Kirby Road Widening Environmental Assessment

Environmental Impact Study Report

Prepared for:

HDR Inc.
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Project No. 2339A | May 2022

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by HDR Inc. on behalf of the City of Vaughan in September 2019 to complete an Environmental Impact Study Report (EIS) as part of the required Class Environmental Assessment (EA) for the road widening of Kirby Road, within the City of Vaughan, Ontario. The proposed project requires the completion and submission of an EIS Report under the Schedule 'C' Environmental Assessment Study in accordance with the requirements of the Municipal Class Environmental Assessment (MEA 2015).

For the purposes of this report, the "study area" refers to Kirby Road and the associated right-of-way (ROW), between Jane Street in the west and Dufferin Street in the east, and the adjacent lands within approximately 120m as shown on Map 1. The study area is located along the northern edge of the currently developed portion of the City of Vaughan, with existing farming (row crop and livestock pasture) and residential subdivision. Existing natural features are fragmented within the study area; however, several significant natural heritage features are present, predominantly in the eastern extent of the study area. Existing natural features present include: Provincially Significant Wetland, Significant Woodland, Areas of Natural and Scientific Interest, and Toronto Region Conservation Authority Environmentally Significant Area.

The City of Vaughan (2010) Official Plan (OP) (Schedule 2) identifies the presence of Core Features, in addition to lands within the study area located in the Greenbelt Natural Heritage System (Government of Ontario 2017a) and Oak Ridges Moraine Conservation Plan (Government of Ontario 2017b). Land located within the Greenbelt Natural Heritage System includes the regulation area of the Toronto and Region Conservation Authority (TRCA) and is subject to Ontario Regulation 166/06 (TRCA 2008a). This EIS Report has been prepared in accordance with the City of Vaughan's Environmental Management Guideline (2013) and TRCA's Environmental Impact Statement Guideline (2014).

This report summarizes background information on natural heritage features within the study area, as well as the results of field surveys completed by NRSI biologists to accurately characterize the existing natural environment conditions. This detailed characterization is to inform an analysis of natural feature significance and sensitivity within the study area with consideration for applicable City, Regional, and provincial legislation and regulations. An impact assessment has been completed based on a conceptual understanding for the Kirby Road widening improvements. The impact assessment is based on the preliminary design for the

Kirby Road widening to identify potential natural heritage impacts, and provide guidance on impact avoidance, minimization, and mitigation.

1.1 Relevant Policies, Legislation, and Planning Studies

Natural heritage features within the study area were assessed for significance by evaluating them against relevant policies, legislation, and planning studies. Table 1 provides an overview of policies and the analysis of natural features within the study area. These findings informed the field program and constraints analysis. The specific implications of these policies are provided to the study team here to help inform and guide a suitable development design while identifying areas to avoid and/or mitigate for.

Table 1. Relevant Policies, Legislation, and Planning Studies

Policy/Legislation	Description	Project Relevance

Provincial Policy Statement (PPS)
 	
(OMMAH 2020).
	• Issued under the authority of Section 3 of the Planning Act, the PPS came into effect on May 1, 2020, replacing the 2014 statement.
	• Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'.
	• The Natural Heritage Reference Manual (OMNRF 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000, OMNR 2015) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.
		• Based on a preliminary analysis, natural features were identified within the study area which have implications under the PPS:
		  • Significant Woodlands
		  • Significant Wetlands
		  • Significant Wildlife Habitat
		  • Habitat for Endangered and Threatened species
		  • Significant Areas of Natural and Scientific Interest (ANSI)

Endangered Species Act (ESA) (Government of Ontario 2019)	• The original ESA, written in 1971, was revised in 2007. • The ESA prohibits killing, harming, harassing, or capturing SAR and protects their habitats from damage and destruction.	• Based on the background review and SAR/SCC screening, several candidate SAR and SCC were reported within the vicinity of the study area.
Migratory Birds Convention Act (Government of Canada 2018)	• The MBCA protects migratory game birds, insectivorous birds, and several other migratory non-game birds from persecution in the form of harassment and was assented in 1994. • The schedule of on-site work must consider MBCA timing windows, with the breeding bird season typically occurring between April 1 and August 31, however, this is a guideline, since the MBCA applies to nesting bird species at any time. • "Incidental take" is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service (CWS).	• The timing of construction activities, especially vegetation clearing and site grading, must have consideration for the MBCA.
Fish and Wildlife Conservation Act, (Government of Ontario 1997)	• The FWCA provides protection for certain bird species not protected under the MBCA (e.g. raptors), as well as furbearing mammals and their dens or habitual dwellings, aside from the Red Fox (*Vulpes vulpes*) and Striped Skunk (*Mephitis mephitis*).	• The timing of construction activities, especially vegetation clearing and site grading, must have consideration for bird nesting and den sites of furbearing mammals.

City of Vaughan Official Plan (2010)	• The City of Vaughan OP requires Natural Heritage and Environmental Management objectives to be met regarding proposed development within or adjacent to identified natural heritage features as outlined in Section 3.2, 3.3 and Schedule 2 - Natural Heritage Network.
	• The OP outlines requirements for protection with respect to the Oak Ridges Moraine (Section 3.4) and Greenbelt (Section 3.5), and
		• Core Natural Areas identified within the study area based on Schedule 2 of the Official Plan include:
		  • Core Features (Significant Woodland and Provincially Significant Wetland)
		  • Greenbelt Natural Heritage System

