

Appendix C

- Natural Environment Investigations

Summary of Ecological Field Investigations

Field Investigation Methods

Ecological field investigations were undertaken along the alternative watermain routes within the study area. Investigations took place on October 9th, 30th and 31st, 2008 and consisted of aquatic habitat assessments at all potential watermain watercourse crossings as well as a brief assessment of some of the terrestrial features such as woodlands, wetlands, hedgerows, individual trees and riparian vegetation within a 20-30 m proximity to the watermain routes. The following describes the existing ecological field conditions along the feedermain routes.

Terrestrial - To assess the existing terrestrial environment within the study area, the following work was undertaken: 1) existing data was collected and reviewed, including ESA reports, completed documentation, aerial photography, topographic maps, GIS database information and Official Plan documents; 2) site investigations noting vegetation within proximity to the alternative alignments, potential impacts from the proposed works and vegetation surveys noting dominant specie types along the alternative routes, as well as a description of existing riparian vegetation along various watercourse crossings.

Aquatic Habitat and Fisheries - Existing aquatic features within the study area were assessed by reviewing existing data and conducting site investigations on October 30th and 31st, 2008. Aquatic habitat assessments were made at all watercourse crossings. Data collected during the field investigations included general physical habitat, watercourse status (i.e., permanence), observed fish and preferred crossing method. Watercourse crossing site reference numbers from **Figure 7, Natural Environment Features**, were used as reference points for this aquatic assessment.

Findings

The natural environmental findings are described in **Section 2.6** of this report.

Route 1: Tomken Road

Along Tomken Road, vegetation has been influenced by development and is therefore dominated by roadside planted trees. However, there is a small agricultural field southwest of Tomken Road, surrounded by two small vegetation patches (future development is planned on this site, pers. comm.). Within these areas are several trees such as white pine (*Pinus strobus*), red pine, silver maple, Norway spruce and tamarack (*Larix laricina*) (see **Table 1** below for details). Also noted within this area is evidence of current clearing activities such as brush piles and cut trees.

There are 2 watercourse crossings (i.e., 1A and 1C) along Route 1. Site 1A is a intermittent, stone-lined stormwater ditch (dry at the time of the field investigations) to the east of Tomken Road and a subterranean sewer on the west side of Tomken Road. There is likely no seasonal habitat at this site. Site 1C is a subterranean sewer that discharges to the east which forms the beginning of Little Etobicoke Creek. There are no surface aquatic features southwest of the culvert discharge where Little Etobicoke Creek starts.

Terrestrial features along Eastgate Parkway consist of patches of red pine, sumac, lilac (*Syringa vulgaris*) and maples. This area has been identified as a Habitat Implementation Area by TRCA; however, due to concurrent projects within the area (i.e., the Mississauga BRT), this has been put on hold. TRCA has also identified several species of conservation concern for this area, including: eastern kingbird, eastern meadow lark, northern mockingbird, chimney crayfish, willow flycatcher, gray catbird, and field sparrow.

Located at the corner of Cawthra Road and Eastgate Parkway is a woodland patch (approximately 500 m from Eastgate Parkway) identified by TRCA, containing 4 ELC units: 1) *FOD 7-2: Fresh-Moist Ash Lowland Deciduous Forest Type*; 2) *FOD7:*

Fresh-Moist Lowland Deciduous Forest Ecosite; 3) *FOD5-8: Dry-Fresh Sugar Maple- White Ash Deciduous Forest Type*; and 4) *MAS2-1: Cattail Mineral Shallow Marsh Type*. Directly adjacent to Eastgate Parkway is a large cultural meadow patch containing two wetland components, one dominated by purple loosestrife and the other by cattail.

Route 1a: Tomken Road (Eglinton Avenue East Option)

The majority of this route is similar to Route 1: Tomken Road. However, immediately east of the Highway 403/Eglinton Avenue East interchange (approximately 500 metres from Eastgate Parkway), there is a Mississauga Natural Area of significance. This woodland contains four ELC units, including a TRCA wetland feature approximately 1 ha in size: 1) *FOD 7-2: Fresh-Moist Ash Lowland Deciduous Forest Type*; 2) *FOD7: Fresh-Moist Lowland Deciduous Forest Ecosite*; 3) *FOD5-8: Dry-Fresh Sugar Maple-White Ash Deciduous Forest Type*; and 4) *MAS2-1: Cattail Mineral Shallow Marsh Type*. Directly adjacent to Eastgate Parkway is a large cultural meadow patch containing two wetland components, one dominated by purple loosestrife and the other by cattail.

There is 1 watercourse crossing (i.e., 1B) along Route 1a. It is part of the same system as crossing 1A on Tomken Road.

Route 1b: Tomken Road (Matheson Boulevard East Option)

In the north end of the study area, the majority of this route is similar to Route 1: Tomken Road. There are no watercourse crossings or features of significant along Matheson Boulevard East. However, the remainder of this route follows either Route 2 or Route 3 south of Matheson Boulevard East, where there are significant terrestrial features and watercourse crossings (see below).

