

TECHNICAL MEMORANDUM TM4

DATE	May 31, 2018
TO	Shivan Narine, York Region
SUBJECT	Stouffville Water System Upgrades Class EA Inventory of the Environment
FROM	Kevin Brown, P. Eng
PROJECT NUMBER	17100

1 Introduction

This technical memorandum will summarize the findings of various reports concerning the inventory of the environment. The study area is located in the Regional Municipality of York, and is approximately bordered on the north side by Vandorf Sideroad, on the east side by York-Durham Line, on the south side by 19th Avenue and on the west side by McCowan Road, in the Town of Whitchurch-Stouffville.

The four Environmental Inventory memos were prepared by Golder Associates:

- Archaeological Screening;
- Cultural Heritage Screening;
- Natural Environment Screening; and
- Geotechnical Screening

Each of these is summarised below, and each of the individual Golder Technical Memoranda have been provided to the Region.

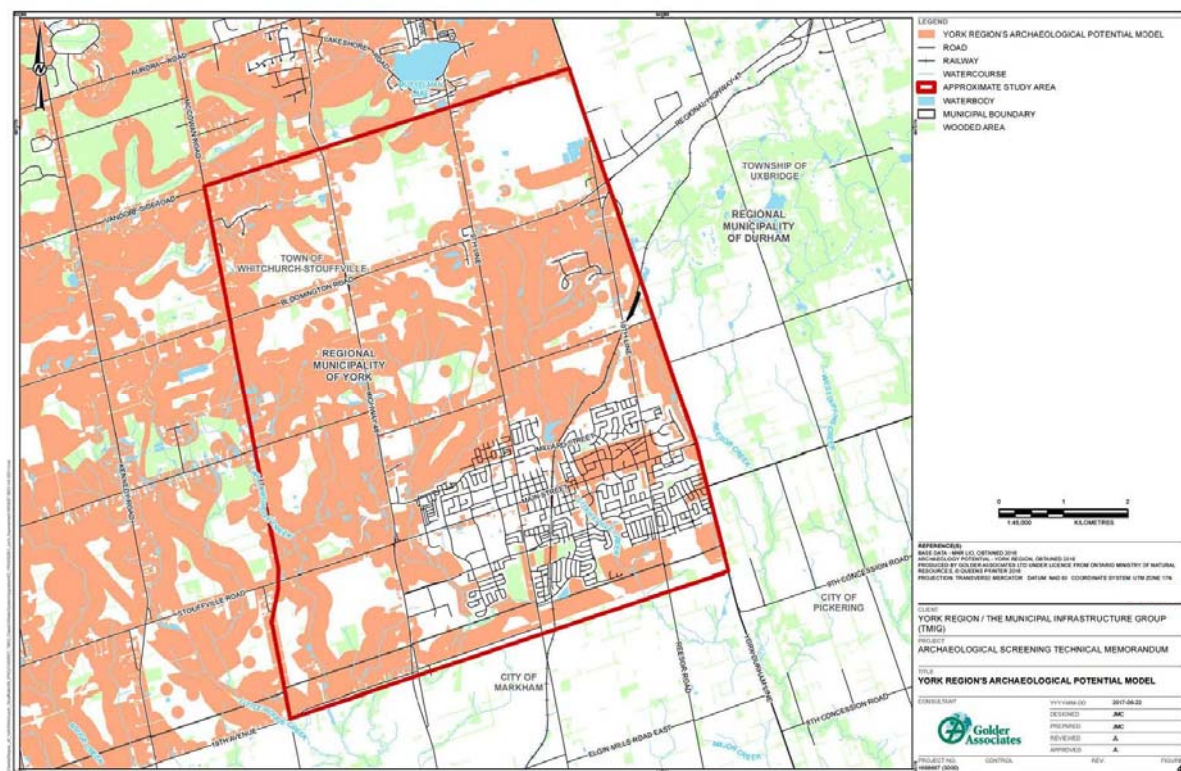
2 Archaeological Screening

Consultation with the Ontario Archaeological Sites Database (OASD) confirmed the presence of 38 archaeological sites located within the study area: 11 pre-contact Aboriginal sites, 23 historical Euro-Canadian sites, and four sites of unknown cultural affiliation. Various factors would have contributed to the appeal of this area during pre-contact Aboriginal and historical times, including access to multiple water sources, soils conducive to pre-contact Aboriginal agricultural practices, and areas of early Euro-Canadian settlement along the 19th century road grid.

