Prepared for: The City of Waterloo

STORMWATER MANAGEMENT MASTER PLAN (SWM-MP) MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Snow Storage Memo





Table of Contents

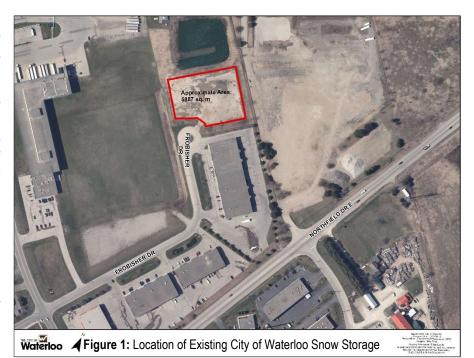
1.0 Introduction	1
2.0 Methodology	2
3.0 Results	3



1.0 Introduction

The City of Waterloo is responsible for clearing snow from roads, sidewalks and trails according to the provincial standards and municipal by-laws. When accumulated snow exceeds the onsite storage capacity of the road right-of-ways and municipal properties, snow must be removed and hauled to the City's snow storage facility.

The City of Waterloo's existing snow storage facility is located on a municipal parcel of land at the northeast limit of Frobisher Drive immediately north of the cul-desac (see **Figure 1**). The snow storage area on this property has a footprint of 0.59 ha. Although the site makes sense from a



logistical standpoint, the storage capacity of the facility has been exceeded in excessively snowy winters. To make up for the storage volume deficit, options include; facility expansion, the development of a new storage facility, and the development of a secondary storage location(s) to be used only when the primary facility's capacity is exceeded. Due to conflicting land uses adjacent to the parcel, expansion of the existing facility is constrained. Aquafor Beech has conducted a GIS analysis to determine possible locations for new facilities and secondary storage locations.

Alternatives not considered in this GIS analysis but may be viable alternatives to new facilities or secondary storage locations include permanent or mobile snow melt systems at the existing facility to accelerate the melt process and free-up storage capacity. These systems can be electric (heating cables) or hydronic (heated fluid) systems.



Figure 2: Existing City of Waterloo Snow Storage Facility from Frobisher Drive. Facility design features include chain link fencing with barbed wire as well as perimeter grading along the east and north to mitigate drainage impacts to neighbouring properties. This a Google Street View photo from August 2015. Note the mud and sediment accumulation that remains well into the summer.



2.0 Methodology

The Ontario Ministry of the Environment, Conservation and Parks (MECP) has recommended the following for disposal of snow:

- Direct disposal of snow to watercourses or ice-covered lakes and rivers shall be eliminated wherever possible.
- Disposal on properly selected land sites, is considered, in most cases, the best solution.

Locally, the Source Protection Plan for the Grand River Source Protection Area (2016) has identified the "Storage of Snow" as a threat to drinking water sources:

"For health and safety reasons (i.e., slipping hazard), snow removed from roads and parking lots must be melted on-site or transported to a location where it is either melted or stockpiled and allowed to melt. Since snow can be contaminated with salt, oil, grease and heavy metals from vehicles, litter, and airborne pollutants, it must be handled and stored in ways that protect water sources. The activities related to snow storage that are considered to be drinking water threats include:

- Snow that is pushed into large piles on a property (e.g. stored in parking lots);
- Snow that is transported to a central site from other locations (e.g. snow disposal sites); and,
- Large snow banks along roads that are close to municipal wellheads or surface water intakes.

The Ministry of the Environment Tables of Drinking Water Threats identify eleven (11) substances such as chloride, copper, sodium and nitrogen, which could make their way into surface and groundwater as a result of runoff from snow storage areas and threaten the safety of drinking water sources."

In order to find possible locations for new snow storage facilities and/or secondary storage locations while taking surface water quality and source protection considerations into account, a GIS analysis was undertaken. **Table 1** outlines the criteria used for the site analysis.

