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Re: Permit Application, Application for a Development, Interference with Wetlands and Alterations to Shorelines and Watercourses – Ontario Regulation 150/06, Phase 2A - York Trunk Sewer & Paisley Clythe Feedermain, City of Guelph

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MMM Group Limited (MMM) has been retained by the City of Guelph to complete the Preliminary and Detail Design of Phase 2 of the York Trunk Sewer and Paisley-Clythe Feedermain in the City of Guelph. Phase 2 of the project has been sub-divided into two sections: Phase 2A and Phase 2B. This letter refers to Phase 2A only which extends from the east side of the Speed River (York Road Park) to Lyon Park, a distance of approximately 1300 m. The study limits are shown on Figure 1: Designated Natural Areas (Appendix A) with further details provided on Figure 2: Vegetation Communities and Proposed Plans (Appendix A), and in the Contract Documents appended.

This letter has been prepared in support of the application for a permit under Ontario Regulation 150/06: Development, Interference with Wetlands and Alterations to Shorelines and Watercourses and documents the natural environmental component of this project. Specifically, this letter includes:

- a description of the natural environmental conditions (updated from the Class Environmental Assessment [Class EA] study (GENVIAR 2009);
- a description of the potential direct and indirect impacts associated with the installation of the proposed watermain and sanitary sewer on the natural features; and,
- detailed mitigation measures recommended to address the potential impacts.

Included within the package are the following:

- One copy of the completed and signed Application Form for a Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation 150/06 permit;
- Three copies of the Construction Drawings, including Erosion and Sediment Control Details
- Permit Application Processing Fee; and,
- Supporting documentation (figures, species lists, SAR screening table, agency communication and Arborist Report).

1.0 APPROACH

1.1 Background Information and Agency Consultation

A variety of background information sources were reviewed and agencies were contacted to update the information database and prepare for field investigations. The primary sources of information are listed below:

- Topographic mapping, Land Information Ontario (LIO), Natural Resources and Values Information System (NRVIS) database, and air photo mosaic;
- Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC) database and direct communication with the MNRF Guelph District office (Marriott pers. comm. Feb. 17, 2015) for significant species and designated natural features within, adjacent to or in the vicinity of the project;
- *York Trunk Sewer and Paisley-Clythe Feedermain Schedule B Class Environmental Assessment Study* (GENIVAR 2009);
- The City of Guelph's Natural Heritage Strategy (Dougan and Associates 2009) and Amendment No 42 to the City of Guelph Official Plan: Natural Heritage System Amendment (OPA 42) (June 2014);
- Consultation with the City of Guelph Environmental Planning, Engineering and Parks Department staff, including a site walk on April 7, 2015*;* and,
- Review of draft 90% Design Contract Drawings.

1.2 Field Surveys

Terrestrial field surveys were focused within the project limits, defined as the area within 50 m on either side of the proposed construction zone and south to the Eramosa River. However, avian species heard south of the Eramosa River were also recorded because birds are likely to move throughout the riparian corridor. Vegetation field surveys were conducted on May 28, 2015 and wildlife surveys were conducted on June 4 and July 2, 2015.

The terrestrial assessment involved:

- Breeding bird surveys conducted according to standard protocols established in the Ontario Breeding Bird Atlas (OBBA, Cadman et.al. 2007). Two survey visits were completed during appropriate timing (early morning during the breeding bird season) and suitable weather conditions (low wind and no precipitation). Breeding bird surveys were conducted by qualified, experienced staff and involved wandering transects through and adjacent to natural features with frequent listening/observation stops at random locations. Species, abundance and level of breeding evidence were recorded for all avifauna observations;

- SAR wildlife habitat assessment for species with potential to occur in the City of Guelph according to MNRF Guelph District guidance and other background review;
- Recording all direct wildlife observations and wildlife sign (including browse, track/trails, animal scat, bird nesting activity, tree cavities, burrows, excavated holes and vocalizations) and identifying potential wildlife usage and habitat functions associated with vegetation communities;
- Classifying and mapping vegetation communities according to the *Ecological Land Classification for Southern Ontario* (Lee et al. 1998), where appropriate;
- Evaluating the sensitivity and significance of vegetation and vegetation communities using the MNRF's NHIC database and SAR websites, and the Significant Plant List for Wellington County (Dougan and Associates 2009) for regional plant status; and,
- Noting general vegetation characteristics including age, general habitat features, drainage conditions and levels of anthropogenic disturbance.

2.0 Existing Conditions

The following sections describe the existing conditions within the project limits based on the background review and 2015 field investigations.

2.1 Designated Natural Areas

Based on information available in the NHIC, NRVIS and LIO databases, consultation with MNRF Guelph District and review of the City of Guelph Official Plan Amendment 42: Natural Heritage System (City of Guelph 2014), the following designated natural areas and significant wildlife habitat occur in the project limits. These areas are delineated on Figure 1, Appendix A.

Provincial Designations

- *Unevaluated Wetlands* – located south of Eramosa River near its confluence with Speed River;
- *Waterfowl Winter Concentration Area* - located at the confluence of the Speed and Eramosa Rivers; portions of this area are within 50 m of the proposed Phase 2A alignment (See Figure 1, Appendix A).

Grand River Conservation Authority Lands

- The project limits are contained within the regulatory floodplain - i.e., regulated under Ontario Regulation 150/06: Development, Interference With Wetlands and Alterations to Shorelines and Watercourses

City of Guelph Designations

- Schedule 10: Natural Heritage System – shows *Significant Natural Area* along the Eramosa River. *Significant Natural Areas* identified in the Natural Heritage System Amendment (OPA 42) may include: Areas of Natural and Scientific Interest (ANSI), Significant Habitat for Provincially Endangered and

Threatened Species, Significant Wetlands, Surface Water Features and Fish Habitat, Significant Woodlands, Significant Valleylands, Significant Landform, Significant Wildlife Habitat (including Ecological Linkages), Restoration Areas, and minimum or established buffers (where applicable) (City of Guelph 2014). OPA 42 Schedules 10A through 10E show additional detail to assist in the interpretation of Schedule 10:

- Schedule 10A: Natural Heritage System: ANSIs and Wetlands – indicates that there are no ANSIs or wetlands within the project limits.
- Schedule 10B: Natural Heritage System: Surface Water and Fish Habitat – indicates that the Eramosa River within the project limits supports 'cool water fish habitat'.
- Schedule 10C: Natural Heritage System: Significant Woodlands – indicates that there are no Significant Woodlands within the project limits.
- Schedule 10D: Natural Heritage System: Significant Valleylands and Significant Landform – indicates that the woodland along the north side of the Eramosa River is mapped as 'Undeveloped Portions of the Regulatory Floodplain' – within the Significant Valleyland designation.
- Schedule 10E: Natural Heritage System: Significant Wildlife Habitat – indicates that the portion of the Speed River at the confluence of the Speed and Eramosa Rivers and westward is mapped as 'Significant Wildlife Habitat'. This corresponds to the *Waterfowl Winter Concentration Area* (City of Guelph 2014).

2.2 Significant Wildlife Habitat

Seasonal Concentration Areas

A noted above, there is a *Waterfowl Winter Concentration Area* identified and delineated by the MNRF along the Speed and Eramosa Rivers in the vicinity of the project (Figure 1, Appendix A). This feature was also noted in the Class EA (GENIVAR 2009) and is mapped on Schedule 10E: Natural Heritage Strategy: Significant Wildlife Habitat (City of Guelph 2014). No other known *Seasonal Concentration Areas* have been identified in the project limits.

Rare Vegetation Communities

No rare vegetation communities (e.g., alvar, prairie, savannah, rare forest types, cliff/talus, rock barrens, sand barrens, or rare ELC communities) are present in the project limits.

Specialized Habitats for Wildlife

The potential for turtle nesting habitat within the projects limits has been identified through correspondence with MNRF; this includes the pedestrian trail, baseball fields and playgrounds, which are adjacent to the Eramosa River. No other specialized habitats for wildlife (e.g. amphibian woodland breeding habitat, amphibian wetland breeding habitat, old growth forest, mast areas, Bald Eagle nesting habitat, seeps and springs, etc.) have been identified within the project limits. Some potential for turtle overwintering and

waterfowl nesting may occur in the unevaluated wetlands (marsh) on the south side of the Eramosa River, beyond the project limits.

Wildlife Movement Corridors

The Speed and Eramosa Rivers and their associated riparian habitats act as natural wildlife movement corridors throughout an otherwise urban context. No other wildlife movement corridors (i.e., deer movement corridors, amphibian movement corridors) have been identified within the project limits.

Habitats of Species of Conservation Concern

There is some potential for SAR wildlife to use habitat within the project limits. Potential habitat for seven species has been identified and is discussed further in Section 2.4.

2.2 Vegetation

The project limits are dominated by manicured parklands with mown grass and planted landscape trees. Natural areas are generally limited to the banks of the Speed and Eramosa Rivers, where riparian and floodplain vegetation is dominated by cultural woodland with some very small meadow marsh communities. Cultural meadow, cultural thicket, and cultural woodland are also present in scattered patches throughout the project limits.

A total of 94 vascular plants were identified during the field surveys, 7 of which were only identified to genus level. Of the 87 identified to species, 57 (66%) are native and 30 (34%) are non-native (ranked SNA). All of the native species recorded are common throughout Ontario (ranked S4 or S5). Two species recorded are regionally rare plants listed in the *Significant Plant List for Wellington County* (Dougan and Associates 2009): Canada Clearweed (*Pilea pumila*) and Giant Solomon's Seal (*Polygonatum biflorum*). These species are discussed further in Section 2.4. All vascular plants recorded are listed in the Plant List (Appendix C, Table 1).

In Phase 2A, four vegetation units comprised of four community types were delineated within the project limits. All of these communities are common in Ontario. Each of the units and communities is described briefly below, and in more detail in the Vegetation Community Table (Appendix C, Table 2). Vegetation communities are delineated on Figure 2 (Appendix A) with representative photos provided in Appendix B.

Unit 1: Mineral Cultural Woodland (CUW1) – The banks of the Speed and Eramosa Rivers in the vicinity of the project limits are dominated by cultural woodland vegetation. This narrow, linear feature has been influenced by anthropogenic activities including the development of adjacent parklands and nearby roads. In order to provide greater context to this area, Unit 1 has been subdivided into several segments - Units 1A, 1B, 1C, 1D and 1E all fall within or adjacent to the Phase 2A project limits. In addition to cultural woodland, Unit 1A contains a **Red-osier Dogwood Mineral Thicket Swamp (SWT2-5) inclusion**. Each of the cultural woodland segments and associated inclusions is defined and described below.

- *Unit 1A – Mineral Cultural Woodland* – This unit is located along the east bank of the Speed River and north bank of the Eramosa River in the vicinity of their confluence. This unit has some edge effects from the adjacent managed parkland, but is relatively natural in comparison to other units in the project limits. The canopy includes abundant Box Elder (*Acer negundo*) and frequent Black Walnut (*Juglans nigra*), along with a mix of other native trees present. The understory includes frequent Buckthorn (*Rhamnus cathartica*) and occasional Choke Cherry (*Prunus virginiana*) and Japanese Knotweed (Polygonum cuspidatum). The ground layer contains a mix of native and exotic species, including abundant Garlic Mustard (*Alliaria petiolata*) and frequent Wild Bergamot (*Monarda fistulosa*).

  Red-osier Dogwood Thicket Swamp Inclusion – located along the east bank of the Speed River, north of the pedestrian bridge. This area is dominated by shrub cover, including frequent Red-Osier Dogwood (*Cornus sericea*). Several other shrub and vine species are also present. Canada Clearweed, which is rare in Wellington County (Dougan and Associates 2009), was observed in this area, in low numbers, and is discussed further in Section 2.4.

- *Unit 1B: Mineral Cultural Woodland* – This area is located east of Unit 1A, along the north bank of the Eramosa River. Unit 1B is mixed, with a strong coniferous component, and appears to have been heavily disturbed at some point prior to being planted with a number of native tree species. The canopy includes abundant Northern White Cedar (*Thuja occidentalis*) with occasional native deciduous tree species. The understory and ground layers are both dominated by exotic species such as abundant Buckthorn, a dense patch of Japanese Knotweed, abundant Garlic Mustard and frequent Common Dandelion (*Taraxacum officinalis*). Frequent regenerating young Box Elder is also present in the understory. No significant features or species were recorded in this unit.

- *Unit 1C: Mineral Cultural Woodland* – This larger woodland area is located east of Unit 1B, along the north bank of the Eramosa River. Unit 1C is mixed, with a minor coniferous component, and is varied in width and canopy cover throughout its length, with some open canopy patches. The canopy includes frequent Sugar Maple (*Acer saccharum var. saccharum*) and Black Walnut, with occasional White Pine (*Pinus strobus*) and a number of common native deciduous trees. The understory includes occasional Buckthorn, Wild Red Raspberry (*Rubus idaeus ssp. strigosus*) and Red-osier Dogwood, as well as abundant Thicket Creeper (*Parthenocissus vitacea*). A dense patch of Japanese Knotweed covers a portion of the riparian area in this unit. The ground layer is comprised of a mix of native and exotic species, including abundant Garlic Mustard, frequent Canada Goldenrod and a mix of grasses and forbs that are typically common in disturbed urban areas. One stem of Giant Solomon's Seal, which is rare in Wellington County (Dougan and Associates 2009), was also observed in this unit, along the bank of the Eramosa River, as discussed further in Section 2.4.