A review of the York Region's Archaeological Potential Model (updated 2015) indicates much of the study area has been identified as exhibiting archaeological potential for the identification of pre-contact Aboriginal and historical Euro-Canadian archaeological resources.

There is a known Wendat (Huron) ancestral village within the southeast part of the community of Stouffville, and much of the area outside of the current settlement area has been identified as having Archaeological Potential (see Figure 1). Much of the land is identified as such due to the proximity of various streams and rivers. Once a conceptual or preliminary design for the Stouffville Water Supply Upgrades is in place, a subsequent Stage 1 Archaeological Assessment may need to be undertaken on individual properties to confirm whether the sites would be suitable for new Regional Water supply or storage facilities.

FIGURE 1 MAP OF ARCHAEOLOGICAL POTENTIAL



3 Cultural Heritage Screening

The results of the desktop survey for cultural heritage resources in the Study area are described below.

Federal, provincial, and municipal heritage registries, inventories and databases were reviewed to identify known cultural heritage resources in the Study area.

Golder Associates also contacted Kennedy Self, Manager of Planning with Development Services at the Town of Whitchurch-Stouffville by phone on July 7, 2017, about the cultural heritage constraints in the Study Area, to identify further sources of information on cultural heritage in the municipality, and confirm that the data in the online municipal inventory was current and valid.

Based on the information compiled above, the MTCS Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes (2015) checklist was completed for the Study Area.

The Study Area contains the following known cultural heritage resources.

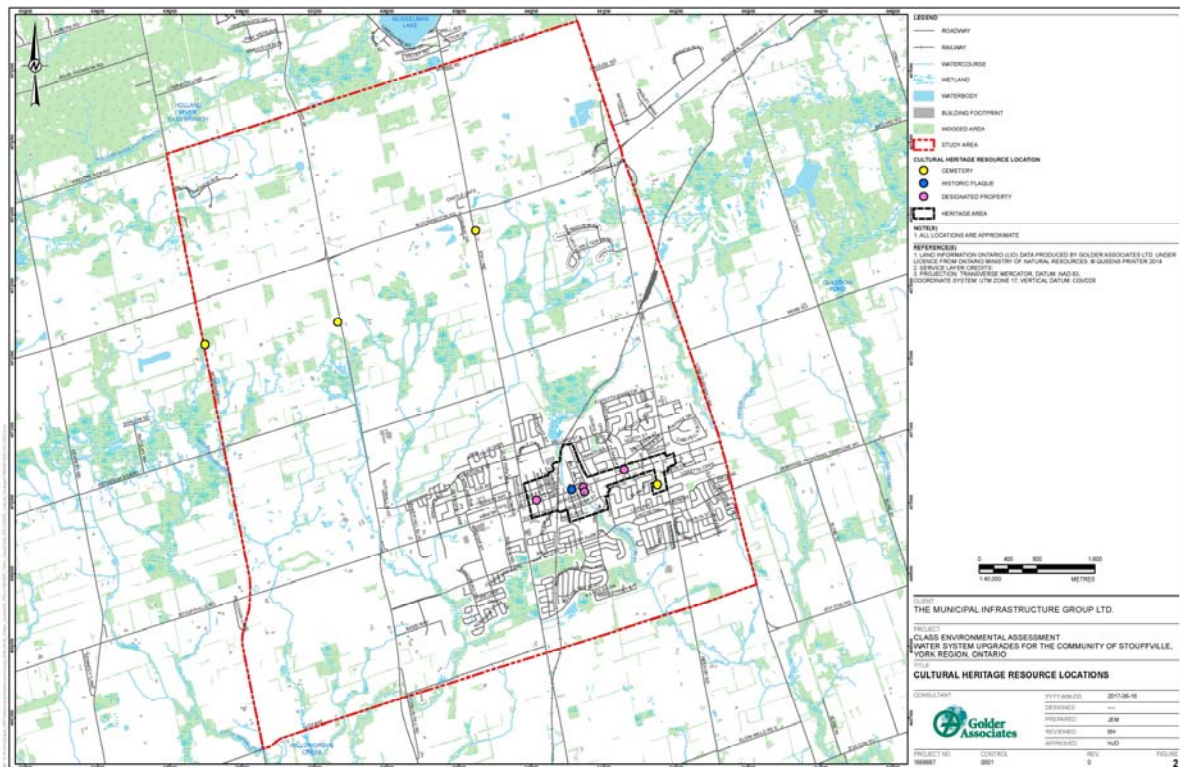
- Four protected heritage properties designated under Part IV of the Ontario Heritage Act:
 - i. 19 North Civic Avenue, Stouffville (Clock Tower);
 - ii. 19 South Civic Avenue, Stouffville (now the Lebovic Centre for Arts & Entertainment since 2009);
 - iii. 6060 Main Street, Stouffville (Residence); and,
 - iv. 6528 Main Street, Stouffville (Memorial Christian Church)
- One 'Heritage Area':
 - i. The Town of Whitchurch-Stouffville Official Plan and Community of Stouffville Secondary Plan have designated a Heritage Area in downtown Stouffville; however, this is not designated as a Heritage Conservation District under Part V of the Ontario Heritage Act.