Table 1: Parcel Search Criteria used in GIS Analysis

Criteria	Reasoning	
Municipal Parcel	To avoid costly land acquisition costs, the parcel must be currently owned by the City	
Ownership	of Waterloo. Around the City boundaries, City of Kitchener properties were also considered in this analysis.	
Parcel Area > 1 ha	A 1 ha minimum parcel area limit was used. Parcels of this size tend to have storage options that do conflict with site uses. It should be noted that the existing snow storage location does not fulfill this criterion.	
Outside Inlet Protection Zone	To avoid potential contamination loading to the Hidden Valley IPZ, areas within the IPZ3 were omitted from consideration.	
Outside Issue	To avoid exacerbating identified chloride issues at Regional of Waterloo wells, areas	
Contributing Area	within ICAs were omitted from consideration.	
Outside Floodplain	To avoid sediment deposition in the floodplain and direct disposal of snow into watercourses, areas within the regulatory floodplain were omitted from consideration.	
Woodlots	To avoid damage to woodlots, areas within Regionally Significant and Local Woodlots were omitted from consideration.	
Wetlands	To avoid damage to wetlands, areas within evaluated and non-evaluated wetlands were omitted from consideration.	
Building Footprints	Existing buildings on municipal properties are constraints. Areas covered by a building footprint were omitted from consideration.	
SWM Facilities	To avoid hydraulic issues such as outlet blockages, areas covered by SWM facilities were omitted from consideration. Areas on SWM parcels adjacent to SWM facilities were considered.	



3.0 Results

The GIS analysis using the filter criteria shown in **Table 1** resulted in 26 potential snow storage facilities. Upon visual inspection of these via satellite imagery it was found that many of these parcels contained land uses that were not suitable for snow storage. Unsuitable land uses included:

- Sports fields (baseball diamonds, soccer pitches, etc.)
- Parks
- Cemeteries
- Public pathways
- Forested areas not identified as woodlots
- Municipal parcels in residential areas

Removing the above land uses from consideration resulted in the following locations remained as potentially viable options. All sites would require site grading and drainage works to accommodate snow storage. **Figures 3 through 11** show the potential snow storage locations.

Location 1: Woolwich Street and University Avenue East (Figures 3 and 4)

Two areas were identified east of University Avenue East. The area west of Woolwich Street is 3.3 ha and is zoned agricultural while the area east of Woolwich Street is 2.0 ha and also zoned agricultural. Available satellite imagery indicates recent corn crops in the area to the west while the area to the east appears to be left fallow. Access to both areas would be from Woolwich Street near the Fire Station.

Potential Use: new snow storage facilities and/or secondary storage locations

Location 2: Woolwich Street and Park Road (Figure 5)

An area was identified north of Park Road and east of Woolwich Street, immediately west of the Grey Silo driving range. The area is **2.21 ha** and is zoned agricultural. Access to the area would be from Woolwich Street or Park Road. Potential Use: new snow storage facility and/or secondary storage location

Location 3: North of University Avenue East and Country Squire Lane (Figure 6)

An area was identified north of University Avenue East and west of Country Squire Lane. The area is **0.97 ha** and is zoned agricultural although it is currently used as a parking lot for municipal baseball diamonds. The parking lot is not currently paved. Access to the area would be from Country Squire Lane.

Potential Use: secondary storage location

Location 4: South of University Avenue East and RIM Park Fields Lane (Figure 7)

An area was identified south of University Avenue East and west of RIM Park Fields Lane. The area is **0.45 ha** and is zoned agricultural although it is currently used as a parking lot for municipal baseball diamonds and soccer pitches. The parking lot is not currently paved. Access to the area would be from RIM Park Fields Lane.

Potential Use: secondary storage location

Location 5: RIM Park Fields 1 (Figure 8)

An area was identified south of University Avenue East and west of RIM Park Fields Lane. The area is **0.38 ha** and is zoned agricultural although it is currently used as a parking lot for municipal baseball diamonds and soccer pitches. The parking lot is not currently paved. Access to the area would be from RIM Park Fields Lane.