Policy/Legislation	Description	Project Relevance
	Schedule 4 – Oak Ridges Moraine Conservation Plan & Greenbelt Plan Areas. • Impacts to natural heritage features as outlined in Section 3.2 and 3.3 of the OP should be minimized, as directed by the OP.	• Oak Ridges Moraine Conservation Plan (Natural Core Area and Natural Linkage Area)
York Region Official Plan (2019)	• The York Region OP contains objectives, policies, and mapping that implement the Region's approach to protecting the natural environment. • It provides guidance for the delineation and protection of the Greenlands System (Section 2.1.9), including Key Natural Heritage Features and Key Hydrologic Features (Section 2.2.1). • The contents of the YROP align with the Provincial Policy Statement and City OP.	• Key Natural Heritage Features identified within the study area include: • Wetlands, • Areas of Natural and Scientific Interest, • Significant Woodlands, • Significant Wildlife Habitat, and • Habitat of Endangered and Threatened Species
Growth Plan for the Greater Golden Horseshoe (Government of Ontario 2020)	• The Growth Plan, in conjunction with other provincial land use plans, builds on the Provincial Policy Statement to establish a land use planning framework for the Greater Golden Horseshoe. • The Growth Plan identifies a Natural Heritage System (NHS) for the Greater Golden Horseshoe to be integrated into long-term regional planning approaches for the protection of these features and their ecological functions. • Updated NHS mapping for the Greater Golden Horseshoe was released in February 2018.	• The Growth Plan defines Key Natural Heritage Features (KNHFs) to include, in part, SAR habitat, fish habitat, wetlands, Significant Woodlands, and SWH. • The Growth Plan defines Key Hydrologic Features (KHFs) to include, in part, permanent and intermittent streams, seepage areas/springs, and wetlands. • The Growth Plan NHS overlaps with portions of the study area.
Greenbelt Plan (Government of Ontario 2017a)	• Aims to protect areas of significance in close proximity to the Golden Horseshoe, surrounding Lake Ontario.	• The Greenbelt Natural Heritage System within the project study area includes the Don River West Branch corridor, identified as HDF3 in this report. • Features identified as "Key Natural Heritage Features" which are or may be applicable to this study include: • Significant habitat of Endangered, Threatened and Special Concern species, • Significant Wildlife Habitat, • Fish Habitat • Features identified as "Key Hydrologic Features" which are or may be applicable to the study area include: • Permanent and intermittent streams, • Seepage areas and springs

Policy/Legislation	Description	Project Relevance

Oak Ridges Moraine Conservation Plan (Government of Ontario 2017b)	• Guides sustainable land use planning for the protection of the ecologically and hydrologically sensitive terrestrial and aquatic features of the Oak Ridges Moraine.	• ORMCP features mapped within the study area include the following:
		  • Natural Core Area
		  • Natural Linkage Area

Fisheries Act	• Under the updated federal *Fisheries Act*, fish are protected through two core prohibitions: Section 34.4(1) the death of fish by means other than fishing, and Section 35(1) the harmful alteration, disruption, or destruction (HADD) of fish habitat (Government of Canada 2019). • Any proposed work, undertaking, or activity should aim to avoid causing the death of fish, or the harmful alteration, disruption or destruction of fish habitat through the course or as a result of any proposed undertaking. Fish habitat is defined as "spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes". • If there is any proposed work below the high-water mark or channel itself, a proponent-led Department of Fisheries and Oceans (DFO) assessment must be completed for the proposed works to determine if the works have the potential to contravene the *Fisheries Act* and require a request for review by the Fisheries Protection Program. • If impacts to fish or fish habitat cannot be mitigated effectively, a *Fisheries Act* Authorization may be required.	• The study area includes headwater drainage features that may be protected under the *Fisheries Act*. • If works are to be completed in the vicinity of watercourses that contain fish habitat, a proponent-led DFO assessment is required to ensure that the works will result in no residual negative effects to fish or fish habitat.

Ontario Reg. 166/06: Toronto And Region Conservation Authority (TRCA): Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (2013)	• Regulation issued under *Conservation Authorities Act,* R.S.O. 1990.
	• Through this regulation, the TRCA has the responsibility to regulate activities in natural and hazardous areas (i.e. areas in and near rivers, streams, floodplains, wetlands, and slopes).
		• The TRCA regulates a portion of the study area, primarily associated with the presence of drainage features and wetlands. TRCA regulated features within the study area, include the following:
		  • a tributary to the Don River,
		  • Unevaluated wetland, and
		  • a portion of the Don River West Branch Headwater Provincially Significant Wetland Complex.

2.0 Background Review and Significant Habitat Screening

2.1 Background Information Secondary Sources

A review of existing natural heritage information was completed to identify the presence of natural heritage features and species that are reported from or have potential to occur within the study area. Background information relevant to the study area was collected and reviewed from the following sources:

- Natural Heritage Information Centre (NHIC) Biodiversity Explorer (MNRF 2020a);
- Species at Risk in Ontario List (MNRF 2020b);
- Land Information Ontario (LIO) data base mapping;
- York Region Official Plan (2019);
- City of Vaughan Official Plan (2010);
- City of Vaughan Natural Heritage Network Study (North-South Environmental Inc. 2010);
- Upper West Don Subwatershed Study City of Vaughan (Cole 2016);
- Fisheries and Oceans Canada (DFO) Species at Risk Mapping (DFO 2019);
- Government of Canada (2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Ontario Breeding Bird Atlas (BSC et al. 2008);
- Ontario Odonata Atlas (MNRF 2005); and
- Ontario Butterfly Atlas (Jones et al. 2020).

2.2 Species at Risk and Significant Wildlife Habitat Screening

For the purposes of this report, SAR include species listed as 'Threatened' or 'Endangered' under the provincial *Endangered Species Act* (ESA). In Ontario, provincial Species of Conservation Concern (SCC) include:

- species designated under the ESA as 'Special Concern' within Ontario,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre,
- species that have a high percentage of their global population in Ontario, and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the Committee on the Status of Species at Risk in Ontario (COSSARO). These species

may be protected by the federal *Species at Risk* Act (SARA) if they are listed as Threatened or Endangered on Schedule 1 of the SARA.

Habitat for SCC is considered Significant Wildlife Habitat (SWH), which is afforded protection under the Provincial Policy Statement (OMMAH 2014) and municipal natural heritage protection policies.