- The Manager of Planning with Development Services identified the Heritage Area as the most significant concentration of known and potential heritage resources in the community, and the most important heritage constraint.
- The four protected heritage properties included above as well as many of the 360 properties listed on the Town's Built Heritage Inventory are located in the Heritage Area.
- Four cemeteries:
 - i. Baker Hill Baptist Church Cemetery, 13448 Highway 48;
 - ii. Bloomington Methodist Cemetery, 13659 Ninth Line;
 - iii. Lemonville United Church Cemetery, 4871 Bloomington Road; and,
 - iv. Stouffville Cemetery, 12118 Tenth Line
- One heritage plaque:
 - i. The plaque commemorating the Founding of Stouffville is located on the north side of Main Street in front of Latcham Gallery (6240 Main Street);

Given the number of known resources and high probability of additional potential cultural heritage resources in the Study Area, Golder recommends the following for future planning for the Whitchurch-Stouffville Water System Upgrades.

- **Avoid the Stouffville Heritage Area and known cemeteries in the Study Area.**
If avoidance of this area or cemeteries is not feasible, Golder recommends **conducting site-specific Heritage Impact Assessments** prior to any development proposed for, or adjacent to, properties in the Stouffville Heritage Area or the cemeteries identified in this technical memorandum.
- For all other areas, Golder recommends **Conducting a Cultural Heritage Assessment Report** once the preferred water system upgrade locations are selected.

FIGURE 2 MAP OF CULTURAL HERITAGE RESOURCE LOCATIONS



4 Natural Environment Screening

The northern part of the study area (north of Bloomington Road) lies within the LSRCA watershed and the southern part (south of Bloomington Road), lies within the TRCA watershed. The study area is crossed by numerous creek tributaries and contains many lakes and ponds. The dominant land-uses within the Study Area are agriculture and the Town of Stouffville, with isolated areas of natural cover including rural woodlots, hedgerows, wooded valleys, and remnant natural cover associated with wetlands.

Based on a review of background materials and aerial imagery to determine potential habitat suitability, there are endangered and threatened species with potential to be present in the Study Area.

Through background review, the potential wetlands were identified and there are three Provincially-Significant Wetlands) PSWs, one Non PSW and numerous other small unevaluated wetlands are present.

Based on a review of background materials, the Study Area contains a large number of surface water features that are confirmed, or have high potential to be considered fish habitat.

The study area contains a variety of Significant Woodlands, Significant Valleylands, and Areas of Natural or Scientific Interest (ANSI), as well as potential to support Significant Wildlife Habitat.

The majority of the Study Area lies within the Oak Ridges Moraine Area of the Greenbelt Plan Area, except for the southwest corner. This southwest corner is mapped as Natural Heritage System under the Protected Countryside designation along the major watercourse features (branches of Willowgrove Creek). The balance of the southwest corner of the Study Area, outside of the noted watercourse features, lies outside of the Greenbelt Plan Area.

The Greenbelt Planning area is a special planning area regulated by the provincial government. Assuming measures are taken to mitigate negative impacts to the existing landscape, infrastructure projects are allowed within the *Protected* Countryside land.

Under York Region's Official Plan, portions of the study area are designated Linkage Areas of the Regional Greenlands System, which incorporates the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan.