- *Unit 1D: Mineral Cultural Woodland* – This unit, which is located east of Unit 1C along the north bank of the Eramosa River, is dominated by dense woodland patches interspersed with some open canopy edges and sections of young planted trees. The canopy includes abundant Box Elder with occasional White Pine and Green Ash (*Fraxinus pennsylvanica*) as well as scattered Quaking Aspen (*Populus tremuloides*), and Crack Willow (*Salix fragilis*). The understory includes frequent Buckthorn and scattered other common and exotic shrub species as well as regenerating young tree species. The

ground layer is comprised of a mix of native and exotic species, including abundant Garlic Mustard and a mix of grasses and forbs that are typically common in disturbed urban areas. No significant features or species were recorded in this unit.

- *Unit 1E: Mineral Cultural Woodland* – This unit includes two small woodland patches located at the west end of the Phase 2A project limits, north of the pedestrian walkway. These patches were identified as being of relatively poor quality in comparison to the other woodland areas in the project limits. Unit 1E is dominated by exotic species including frequent Norway Maple (*Acer platanoides*) in the canopy and sub-canopy, as well as abundant Buckthorn and Common Lilac (*Syringia vulgaris*) in the understory and ground layers. A low diversity of native trees and shrubs also provide some cover in this unit. Ground cover and diversity is limited due to the density of tree and shrub growth.

Unit 2: Dry-Moist Old Field Meadow (CUM1-1) – This unit is located north of Unit 1C, and is comprised of two cultural meadow areas with scattered planted trees, located on either side of a small laneway. The ground layer is comprised of common roadside and cultural meadow species including abundant Kentucky Bluegrass (*Poa pratensis ssp. pratensis*), Canada Goldenrod and Creeping Thistle (*Cirsium arvense*), with occasional Common Dandelion, Leafy Spurge (*Euphorbia esula*) and Tufted Vetch (*Vicia cracca*). No significant features or species were recorded in this unit.

Unit 3: Mineral Meadow Marsh (MAM2) – This unit is comprised of two small pockets of marsh habitat located within Unit 1D, along the north shore of the Eramosa River. This is a wetland community, which is mainly comprised of native wetland species and is relatively sensitive to disturbance in comparison to other natural / semi-natural vegetation within the project limits. The ground layer is generally comprised of common wetland species such as Reed Canary Grass (*Phalaris arundinacea*), Orange Jewelweed (*Impatiens capensis*), Purple-stemmed Aster (*Symphyotrichum puniceum var. puniceum*), Smooth Goldenrod (*Solidago gigantea*), Common Boneset (*Eupatorium perfoliatum*), Canada Anemone (*Anemone canadensis*), and Stinging Nettle (*Urtica dioica ssp. dioica*). Garlic Mustard is also present.

Unit 4: Dry-Moist Old Field Meadow (CUM1-1) – This unit has recently undergone restoration efforts and is comprised of a grass dominated, low diversity meadow, with a variety of young planted trees. The ground layer is dominated by Kentucky Bluegrass, with scattered other grasses and common meadow forbs. The young planted trees (all under approximately 3 m in height) include a mix of native and exotic deciduous and coniferous trees, some of which were found to be in poor condition at the time of the survey in May 2015.

2.3 Wildlife and Wildlife Habitat

Wildlife resources were evaluated using a review of background material and field surveys. Breeding bird and general wildlife surveys were conducted on June 4 and July 2, 2015 within the project limits and adjacent natural features. Incidental wildlife observations were also recorded during other field work conducted within the project limits. In total, 45 wildlife species were recorded during the field surveys, comprising of 38 avifauna species, two amphibians and five mammals. Results of the wildlife field surveys

are discussed below and SCC are discussed in Section 2.4. A complete list of wildlife species for the project limits is provided in Appendix D.

As part of these surveys, an assessment for potential bat maternity colony habitat was conducted by surveying forested areas and isolated trees for suitable cavity trees. The only suitable cavity trees identified were beyond the project limits of Phase 2A and will be discussed in future reporting for Phase 2B.

Birds

The avifauna species observed through field surveys are expected given the habitat conditions and most are commonly found throughout southern Ontario. Of the 38 bird species, breeding evidence (i.e., Possible, Probable or Confirmed according to OBBA standards) was recorded for 35 species; three species were observed as flyovers or without suitable nesting habitat: Barn Swallow (*Hirundo rustica*), Chimney Swift (*Chaetura pelagica*) and Ring-billed Gull (*Larus delawarensis*). Avifauna observed were primarily disturbance-tolerant, urban-adapted and associated with forest edge habitat (e.g., American Goldfinch [*Spinus tristis*], American Robin [*Turdus migratorius*], Black-capped Chickadee [*Poecile atricapillus*], Common Grackle [*Quiscalus quiscula*] and Song Sparrow [*Melospiza melodia*]). However, species associated with a variety of other habitats were also recorded, including: semi-mature to mature deciduous riparian forest (e.g., Baltimore Oriole [*Icterus galbula*], American Redstart [*Setophaga ruticilla*], Hairy Woodpecker [*Picoides villosus*], White-breasted Nuthatch [*Sitta carolinensis*]), small openings and shrubs along the river shoreline (e.g., Red-winged Blackbird [*Agelaius phoeniceus*], Gray Catbird [*Dumetella carolinensis*], Common Yellowthroat [*Geothlypis trichas*] and Yellow Warbler [*Setophaga petechia*]), as well as the aquatic / river areas (e.g., American Black Duck [*Anas rubripes*], Canada Goose [*Branta canadensis*], Common Merganser [*Mergus merga*nser] and Mallard [*Anas platyrhynchos*]).

A number of SAR / SCC were recorded within the project limits or adjacent natural features during the field surveys:

- Three species are listed under the provincial Endangered Species Act (ESA 2007): Barn Swallow (Threatened), Chimney Swift (Threatened) and Eastern Wood-pewee (*Contopus virens* – Special Concern).
- Four species are listed as Area Sensitive by the MNRF: American Redstart, Common Merganser, Hairy Woodpecker and White-breasted Nuthatch. Area Sensitive birds are species that require large areas of suitable habitat for long-term population survival (MNRF 2000).
- Seven species are listed as Locally Significant by the City of Guelph (2012): American Redstart, Baltimore Oriole, Common Merganser, Eastern Kingbird (*Tyrannus tyrannus*), Hairy Woodpecker, Northern Flicker (*Colaptes auratus*) and Ring-billed Gull.

These species are discussed further in Section 2.4.

Mammals

Five mammal species were recorded during field visits: Beaver (*Castor canadensis*; no active dam observed, only historical evidence of cut trees), Eastern Chipmunk (*Tamias striatus*), Eastern Cottontail (*Sylvilagus floridanus*), Raccoon (*Procyon lotor;* tracks observed along riverbank) and Gray Squirrel (*Sciurus carolinensis*). No SAR / SCC mammals were recorded within the project limits; however, there is potential for SAR bats to occur within the project limits (see Section 2.4). The general area likely supports a range of other mammal species often found in similar habitats, including: Groundhog (*Marmota monax*), Striped Skunk (*Mephitis mephitis*), Mink (*Mutela vison*), Muskrat (*Ondatra zibethicus*), Coyote (*Canis latrans*), Red Fox (*Vulpes vulpes*), White-tailed Deer (*Odocoileus virginianus*), and a number of small mammals that often go undetected (for example shrews, voles, mice, bats).

Herpetofauna

Two herpetofauna species were detected during the field surveys: one American Toad (*Anaxyrus americanus*) in Unit 1D and one calling Green Frog (*Lithobates clamitans*) in Unit 1B. No SAR / SCC herpetofauna were recorded during the field surveys; however, suitable habitat for three SAR / SCC species was identified within the project limits: Eastern Ribbonsnake (*Thamnophis sauritus septentrionalis*), Milksnake (*Lampropeltis triangulum*) and Snapping Turtle (*Chelydra serpentina*). The general area likely supports a range of amphibian and reptile species often found in similar habitats, including: Northern Leopard Frog (*Lithobates pipiens*), Dekay's Brownsnake (*Storeria dekayi*), Eastern Gartersnake (*Thamnophis sirtalis*), Red-bellied Snake (*Storeria occipitomaculata*) and Midland Painted Turtle (*Chrysemys picta marginata*).

MMM did not observe evidence of turtle nesting (e.g., past nest predation) during the field surveys; however in June 2015, two Snapping Turtles were observed by the construction crew within the active construction zone for Phase 1, where it joins the west limits of Phase 2A[1]. Ideal nest sites for turtles tend to face south or west with little overhead cover, have gravely, sandy or loamy soil, and are within a few meters of water. Most of the Eramosa River shoreline adjacent to the project limits is shaded and covered by vegetation with no ideal turtle nesting habitat (e.g., sand or gravel beaches and shoals). However, MNRF correspondence noted that the pedestrian trail, baseball fields and playgrounds are frequently used by Snapping Turtle for nesting habitat.

Snakes may hibernate within rock piles or small mammal burrows within the project limits; however, no confirmed reptile hibernacula or obvious potential hibernacula sites (e.g., large, deep crack / crevices in rocks) were noted within the project limits.

[1] MMM Group consulted with Guelph District MNRF and provided direction to the contractor so that these nests were protected through the incubation period.

2.4 Species of Conservation Concern

In this report, the term Species of Conservation Concern (SCC) includes: Species at Risk (SAR) (i.e., species that are "designated" by the Committee on the Status of Endangered Wildlife in Canada [COSEWIC] and/or listed under the Species at Risk Act [SARA] and species "designated" by the Committee on the Status of Species at Risk in Ontario [COSSARO], including those [Endangered and Threatened] species listed and regulated under Ontario's Endangered Species Act [ESA 2007]); provincially rare species (NHIC S-rank of S1 to S3); Locally Significant wildlife species (City of Guelph 2012); and regionally rare species listed in the *Significant Plant List for Wellington County* (Dougan and Associates 2009) and *Significant Wildlife List for Wellington County* (Dougan and Associates 2009) .

Through a background review, 23 SCC were identified as having potential to occur in the vicinity of the project, including:

- 23 SAR identified by the Guelph MNRF with potential to occur in the City of Guelph (Appendix F – SAR Screening Table);
- 1 SAR confirmed through Guelph MNRF correspondence as being present in the vicinity of the project limits: Snapping Turtle (Special Concern); and
- 1 SCC identified through the MNRF NHIC database as having potential to occur in the vicinity of the project (Eastern Ribbonsnake – Special Concern; 1990 record). Five other SCC species have NHIC records of occurrence within the vicinity of the project limits; however, these are historic records (pre-1990) and no longer relevant due to significant changes in habitat conditions.

Of the 23 potential SCC, 1 is a vascular plant species and 22 are wildlife species. Potential habitat for these SCC was examined during field review and a full assessment of habitat suitability and potential for presence is included in Appendix F (SAR Screening Table).

Field surveys by MMM Group in 2015 confirmed the presence of 12 SCC (10 wildlife and two plants) within the project limits or adjacent natural features; these confirmed SCC are discussed further below.

2.4.1 Vascular Plant SCC

Two vascular plant SCC were confirmed by MMM biologists during field work, both regionally rare plants listed in the *Significant Plant List for Wellington County* (Dougan and Associates 2009). These species are:

- Canada Clearweed – observed on the east bank of the Speed River, north of the pedestrian bridge in Unit 1A; and
- Giant Solomon's Seal – (one stem, potentially a garden escape) observed along the south side of the trail, near the bank of the Speed River in Unit 1C.

Both of these species are ranked “R-A”, meaning that they have been found to occur on 1 to 10 natural sites in Wellington County (Dougan and Associates 2009) and both are contained within the area protected by tree preservation fencing (Figure 2).

2.4.2 Wildlife SCC

Ten wildlife SCC were observed in the field by MMM staff, including three SAR and seven Locally Significant wildlife species (City of Guelph 2012):

- Barn Swallow (*Hirundo rustica* - Threatened, COSEWIC and COSSARO) – Five individuals foraging over the open lawn areas with no breeding evidence observed and no suitable nesting habitat (e.g., culverts or bridges);
- Chimney Swift (*Chaetura pelagica* - Threatened, COSEWIC and COSSARO) – One individual flying high above the confluence of the Speed and Eramosa River with no breeding evidence observed and no suitable habitat within the project limits (i.e., cavity trees or chimneys);
- Eastern Wood-pewee (*Contopus virens* - Special Concern, COSEWIC and COSSARO). One singing male heard in the woodland area on the southeast side of the Eramosa River; although this habitat is beyond the project limits, Eastern Wood-Pewee may move within the project limits to forage or defend territory. It is unlikely that Eastern Wood-pewee would nest within the project limits as this species prefers larger forest patches, which are available on the southeast side of the river.
- Seven Locally Significant species:
    - American Redstart, Baltimore Oriole, Common Merganser, Eastern Kingbird, Hairy Woodpecker, Northern Flicker and Ring-billed Gull (no breeding evidence).