Based on NRSI's examination of background sources and federally or provincially significant species with occurrence records in the study area vicinity (within 10km), an assessment of SAR and SCC suitable habitat presence within the study area was completed. Assessments of habitat suitability in the study area were made by cross-referencing each species' known habitat preferences or requirements (e.g. OMNR 2000) against habitats known to occur in the study area. This was completed to ensure that the potential presence of all significant species within the study area was adequately assessed to inform the Class EA.

Based on this screening exercise, suitable habitat for several SAR and SCC was identified within the study area (Appendix I).

A preliminary screening for the presence of SWH was also completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) is a guideline document that outlines the types of habitats that the MNRF considers significant in Ontario, as well as criteria to identify these habitats (OMNR 2000, MNRF 2015). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of SCC, and animal movement corridors. This screening involved the comparison of MNRF criteria outlined for Ecoregion 7E, in which the study area is located, against habitats known to occur in the study area.

Based on this screening exercise, confirmed and candidate SWH were identified within the study area (Appendix II).

3.0 Field Methods

Terrestrial and aquatic field surveys were undertaken within the study area to characterize natural features and identify those that are significant and sensitive and that have potential to be adversely affected by the proposed undertaking. A total of 11 site visits were completed in 2019 and 2020, as described below, with details provided in Table 2.

3.1.1 Terrestrial Field Surveys

Vegetation Community Mapping and Vascular Floral Inventory

Vegetation communities within the study area were described and mapped using the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). A comprehensive inventory of vascular flora was completed to inform the ELC vegetation community classifications. ELC and vegetation inventory work was restricted to the road ROW due to land access within the study area.

Tree Inventory

All trees ≥10cm diameter-at-breast-height (DBH) within the study area, including intersecting roads, were inventoried and assessed for health condition by Certified Arborists. The following information was recorded for each tree:

- species,
- DBH (cm),
- crown radius (m),
- general health (excellent, good, fair, poor, very poor, dead),
- potential for structural failure (improbable, possible, probable, imminent),
- general comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development), and
- presence of tree cavities using MNRF bat habitat assessment protocol (see below).

The location of each inventoried tree was georeferenced to sub-meter accuracy using a SXBlue II GNSS GPS unit by a biologist.

Bat Habitat Tree Assessment

Two bat species reported from the area are listed as Endangered provincially and are afforded general habitat protection under the *Endangered Species Act* (2007): Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*).

These species are known to roost in tree cavities, hollows, or under loose bark, as well as within buildings (OMNR 2000). As part of the tree health assessments, NRSI's Certified Arborists, who are trained and experienced in the Ministry of Natural Resources and Forestry (MNRF) bat habitat assessment protocols (OMNRF 2017), visually scanned all trees ≥10cm DBH for the presence of features (i.e. cavities, loose bark, etc.) that may provide bat maternity colony habitat.

Breeding Bird Surveys

Two early morning breeding bird area search surveys were completed in accordance with the Ontario Breeding Bird Atlas (OBBA) protocol (BSC 2001). Surveys were completed between a half-hour before sunrise and 1000hrs and were timed to occur at least 10 days apart. Surveys were completed through a comprehensive area search of study area lands. Standard breeding evidence codes were recorded based on OBBA protocol (BSC 2001).

Visual Reptile Survey

Two visual encounter surveys (VES) were completed to assess the presence of basking reptiles (snakes and turtles) in suitable habitat within the study area. The investigation included an assessment of habitat suitability for reptile species reported from the study area vicinity (Ontario Nature 2019).

3.1.2 Headwater Drainage Feature Assessment

NRSI conducted a headwater drainage feature (HDF) assessment to identify, evaluate and classify HDFs within the study area. A guideline document was prepared by the TRCA and Credit Valley Conservation Authority (2014) to provide direction for features that are not clearly covered by existing policy and legislation, but may contribute to the overall health and function of the watershed. According to the guideline, headwater features include:

- non-permanently flowing drainage features that may not have defined bed or banks;
- first-order and zero-order intermittent and ephemeral channels;
- swales; and
- headwater wetlands.

The Headwater Guideline (CVC and TRCA 2014) was developed in conjunction with the Ontario Stream Assessment Protocol (OSAP) Section 4: Module 10 methods for Assessing Headwater Drainage Features (Stanfield 2017). Based on the background information collected for the

study area and a review of aerial photography, field surveys were scoped to the rapid assessment level. The rapid methodology involves evaluating an HDF using the OSAP methods only. No additional surveys are required; however, anuran surveys were conducted for the EIS and the results were used to inform the HDF assessment.

NRSI conducted 2 site visits, as per the Headwater Guideline (CVC and TRCA 2014) and OSAP (Stanfield 2017) methods; a third visit was not required due to the results of the first two visits. The first visit was conducted on April 24, 2020 and the second on May 22, 2020. During the first and second HDF site visits, the Kirby Road ROW within the study area was walked in its entirety, where access permitted, to identify the presence of HDFs. Headwater Drainage Features are shown on Map 2. Data was collected using the OSAP field form, and photographs and GPS coordinates were taken during the first and second site visit.

Following the second site visit, NRSI classified the HDF following the Headwater Guideline and the 4 categories of classification: Hydrology, Riparian, Fish and Fish Habitat, and Terrestrial Habitat (CVC and TRCA 2014). The overall classification for the HDF includes the combination results from all surveys and is based on the highest level of function.

Following the second site visit, NRSI assessed each HDF over 4 steps to evaluate and classify its functional importance and to identify management recommendations. Step 1 evaluates the hydrologic contribution and function of each reach; Step 2 assesses the riparian vegetation and conditions; Step 3 assesses the features contribution to fish and fish habitat; and Step 4 evaluates the terrestrial habitat function each reach provides. The field work included documenting information on ecological and geomorphological form and function to inform these steps. The information collected at several locations within each HDF included the following:

- Bankfull width and depth;
- Wetted width and depth;
- Bank height;
- Bank angle;
- Bank material;
- Substrate composition;
- Flow velocity;
- Riparian habitat type;
- Feature vegetation; and

- Observed wildlife.