Given the number of known and potential natural heritage features in the Study Area, Golder recommends that future planning for the Whitchurch-Stouffville Water System Upgrades consider alternative that avoid the natural heritage features confirmed in this report to be present in the Study Area.

Once potential route alternatives are known, additional natural heritage screening to identify potential features occurring within the refined footprint should be identified along each proposed alternative alignment and where the Natural Heritage features cannot be avoided by the preferred alternative, additional study will be required to conform to the policies of the Greenbelt Plan, as well as the ORMCP and Town of Whitchurch-Stouffville OP to ensure conformity with Section 41 of the ORMCP to the satisfaction of the Town.

FIGURE 3 MAP OF GREENBELT PLAN AREA

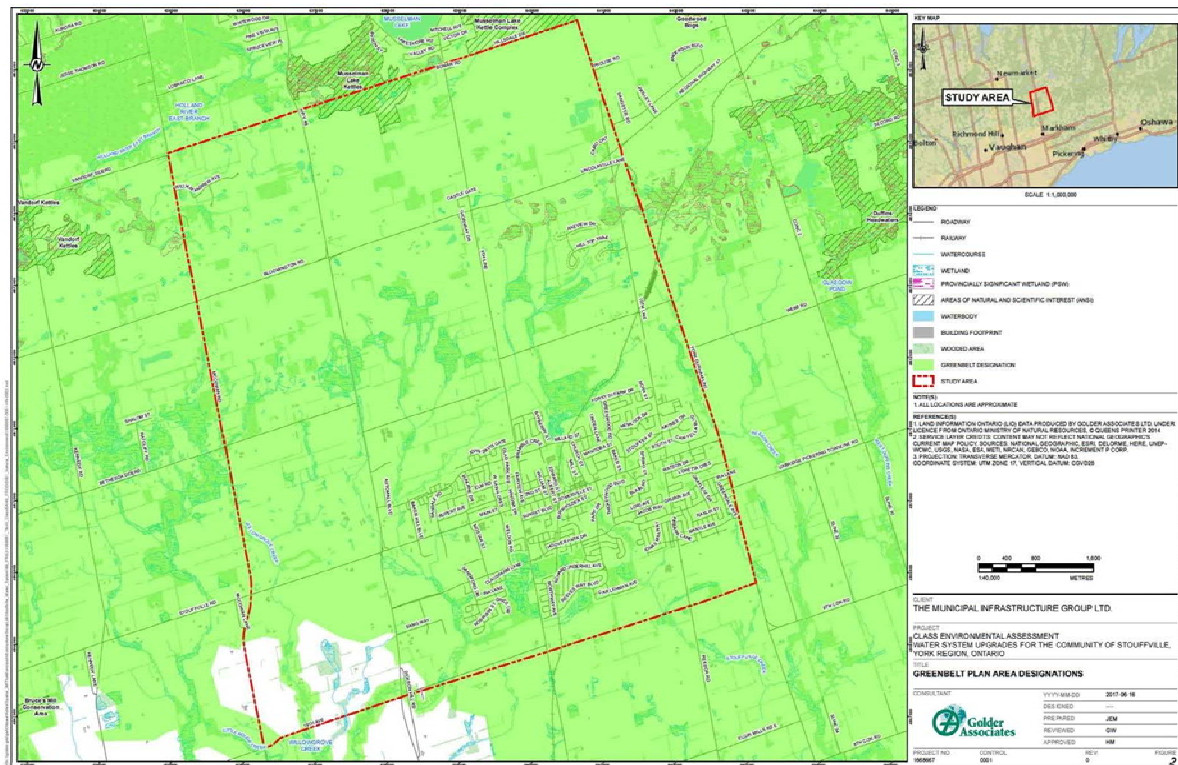
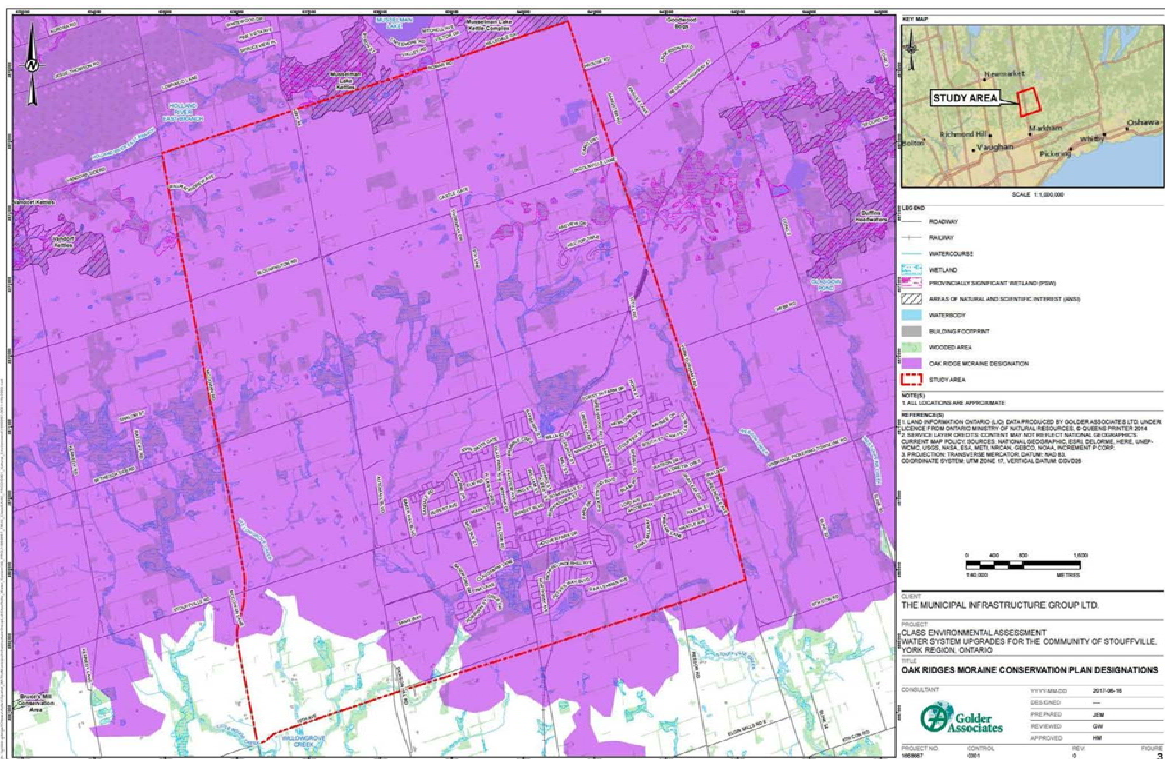