Of the additional 19 wildlife SCC identified through the background review, the following eight species have a moderate to high likelihood of using habitat within the project limits:

- Red-headed Woodpecker (*Melanerpes erythrocephalus* – Special Concern, COSSARO; Threatened, COSEWIC, SARA) - suitable habitat present within project limits (known to occur in a variety of habitats including open wooded areas, urban parks and riparian forests). OBBA record of possible breeding evidence within general area (OBBA square = 100 km^2);
- Eastern Ribbonsnake (Special Concern, COSSARO, COSEWIC and SARA) - marginally suitable habitat within riparian zone of the Eramosa River; considered marginal because species prefers slow moving water and wetlands/marsh habitat, and availability of suitable prey species (e.g. frogs) was low. Known occurrence within the vicinity of project limits (NHIC record for 1990);
- Milksnake (Special Concern, COSSARO, COSEWIC and SARA) - suitable habitat present within the project limits (habitat generalist; may occur in both open areas and forest edges, typically near water). No known recent occurrences in the vicinity of the project limits;
- Snapping Turtle (Special Concern, COSSARO, COSEWIC and SARA) - confirmed through Guelph MNRF correspondence as being present in the vicinity of the project limits and two individuals

confirmed nesting at west end of project limits by construction crew in 2015; potential nesting habitat includes the pedestrian trail, baseball fields and playgrounds;

- Little Brown Bat (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*) - no suitable cavity trees for maternity colony habitat or caves for overwintering habitat within Phase 2A project limits; only non-SAR bats were detected during acoustic monitoring of cavity trees in Phase 2B project limits. May occur as foraging visitant over open lawn areas and Eramosa River. Atlas of the Mammals of Ontario (1994) shows records of occurrence near the City of Guelph;
- Monarch (*Danaus plexippus* - Special Concern, COSSARO, COSEWIC and SARA) – suitable habitat in small cultural meadow communities within the project limits where milkweed plants (limited to scattered occurrence in Unit 1C) and other wildflowers occur; and
- Rusty-patched Bumblebee (*Bombus affinis* - Endangered, COSSARO, COSEWIC and SARA) – suitable habitat for this species is present (occurs in variety of habitats including lightly wooded and urban areas; forages on wildflowers). The likelihood of this species occurring within the project limits is fairly limited due to its' provincial rarity; however, an NHIC record exists for the City of Guelph (2002).

Further details regarding habitat availability for SAR wildlife are presented in the screening table (Appendix F).

3.0 Proposed Works - Trunk Sewer and Feedermain Installation

The York Trunk Sewer is a proposed 1200 mm diameter sanitary trunk sewer that will run east-west through the City of Guelph parallel to the Speed and Eramosa Rivers. The Paisley-Clythe Watermain is a proposed 600 mm diameter watermain that will run east-west through the City parallel to the new York Trunk Sewer. This phase (Phase 2A) of the York Trunk Sewer & Paisley-Clythe Watermain project is from York Road Park to Lyon Park, a distance of approximately 1300 m. Phase 2A of the project will be constructed entirely using open cut construction techniques.

The anticipated impacts of the proposed works and associated mitigation measures are described below in Sections 4 and 5 of this report.

4.0 Impact Assessment

The proposed works along the majority of the alignment will be temporary in nature with all areas disturbed for the installation of services to be restored following construction. The greatest ecological impact of the works in Phase 2A will be the removal of 11 trees along the project limits, as outlined further in Section 4.2.

4.1 Impacts to Designated Areas

Provincial Designations

There will be no direct impacts to the Unevaluated Wetlands south of Eramosa River or the *Waterfowl Winter Concentration Area* near its confluence with the Speed River. Mitigation measures will be in place to ensure no sediment release to the Speed River and downstream resources, as described in Section 5.0.

Grand River Conservation Authority Lands

There will be direct, temporary impacts to vegetation within the regulatory floodplain, which is regulated under Ontario Regulation 150/06 (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses). This letter has been prepared in support of an application for a permit under Ontario Regulation 150/06.

City of Guelph Designations

There will be no direct impacts to any of the City of Guelph designated features, including the designated cool water fish habitat, Significant Valleylands or Significant Wildlife Habitat identified on Schedules 10B, 10D and 10E of the Natural Heritage System Amendment (OPA 42).

4.2 Impacts to Vegetation Resources

As noted above, most of the impacts to vegetation resources will be temporary in nature with all disturbed areas restored following construction. Although efforts have been made to minimize impacts to trees, the selected alignment will require some tree removals. Tree removals have been determined for trees with diameter at breast height (DBH) greater than 10 cm (see Appendix G: Arborist Report).

Eleven trees larger than 10 cm DBH are expected to be removed for the construction of Phase 2A. These are all planted landscape trees located in manicured areas, excluding one Silver Maple located in Unit 2. The locations of each tree removal are described in Table 1 and can be found on Drawings T2 of the Arborist Report (Appendix G). In addition to tree removals, 0.11 ha of cultural meadow vegetation will be temporarily disturbed within Unit 2. No removals are expected in any of the other natural / semi-natural vegetation communities, all of which will be protected by the proposed tree preservation fencing and/or silt fencing.

Overall, the vegetation removals that will be required are anticipated to be nominal, and limited to areas that have been impacted to some degree by previous anthropogenic disturbance including road and parkland maintenance activities. Tree removals will be replaced at a ratio greater than 3:1 (i.e., for the 11 trees removed, > 33 native trees will be planted). Planting details can be found on drawings L1 – L5 (Appendix G). Following re-grading and seeding, similar vegetation is expected to regenerate naturally in other areas temporarily disturbed for construction. See Section 4.4 for a discussion of impacts to Species of Conservation Concern.

Table 1. Tree Removals.

Tree Inventory #[2]	Species	Location Description
374	Silver Maple	Individual tree of assumed natural origin, located in Unit 2.
398	White Ash	Individual planted tree located east of Unit 2 / northeast of Unit 1C; planted between gravel parking and lane areas.
409, 410, 411, 412, 413	Silver Maple (3) and White Ash (2)	Cluster of planted trees located in manicured / managed park area northeast of Unit 1C.
G4	Apple Species (3)	Three planted trees located east of Unit 2 / northeast of Unit 1C; planted between gravel parking and lane areas.
419	White Ash	Individual planted tree located north of a paved road, north of Unit 1D.

4.3 Impacts to Wildlife and Wildlife Habitat

Impacts to wildlife are expected to be negligible given that habitat removals will be temporary and no critical habitats will be affected. The majority of the species observed to be utilizing the affected areas are common, disturbance-tolerant species.

No confirmed avian nesting was observed within the vegetation or tree removal areas; however, the vegetation / tree removals from Unit 2 (CUM1-1) and north of 1C (planted immature trees) may impact nesting and foraging habitat for common avifauna that were observed in the area, including American Goldfinch, American Robin, Black-capped Chickadee, Common Grackle and Red-winged Blackbird. In addition, temporary vegetation disturbance in Unit 2 may impact habitat for small mammals (mice, voles) and common snakes (Eastern Gartersnake). However, the vegetation will re-generate following completion of the proposed works and with the proper implementation of the recommended mitigation measures, no significant impacts on wildlife and wildlife habitat are anticipated.

As previously noted, there is potential turtle nesting habitat within the project limits, including the pedestrian trail, baseball fields and playgrounds. Potential impacts on turtle nesting, including disturbance or loss of young, can be effectively mitigated thought the use of exclusion fencing, as described in Section 5.2. Impacts on the availability of turtle nesting habitat are expected to be temporary; following completion of the proposed works, the open-cut trenches will be filled and restored to pre-existing conditions.

The mitigation measures outlined in Section 5.0 will ensure that habitat will be restored and that wildlife is not disturbed during critical nesting times. Furthermore, as outlined in Section 5.2, all efforts will be made to ensure that any wildlife incidentally encountered during construction will be protected from harm.

[2] Refers to tree inventory numbers provided in the Tree Inventory and Management Plan (MMM November 2015).

4.4 Impacts to Species of Conservation Concern

Vascular Plant SCC

Neither of the regionally rare vegetation species found (Canada Clearweed and Giant Solomon's Seal) is anticipated to be impacted by the proposed works – they are both located beyond the proposed tree preservation fencing and/or silt fencing, and thus outside of the construction zone for the watermain and sewer alignments.

Wildlife SCC

Three SAR wildlife were confirmed within or adjacent to the project limits: Barn Swallow, Chimney Swift and Eastern Wood-Pewee. In addition, potential habitat for eight SAR was identified within the project limits. Potential impacts can be summarized as follows:

- No suitable nesting habitat for Barn Swallow (e.g., culverts or bridges) or Chimney Swift (e.g. tree cavities) will be affected by the proposed works, and any disturbance of foraging habitat for Barn Swallow or Chimney Swift (open lawn areas) will be temporary.
- Eastern Wood-Pewee was only detected on the east side of the Eramosa River and the tree removals or other construction activities within the project limits are not expected to impact breeding habitat.
- Marginally suitable habitat for Red-headed Woodpecker (variety of open treed areas) is present within the project limits; however, no impacts on nesting habitat are expected as trees requiring removal are not suitable cavity trees.
- Potential impacts on herpetofauna SAR, including incidental encounters with Eastern Ribbonsnake and Milksnake or disturbance of Snapping Turtle nesting, can be effectively mitigated through implementation of temporary exclusion fencing.
- No suitable maternity colony or overwintering habitat for Little Brown Bat or Northern Myotis will be affected by the proposed works, and any disturbance of foraging habitat (e.g., open lawn areas) will be temporary.
- Potential impacts on suitable habitat for Monarch (i.e., cultural meadow areas with Milkweed and other wildflowers) and Rusty-patched Bumblebee (areas with wildflowers) will be minor and temporary as these areas will be restored to a similar or improved condition (i.e., restoration with a greater diversity of native vegetation) following construction.
- Temporary disturbances within the project limits is unlikely to affect any critical habitat features for the seven Locally Significant bird species recorded (i.e., American Redstart, Baltimore Oriole, Common Merganser, Eastern Kingbird, Hairy Woodpecker, Northern Flicker and Ring-billed Gull).

5.0 Mitigation Measures

5.1 Vegetation

The following mitigation measures are recommended to minimize effects to the local vegetation communities and their associated habitat functions:

- Install tree protection and erosion and sediment control fencing (per drawings L1 – L5, Appendix G) prior to vegetation clearing, and maintain throughout construction and until all disturbed ground has been permanently stabilized.
- Clearly delineate vegetation clearing zones and vegetation retention zones (i.e., Tree Protection Fence and siltation control fencing as shown on contract documents) on both the construction drawings and in the field with the contractor prior to clearing and grading. Equipment, materials and other construction activities will not be permitted in vegetation retention zones.
- Re-stabilize and re-vegetate exposed surfaces as soon as possible, using native seed mixes and native plant material, following the Landscape Plans found in Appendix G.
- The Environmental Inspector should be notified in the event the Contractor needs to clear additional vegetation beyond the identified limits (to be reviewed in the field).
- Dispose of cut and grubbed material through chipping.
- Avoid all unnecessary traffic, dumping and storage of materials over tree root zones adjacent to natural areas
- In dust-sensitive areas, control dust using water and not chemical suppressants.
- Conduct vehicle maintenance and fuelling at the designated and properly contained maintenance areas in the works yards or at commercial garages.
- Remove and dispose of all construction-related debris following construction in appropriately designated areas.
- Implement environmental inspection during construction to ensure that protection measures are implemented, maintained and repaired and remedial measures are initiated where warranted.
- Ensure equipment and materials storage through the construction period is located in designated and properly contained areas located well away from the river and outside of retained vegetation areas.

5.2 Wildlife and Wildlife Habitat

The mitigation measures outlined above to minimize effects to vegetation and protect adjacent natural areas will also protect the associated wildlife habitat. However, it is also necessary to ensure the protection of nesting migratory birds as well as all wildlife that may utilize the area where construction is proposed.

To protect nesting migratory birds, no work is permitted to proceed that would result in the destruction of active nests (nests with eggs or young birds), or the wounding or killing of bird species protected under the

Migratory Birds Convention Act (MBCA 1994) and / or Regulations under that Act. In order to protect nesting migratory birds, in accordance with the MBCA, the contractor will:

- Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season (approximately April 1 to August 31). It is the contractor's responsibility to ensure that active nests of migratory species are not disturbed during construction.
- The Contractor shall not destroy active nests (nests with eggs or young birds) of protected migratory birds, including SAR protected under the ESA (2007). When these nests are encountered, the Contract Administrator must be contacted.
- If a nesting migratory bird is identified within or adjacent to the construction site and the construction activities are such that continuing construction in that area would result in a contravention of the MBCA or ESA (2007), **all activities will stop and MNRF and Environment Canada will be contacted to discuss mitigation options**, and/or to obtain a LOA from MNRF to follow for species listed under the ESA (2007);
- Additional / modified measures may be required for any SAR and will be determined on a case-by-case basis through consultation with MNRF.

The following measures are recommended for the protection of herpetofauna SCC, including Snapping Turtle, which may attempt to nest within the work area:

- Erect temporary exclusion fencing prior to June 1 (or prior to the start of construction, whichever is sooner) to prevent snakes and turtles from entering the construction zones. At a minimum, exclusion fencing should be installed along the side facing the Eramosa River (per L1 - L5, Appendix G).
- It should be feasible to combine the exclusion fencing with silt fencing requirements when they occur together, by modifying the latter to use wire-backed silt fencing and flaring out the ends of the fencing to redirect wildlife away from the construction zones / roads and back towards the habitat side of the fence (see detail 3 on drawing L10, Appendix G). Wire-backed silt fencing should be provided at all sites to prevent entanglement of snakes in the fencing. Fencing should meet the MNRF Best Practices guidelines for Reptile and Amphibian fencing: http://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_tx_rptl_amp_fnc_en.pdf
- Prior to starting works each day, the Contractor will examine the length of the fence to repair any damages and remove any turtles and snakes (or other wildlife) that may have entered the construction zone or become trapped inside the fencing. Turtles should be placed back on the wetland or watercourse side of the fence. Refer to the MNRF SAR Handling Manual on how to safely handle turtles: http://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_tx_sar_hnd_mnl_en.pdf. Any equipment parked overnight in the area will also be inspected to ensure no snakes have climbed into / under it.
- The Contract specifications will identify the potential for SAR to be encountered during construction and the procedures to be followed in the event of an encounter.