NRSI then determined the management recommendation for the HDF following the science-based decision-making framework provided in the Headwater Guideline (CVC and TRCA 2014). This decision-making framework applies the precautionary principle to provide recommendations based on the highest level of function observed.

Table 2. Field Survey Summary

Survey Type	Protocol	Date (2020)	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Significant Wildlife Habitat Search	Systematic search by ELC polygon	November 12[1]	1030-1330	-4	3	0	None	K. Burrell P. Deacon
Ecological Land Classification	Lee et. al (2008)	November 12[1]	1030-1330	-4	3	0	None	K. Burrell P. Deacon
		May 30	0630-1030	14	1	60	None	J. Pickering
		July 9	0700-1000	23	0	0	None	K. Burrell P. Deacon
Vascular Flora Inventory	Systematic search by ELC polygon	November 12[1]	1030-1330	-4	3	0	None	K. Burrell P. Deacon
		May 30	0630-1030	14	1	60	None	J. Pickering
		July 9	0700-1000	23	0	0	None	K. Burrell P. Deacon
Tree Inventory and Bat Habitat Assessment	MNRF (2017)	December 10[1]	--	--	--	--	--	J. Lance K. Ellis L. Milne
		December 11[1]						
		December 12[1]						
Breeding Bird Surveys	BSC (2001)	May 30	0630-1000	14	1	60	None	J. Pickering
		July 9	0700-1000	23	0	0	None	K. Burrell P. Deacon
Anuran Call Surveys	BSC 2009	April 30	2030-2130	8	3	50	None	K. Burrell L. Knopf
		May 21	2100-2200	17	2	70	None	K. Burrell L. Knopf
		June 25	2100-2215	18	2	60	None	K. Burrell L. Knopf

Survey Type	Protocol	Date (2020)	Start and End Time (24 hrs)	Temp. (°C)	Wind Speed (Beaufort Scale)	Cloud Cover (%)	Precipitation	Observers
Reptile Area Searches	Systematic search within suitable habitat	May 30	0630-1030	14	1	60	None	J. Pickering
		July 9	0700-1000	23	0	0	None	K. Burrell P. Deacon
Headwater Drainage Feature Assessment	CVC and TRCA (2014)	April 24	1100-1400	11	3	0	None	G. MacVeigh J. Pickering
		May 22	1200-1500	22	0	20	None	G. MacVeigh J. Pickering

[1]Survey completed in 2019.

4.0 Existing Conditions

4.1 Soils, Terrain and Drainage

The study area is located in an area characterized by rolling topography. Soils within the western half of the study area are characterized by Monoghan and Woburn soil types, consisting of silt loam and sandy loam, respectively (Hoffman and Richards 1955). The western portion of the study area gradually ascends to the east, where it reaches a high point of 313 metres above sea-level (masl), opposite the entrance to Ravineview Drive. The eastern half of the study area is characterized by Pontypool soils, consisting of sandy loam (Hoffman and Richards 1955). The elevation in this section of the study area drops relatively quickly opposite Ravineview Drive, to a low point of 283 masl, before ascending again, at the far eastern end of the study area.

In the western portion of the study area, the Don River West Branch is a tributary that is regulated by the TRCA. This tributary was observed to be dry throughout the course of fieldwork collection (i.e. 2019 and 2020) and is actively farmed; it was assessed as a HDF. The Upper West Don Subwatershed Study (Cole 2016) identified this as an ephemeral tributary, Tributary 1. The study area is located in an area undergoing rapid intensification: the eastern half of the study area is characterized by new residential homes, while the western half of the study area is characterized by active agriculture.

4.2 Vegetation

The study area consists of both urban and rural residential properties, industrial and commercial sites, a golf facility, an active rail line, agricultural lands, and woodlands located primarily in the eastern portion of the study area. As surveys were conducted from within the road ROW and without access to private properties, soil sampling was not completed as part of the vegetation community mapping exercise. The vegetation communities present within the study area are described in Table 4, below. Refer to Map 2 for the study area ELC communities and the surrounding land-uses.

Table 3. Vegetation Communities Identified within the Study Area

ELC Ecosite Type	ELC Description	Environmental Characteristics
FOD5	Dry - Fresh Sugar Maple Deciduous Forest Ecosite	A relatively large Sugar Maple (*Acer saccharum*) dominated forest is present in the western extent of the study area, approximately 150m north of Kirby Road. Other tree species