FIGURE 4 MAP OF OAK RIDGES MORaine CONSERVATION PLAN AREAS



5 Geotechnical Screening

Golder Associates undertook a desktop Geotechnical study of the study area to provide general information about the subsurface conditions.

The study area is located within the Oak Ridges Moraine Conservation Area and consists of mixed use - agricultural areas, mining pits, protected areas and residential areas.

Based on surficial geology mapping, the study area is generally composed of non-cohesive and frequently granular deposits. The northern portion of the study area mostly consists of deposits of fine textured glaciolacustrine silt and clay with organic deposits; however, ice-contact stratified deposits of sand and gravel and older alluvial deposits are also mapped. In the south-western portion of the site, the subsurface conditions consist of interbedded flow till with rainout deposits and silt and clay. Foreshore-basinal deposits are found in the south-western portion of the site, and organic deposits are found throughout.

Golder Associates have carried out multiple geotechnical investigations in the study area. The investigations resulted in confirmation of the surficial geology mapping. In the northern portion of the site which falls within the Oak Ridges Moraine, sand and gravel and non-cohesive deposits were found and groundwater levels measured in monitoring wells installed were generally at depths of some 28 m below ground surface and lower. In the southern portion of the site, which falls within the South Slope, silt, fine sand, clay and till are most commonly found and groundwater level measured in monitoring wells and standpipes are shallow or near ground surface, with artesian conditions (above ground surface) locally encountered.