The following measures are recommended for the protection of wildlife in general:

- Under no circumstances will any animal (e.g., bird, turtle, snake, mammal) be knowingly harmed, harassed or otherwise disturbed. If an animal is encountered, it will be allowed to move away on its own. In the event that wildlife encountered does not move from the construction zone, the Contract Administrator will be notified. Small wildlife (e.g., turtles, amphibians) stranded within a contained construction zone will be captured and released by a suitably qualified individual (e.g., Environmental Inspector).
- In the event that a SAR or possible SAR is found in the construction area, all construction that could potentially harm the animal will cease immediately and the Contract Administrator will be notified. The Contract Administrator will then contact the MNRF SAR Biologist for direction, as these animals are protected under the ESA (2007).

6.0 Conclusions

With the implementation of all recommended mitigation measures, the installation of the sanitary sewer and watermain within the project limits is not anticipated to result in adverse effects to vegetation, wildlife, wildlife habitat or SCC.

If you require additional information or clarification regarding this information, please contact the undersigned at drosth@mmm.ca or (519)-743-8777 ext. 2240.

Sincerely,

MMM Group Limited

Heather Drost, B.Sc.
Project Ecologist - Botanist
Ecology Department

cc: Prachi Patel (City of Guelph)
Majde Qaqish (City of Guelph)
Mani Ruprai (MMM)

Enclosed: Permit Application Form
Permit Application Fee Payment (*cheque)*

Appendix A: Figure 1: Designated Natural Features
Figure 2: Vegetation Communities and Proposed Plans
Appendix B: Representative Photos
Appendix C: Plant Species List and Vegetation Communities Table
Appendix D: Wildlife Species List
Appendix E: Correspondence

Appendix F: SAR Screening Table
Appendix G: Arborist Report and Landscape Plans

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APPENDIX A – Figures

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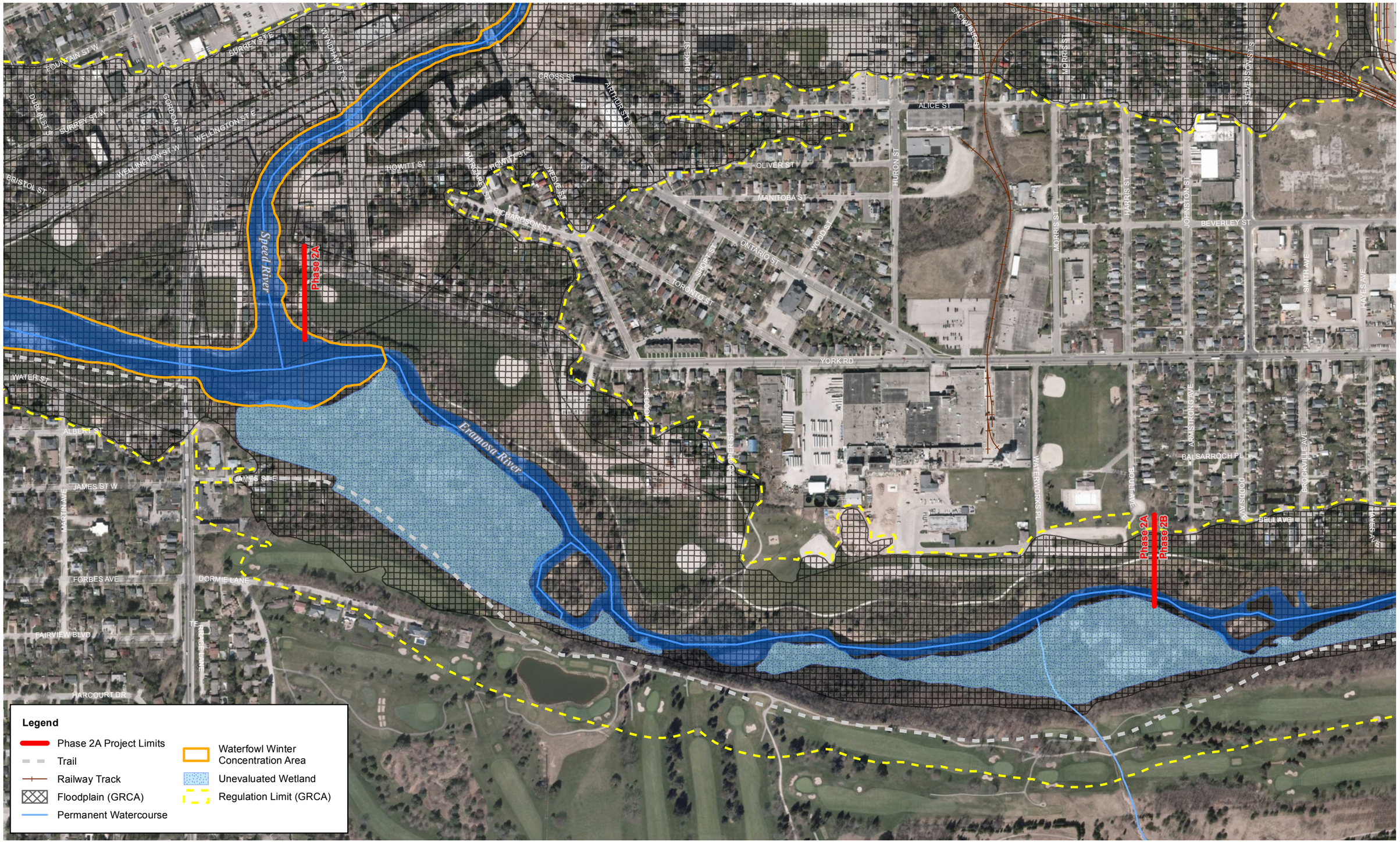

Legend

- Phase 2A Project Limits
- Trail
- Railway Track
- Floodplain (GRCA)
- Permanent Watercourse
- Waterfowl Winter Concentration Area
- Unevaluated Wetland
- Regulation Limit (GRCA)

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YORK TRUNK SEWER AND PAISLEY-CLYTHE FEEDERMAIN – Phase 2A
Designated Natural Features

ESRI Basemaps

0 100 200
metres
1:5,000

Date: November 2015
Project No: 1014079
Figure No: 1

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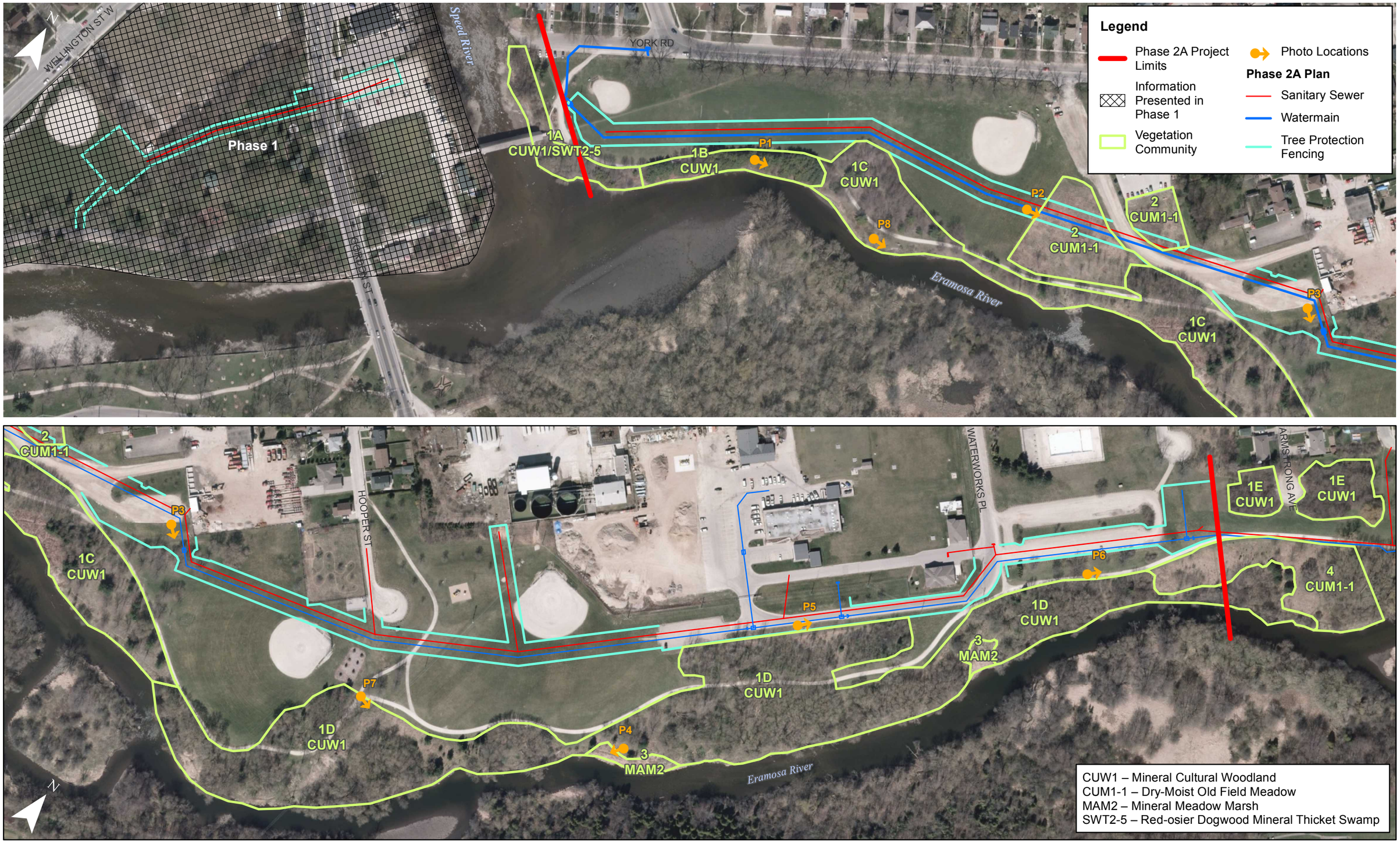

MMM GROUP

YORK TRUNK SEWER AND PAISLEY-CLYTHE FEEDERMAIN – Phase 2A
Vegetation Communities and Proposed Plans

ESRI Basemaps

0 50 100
metres
1:2,500

Date: November 2015
Project No: 1014079
Figure No: 2

APPENDIX B – Representative Photos

Photo 1: Pedestrian trail though Cultural Woodland along Eramosa River (Unit 1B)

Photo 2: Naturalized Area / Cultural Meadow feature with required tree/vegetation removals (Unit 2A)

Photo 3: Planted White Ash and Silver Maple area north of Unit 1C with required tree removals

Photo 4: Eramosa River riparian zone with small patch of Meadow Marsh and surrounding Cultural Woodland

Photo 5: Mowed lawn adjacent to parking lot/road and Cultural Woodland feature with Black Maple and dead Ash trees (Unit 1D)

Photo 6: Pedestrian trail through mown lawn and cultural woodland (Unit 1D)

Photo 7: American Toad (*Anaxyrus americanus*) found in Cultural Woodland along Eramosa River (Unit 1D)

Photo 8: Eramosa River banks and riparian forest (taken at dawn during Breeding Bird Surveys)

APPENDIX C – Plant Species List and Vegetation Communities

Appendix C - Table 1: Plant List

Common Name	Scientific Name	cc[1]	cw[1]	OWES Wetland Plant List	Grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	City of Guelph (Dougan 2009)[7]	Unit 1A CUW1	Unit 1B CUW1	Unit 1C CUW1	Unit 1D CUW1	Unit 1E CUW1	Unit 2 CUM1-1	Unit 3 MAM2	Unit 4 CUM1-1
Balsam Fir	*Abies balsamea*	5	-3	X	G5	S5													x
Amur Maple	*Acer ginnala*	*	5		GNR	SNA									x				
Box Elder	*Acer negundo*	0	-2	X	G5	S5						x	x	x	x		x	x	x
Norway Maple	*Acer platanoides*	*	5		GNR	SNA						x	x			x			
Red Maple	*Acer rubrum*	4	0	X	G5	S5							x						
Silver Maple	*Acer saccharinum*	5	-3	X	G5	S5							x	x			x		
Sugar Maple	*Acer saccharum var. saccharum*	4	3		G5T5	S5							x	x			x		
Freeman's Maple	*Acer X freemanii*			X	GNA	SNR						x		x		x	x		x
Garlic Mustard	*Alliaria petiolata*	*	0		GNR	SNA						x	x	x	x			x	
Serviceberry Species	*Amelanchier sp*											x							
Canada Anemone	*Anemone canadensis*	3	-3	X	G5	S5								x	x			x	
Great Angelica	*Angelica atropurpurea*	6	-5	X	G5	S5												x	
Lesser Burdock	*Arctium minus*	*	5		GNR	SNA						x	x	x	x	x			
Kansas Milkweed (Common Milkweed)	*Asclepias syriaca*	0	5		G5	S5								x					
Devil's Beggar's Ticks	*Bidens frondosa*	3	-3	X	G5	S5						x							
Sedge Species	*Carex sp*											x							
Greater Celadine	*Chelidonium majus*	*	5		GNR	SNA						x	x	x	x				
Enchanter's Nightshade	*Circaea lutetiana ssp canadensis*	3	3		G5T5	S5						x	x	x					
Creeping Thistle (Canada Thistle)	*Cirsium arvense*	*	3		GNR	SNA								x			x		
Alternate-leaf Dogwood	*Cornus alternifolia*	6	5		G5	S5								x					
Rough-leaved Dogwood	*Cornus drummondii*	4	0		G5	S4						x							
Red-osier Dogwood	*Cornus sericea*	2	-3	X	G5	S5						x		x			x		x
Dotted Hawthorn	*Crataegus punctata*	4	5		G5	S5										x			
Queen Anne's Lace	*Daucus carota*	*	5		GNR	SNA								x					x
Fuller's Teasel	*Dipsacus fullonum*	*	5		GNR	SNA						x							
Creeping Wild Rye	*Elymus repens*	*	3		GNR	SNA						x							
Wild-rye Species	*Elymus sp*											x							
Small-flower Willow-herb	*Epilobium parviflorum*	*	3	X	GNR	SNA						x							