ELC Ecosite Type	ELC Description	Environmental Characteristics
		present include American Basswood (*Tilia americana*), Black Cherry (*Prunus serotina*), and Bitternut Hickory (*Carya cordiformis*). The understorey and groundcover could not be assessed from the roadside.
FOD1-1	Dry - Fresh Red Oak Deciduous Forest Type	The forest to the east of Dufferin Street is rolling with a canopy of Red Oak (*Quercus rubra*). The drier soils support a unique groundcover dominated by Bracken Fern (*Pteridium aquilinum*) and Pennsylvania Sedge (*Carex pensylvanica*). The forest has complex topography and drainage and a number of regionally significant plant species are found in this habitat (all were observed in the western unit during the 2020 roadside surveys).
FOD	Deciduous Forest	Two portions of the forest in the eastern extent of the site could not be assessed from the roadside. Given the similar topography it is assumed that these areas reflect the Dry - Fresh Red Oak Deciduous Forest Type (FOD1-1) community to the east of Dufferin Street.
FOM2	Dry - Fresh White Pine - Maple - Oak Mixed Forest Ecosite	Two areas of mixed forest are present in the eastern extent of the study area on the north side of Kirby Road. The western unit is situated on an east-facing slope while the eastern unit is on a west-facing slope. These areas contain a mixture of Sugar Maple, White Pine (*Pinus strobus*), and Red Oak. The eastern unit has a concentration of Eastern Hemlock (*Tsuga canadensis*) near the toe-of-slope and may be directing groundwater toward the adjacent wetland. Similar to the Dry - Fresh Red Oak Deciduous Forest (FOD1-1), a number of regionally significant plant species are found in this habitat (all were observed in the eastern unit during the 2020 roadside surveys).
SWD3	Maple Mineral Deciduous Swamp Ecosite	Near the eastern extent of the study area, a Freeman Maple (*Acer* X *freemanii*) swamp is bisected by Kirby Road. The swamp exhibits a diverse groundcover, including Sensitive Fern (*Onoclea sensibilis*), Field Horsetail (*Equisetum arvense*), and a diversity of Sedges (*Carex* spp.). The small portion of the swamp to the north of the road directs flows to the south.
SWT	Thicket Swamp	A portion of the roadside ditch corridor in the west half of the study area is comprised of thicket swamp. Roadside assessment noted the presence of Willows (*Salix* spp.) and Dogwood (*Cornus* sp.) with Reed-canary Grass (*Phalaris arundinacea*) occurring in patches throughout.
MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type	A portion of the roadside ditch corridor in the west half of the study area contains a riparian marsh dominated by Reed-canary Grass. Sparse trees and shrubs are present and transition to swamp thicket to the west.
MAM2	Mineral Meadow Marsh Ecosite	A small, isolated wetland is present near the Kirby Road – Ravineview Drive intersection. This marsh contains a mixture of Narrow-leaved Cattail (*Typha angustifolia*) and Reed-canary Grass, with Red-osier Dogwood (*Cornus sericea*) and Willows (*Salix* spp.) occurring sporadically. The feature appears to drain in an eastward direction along the north side of Kirby Road but dissipates through the agricultural field before reaching any other natural feature.

ELC Ecosite Type	ELC Description	Environmental Characteristics
CUW	Cultural Woodland	A treed area is present on the southwest corner of the Kirby Road – Dufferin Street intersection. This stand of mid-age trees appears to have been planted and includes a mixture of Maple (*Acer* sp.), White Pine and declining Ash (*Fraxinus* sp.). A dense groundcover of Raspberry (*Rubus* sp.) and Goldenrod (*Solidago* sp.) is present where canopy openings exist. This community is approximately 5-10m below the grade of the surrounding roads.
CUP3-2	Plantation	Areas of mature White Pine plantation are present near the Dufferin Street intersection and are associated with the larger deciduous forest feature. The roadside assessment noted a small amount of hardwood regeneration in the understorey and a sparse groundcover of native species including Canada Mayflower (*Maianthemum canadnese*) and Spinulose Woodfern (*Dryopteris carthusiana*).
CUS	Cultural Savannah	This community type is present on the south side of Kirby Road across from the golf facility and contiguous with hedgerow H3. The small lot appears to be an abandoned residential property with sparse mid-age landscape trees including White Cedar (*Thuja occidentalis*) and Maple (*Acer* sp.) remaining and a groundcover of overgrown turfgrass.
CUM	Cultural Meadow	Three areas of Cultural Meadow are present on the south side of Kirby Road including an abandoned rural residence site, a meadow surrounding a marsh and a slope to the west of the intersection with Ravineview Drive. Narrow strips of meadow are also present within the road ROW at several locations. These areas are comprised of Smooth Brome (*Bromus inermis*), Reed-canary Grass, New England Aster (*Symphyotrichum novae-angliae*), Canada Goldenrod (*Solidago candensis*), Wild Teasel (*Dipsacus fullonum*), and Creeping Thistle (*Cirsium arvense*). Trembling Aspen (*Populus tremuloides*) saplings are beginning to establish in these areas.
H	Hedgerow	Deciduous hedgerows are present within the study area; both parallel and perpendicular to Kirby Road. These features are comprised mainly of mid-age deciduous trees including Sugar Maple, American Basswood, Black Cherry, and Red Oak, with an understorey of Grey Dogwood, Alternate-leaved Dogwood, and Chokecherry. As of August 2020, H1, as shown on Map 2A, had been cleared up to the edge of the deciduous forest and had become agricultural land (i.e. ploughed). H2 and H3 follow property boundaries and act as a narrow, vegetated corridor crossing Kirby Road between Jane Street and Keele Street. H4 is present immediately north of Kirby Road near the intersection with Foot Hills Road. This hedgerow contains mature Red Oak and connects forest parcels to the west and east.
Ag	Agriculture	Agricultural lands observed in 2019 and 2020 include fields of soybeans and corn, as well as several hayfields and an actively grazed pasture. The hayfields and pasture are located in the western extent of the study area and are comprised of cool season forage grasses and legumes. The hayfields appear to be cut annually and exhibit relatively low plant species diversity.

ELC Ecosite Type	ELC Description	Environmental Characteristics
Res	Residential	The study area contains both urban and rural residential properties. Most rural residences are near Jane Street and some barns or outbuildings are present.

4.2.1 Vascular Flora

A total of 130 species of vascular flora were inventoried within the study area during the three-season roadside surveys. A complete list of inventoried species is provided in Appendix I. Of the species observed, 74% are considered native (MNRF 2019a). The majority of inventoried species reflect the intact to moderately disturbed natural features concentrated in the eastern extent of the study area. Most non-native invasive species are found in the cultural meadows and abandoned parcels in the western extent of the study area and along the road ROW.

No federally and provincially significant flora species were observed. A number of plant species considered significant in York Region (Varga 2000) or within the TRCA watershed (TRCA 2008b) were documented from the woodlands near the Kirby Road - Dufferin Street intersection. Those species considered significant in York Region, many of which exhibit a high Coefficient of Conservatism value (Oldham et al. 1995) are outlined in Section 5.7 and Table 5, below. The 'R#' rank indicates the number of stations for a given species known at the time the list was published in 2000. Additional species considered uncommon in the Region or significant in the TRCA watershed are listed in Appendix I; these are not indicated on Map 3.