Route 2: Parkway Belt West Corridor

Terrestrial features the Parkway Belt West Corridor consist mainly of culturally influenced vegetation. However, this route crosses the park's paved trails and parking lots before entering the corridor. Vegetation within the corridor consists of teasel (*Dipsacus sylvestris*), goldenrods, asters (*Aster sp*), common burdock (*Arctium minus*), bull thistle (*Cirsium vulgare*) and many grasses. The route also runs south of an unevaluated vegetation patch which consists of oak, trembling aspen (*Populus tremuloides*), white ash (*Fraxinus Americana*), and buckthorn (*Rhamnus cathartica*) as well as a small wetland component to the east containing cattail (*Typha latifolia*) and common reed grass (*Phragmites australis*).

Three watercourse crossings occur along this route at Sites 2A, 2B and 2C. Site 2A is a surface water conveyance ditch (dry at the time of the survey) and provides no fish habitat. Water from this feature is conveyed to a storm water dry pond and eventually to Little Etobicoke Creek. Only Site 2B acts as a constraint as it is a fairly major storm drain system and provides, at the least, indirect fish habitat. A substantial stormwater conveyance channel (with a bankfull width and bankfull depth of approximately 5.5 m and 1.5 m respectfully) occurs at Site 2B. This channel is formed at the discharge of an approximately 1800-mm diameter concrete round culvert into a large plunge/scour pool approximately 10 m upstream of the crossing site. This section of watercourse contains fish habitat until it flows into a storm sewer at Highway 403, but it is unknown if fish occur in this section. Site 2C is an area of marsh with no defined channel and no fish habitat.

Route 3: Kennedy Road

Kennedy Road bisects Britannia Woods just south of Matheson Boulevard East. Britannia Woods is classified in the Mississauga NAS (2007) as an ESA and designated as a Mississauga Natural Area (HO9, see Appendix B). Two TRCA-identified species of conservation concern (one provincially and nationally designated) have also been recorded within Britannia Woods. The route

also crosses one Mississauga Linkage Area immediately north of Highway 403 and south of Eglinton Avenue East (location of the future Mississauga Bus Rapid Transitway).

There are three watercourse crossings located along Route 3 (Sites 3A, 3B and 2C). As mentioned above, Site 2C is an area of marsh with no defined channel and no fish habitat. Both crossings 3A and 3B, respectively located at Rathburn Road East and south of Eglinton Avenue East, are actually part of a significant underground stormwater conveyance system which discharges to Cooksville Creek south of Rathburn Road East. Tunnel crossing is recommended here due to the significance of the existing infrastructure.

Table 1 below provides more detail (where collected) concerning the terrestrial vegetation along sections of the alternative routes. **Table 2** below provides more detail concerning the aquatic conditions.

Table 1: Detailed Terrestrial Conditions

Alignment	Field Observations			
	Species	DBH	Height	Health
Route 1: Tomken Road	2 white pine	~30cm	~12m	good
	Norway spruce	~30cm	~15m	good
	white pine	~19cm	~10m	good
	silver maple	~60cm	~10m	~fair ~25% dead
	white oak, 2 trunks	~24-34cm	~10m	good
	white pine	~31cm	~15m	good
	Tamarack	~22cm	~15m	good
	white ash	~31cm	~15m	good
	Norway spruce	~10m	~33cm	good
	tamarack	~19cm	~13m	poor
	white birch, 3 trunks	~13-14cm	~15m	good
	fruit tree, 3 trunks	~10-17cm	~10m	good
	hawthorn		~15m	good
	Scott's pine	~13-15cm	~15m	good
	ironwood	~16cm	~15m	good
	sugar maple	~11.5cm	~10m	good
	hawthorn		~5-10m	good
	elm	10cm	~12m	good

Table 2. Natural Aquatic Environment Conditions

Site	Average Wetted Width (m)/ Average Water Depth (m)	Riffle/Pool Definition (poor, moderate, good, excellent)	Substrate Description	Woody Debris Availability (poor, moderate, good, excellent)	Average In-Stream Cover – all types (%)	Average Terrestrial Canopy Cover (%)	Potential Fish Habitat
1A/1B Little Etobicoke Creek tributary	0	n/a	Debris, terrestrial herbaceous plants (n/a)	n/a	n/a	n/a	No fish habitat (possible intermittent degraded habitat or indirect habitat when wetted)
1C Little Etobicoke Creek headwater drainage	Drainage in sewers that eventually discharges on SE side of Britannia Road forming the beginning of Little Etobicoke Creek	n/a	n/a	n/a	n/a	n/a	Habitat or indirect fish habitat at and downstream of discharge
2A Unnamed Little Etobicoke Creek tributary	n/a	n/a	n/a	n/a	n/a	n/a	Dry surface water conveyance ditch – no fish habitat or intermittent indirect fish habitat
2B Unnamed Little Etobicoke Creek tributary	3.0/0.15	Poor/moderate	Bedrock, boulders, cobbles, gravels, sand, algae	poor	15	10	Potential fish habitat but fish presence or use unknown (stormwater drain) or indirect habitat
2C Little Etobicoke Creek headwater drainage	Cattail marsh	n/a	n/a	n/a	n/a	n/a	No fish habitat
3A/3B Unnamed Cooksville Creek tributary	n/a	n/a	n/a	n/a	n/a	n/a	Habitat or indirect fish habitat at and downstream of discharge (tunnel due to existing infrastructure)