Appendix C - Table 1: Plant List

Common Name	Scientific Name	cc[1]	cw[1]	OWES Wetland Plant List	Grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	City of Guelph (Dougan 2009)[7]	Unit 1A CUW1	Unit 1B CUW1	Unit 1C CUW1	Unit 1D CUW1	Unit 1E CUW1	Unit 2 CUM1-1	Unit 3 MAM2	Unit 4 CUM1-1
Philadelphia Fleabane	*Erigeron philadelphicus var. philadelphicus*	1	-3	X	G5T5	S5						x							
Spotted Joe-pye Weed	*Eupatorium maculatum var. maculatum*	3	-5	X	G5T5	SNR								x					
Common Boneset	*Eupatorium perfoliatum*	2	-4	X	G5	S5												x	
Leafy Spurge	*Euphorbia esula*	*	5		GNR	SNA									x		x		x
White Ash	*Fraxinus americana*	4	3		G5	S5								x		x	x		
Green Ash	*Fraxinus pennsylvanica*	3	-3	X	G5	S5						x	x	x	x		x		
Ash Species	*Fraxinus sp*																x		
Great Hedge Bedstraw	*Galium mollugo*	*	5		GNR	SNA									x				
Marsh Bedstraw	*Galium palustre*	5	-5	X	G5	S5						x							
Yellow Avens	*Geum aleppicum*	2	-1	X	G5	S5										x			
Avens Species	*Geum sp*											x	x		x				
Ground Ivy	*Glechoma hederacea*	*	3		GNR	SNA							x	x	x				
Virginia Stickseed	*Hackelia virginiana*	5	1		G5	S5						x							
Dame's Rocket	*Hesperis matronalis*	*	5		G4G5	SNA						x		x	x	x	x	x	
Orange Jewelweed	*Impatiens capensis*	4	-3	X	G5	S5						x		x				x	
Black Walnut	*Juglans nigra*	5	3		G5	S4						x	x	x					
American Larch	*Larix laricina*	7	-3	X	G5	S5								x	x				x
Cutgrass Species	*Leersia sp*											x							
Common Motherwort	*Leonurus cardiaca ssp. cardiaca*	*	5		GNRTNR	SNA									x				
Tartarian Honeysuckle	*Lonicera tatarica*	*	3		GNR	SNA						x			x	x			
American Bugleweed	*Lycopus americanus*	4	-5	X	G5	S5						x							
Ostrich Fern	*Matteuccia struthiopteris*	5	-3	X	G5	S5									x				
Wild Bergamot	*Monarda fistulosa*	6	3		G5	S5						x							
Thicket Creeper	*Parthenocissus vitacea*				G5	S5							x	x	x				
Reed Canary Grass	*Phalaris arundinacea*	0	-4	X	G5	S5						x	x	x	x		x	x	x
Eastern Ninebark	*Physocarpus opulifolius*	5	-2	X	G5	S5						x							
White Spruce	*Picea glauca*	6	3	X	G5	S5						x		x	x				x

Appendix C - Table 1: Plant List

Common Name	Scientific Name	cc[1]	cw[1]	OWES Wetland Plant List	Grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	City of Guelph (Dougan 2009)[7]	Unit 1A CUW1	Unit 1B CUW1	Unit 1C CUW1	Unit 1D CUW1	Unit 1E CUW1	Unit 2 CUM1-1	Unit 3 MAM2	Unit 4 CUM1-1
Canada Clearweed	*Pilea pumila*	5	-3	X	G5	S5					R-A	x							
Eastern White Pine	*Pinus strobus*	4	3	X	G5	S5							x	x	x				x
Nipple-seed Plantain	*Plantago major*	*	-1		G5	S5						x			x				
Fowl Bluegrass	*Poa palustris*	5	-4	X	G5	S5						x		x					
Kentucky Bluegrass	*Poa pratensis ssp. pratensis*				G5T5	S5								x	x		x		x
Bluegrass Species	*Poa sp*											x							
Giant Solomon's Seal	*Polygonatum biflorum*				G5	S4					R-A			x					
Japanese Knotweed	*Polygonum cuspidatum*	*	3		GNR	SNA						x	x						
Quaking Aspen	*Populus tremuloides*	2	0		G5	S5									x				
Choke Cherry	*Prunus virginiana var. virginiana*	2	1		G5T5	S5						x		x	x	x	x		
Bur Oak	*Quercus macrocarpa*	5	1	X	G5	S5								x					x
Buckthorn	*Rhamnus cathartica*	*	3	X	GNR	SNA						x	x	x	x	x	x		
Staghorn Sumac	*Rhus typhina*	1	5		G5	S5								x	x				
Wild Black Currant	*Ribes americanum*	4	-3	X	G5	S5						x			x			x	
Black Locust	*Robinia pseudoacacia*	*	4		G5	SNA													x
Rambler Rose	*Rosa multiflora*	*	3		GNR	SNA						x							
Wild Red Raspberry	*Rubus idaeus ssp. strigosus*				G5T5	S5								x					
Curly Dock	*Rumex crispus*	*	-1	X	GNR	SNA											x		
Crack Willow	*Salix fragilis*	*	-1		GNR	SNA									x				
Common Elderberry	*Sambucus nigra ssp. canadensis*	5	-2	X	G5	S5						x					x		
Red Elderberry	*racemosa*	5	2		G5T4T5	SNR							x						
Bouncing-bet	*Saponaria officinalis*	*	3		GNR	SNA							x		x				
Climbing Nightshade	*Solanum dulcamara*	*	0	X	GNR	SNA								x					
Canada Goldenrod	*Solidago canadensis*	1	3		G5	SNR						x	x	x	x		x		
Smooth Goldenrod	*Solidago gigantea*	4	-3	X	G5	S5								x	x			x	
Early Goldenrod	*Solidago juncea*	3	5		G5	S5								x					
Calico Aster	*Symphyotrichum lateriflorum var. lateriflorum*	3	-2	X	G5T5	SNR						x							

Appendix C - Table 1: Plant List

Common Name	Scientific Name	cc[1]	cw[1]	OWES Wetland Plant List	Grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	SARA Status[6]	Schedule[6]	City of Guelph (Dougan 2009)[7]	Unit 1A CUW1	Unit 1B CUW1	Unit 1C CUW1	Unit 1D CUW1	Unit 1E CUW1	Unit 2 CUM1-1	Unit 3 MAM2	Unit 4 CUM1-1
Purple-stemmed Aster	*Symphyotrichum puniceum var. puniceum*	6	-5	X	G5T5	S5												x	
Common Lilac	*Syringa vulgaris*	*	5		GNR	SNA									x	x			
Common Dandelion	*Taraxacum officinale*	*	3		G5	SNA						x	x		x	x	x		x
Northern White Cedar	*Thuja occidentalis*	4	-3	X	G5	S5						x	x						x
American Basswood	*Tilia americana*	4	3		G5	S5								x					
Littleleaf Linden	*Tilia cordata*				GNR	SNA						x							
American Elm	*Ulmus americana*	3	-2	X	G5?	S5						x	x			x			x
Stinging Nettle	*Urtica dioica ssp. dioica*	*	-1		G5T5?	SNA								x				x	
Nannyberry	*Viburnum lentago*	4	-1	X	G5	S5						x							
Guelder-rose Viburnum	*Viburnum opulus*	*	0		G5	SNA								x					
Tufted Vetch	*Vicia cracca*	*	5		GNR	SNA											x		
Riverbank Grape	*Vitis riparia*	0	-2		G5	S5						x		x					

Plant List Legend

Accepted Name and Author
Accepted Name and Author were updated primarily using NatureServe Explorer (Updated June 2013), in combination with the Integrated Taxonomic Information System (ITIS), United States Department of Agriculture (USDA) Plants Database, and the New York Flora Atlas.

NatureServe Explorer: http://www.natureserve.org/explorer/index.htm
ITIS: http://www.itis.gov/
USDA Plants: http://plants.usda.gov/java/
New York Flora Atlas: http://newyork.plantatlas.usf.edu/Default.aspx

[1]Coefficient of Conservatism and Coefficient of Wetness (Oldham et al. 1995)

CC: Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.
CW: Coefficient of Wetness. Value between 5 and –5. A value of –5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories.

[2]G-Rank (Global)
(Global Status from MNR Biodiversity Explorer September 2012)

Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

Global (G) Conservation Status Ranks
G1: Extremely rare – usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G2: Very rare – usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
G3: Rare to uncommon – usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
G4: Common – usually more than 100 occurrences; usually not susceptible to immediate threats.
G5: Very common – demonstrably secure under present conditions.

Variant Ranks
G#G#: Range Rank – A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).
GU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.
GNR: Unranked – Global rank not yet assessed
GNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Rank Qualifiers
?: Inexact Numeric Rank – Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.

Q: Questionable taxonomy that may reduce conservation priority – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower priority (numerically higher) conservation status rank. The "Q" modifier is only used at a global level and not at a national or subnational level.

C: Captive or Cultivated Only – Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The "C" modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to "Extinct" in the Wild (EW) in IUCN's Red List terminology (IUCN 2001).

[3]S-Ranks (Provincial)

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.
(Provincial Status from MNR Biodiversity Explorer September 2012)

S1: Critically Imperiled – Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2: Imperiled – Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3: Vulnerable – Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4: Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5: Secure – Common, widespread, and abundant in the nation or state/province.
S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SX: Presumed Extirpated – Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH: Possibly Extirpated (Historical) – Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
SE: Species is considered exotic in Ontario
SNR: Unranked – Nation of state/province conservation status not yet assessed.
SU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.[1]

[4]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
(federal status from COSEWIC November 2012)

EXT: Extinct – A species that no longer exists.
EXP: Extirpated – A species no longer existing in the wild in Canada, but occurring elsewhere.
END: Endangered – A species facing imminent extirpation or extinction.
THR: Threatened – A species likely to become endangered if limiting factors are not reversed.
SC: Special Concern (formerly vulnerable) – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR: Not At Risk – A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD: Data Deficient (formerly Indeterminate) – Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

Implied COSEWIC Status Notations (Status Due to Taxonomic Relationships)[2]
value (Flagged Value) – The taxon itself is not named in the Canadian Species at Risk list, however, it does have status as a result of its taxonomic relationship to a named entity. For example, if a species has a COSEWIC status of "threatened", then by default, all of its recognized subspecies that occur in Canada also have a threatened status. The subspecies in this example would have the value "$T_{(2)}$" under COSEWIC. Likewise, if all of a species' infraspecific taxa occurring in Canada have the same COSEWIC status, then that status appears in the entry for the "full" species as well. In this case, if the species name is not mentioned in the Canadian Species at Risk list, the status appears with a flag $_{(2)}$ in NatureServe Explorer.

value, value: (Combination values with flags) – The taxon itself is not named in the Canadian Species at Risk list, however, all of its infraspecific taxa occurring in Canada do have status but two or more of the taxa do not have the same status. In this case, a combination of statuses shown with a flag $_{(7)}$ indicates the statuses that apply to infraspecific taxa or populations within this taxon.
PS: Indicates "partial status" – in only a portion of the species' range in Canada. Typically indicated for a "full' species where at least one but not all of a species' infraspecific taxa or populations has COSEWIC status.

PS*value*: Indicates "partial status" – status in only a portion of the species' range. The value of that status appears because the entity with status (usually a population defined by geopolitical boundaries within Canada) does not have an individual entry in NatureServe Explorer. Information about the entity with status can be found in reports for the associated species.

[1] Added on June 4, 2013 from http://nhic.mnr.gov.on.ca/glossary/srank.cfm
[2] Added on June 5, 2013 from http://www.natureserve.org/explorer/statusca.htm

[5]MNR (Ministry of Natural Resources)

(*provincial status from MNR January 13, 2012)*
The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO).

EXT: Extinct – A species that no longer exists anywhere.
EXP: Extirpated – A species that no longer exists in the wild in Ontario but still occurs elsewhere.
END: Endangered – A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA).
THR: Threatened – A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC: Special Concern (formerly Vulnerable) – A species with characteristics that make it sensitive to human activities or natural events.
NAR: Not at Risk – A species that has been evaluated and found to be not at risk.
DD: Data Deficient (formerly Indeterminate) – A species for which there is insufficient information for a provincial status recommendation.

[6] SARA (Species at Risk Act) Status and Schedule

The Act establishes Schedule 1, as the official list of species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented.

EXT: Extinct – A species that no longer exists.
EXP: Extirpated – A species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END: Endangered – A species that is facing imminent extirpation or extinction.
THR: Threatened – A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC: Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Species at Risk.

Government of Canada. Species at Risk Public Registry. Website: [http://www.sararegistry.gc.ca/default_e.cfm September 27, 2012]

Glossary: http://www.sararegistry.gc.ca/about/glossary/default_e.cfm#e
Species Index A-Z: http://www.sararegistry.gc.ca/sar/index/default_e.cfm
Species Listing by Schedule: http://www.sararegistry.gc.ca/sar/listing/default_e.cfm

[7] Regional Status

City of Guelph (*Required for EIS in City of Guelph)
Significant Plant List for Wellington County (Dougan & Associates 2009)

Codes are defined as follows:

R-A: Included based on "rare" status (i.e. occurrence at between 1 and 10 natural sites in the County) in the Flora of Wellington County (Anderson and Frank 2004, unpublished) and subsequent revisions by A. Anderson over 2005-2008).
R-B: Added as a plant record from post-1990 environmental studies within Guelph with global and /or provincial significance.
R-C: Added based on records provided by Mike Oldham (NHIC) for Wellington County in 2005, verification of records in OAC herbarium (Jan.-Feb. 2008) and supplementary review by Mike Oldham Dec. 2007 - Feb. 2008.
R-D: New record for Wellington County (observed during field work conducted by Dougan & Associates 2005-2006).