Table 4. Regionally Significant Plant Species Observed

Common Name	Scientific Name	York Region	Observation Notes
New York Fern	*Thelypteris noveboracensis*	R10	One patch on lower slope in FOM2.
Fragrant Sumac	*Rhus aromatica*	R1	Demonstrably planted at residential property, not considered native at this location.
Poke Milkweed	*Asclepias exaltata*	R3	One patch on dry-fresh slope in FOM2.
Pale Dogwood	*Cornus obliqua*	R7	Shrubs growing in several areas in SWD3 on both sides of Kirby Road.
Large Tick-trefoil	*Hylodesmum glutinosum*	R6	About 10 plants growing on dry forest ridge in FOD1-1 with other dry oak forest species.
Common Prickly-ash	*Zanthoxylum americanum*	R1	Clone patch growing on dry forest ridge in FOD1-1 with other dry oak forest species.

Common Name	Scientific Name	York Region	Observation Notes
Thin-leaved Sedge	*Carex cephaloidea*	R3	About 5 plants growing on dry forest ridge in FOD1-1 with other dry oak forest species.
Bronze Sedge	*Carex foenea*	-	Not reported for York Region and presumably new for the Region. A few plants growing on dry forest ridge in FOD1-1 with other dry oak forest species.
Troublesome Sedge	*Carex molesta*	R8	A single plant on dry-fresh slope in FOM2.
Eastern Mannagrass	*Glyceria septentrionalis*	R10	Large patch of hundreds of stems in wetland.

A number of aggressive non-native species were observed within the study area, including European Buckthorn (*Rhamnus cathartica*), Autumn Olive (*Elaeagnus umbellata*), Tartarian Honeysuckle (*Lonicera tatarica*), European Swallowwort (*Vincetoxicum rossicum*), European Reed (*Phragmites australis* ssp. *australis*), and Scot's Pine (*Pinus sylvestris*). These species generally occur along edges of natural features or in disturbed areas and can out-compete native vegetation and lead to a reduction in biodiversity.

4.2.2 Tree Inventory

In total, 466 trees ≥10cm DBH were inventoried within the Kirby Road ROW within the study area, comprising 45 species. Of the native species observed, Eastern Red Cedar (*Juniperus virginiana*) and Slippery Elm (*Ulmus rubra*) are listed as uncommon in York Region (Varga 2000). No SAR trees were observed within the study area. A high proportion of inventoried trees are native species (77%). Nearly all of the Ash (*Fraxinus* sp.) trees inventoried displayed evidence of infestation by Emerald Ash Borer (*Agrilus planipennis*).

Natural Resources Canada has confirmed that Asian Longhorned Beetle (*Anoplophora glabripennis*) outbreak is officially exterminated (Government of Canada 2020).

A detailed assessment of trees within the study area, and comments about avoiding or mitigating project impacts upon trees, are provided in the Tree Protection Plan (TPP; Appendix IV).

It should be noted that, because the preferred Preliminary Design proposes the widening of the existing ROW in places, such that some trees within the widened ROW could not be inventoried from the current publicly accessible ROW, some trees that were not recorded during the tree inventory may be impacted by the undertaking. It is therefore recommended that

supplementary tree inventory take place in support of the Detailed Design in order to fully assess impacts to trees in the study area. See the TPP for specific portions of the study area that require supplemental tree inventory work.

4.3 Wildlife

4.3.1 Birds

A total of 135 bird species are reported from the 10x10km OBBA squares that overlap with the study area (BSC et al. 2008). The data found in the OBBA includes those species that have been observed in the area (10x10km range), are known to nest in the area, and/or have exhibited some evidence of breeding in the area. A total of 46 of these species were documented within the study area during the field surveys, of which 42 species exhibited signs of breeding, such as males singing, females carrying food or nest materials, or the presence of fledged young. An additional 4 species were observed during other field investigations which did not exhibit signs of breeding evidence, such as species observed during migration periods. A complete list of bird observations is provided in Appendix III.

NRSI field surveys documented 3 significant bird species within the study area: Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), and Eastern Wood-Pewee (*Contopus virens*).

Barn Swallow is ranked as Threatened provincially; the species is noted to be common throughout Ontario, however, it has experienced widespread declines. Barn Swallows were noted at 3 locations within the study area on May 30 (Map 3), comprising single individuals at each location (i.e. BARS-001 – 003). At least 6 individuals were documented on the second breeding bird visit (July 9) at BARS-001 (Map 2). All individuals documented throughout the study area were of individuals foraging over open fields and meadow habitats. Suitable nesting locations, in the form of an active barn with livestock is present at the extreme western end of the study area. Access to this property was not granted during the course of fieldwork; however, observations indicate that nesting is likely occurring within the barn, given excellent foraging areas (i.e. pasture) immediately adjacent to the barn, and the barn providing an ideal nesting location for the species. Observations of Barn Swallows at BARS-001 and -002 were not in the vicinity of suitable nesting locations.

Bobolink is ranked as Threatened provincially; the species is noted to be common throughout Ontario, however, it has experienced widespread declines. A single individual was documented on the May 30 visit (BOBO-001) and two individuals were observed on the July 9 visit (BOBO-

002) (Map 3). Both observations were within the same agricultural pasture, outside of the study area, however, contiguous habitat is present within the study area. Based on the habitat present and the nature of observations, it is presumed that nesting occurred within the agricultural pasture.

Eastern Wood-Pewee is ranked as Special Concern provincially; the species is noted to be common throughout Ontario, however, it has experienced widespread declines. Eastern Wood-Pewee was observed on both breeding bird visits (May 30 and July 9) and was documented by the presence of singing males at four locations (Map 3). Probable nesting was documented by the presence of singing males observed at these locations on both dates, spanning a period of more than 7 days. Based on the habitat requirements of the species (i.e. deciduous and mixed woodland), the species is most likely breeding within the study area.

An additional 4 species of regional significance were documented over the course of NRSI field investigations: Black-billed Cuckoo (*Coccyzus erythropthalmus*), Chestnut-sided Warbler (*Setophaga pensylvanica*), Eastern Towhee (*Pipilo erythrophthalmus*), and Vesper Sparrow (*Pooecetes gramineus*), and. All of these species are ranked as S4 or S5 in Ontario, designating their abundance in the province. Locations of observations are provided on Map 3.