Potential Use: secondary storage location

Location 6: RIM Park Fields 2 (Figure 9)

An area was identified at the southern terminus of RIM Park Fields Lane. The area is **0.38 ha** and is zoned agricultural although it is currently used as a parking lot for municipal baseball diamonds and soccer pitches. The parking lot is not currently paved. Access to the area would be from the park access road.

Potential Use: secondary storage location



Location 7: Lexington Park (Figure 10)

An area was identified in the parking lot of Lexington Park. The area is **0.09 ha** and is zoned green two. The parking lot is not currently paved. Access to the area would be from Lexington Road.

<u>Potential Use</u>: secondary storage location

Location 8: Hydro Corridor at Ladyslipper Drive (Figure 11)

An area was identified in the hydro corridor south of Ladyslipper Drive. The area is **0.58** ha and is zoned green one. The area is grassed. Access to the area would be from Ladyslipper Drive.

Potential Use: secondary storage location

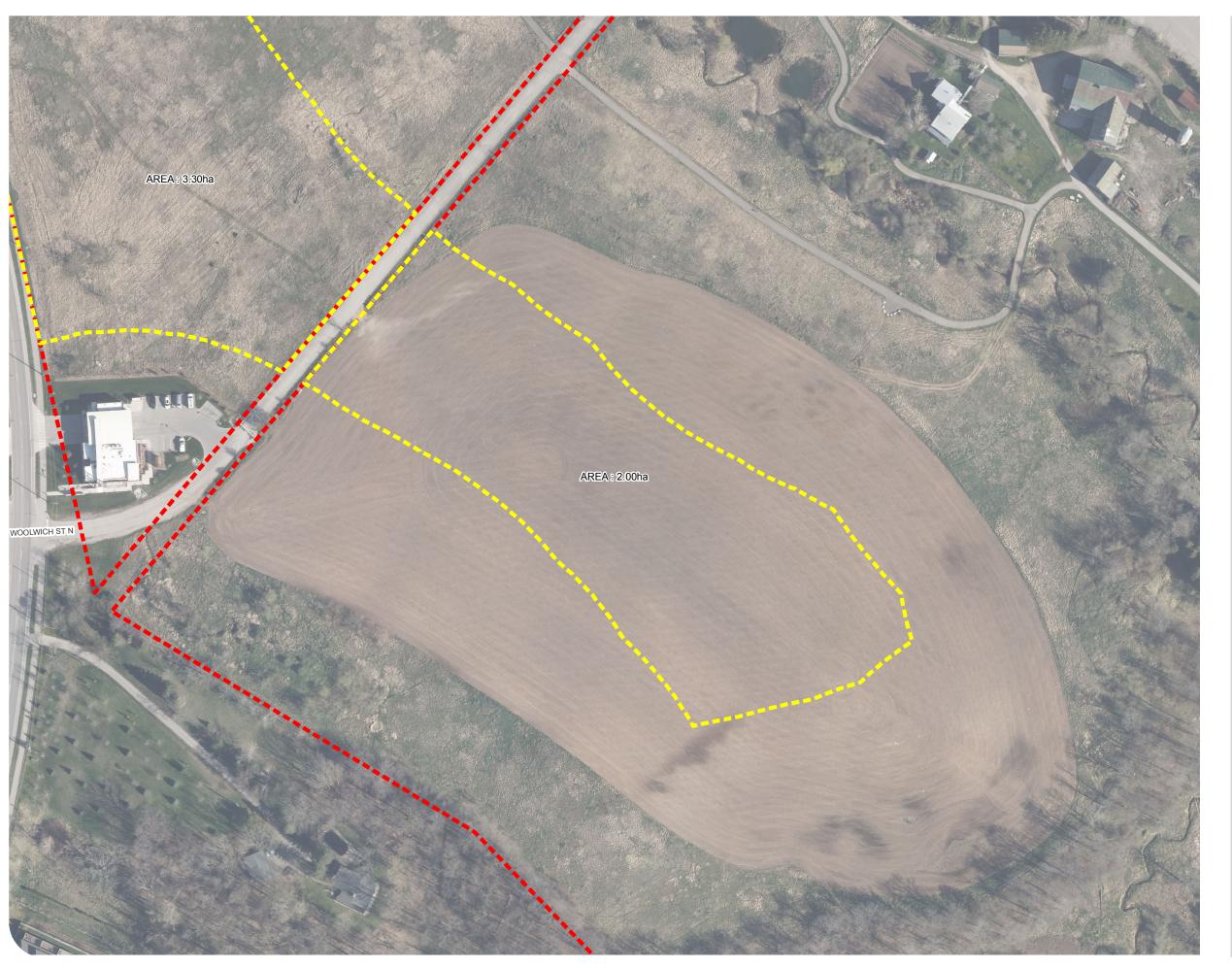
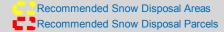