Unit Number and ELC Interpretation	General Description	Dominant Component Species (generally listed in order of decreasing abundance)	Sensitivities and Level of Disturbance
Unit 1A Cultural Woodland (CUW1) with Red-osier Dogwood Mineral Thicket Swamp (SWT2-5) edge / inclusion	This woodland segment, located along the east bank of the Speed River and the north bank of the Eramosa River is limited to a narrow area, which has been impacted by previous anthropogenic disturbances including the construction of the pedestrian bridge and adjacent parklands and urban developments. A small area dominated by shrub cover (SWT2-5) is located along the east river bank north of the pedestrian bridge.	**Canopy/Sub-canopy:** The canopy includes abundant Box Elder (*Acer negundo*) and frequent Black Walnut (*Juglans nigra*), with occasional American Basswood (*Tilia americana*), Northern White Cedar (*Thuja occidentalis*), Green Ash (*Fraxinus pennsylvanica*) and Freeman's Maple (*Acer x freemanii*). **Understory:** The understory includes frequent Buckthorn (*Rhamnus cathartica*) and occasional Choke Cherry (*Prunus virginiana*) and Japanese Knotweed (*Polygonum cuspidatum*). The small thicket swamp inclusion is comprised of species such as Red-Osier Dogwood (*Cornus sericea*), Rough-leaved Dogwood (*Cornus drummondii*), Rambler Rose (*Rosa multiflora*), Guelder-rose Viburnum (*Viburnum opulus*) and Wild Grape (*Vitis riparia*). **Ground layer:** The ground layer contains a mix of native and exotic species, including abundant Garlic Mustard (*Alliaria petiolata*), frequent Wild Bergamot (*Monarda fistulosa*), Dame's Rocket (*Hesperis matronalis*), Greater Celandine (*Chelidonium majus*) and Reed Canary Grass (*Phalaris arundinacea*), as well as occasional Orange Jewelweed (*Impatiens capensis*), Canada Goldenrod (*Solidago canadensis*), Common Dandelion (*Taraxacum officinalis*), and Calico Aster (*Symphyotrichum lateriflorum var. lateriflorum*). Canada Clearweed (*Pilia pumila*), which is rare in Wellington County (Dougan and Associates 2009), was also observed in this unit, in low numbers along the SWT2 edge north of the pedestrian bridge.	One regionally rare species – Canada Clearweed – was observed in this unit. This unit has some edge effects from the adjacent cleared parkland, but is relatively natural in comparison to other units in the study area.
Unit 1B Cultural Woodland (CUW1)	This small woodland segment, located along the north bank of the Eramosa River, is mixed, with a strong coniferous component and appears to have been heavily disturbed at some point prior to being planted with a number of native tree species.	**Canopy/Sub-canopy:** The canopy includes abundant Northern White Cedar with occasional Box Elder, Green Ash and Silver Maple (*Acer saccharinum*) and scattered Red Maple (*Acer rubrum*), Sugar Maple (*Acer saccharum var. saccharum*) and Black Walnut. **Understory:** The understory includes abundant Buckthorn, a patch of Japanese Knotweed along the shoreline, frequent young Box Elder, and occasional Red Elderberry (*Sambucus racemosa var. racemosa*). **Ground layer:** The ground layer is mainly comprised of exotic species, including abundant Garlic Mustard, frequent Common Dandelion and occasional Lesser Burdock (*Arctium minus*). Other species present include Greater Celandine, Ground Ivy (*Glechoma hederacea*), Reed Canary Grass, Canada Goldenrod and Enchanter's Nightshade (*Circaea lutetiana ssp. canadensis*).	No significant features or species were recorded in this unit. This unit includes a number of exotic / invasive species and is adjacent to a manicured park landscape.

Unit Number and ELC Interpretation	General Description	Dominant Component Species (generally listed in order of decreasing abundance)	Sensitivities and Level of Disturbance
Unit 1C Cultural Woodland (CUW1)	This large woodland segment, located along the north bank of the Eramosa River, is mixed, with a minor coniferous component, and is varied in width and canopy cover throughout its length, with some fairly open canopy areas.	**Canopy/Sub-canopy:** The canopy includes frequent Sugar Maple and Black Walnut, with occasional White Pine (*Pinus strobus*), Box Elder, Green Ash and White Ash (*Fraxinus americana*), and several other tree species present in lower numbers. **Understory:** The understory includes occasional Buckthorn, Wild Red Raspberry (*Rubus idaeus ssp. strigosus*) and Red-osier Dogwood (*Cornus sericea*), as well as abundant Thicket Creeper (*Parthenocissus vitacea*). **Ground layer:** The ground layer is comprised of a mix of native and exotic species, including abundant Garlic Mustard, frequent Canada Goldenrod and occasional Lesser Burdock, Greater Celandine, Dame's Rocket, Reed Canary Grass, Enchanter's Nightshade, Kentucky Bluegrass (*Poa pratensis ssp. pratensis*), Fowl Bluegrass (*Poa palustris*), Early Goldenrod (*Solidago juncea*) and Smooth Goldenrod (*Solidago gigantea*). One stem, potentially a garden escape, of Giant Solomon's Seal (*Polygonatum biflorum*), which is rare in Wellington County (Dougan and Associates 2009), was also observed in this unit, along the bank of the Eramosa River.	One regionally rare species – Giant Solomon's Seal – was observed in this unit. This unit includes a number of exotic / invasive species and is adjacent to a manicured park landscape.
Unit 1D Cultural Woodland (CUW1)	This unit, located along the north bank of the Eramosa River, is dominated by dense woodland patches interspersed with some open canopy edges and sections of young planted trees.	**Canopy/Sub-canopy:** The canopy includes abundant Box Elder with occasional White Pine and Green Ash as well as scattered Quaking Aspen (*Populus tremuloides*), and Crack Willow (*Salix fragilis*). **Understory:** The understory includes frequent Buckthorn, with scattered Choke Cherry, Tartarian Honeysuckle (*Lonicera tatarica*), Staghorn Sumac (*Rhus typhina*), Common Lilac (*Syringia vulgaris*) and Wild Black Currant (*Ribes americana*). A number of young planted trees are also present in the understory, including young White Spruce (*Picea glauca*), American Larch (*Larix laricina*) and Amur Maple (*Acer ginnala*). **Ground layer:** The ground layer is comprised of a mix of native and exotic species, including abundant Garlic Mustard and occasional Canada Goldenrod, Ground Ivy, Common Dandelion, Reed Canary Grass, Lesser Burdock, Kentucky Bluegrass, Dame's Rocket, Greater Celandine and avens (*Geum sp.*).	No significant features or species were recorded in this unit. This unit includes a number of exotic / invasive species and is adjacent to a manicured park landscape.
Unit 1E Cultural Woodland (CUW1)	This unit is comprised of two small woodland patches, located north of the existing trail, near the end of Armstrong Avenue. These areas are fairly dense and uniform, with low overall species diversity.	**Canopy/Sub-canopy:** The canopy includes frequent Norway Maple (*Acer platanoides*), with occasional White Ash, Freeman's Maple and American Elm (*Ulmus americana*). **Understory:** The understory is dominated by abundant Buckthorn, with occasional Choke Cherry, Tartarian Honeysuckle (*Lonicera tatarica*) and Common Lilac (*Syringia vulgaris*). **Ground layer:** The ground layer is very limited in cover, due to the dense canopy and understory layers. Species present include scattered Common Dandelion, Lesser Burdock, Dame's Rocket and avens.	No significant features or species were recorded in this unit. This unit includes a number of exotic / invasive species.

Unit Number and ELC Interpretation	General Description	Dominant Component Species (generally listed in order of decreasing abundance)	Sensitivities and Level of Disturbance
Unit 2 Dry-Moist Old Field Meadow (CUM1-1)	This unit is located north of Unit 1C, and is comprised of two cultural meadow areas with scattered planted trees, located on either side of a small laneway.	**Canopy/Sub-canopy:** Tree species in this area include occasional White Ash, Green Ash, Sugar Maple and Silver Maple. **Understory:** The understory is limited to scattered Choke Cherry, Red-osier Dogwood and Common Elderberry (*Sambucus nigra ssp. canadensis*). **Ground layer:** The ground layer is comprised of common roadside and cultural meadow species including abundant Kentucky Bluegrass, Canada Goldenrod and Creeping Thistle (*Cirsium arvense*), with occasional Common Dandelion, Leafy Spurge (*Euphorbia esula*) and Tufted Vetch (*Vicia cracca*).	No significant features or species were recorded in this unit. This is unit is limited to a fairly small area and is generally comprised of early successional, disturbance tolerant, common species.
Unit 3 Mineral Meadow Marsh (MAM2)	This unit is comprised of several small pockets of marsh habitat located within Unit 1D, along the north shore of the Eramosa River.	**Canopy/Sub-canopy:** These small pockets of meadow marsh are limited to open-canopy areas with no mature or mid-aged trees. **Understory:** The understory is limited to scattered young Box Elder and some Wild Black Currant. **Ground layer:** The ground layer is generally comprised of common wetland species such as Reed Canary Grass, Orange Jewelweed, Purple-stemmed Aster (*Symphyotrichum puniceum var. puniceum*), Smooth Goldenrod (*Solidago gigantea*), Common Boneset (*Eupatorium perfoliatum*), Canada Anemone (*Anemone canadensis*), and Stinging Nettle (*Urtica dioica ssp. dioica*). Garlic Mustard is also present.	No significant features or species were recorded in this unit. This is a wetland unit, which is mainly comprised of native wetland species and is relatively sensitive to disturbance in comparison to other natural / semi-natural vegetation within the study area.
Unit 4 Dry-Moist Old Field Meadow (CUM1-1)	This unit is located east of unit 1D, south of the existing pathway and Unit 1E. This area has been recently planted with a number of tree species and is expected to succeed to a treed community over time.	**Canopy/Sub-canopy:** This is an open canopy area with no mature or mid-aged trees present. **Understory:** The understory includes a number of young planted trees such as Box Elder, Freeman's Maple, American elm, White Pine, American Larch, Northern White Cedar and White Spruce. Some Red-osier Dogwood is also present. **Ground layer:** The ground layer is dominated by Kentucky Bluegrass, and also contains some other common meadow species such Common Dandelion, Leafy Spurge and Queen Anne's Lace (*Daucus carota*).	No significant features or species were recorded in this unit. This has been targeted for restoration and recently planted with a number of native tree species, which will be relatively sensitive to disturbance until they become well-established.

APPENDIX D – Wildlife Species List

Appendix D - Table 1: Wildlife List

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Sched.[5]	City of Guelph - Local Significance[6]	MNR Area Sensitive[7]	2015 Field Surveys		Comments
										Abundance	Breeding Status/ Evidence*	
BIRDS												
American Black Duck	*Anas rubripes*	G5	S5B							1	POSS	
American Crow	*Corvus brachyrhynchos*	G5	S5B							4	PROB	
American Goldfinch	*Spinus tristis*	G5	S5B							12	PROB	
American Redstart	*Setophaga ruticilla*	G5	S5B					G	X	4	PROB	
American Robin	*Turdus migratorius*	G5	S5B							12	CONF	
Baltimore Oriole	*Icterus galbula*	G5	S4B					G		4	PROB	
Barn Swallow	*Hirundo rustica*	G5	S4B	THR	THR	No Status	No schedule			5	OBS	Foraging over fields, no breeding evidence
Black-capped Chickadee	*Poecile atricapillus*	G5	S5							12	PROB	
Blue Jay	*Cyanocitta cristata*	G5	S5							2	PROB	
Brown-headed Cowbird	*Molothrus ater*	G5	S4B							2	POSS	
Canada Goose	*Branta canadensis*	G5	S5							14	CONF	
Cedar Waxwing	*Bombycilla cedrorum*	G5	S5B							7	PROB	
Chimney Swift	*Chaetura pelagica*	G5	S4B,S4N	THR	THR	THR	1			1	OBS	Flying high above covered bridge, no breeding evidence observed
Chipping Sparrow	*Spizella passerina*	G5	S5B							2	PROB	
Common Grackle	*Quiscalus quiscula*	G5	S5B							20	PROB	
Common Merganser	*Mergus merganser*	G5	S5B,S5N					G	X	2	PROB	
Common Yellowthroat	*Geothlypis trichas*	G5	S5B							3	PROB	
Downy Woodpecker	*Picoides pubescens*	G5	S5							3	PROB	
Eastern Kingbird	*Tyrannus tyrannus*	G5	S4B					G		2	PROB	
Eastern Phoebe	*Sayornis phoebe*	G5	S5B							1	POSS	
Eastern Wood-pewee	*Contopus virens*	G5	S4B	SC	SC	No Status	No schedule			1	PROB	Singing male on opposite side of river
European Starling	*Sturnus vulgaris*	G5	SNA							16	PROB	
Gray Catbird	*Dumetella carolinensis*	G5	S4B							4	PROB	
Great Crested Flycatcher	*Myiarchus crinitus*	G5	S4B							2	PROB	
Hairy Woodpecker	*Picoides villosus*	G5	S5					G	X	1	PROB	
House Sparrow	*Passer domesticus*	G5	SNA							4	PROB	
Mallard	*Anas platyrhynchos*	G5	S5							12	CONF	
Mourning Dove	*Zenaida macroura*	G5	S5							3	PROB	
Northern Cardinal	*Cardinalis cardinalis*	G5	S5							6	CONF	
Northern Flicker	*Colaptes auratus*	G5	S4B					G		1	PROB	
Red-eyed Vireo	*Vireo olivaceus*	G5	S5B							4	PROB	
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S4							12	PROB	
Ring-billed Gull	*Larus delawarensis*	G5	S5B,SZN					G		2	OBS	
Rock Pigeon	*Columba livia*	G5	SNA							5	PROB	
Song Sparrow	*Melospiza melodia*	G5	S5B							8	PROB	