All observations involved a single, singing male of each species exhibiting possible breeding behaviour. The location of the singing male Vesper Sparrow was noted to be outside of the study area.

4.3.2 Herpetofauna

According to the Ontario Reptile and Amphibian Atlas (ORAA), 23 species and forms of herpetofauna are reported from the vicinity (approximately 10km) of the study area (Ontario Nature 2019). NRSI field investigations confirmed the presence of 2 species within the study area: Spring Peeper (*Pseudacris crucifer*) and Gray Treefrog (*Hyla versicolor*). Both Spring Peeper and Gray Treefrog are common and secure in Ontario.

Anuran call surveys were conducted to identify the presence of breeding frog and toad species within the subject property. Anurans were observed at both stations: ANR-001 and -002. A total of two Spring Peepers were noted on the April visit at ANR-001. A single Gray Treefrog was documented while NRSI biologists completed the May visit at ANR-002, however, this individual was noted to be >100m from the station centre.

A complete list of herpetofauna reported from the study area, based on background information and observations by NRSI biologists, is included in Appendix IV.

4.3.3 Insects

According to the Ontario Butterfly Atlas (Jones et al. 2020), 52 butterfly species are known to occur within the 10x10km atlas square that overlaps with the study area, one of which, Monarch (*Danaus plexippus*), is identified as significant. NRSI biologists observed 4 species during surveys completed within the study area: Cabbage White (*Pieris rapae*), Clouded Sulphur (*Colias philodice*), Common Wood-Nymph (*Cercyonis pegala*), and Common Ringlet (*Coenonympha tullia*). All butterfly species observed by NRSI biologists are species ranked as common and secure throughout the province. Although Monarch was not observed by NRSI biologists, it may be present, as its larval food source, Milkweed sp. (*Asclepias* sp.) was observed within the study area, albeit in low abundance. A complete list of species observed is provided in Appendix IV.

4.3.4 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 42 mammal species are reported from within 10km of the study area. Four mammal species were observed by NRSI biologists within the study area. These include species commonly found within woodland and urban environments: Eastern Cottontail (*Sylvilagus floridanus*), Gray Squirrel (*Sciurus carolinensis*), Eastern Chipmunk (*Tamias striatus*), and Northern Raccoon (*Procyon lotor*). Appendix IV provides a complete list of mammal species reported from the study area.

Bat Habitat Assessment

A bat habitat assessment was conducted within the Kirby Road ROW, within the study area. Bat roost habitat assessments found 11 trees that have cavities, cracks or loose bark that may provide suitable maternal roosting habitat for Little Brown Myotis or Northern Myotis. Seven of these trees are part of woodlands adjacent to the study area, and the other 4 are either in a hedgerow or isolated along the Kirby Road ROW. Trees with features suitable for maternal roosting habitat for SAR bats are identified on Map 3.

Evaluation methods followed the MNRF Guelph District's guidance document, *Survey Protocol for Species at Risk Bats within Treed Habitats* (OMNRF 2017).

4.4 Headwater Drainage Feature Assessment

Six potential HDFs were identified within the study area (Map 2). HDR1 is a roadside ditch within the northeast corner of the study area. HDR2 and HDR2-001 are an unconstrained feature leading to a roadside ditch located along the northern edge of the study area. HDR3 and HDR4 are undefined features that connect to the roadside ditches in the western extent of the study area. HDR5 is the wetland along the northern extent of the study area.

Much of the study area has seen modification through agricultural and residential development. The following table describes the HDF dimensions and other characteristics based on data collected during the 2 site visits.

Table 6. Headwater Drainage Feature Characteristics

	HDR1	HDR2	HDR2-001	HDR3	HDR4	HDR5
Average Bankfull Width	1.9 m	0.95 m	1.2 m	0.8 m	N/A	N/A
Average Bankfull Depth	0 mm	83 mm	50 mm	273 mm	N/A	N/A
Evidence of Sediment Transport	None	Evidence of sediment transport through sheet erosion visible during site visit 1 and 2	None	Evidence of sediment transport through instream bank erosion and adjacent rills present during site visit 1	Some evidence of sediment transport through sheet erosion visible during site visit 1	None
Evidence of Sediment Deposition	None	Significant sediment deposition present during site visit 1 and 2	Minimal sediment deposition present (<5mm) during site visit 1 and 2	Significant sediment deposition present during site visit 1	None	None

* Averages were based on a minimum of 3 measurements taken along the length of the segment during each site visit.

HDF1

HDF1 is located in the northeast corner of the study area running parallel on the north side of Kirby Road. HDF1 was noted to be dry during both site visits. The feature is classified as a roadside ditch, with boulder substrate that was dry with no visible groundwater inputs. The feature is located within the FOM2 community, while the southern bank was primarily manicured lawn, adjacent to Kirby Road.

HDF2

HDF2 is located in the eastern portion of the study area, on the north side of Kirby Road. The feature runs west to east and is an undefined channel, where it merges with HDF2-001. There was extensive evidence of sediment transport and deposition present, however, there was no substrate sorting visible. The feature was generally undefined with active agricultural lands surrounding it.

HDF2-001

HDF2-001 is a roadside ditch located between HDF1 and HDF2. This feature runs parallel to Kirby Road; the feature was noted to be dry during the both site visits. There was no evidence of sediment transport. Vegetation surrounding this feature was primarily active agricultural lands and an FOM2 community.

HDF3

HDF3 is an undefined feature flowing from the north towards the roadside ditch alongside Kirby Road within the western portion of the study area. There was evidence of sediment transport and deposition during the first visit, however, between the first and second visit the feature was tilled for agriculture. Active agricultural lands surround this feature.