Impact Assessment

There are two key stages in installation of the MCC Watermain during which potential environmental effects may occur: 1) construction stage and 2) post-construction stage. The majority of short-term impacts will be related to the construction stage of the watermain installation. Generally, these will be temporary in nature and are preventable through proper construction practices and site inspection (see **Section 8** of this report). Long-term impacts are considered as those related to the general roads maintenance.

Existing Impacts

It is recognized that within Southern Ontario there are few, if any, natural areas that have not been disturbed by some human activity in the past. Therefore, in order to assess the potential impacts of a proposed development, it is necessary to consider the historical and the existing impacts that are present within the site prior to the initiation of development-related work. Historical/existing impacts should be documented in order to determine, following land development, whether impacts are a result of the development or a result of previous activities or events on the site. Some historical/existing impacts provide an opportunity for the implementation of restoration initiatives as part of the environmental management for the proposed development.

The following existing impacts have been noted for areas within the study area lands:

- Loss and fragmentation of vegetation/wildlife habitat through past agricultural uses and urban sprawl;
- Sedimentation via overland flow from surrounding agricultural communities; and
- Manipulation of watercourses by straightening, artificial bank armouring, great variation in flow rates, confinement to sewers and loss of riparian vegetation causing bank erosion.

Potential Short-term Construction-Related Impacts

The potential short-term environmental effects associated with the proposed installation of the MCC Watermain relate primarily to construction activities. Potential construction-related impacts that are of particular relevance to the development include:

1. **Soil disturbance/sedimentation to watercourses and woodlands (i.e., Britannia Woods ESA)** - The grading and disturbance of soils within the site introduce the potential for erosion and deposition of soils and silt within the wetland and aquatic communities, especially during rain events during which storm water flow in intermittent watercourses may materialize.
2. **Disturbance of street trees** – Through the installation of the MCC Watermain, various street trees will be affected and will have to be removed or pruned due to their proximity to the existing road. Since there is a large number of planted trees for each route, this impact will be difficult to avoid.

Potential Long-Term Environmental Impacts

After construction, potential long-term environmental effects associated with the proposed installation of the MCC Watermain relate to the future maintenance of the watermain potentially disturbing nearby watercourses, woodlands and/or street trees. If maintenance is required, a monitoring plan (including sediment control and restoration measures) for potentially affected natural features is recommended.

Recommendations

The following provides recommendations for future work along the preferred feedermain route.

Recommendation 1 – Protection of Britannia Woods should be maintained as this feature is the most significant within the study area.

Recommendation 2 – Provision of a Tree Preservation/Replacement plan for individual trees along the preferred route. Trees will be affected by the watermain installation. During detailed design, information on individual trees should be confirmed and individuals surveyed. Those trees lost should be replaced at a minimum 1:1 ratio. This should be completed in consultation with the City of Mississauga's forester.

Recommendation 3 – Provision of Sediment Control Measures for all watercourses and water conveyance systems to ensure sedimentation does not occur. Heavy duty fencing (OPSD 219.130) should be installed for works in the vicinity of watercourses, sediment fencing following (OPSD 219.190) should be installed for the remainder of the study area.

Recommendation 4 – Provision of Restoration Measures of any Disturbed Habitat for all wetland and woodland communities. Restoration measures should involve replacement of wetland/woodland communities at a 1:1 ratio within proximity to the area of disturbance. At the detailed design stage, appropriate areas should be delineated with an appropriate planting plan in consultation with TRCA and/or CVC. If wetland communities are disturbed along the preferred alignment, authorization from the appropriate conservation authority is required according to the *Conservation Authorities Act*.

Recommendation 5 – Watercourse Crossing Methods are recommended in **Table 3** below.

Table 3: Suggested Watercourse Crossing Methods

Site	Watercourse Crossing Method	Site	Watercourse Crossing Method
1A Little Etobicoke Creek tributary	Open cut in dry	2B Unnamed Little Etobicoke Creek tributary	Tunnel (potential for high flashy flows)
1B Little Etobicoke Creek tributary	Open cut in dry	2C Little Etobicoke Creek headwater drainage	Open cut with agency consultation required (wetland)
1C Little Etobicoke Creek headwater drainage	Open cut	3A Unnamed Cooksville Creek tributary	Tunnel (due to existing infrastructure)
2A Unnamed Little Etobicoke Creek tributary	Open cut in dry	3B Unnamed Cooksville Creek tributary	Tunnel (due to existing infrastructure)