FIGURE: 3
RECOMMENDED SNOW DISPOSAL LOCATIONS



NOTES: STREET - WOOLWICH STREET N

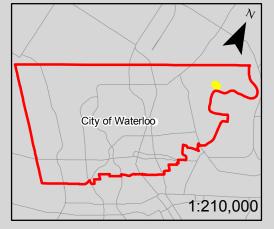






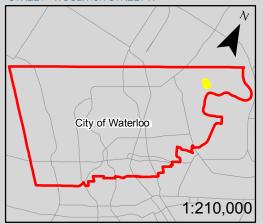




FIGURE: 4
RECOMMENDED SNOW DISPOSAL LOCATIONS







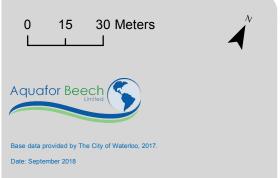


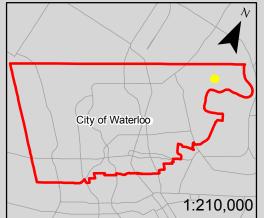


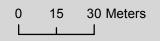


FIGURE: 5
RECOMMENDED SNOW DISPOSAL LOCATIONS



NOTES: STREET - WOOLWICH STREET N







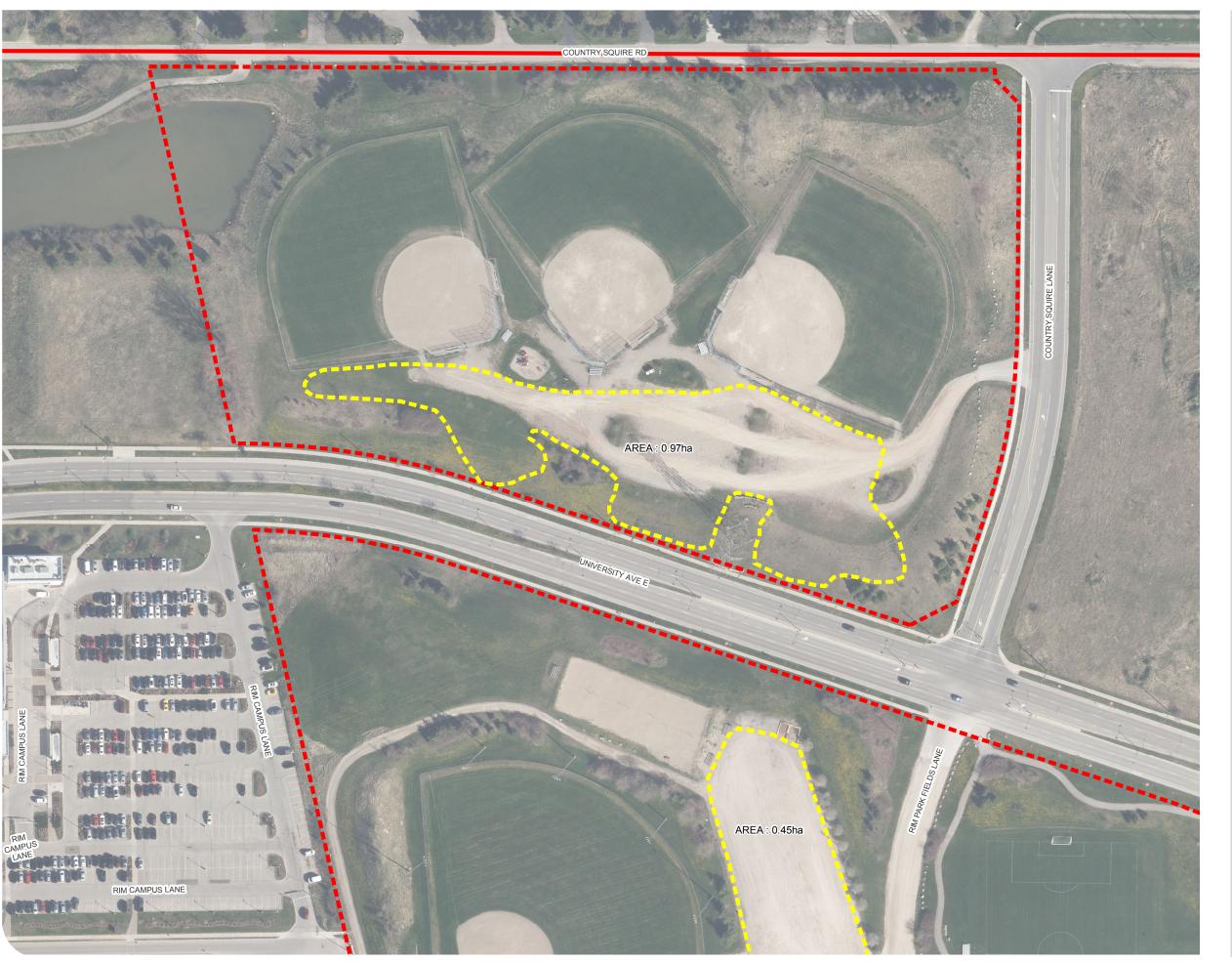
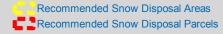
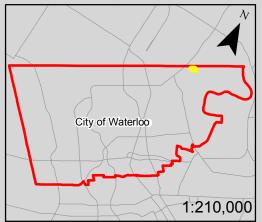


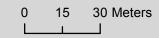


FIGURE: 6
RECOMMENDED SNOW DISPOSAL LOCATIONS



NOTES: STREET - COUNTRY SQUIRE ROAD











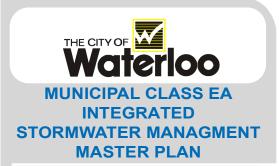


FIGURE: 7
RECOMMENDED SNOW DISPOSAL LOCATIONS





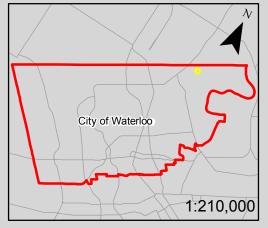




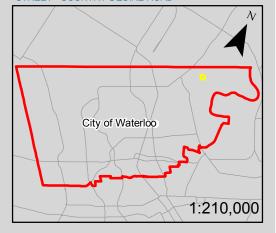




FIGURE: 8
RECOMMENDED SNOW DISPOSAL LOCATIONS



NOTES: STREET - COUNTRY SQUIRE ROAD



0 15 30 Meters



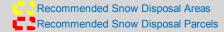
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FIGURE: 9
RECOMMENDED SNOW DISPOSAL LOCATIONS