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Sched.[5]	City of Guelph - Local Significance[6]	MNR Area Sensitive[7]	2015 Field Surveys		Comments
										Abundance	Breeding Status/ Evidence*	
Warbling Vireo	*Vireo gilvus*	G5	S5B							3	PROB	
White-breasted Nuthatch	*Sitta carolinensis*	G5	S5						X	1	PROB	
Yellow Warbler	*Setophaga petechia*	G5	S5B							2	POSS	
HERPETOFAUNA												
American Toad	*Anaxyrus americanus*	G5	S5							1	OBS	
Green Frog	*Lithobates clamitans*	G5	S5							1	VOC	
MAMMALS												
Beaver	*Castor canadensis*	G5	S5							-	OBS	Sign of dam building (cut trees); no active dam observed
Eastern Chipmunk	*Tamias striatus*	G5	S5							-	OBS	
Eastern Cottontail	*Sylvilagus floridanus*	G5	S5							-	OBS	
Grey Squirrel	*Sciurus carolinensis*	G5	S5							-	OBS	
Raccoon	*Procyon lotor*	G5	S5							-	TRK	Tracks along river

LEGEND

***Breeding Status/Evidence abbreviations:**

According to Ontario Breeding Bird Atlas definitions
OBS = Observed (no breeding evidence)
POSS = Possible breeding evidence
PROB = Probable breeding evidence
CONF = Confirmed breeding evidence

Non-avian wildlife
OBS = Observed
VOC = Vocalization
TRK = Tracks/prints

[1]G-Rank (global)
Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

- G1 Extremely rare - usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G2 Very rare - usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
- G3 Rare to uncommon - usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- G4 Common - usually more than 100 occurrences; usually not susceptible to immediate threats.
- G5 Very common - demonstrably secure under present conditions.

[2]S-Ranks (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

- S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 Secure - Common, widespread, and abundant in the nation or state/province.
- S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SAN Non-breeding accidental.
- SE Exotic - not believed to be a native component of Ontario's fauna.
- SZN Non-breeding migrants/vagrants.
- SZB Breeding migrants/vagrants.

[3]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
(federal status from COSEWIC April 2014)

EXT Extinct - A species that no longer exists.
EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
END Endangered - A species facing imminent extirpation or extinction.
THR Threatened - A species likely to become endangered if limiting factors are not reversed.
SC Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

[4]OMNRF (Ontario Ministry of Natural Resources and Forestry)
EXT Extinct - A species that no longer exists anywhere in the world.
EXP Extirpated - A species that lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.
END Endangered - A species that is facing imminent extinction or extirpation.
THR Threatened - A species that is likely to become endangered if steps are not taken to address factors threatening to lead to its extinction or extirpation.
SC Special Concern – A species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

[5]SARA (Species at Risk Act) Status and Schedule
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

EXT Extinct - A wildlife species that no longer exists.
EXP Extirpated **-** A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END Endangered - A wildlife species that is facing imminent extirpation or extinction.
THR Threatened - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC Special Concern - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

[6]**City of Guelph – Local Significance**
City of Guelph. 2012. Locally Significant Species List: Significant Wildlife List (http://guelph.ca/wp-content/uploads/LocallySignificantSpeciesListCityofGuelphJune2014.pdf).

G: Locally Significant as per Significant Wildlife List

[7] **MNR Significant Wildlife Habitat Technical Guide Area Sensitive Species**
Area Sensitivity is defined as species requiring large areas of suitable habitat in order to sustain population numbers
From: Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section. Science Development and Transfer Branch, Southcentral Science Section. 151pp. + appendices.

APPENDIX E – Correspondence

From: Marriott, David (MNRF) <David.Marriott@ontario.ca>
Sent: Tuesday, February 17, 2015 10:12 AM
To: Chris Lorenz
Cc: Timmerman, Art (MNRF); Thompson, Melinda (MNRF)
Subject: RE: Phase 2 York Trunk Sewer & Paisley Clythe Watermain - Background Information Request
Attachments: Eramosa River.jpg; 1014079_YorkSewerPh2_MNRDataRequest_2015-01-26.pdf; MNRF Guelph District - Guelph SAR List.xlsx

Hi Chris,

The Ministry of Natural Resources and Forestry (MNRF) Guelph District Office has had an opportunity to review the natural heritage information and records for the Phase 2 Sewer and Watermain project area, in the City of Guelph. It is understood that the project is currently in detailed design. Based on the location map provided, MNRF staff can provide the following comments and information for your consideration.

Fisheries

The Eramosa River adjacent to the project area is a coolwater system, that supports warmwater species, coolwater species (such as Northern Pike), and the occasional coldwater species (such as Brown Trout and mottled sculpin). The river is also a known Northern Pike spawning area at several locations within this reach. It is recommended that appropriate erosion and sedimentation controls be implemented in support of the project, to prevent sediment from entering the river.

The attached map indicates where fish and/or fish habitat data has been collected in the past. If you would like to review this information, it is recommended that Art Timmerman (MNRF Management Biologist) be contacted at art.timmerman@ontario.ca.

Species at Risk

MNRF staff notes that the pedestrian trail, baseball fields, playgrounds and beach volleyball courts are used extensively by Snapping Turtles (special concern), that come out of the river and lay their eggs. It is recommended that disturbance in these areas be avoided during the June egg-laying period, and the June to September incubation period.

Please be advised however, that because the province has not been surveyed comprehensively for the presence of listed species, the absence of a record is not an appropriate indicator for the absence of SAR from an area. To determine the presence of SAR for a given study area, the District's recommended approach includes the following:

I. Habitat Inventory

MNRF staff recommends undertaking a comprehensive botanical inventory of the entire area that may be subject to direct and indirect impacts from the proposed activity. The vegetation communities should be classified as per the "Ecological Land Classification (ELC) for Southern Ontario" system, to either the "Ecosite" or "Vegetation Type" level. With respect to aquatic habitats in the study area, we recommend you collect data on the physical characteristics of the

waterbodies and inventory the riparian zone vegetation, so that these habitats can be classified as per the Aquatic Ecosites described in the ELC manual.

II. Potential Species at Risk within the Study Area

A list of SAR that have the potential to occur in the area can be produced by cross-referencing the ecosites described during the habitat inventory with the habitat descriptions of SAR known to occur within the planning area. The list of SAR known to occur in the City of Guelph is attached for your reference. The species-specific COSEWIC status reports (www.cosewic.gc.ca) are a good source of information on habitat needs and will be helpful in determining the suitability of the study areas ecosites for a given species.

Please note that the Species at Risk in Ontario list (SARO) is a living document and is amended periodically as a result of species assessment and re-assessments conducted by the Committee on the Status of Species at Risk in Ontario (COSSARO). The SARO list can be accessed on the webpage https://www.ontario.ca/environment-and-energy/species-risk-ontario-list.

COSSARO also maintains a list of species to be assessed in the future. It is recommended to take COSSARO's list of anticipated assessments into consideration, especially when the proposed start date of the activity is more than 6 months away, or the project will be undertaken over a period greater than 6 months. The list can be viewed at http://www.ontario.ca/environment-and-energy/help-protect-species-risk.

SAR habitat prescribed under regulation can be accessed on the Environmental Registry and searching for postings related to Ontario Regulation 242/08 under the *Endangered Species Act*.

III. Species at Risk Surveys

Ministry staff are of the opinion that each SAR identified under Step II should be surveyed for, regardless of whether or not the species has been previously recorded in the area. The survey report should describe how each SAR was surveyed for, and provide a rationale for why certain species were not afforded a survey (e.g. habitat within the study area is not suitable for a specific SAR). Please note that some targeted surveys may require provincial authorizations.

Other information

MNRF staff additionally recommends contacting the City and the Conservation Authority to determine if they have any additional information or records of interest for the project area.

I hope this is of assistance.

Dave

Dave Marriott
District Planner
Ministry of Natural Resources and Forestry, Guelph District
1 Stone Road West
Guelph ON, N1G 4Y2

(P) 519-826-4926
(F) 519-826-6849
email: david.marriott@ontario.ca

From: Chris Lorenz [mailto:LorenzC@mmm.ca]
Sent: January 26, 2015 10:20 AM
To: Marriott, David (MNRF)
Cc: Heather Drost
Subject: Phase 2 York Trunk Sewer & Paisley Clythe Watermain - Background Information Request

Good morning David,

Please find attached a request for Natural Heritage information records for the installation of the York Trunk Sewer and Paisley Clythe Watermain in Guelph, ON (Key Plan included in attachment).

Please feel free to contact me if you have any questions. I look forward to your response.

Regards,

Chris

Chris Lorenz, M.Sc.
Ecologist - Fisheries
Ecology Department

MMM Group Limited
582 Lancaster Street West
Kitchener, ON Canada N2K 1M3
t: 519.743.8777 x2275 | f: 519.743.8778 | c: 226.220.5378
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Please consider the environment before printing this e-mail and/or its attachments.

From: Jason Wagler <jwagler@grandriver.ca>
Sent: Tuesday, February 03, 2015 9:27 AM
To: Chris Lorenz
Subject: RE: Phase 2 York Trunk Sewer & Paisley Clythe Watermain - Background Information Request

Hi Chris,

Current GRCA records provide the following preliminary background information:

GRCA Regulatory Features:

- The study area is adjacent to the Eramosa River.
- No wetlands are identified as occurring in the study area on the north side of the Eramosa River.
- The study area is located within the regulatory floodplain.
- There are no slope erosion hazards identified on the north side of the Eramosa River.
- There are slope valley hazards identified in the study area, along portions of the north side of the Eramosa River.

Additional Natural Heritage Information:

- There is documented pike spawning in the reaches of the Eramosa River located in the study area. There is also smallmouth bass spawning near Victoria Road. Multiple fishery monitoring locations are present along this stretch of the Eramosa River. The district Ministry of Natural Resources and Forestry (MNRF) office should be contacted for additional information.
- Information available to GRCA does not indicate any fish or mussel Species at Risk in the study area.
- There are recent observations of species of conservation concern in the study area. These species include:
    - Snapping turtle (*Chelydra serpentina*)
- There are additional historical records of herpetofaunal Species at Risk. The district MNRF office should be consulted for additional information.
- The study area has been identified as having a high water table and may have ground water discharge.

You may find background information and regulatory mapping on the Grand River Information Network (GRIN - Home). Additional information can be found in the Eramosa River Blue Springs Creek Subwatershed Study.

I trust this is helpful.

Regards,

Jason Wagler, MCIP, RPP
Resource Planner
Grand River Conservation Authority
400 Clyde Rd, Cambridge ON N1R 5W6
(519) 621-2763 x2320

www.grandriver.ca

From: Chris Lorenz [mailto:LorenzC@mmm.ca]
Sent: January-26-15 10:18 AM
To: Nathan Garland
Cc: Heather Drost
Subject: Phase 2 York Trunk Sewer & Paisley Clythe Watermain - Background Information Request

Good morning Nathan,

Please find attached a request for Natural Heritage information records for the installation of the York Trunk Sewer and Paisley Clythe Watermain in Guelph, ON (Key Plan included in attachment).

Please feel free to contact me if you have any questions. I look forward to your response.

Regards,

Chris

_____

Chris Lorenz, M.Sc.
Ecologist - Fisheries
Ecology Department

MMM Group Limited
582 Lancaster Street West
Kitchener, ON Canada N2K 1M3
t: 519.743.8777 x2275 | f: 519.743.8778 | c: 226.220.5378
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York Trunk Sewer & Paisley-Clythe Watermain Phase 2 – Notes from April 7th, 2015 Site Walk

Site Walk Attendees:

Don Kudo, City of Guelph Engineering
Helen White, City of Guelph Parks Department
April Nix, City of Guelph Environmental Planner
Prachi Patel, City of Guelph Environmental Planner
Amanda Gebhardt, MMM Group Landscape Architect
Alex Slywynskyj, MMM Group Infrastructure Engineering
Alex Green, MMM Group Infrastructure Engineering

Distribution:

Majde Qaqish, City of Guelph Engineering
Andrew Janes, City of Guelph Engineering
Mani Ruprai, MMM Group Project Manager
Peter Barrington, MMM Group Contract Administrator
Heather Drost, MMM Group Ecologist

The following items were discussed during the April 7th, 2015 site walk of the route of Phase 2 of the York Trunk Sewer & Paisley-Clythe Watermain:

1. At specific locations, namely in York Road Park and near Waterworks Place, it was noted that the areas are known to be crossing habitat for wildlife, particularly turtles. It was agreed that in these and other locations deemed to be crossing habitat that a wildlife barrier, in the form of a siltation control fence, would be erected along the limits of the construction zone. This will also be addressed in the specification.
2. On this phase MMM Landscape or Ecology staff will partake in an inspection program of the siltation control works during construction to ensure that the Contractor is in compliance with the contract.
3. Construction will be staged so as to minimize impacts to the playing fields during sports season (May 1st – September 30th).
4. The following Parks parking lots will be impacted during construction – parking lot south of Prior Construction yard (Sta. 0+530 to Sta. 0+570), parking lot at west side of Waterworks (Sta. 0+940 to Sta. 0+990), south parking lot at east side of Waterworks (Sta. 1+200 to Sta. 1+310), parking lot south of Lawrence Ave.
5. Concerns were raised about stockpiling large quantities of material so close to the river for such an extended period of time. MMM will address this in the specification by either stating that material must be taken offsite immediately or that material must be taken offsite after a certain period of time.

