock to pave on-site haulage routes;
- using temporary grassing on material stockpiles;
- covering stockpiles and locating them where not exposed to wind;
- use of alternative water sources such as on-site sediment ponds or recycled water; and,

- use of bitumen straw mulching and other materials.

More advanced technology can also be used for water tankers and other equipment that can achieve the same results with greater efficiency. Most notably, hydraulic spinning systems disperse water in a fine mist. These only use around 100 litres per minute, which can equate to as little as nine per cent of their equivalent splash plate systems on conventional tanker trucks. Similarly, fan misting systems can also be used at static sites which are much more efficient than rain guns or cannons (WRAP, 2001).

Challenges with these alternatives include that they are more expensive to hire or purchase and not as widely available. As well, higher water quality may be needed to prevent blockages, meaning that alternative sources such as settlement lagoons may not be usable.

Whether these technologies can be used will vary from case-to-case depending on dust levels and other conditions.

Hydraulic Spinning Dust Suppression Systems (Static and Truck Mounted)



Source: COLDMist Cooling Australia; BKB Dust Suppression Solutions

Chemical additives or alternative suppressants are also an option to assist in reducing the volume of water needed. These include deliquescent salts (calcium chloride and magnesium chloride), petroleum-based binders, various vegetable oils, synthetic polymers and others. These choices are more expensive and may not be suitable in all situations due to environmental considerations and other factors. However, they are longer lasting and may be an appropriate choice for applications such as permanently unpaved roads.

Contribution to Overall Outdoor Water Use

Indicator	Impact
Portion of customers that practice the end use	Low
Average volume of water used each time the end use is practiced	Large
Average frequency with which customers practice the end use	Infrequent
Contribution of end use to overall outdoor consumption	Low