NOTES: STREET - PARKVIEW CEMETERY LANE

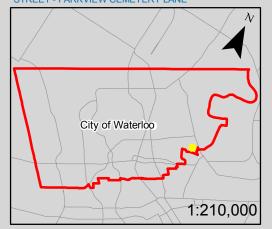








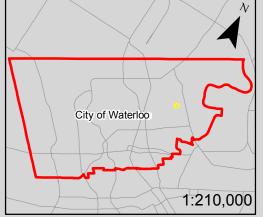




FIGURE: 10
RECOMMENDED SNOW DISPOSAL LOCATIONS



NOTES: STREET - LEXINGTON ROAD







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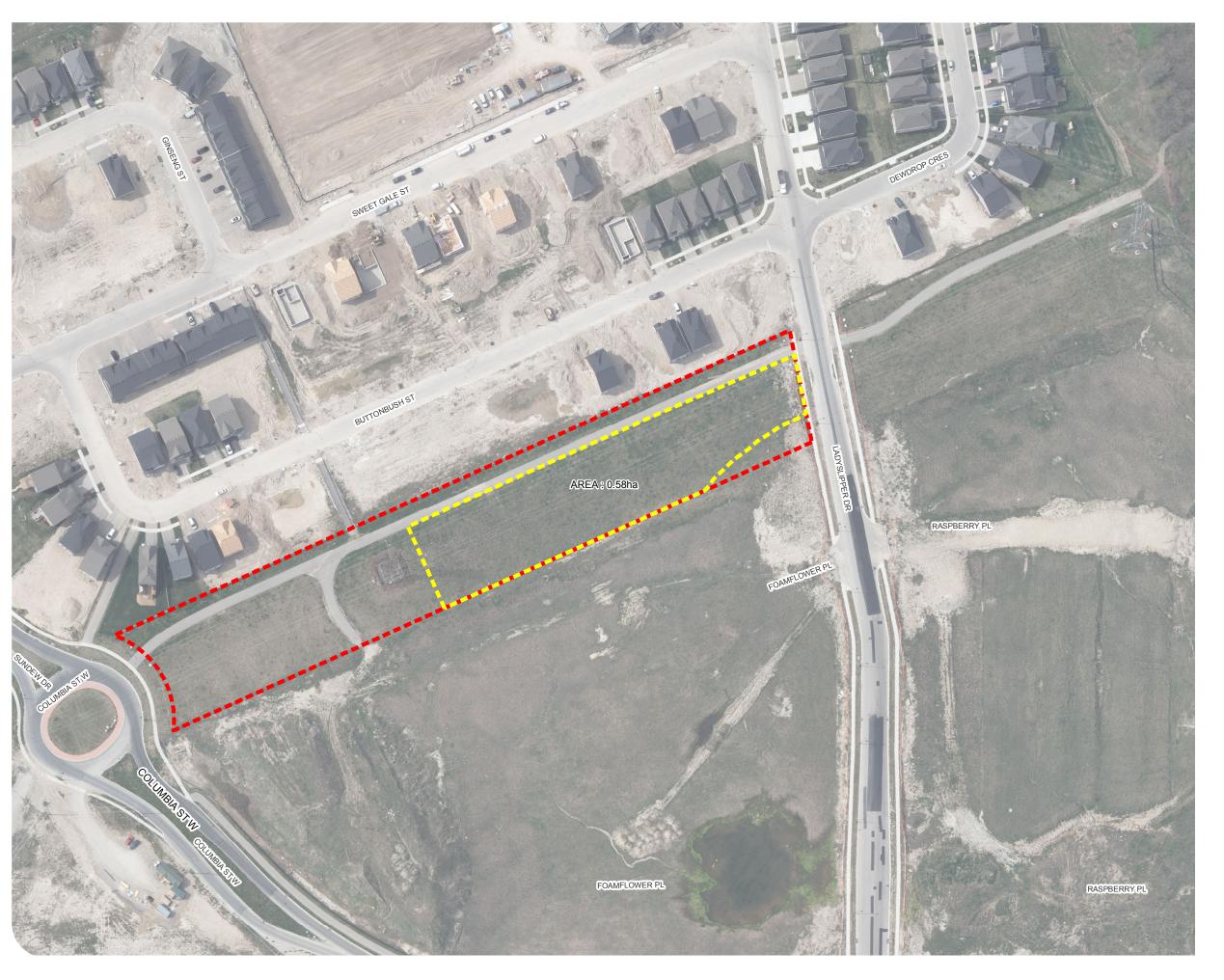




FIGURE: 11
RECOMMENDED SNOW DISPOSAL LOCATIONS



NOTES: STREET - LADYSLIPPER DRIVE