6. The sewer and watermain are currently impacting the dripline in York Road Park between Sta. 0+220 and Sta. 0+240. It was agreed to move the alignment about 2 metres to the north in order to eliminate impacts to the driplines in this area.
7. The sewer and watermain travel through a naturalized area between Sta. 0+360 and Sta. 0+420. It was agreed to shift the alignment about about 5 metres to the north, in order to reduce the impact on the naturalized area. This will result in the removal of the tree located at Sta. 0+370.
8. The sewer and watermain alignment will impact the driveway of Prior Construction between Sta. 0+420 and Sta. 0+520. Access to Prior's yard must be maintained during construction. It was noted that large 5-axle trucks require access to the yard, and we will need to ensure that these trucks can continue to access this yard during construction.
9. The sewer and watermain will require the removal of approximately 4 trees near Sta. 0+600. The City's preference is to impact Norway Maples as opposed to other species, as Norway Maples are considered to be an invasive species.
10. The Parks Department noted that the parking lot between Sta. 0+940 and Sta. 0+990 does not include any catchbasins and that all drainage is directed towards a break in the south curb. When this parking lot is restored, it will be imperative to ensure that this grading is maintained.
11. The greatest ecological impact will occur between Sta. 1+400 and Sta. 1+480, where the large willow tree will need to be removed as well as the first row of trees along the edge of the woodland. Beaver activity was also noted in this area. The restoration drawings for this area will be critical.
12. The City will look into whether it is possible to maintain some public access to the trail area between Sta. 1+300 and Sta. 1+900. This could include installing solid wood hoarding to separate the public area from the construction work zone.
13. It was decided to shift the pathway further to the north, such that it is in the centre of the clearing between Sta. 1+360 and 1+560.
14. At the east end of the project the watermain will be aligned with the east curb of Lawrence Ave. to allow for continuation on a future project. A multi-stem tree will be removed immediately south of the parking lot south of Lawrence Ave.
15. MMM will address other environmental concerns raised by the City in the Arborist and Environmental reports. Relevant details will be included in the contract specifications.

Notes prepared by:

Alex Green, P.Eng.
Engineer
Infrastructure and Environment

APPENDIX F – SAR Screening Table

Species At Risk Designations
ENDANGERED
THREATENED
SPECIAL CONCERN
EXTIRPATED

Species	ESA Status and Regional Occurrence	ESA Protection	Source of Record	Key Habitats Used By Species in Ontario	Reasonable Likelihood of Presence within Project Limits	Surveys Undertaken	Field Survey Results	Likelihood and Magnitude of Impacts to Species and/or Habitats
Amphibians								
Jefferson Salamander (*Ambystoma jeffersonianum*)	**Known to Occur**	Species Protection and **Habitat Regulation**	MNRF City of Guelph List (2015)	inhabit deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	None - no suitable habitat (e.g. vernal pools) within project limits and no known records within the vicinity of the project limits	General Wildlife surveys within project limits on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Birds								
Bald Eagle (*Haliaeetus leucocephalus*)	**Known to Occur**	N/A	MNRF City of Guelph List (2015); eBird	prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers; They roost in super canopy trees such as Pine	Low likelihood - known to occur in vicinity of project area as a foraging visitant/migrant along the riparian corridor (eBird records for south side of Eramosa River in winter 2014); however, no suitable nesting habitat (tall, mature trees adjacent to river) within project limits.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Barn Swallow (*Hirundo rustica*)	**Known to Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015)	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	High likelihood - common in the general area; suitable nesting habitat likely to occur in surrounding areas (bridges, barns) and foraging habitat over the Eramosa River and open lawn areas.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Confirmed (five individuals foraging over the open lawn areas with no breeding evidence observed).	No impacts to breeding habitat anticipated. Unlikely to be impacted as foraging visitant.
Bobolink (*Dolichonyx oryzivorus*)	**Known to Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015)	generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Low likelihood - no suitable nesting habitat (large areas of pasture, wheat or hay fields) within project limits and no known records within the vicinity of the project limits.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Canada Warbler (*Cardellina canadensis*; formerly *Wilsonia canadensis*)	**Suspected to Occur**	N/A	MNRF City of Guelph List (2015), eBird	Generally prefers wet coniferous, decediuous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Low likelihood - no suitable habitat (wet coniferous/deciduous forest with well-delevelped understory) within project limits; eBird records (2015) within the vicinity of the project limits - only spring/fall migrants on east side of Eramosa River.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Chimney Swift (*Chaetura pelagica*)	**Known to Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015)	historically found in deciduous and coniferous, usually wet forest types, all with a welldeveloped, dense shrub layer; now most are found in urban areas in large uncapped chimneys	High likelihood - common in the general area; suitable nesting habitat likely to occur in surrounding areas (buildings and cavity trees) and foraging habitat over the Eramosa/Speed Rivers.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Confirmed (one individual flying high above the confluence of the Speed and Eramosa River with no breeding evidence observed).	No impacts to breeding habitat anticipated. Unlikely to be impacted as foraging visitant.
Common Nighthawk (*Chordeiles minor*)	**Known to Occur**	N/A	MNRF City of Guelph List (2015)	generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops)	Low likelihood - no suitable nesting habitat (vegetation-free habitats) within project limits and no known records within the vicinity of the project limits. May occur as foraging visitant over the river.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Eastern Meadowlark (*Sturnella Magna*)	**Known to Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015)	generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Low likelihood - no suitable nesting habitat (large areas of pasture, grasslands or hay fields) within project limits and no known records within the vicinity of the project limits.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Eastern Wood-Pewee (*Contopus virens*)	**Known to Occur**	N/A	MNRF City of Guelph List (2015)	asscoiated with deciduous and mixed forests. Witin mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges.	Moderate likelihood - suitable nesting habitat in large forested areas on opposite (east) side of Eramosa River beyond project limits; unlikely to breed within project limits (smaller, less mature forest), but may occur as foraging visitant	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Confirmed adjacent to project limits (one singing male in forest on east side of Eramosa River).	Unlikely to impact breeding habitat or foraging visitants.
Golden-winged Warbler (*Vermivora chrysoptera*)	**Suspected to Occur**	N/A	MNRF City of Guelph List (2015)	generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	Low likelihood - no suitable nesting habitat (early successional vegetation) within project limits and no known records within the vicinity of the project limits.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Red-Headed Woodpecker *(Melanerpes erythrocephalus)*	**Suspected to Occur**	N/A	MNRF City of Guelph List (2015)	generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Moderate likelihood - known to occur in a variety of open forested habitats; suitable nesting habitat with cavity trees beyond the project limits to the north; unlikely to breed within project limits (less mature, low potential for cavity trees) and no known records within vicinity of project limits.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	Unlikely to impact breeding habitat or foraging visitants.

Species	ESA Status and Regional Occurrence	ESA Protection	Source of Record	Key Habitats Used By Species in Ontario	Reasonable Likelihood of Presence within Project Limits	Surveys Undertaken	Field Survey Results	Likelihood and Magnitude of Impacts to Species and/or Habitats
Wood Thrush (*Hylocichla mustelina*)	**Suspected to Occur**	N/A	MNRF City of Guelph List (2015), eBird	Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments.	Low likelihood - no suitable nesting habitat (large mature forest with well-developed understory) within project limits; limited eBird records (2014, 2015) within the vicinity of the project limits - only spring migrants on east side of Eramosa River.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Yellow-breasted Chat *(Icteria virens)*	**Known to Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015)	generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings	Low likelihood - no suitable nesting habitat within project limits and no known records within the vicinity of the project limits.	Breeding Bird surveys within project limits and adjacent natural features on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Insects								
Monarch Butterfly *(Danaus plexippus)*	**Known to Occur**	N/A	MNRF City of Guelph List (2015)	exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Moderate likelihood - limited areas of suitable cultural meadow habitat with Milkweed and other wildflowers are present within the project limits; likely to occur within vicinity of project area based on known distribution.	General Wildlife surveys within project limits on June 4 and July 2, 2015	Not detected.	Potential for temporary removal of suitable habitat; however, no vegetation removals are proposed for areas where Milkweed was recorded (low abundance) and impacts to cultural meadow features where other wildflower species occur will be tempoary as vegetation will be restored following completion of proposed works.
Rusty-patched Bumble Bee (*Bombus affinis*)	**Formerly Occurred and May Still Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015)	generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows	Moderate likelihood - potential habitat exists (urban and wooded areas) and NHIC record within vicinity of project limits (2002); however, this species is provincially very uncommon.	General Wildlife surveys within project limits on June 4 and July 2, 2015	Not detected.	Potential for temporary removal of suitable habitat; impacts to cultural meadow features where wildflower species occur will be temporary as vegetation will be restored following completion of proposed works.
West Virginia White (*Pieris virginiensis*)	**Historically Known to Occur**	N/A	MNRF City of Guelph List (2015)	generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Low likelihood - Two-leaved Toothwort not recorded during botanical field surveys and no known records within the vicinity of the project limits.	General Wildlife surveys within project limits on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Mammals								
Little Brown Myotis (*Myotis lucifugus*)	**Known to Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015); Atlas of the Mammals of Ontario (1994)	Overwintering habitat: Caves and mines that remain above 0, Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Moderate likelihood - no suitable cavity trees for maternity colony habitat or caves for overwintering habitat within Phase 2A project limits; may occur as foraging visitant over open lawn areas and Eramosa River; Atlas of the Mammals of Ontario shows records of occurrence near the City of Guelph.	Tree cavity assessment and General Wildlife surveys within project limits on June 4 and July 2, 2015. Acoustic monitoring was conducted for cavity trees identified in the Phase 2B project limits on July 16, 2015.	Not detected. Only non-SAR bats were detected through acoustic monitoring of cavity trees in the Phase 2B project limits.	No impacts to maternity or overwintering habitat anticipated; unlikely to be impacted as foraging visitant.
Northern Myotis (*Myotis septentrionalis*)	**Known to Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015); Atlas of the Mammals of Ontario (1994)	Overwintering habitat: Caves and mines that remain above 0 . Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Moderate likelihood - no suitable cavity trees for maternity colony habitat or caves for overwintering habitat within Phase 2A project limits; may occur as foraging visitant over open lawn areas and Eramosa River; Atlas of the Mammals of Ontario shows records of occurrence near the City of Guelph.	Tree cavity assessment and General Wildlife surveys within project limits on June 4 and July 2, 2015. Acoustic monitoring was conducted for cavity trees identified in the Phase 2B project limits on July 16, 2015.	Not detected. Only non-SAR bats were detected through acoustic monitoring of cavity trees in the Phase 2B project limits.	No impacts to maternity or overwintering habitat anticipated; unlikely to be impacted as foraging visitant.
Plants								
Butternut *(Juglans cinerea)*	**Known to Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015)	generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Low likelihood - there are no known records within the study area and this species was not recorded in the Phase 2 section during the EA (Genivar 2012).	Botanical inventory undertaken on May 28, 2015.	Not found.	No impacts anticipated.
Reptiles								
Blanding's Turtle *(Emydonidea blandingii)*	**Formerly Occurred and May Still Occur**	Species and General Habitat Protection	MNRF City of Guelph List (2015)	generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one meter in depth, or in slow-flowing streams	Low likelihood - no suitable habitat within project limits; potential habitat (marsh) present east of Eramosa river, beyond project limits; no known records within vicinity of project limits.	General Wildlife surveys within project limits on June 4 and July 2, 2015	Not detected.	No impacts anticipated.

Species	ESA Status and Regional Occurrence	ESA Protection	Source of Record	Key Habitats Used By Species in Ontario	Reasonable Likelihood of Presence within Project Limits	Surveys Undertaken	Field Survey Results	Likelihood and Magnitude of Impacts to Species and/or Habitats
Eastern Ribbonsnake ***(Thamnophis sauritus)***	**Known to Occur**	N/A	MNRF City of Guelph List (2015), NHIC (1990)	generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Moderate likelihood - suitable habitat within project limits (vegetation along Eramosa River); last known NHIC record within vicinity of project limits is from 1990 and habitat conditions may have been altered. No potential hibernacula features noted within project limits.	General Wildlife surveys within project limits on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Milksnake ***(Lampropeltis triangulum)***	**Known to Occur**	N/A	MNRF City of Guelph List (2015); NHIC (1978)	generally occur in rural areas, where it is most frequently reported in and around buildings, especially old structures. It is also found in a wide variety of habitats, from prairies, pastures, and hayfields, to rocky hillsides and a wide variety of forest types. They must also be in proximity of water, and suitable locations for basking and egg-laying.	Moderate likelihood - suitable habitat within project limits (occurs in variety of habitats, proximity to water); no known records within vicinity of project limits. No potential hibernacula features noted within project limits.	General Wildlife surveys within project limits on June 4 and July 2, 2015	Not detected.	No impacts anticipated.
Snapping Turtle ***(Chelydra serpentina)***	**Known to Occur**	N/A	MNRF City of Guelph List (2015)	generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	High likelihood - MNRF correspondence noted that the pedestrian trail, baseball fields, playgrounds and beach volleyball courts (within and adjacent to project limits) are used extensively by Snapping Turtles that come out of the river to lay their eggs in these areas.	General Wildlife surveys within project limits on June 4 and July 2, 2015	Not detected.	Unlikely to impact potential nesting if mitigation measures (including temporary exclusion fencing) are implemented. Not expected to impact availability of nesting habitat following completion of proposed works.