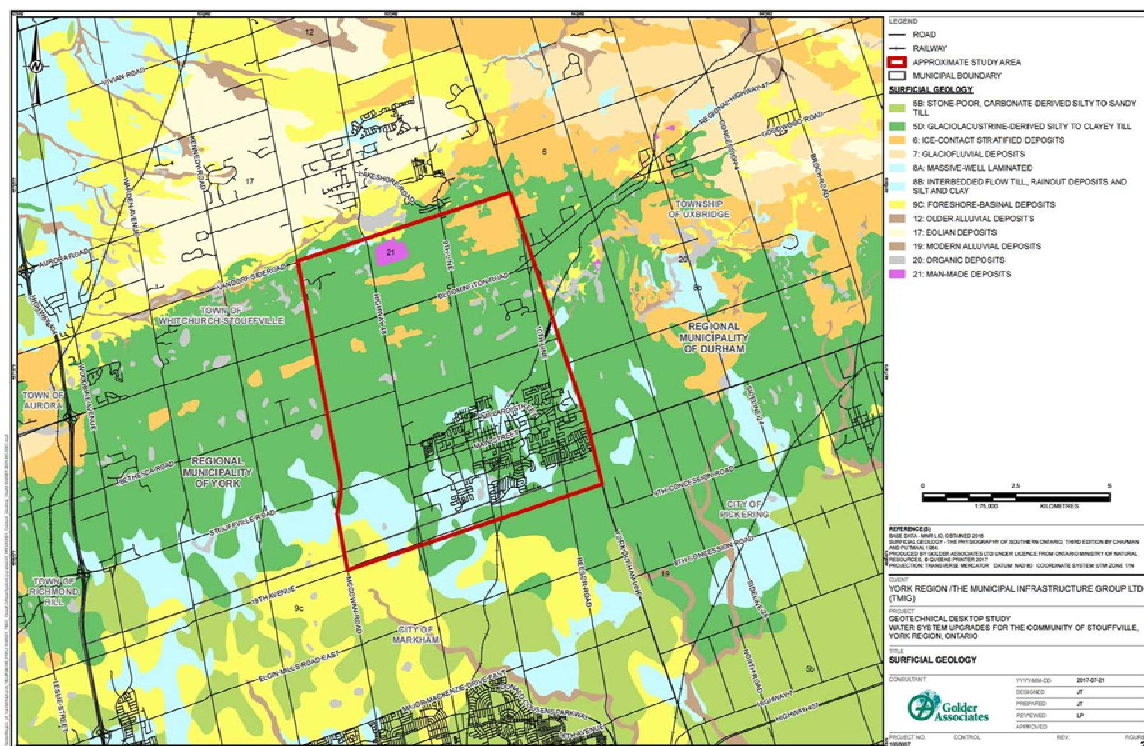
The bedrock surface elevation varies from elevations of 140m and 170m. The bedrock consists of shale, limestone, dolostone and siltstone of the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member and Eastview Member.

Glacially derived till soils may impact excavations and may require cobble/boulder removal. The excavation rate may be impacted when excavating the very dense till material.

Conventional bedding for underground utility installation are generally anticipated; however, bedding thickness may be required to maintain basal stability of trenches during construction.

In the southern portions of the study area, groundwater is typically found at shallow depths below the ground surface, but locally will be measured in standpipes to be above the ground surface (artesian). Site specific geotechnical investigations should address the concerns.

FIGURE 5 MAP OF SURFICIAL GEOLOGY



6 Conclusions

Based on the results of the Desktop environmental studies, we can draw the following conclusions with respect to the evaluation of the alternative solutions and the potential for more detailed field investigations:

- From a **Geotechnical** perspective, the conditions across the Study Area are reasonably homogeneous. Overall, the surficial geology is glacially-derived, and there will be potential for boulders to be encountered during the construction of any new facilities. That potential is expected to be reasonably consistent throughout the Study Area, so there is no basis to exclude any areas from future consideration based on the geology.
- From a **Cultural Heritage** perspective, the significant sites are generally located in the established community core, which would not normally represent a suitable location for new water supply or storage facilities.
- The primary site constraints – from the Class EA perspective – then, are the **Archaeological Potential** and the **Natural Environment**.
- Virtually all of the Study Area is located within Greenbelt and Oak Ridges Moraine areas, both of which can be deemed suitable for new facilities, subject to meeting the specific criteria of the legislation.
- Comparing the **Archaeological** and **Natural Environment** maps indicate that there is significant land area which is not constrained by either archaeological potential nor significant natural features. These areas are predominantly located north of Bloomington Road, but there are isolated sites throughout the area which would likely accommodate new water storage or supply facilities. These isolated areas represent a variety of ground elevations, which will allow a variety of types of storage (elevated tanks, standpipes, at-grade reservoirs) to be considered.

As the evaluation of alternatives progresses and specific land requirements are identified, additional field investigations may be warranted.