HDF4

HDF4 is an undefined feature flowing from the north towards the roadside ditch alongside Kirby Road at the westernmost extent of the study area. There was minimal sediment transport and deposition visible during the first visit and none during the second visit, as the feature had been tilled for agriculture. Active agricultural lands surround this feature.

HDF5

HDF5 is a small MAM2 wetland feature to the north of Kirby Road, near the centre of the study area. The feature had standing surface water during visit 1 and 2, but no evidence of flow, sediment transport, or deposition. The feature was identified as a MAM2 wetland feature, while active agricultural lands are present to the north of the feature.

5.0 Natural Feature Significance and Sensitivity

Analysis of the significance of existing natural features was used to identify those features and habitats that are sensitive to disturbance based on the rarity or sensitivity of the feature or the functions/processes that contribute toward their significance. This assessment also considered the policies, legislation, and regulations that apply to the study area natural features which must be considered in the evaluation of the proposed road widening. The following is a discussion of the results of this analysis with regards to background information and the presence of natural features within the study area.

5.1 Significant Woodlands

The woodland features within the study area are mapped as Significant Woodland in the City of Vaughan Official Plan (2010). The designation as Significant is further defined under York Region's Official Plan (2019). As per York Region's Official Plan, designation of significance must be confirmed on a site-by-site basis and meet a variety of criteria, as outlined in Section 2.2.45 of the York Region Official Plan. The Significant Woodlands present within the study area are shown on Map 1.

5.2 Significant Wetlands

As noted in Section 1, the Don River West Branch Headwater Provincially Significant Wetland (PSW) Complex is located within the study area (see Map 1 and 3).

Additional, unmapped and unevaluated wetlands were identified by NRSI biologists during field work. A small Mineral Meadow Marsh (MAM2) is located opposite Ravineview Drive, on the north side of Kirby Road (see Map 2). In addition, there is a Maple Mineral Deciduous Swamp (SWD3) at the eastern extent of Kirby Road. Based on complexing rules under the Ontario Wetland Evaluation System (MNRF 2014), it is anticipated that these wetlands would meet criteria for being complexed with the larger Don River West Branch Headwater PSW, as they are located 450m and 590m from evaluated PSW. As such, the wetlands should be treated as provincially significant.

5.3 Areas of Natural and Scientific Interest (ANSI) and Environmentally Significant Areas (ESA)

The York Region and the City of Vaughan Official Plans recognize Areas of Natural and Scientific Interests (ANSI), which are characterized as Core Features of the Natural Heritage Network. Core Features are mapped on Schedule 2 of the City of Vaughan Official Plan (2010), which shows the 'Maple Uplands and Kettle' candidate Life Science ANSI (regionally

significant), the ‘Maple Spur Channel’ Earth Science ANSI (regionally significant), and the ‘Maple Spur’ candidate Earth Science ANSI (regionally significant) as comprising portions of the eastern study area (Map 1).

York Region and the City of Vaughan Official Plans recognize Environmentally Significant Areas (ESA), which are characterized as Core Features of the Natural Heritage Network and are mapped on Schedule 2 of the City of Vaughan Official Plan (2010). Schedule 2 delineates Core Features throughout the City of Vaughan, with which the McGill Area ESA comprises a portion of the eastern study area (Map 1).

5.4 Significant Wildlife Habitat

Based on background information review, desktop analysis, and field studies, 1 SWH type was confirmed for the study area: Special Concern and Rare Wildlife Species Habitat (Eastern Wood-Pewee).

An additional 1 SWH type was determined to be candidate: Bat Maternity Colony. The confirmed and candidate habitats are discussed in detail in the following sections.

5.4.1 Special Concern and Rare Wildlife Species Habitat

Eastern Wood-Pewee is listed as Special Concern both federally and provincially (Government of Canada 2019, MNRF 2018a) and was confirmed within the study area (Map 3) as a probable breeder. Eastern Wood-Pewee were observed from all the natural woodlands within the study area, including: Dry – Fresh Sugar Maple Deciduous Forest (FOD5), Dry – Fresh White Pine – Maple – Oak Mixed Forest (FOM2), Deciduous Forest (FOD), and Maple Mineral Deciduous Swamp (SWD3).

5.4.2 Bat Maternity Colonies

Bat maternity colonies are typically found in cavity trees with a DBH of >25cm and older buildings within forested vegetation communities. Any ELC ecosite that is determined to contain a bat maternity colony is considered SWH. Given that the FOD, FOD1-1, FOD5, FOM2, and SWD3 communities contain the most ideal habitat and largest number of potentially suitable trees for bat maternity colonies, these have been designated as candidate bat maternity colony SWH. The location of this candidate SWH is shown on Map 3.

5.5 Habitat of Endangered and Threatened Species

Based on the completion of the background information review and field investigations, 2 regulated SAR were documented within the subject property: Barn Swallow and Bobolink. Both Barn Swallow and Bobolink are listed as provincially and federally Threatened (Government of Canada 2019, MNRF 2018a).

As described in Section 4.3.1, Barn Swallows were observed foraging throughout the study area and are anticipated to be nesting within the active farm at the western end of the study area (Map 3). Given that the development of Kirby Road is sufficiently distant from the presumed nesting location of Barn Swallows within the active barn, and that the existing pasture lands are largely outside of the developable lands associated with the Kirby Road widening, there are no negative impacts on this species. There are no suitable culverts for Barn Swallow nesting underneath Kirby Road.

Bobolink was observed in the active pasture lands, located in the far western portion of the study area (Map 3). Field surveys documented the presence of a single individual on May 30 and two birds on July 9. Based on the observations documented, along with the presence of suitable habitat in this location, it is presumed that nesting occurred within the pasture south of Kirby Road. Given that the development of Kirby Road will be located within the ROW, and that the existing pasture lands are largely outside of the developable lands associated with the Kirby Road widening, there are no proposed negative impacts on the species.

As noted above, Candidate SWH for bat maternity colonies is located within the FOD, FOD1-1, FOD5, FOM2, and SWD3 communities. Based on this assumption and their individual habitat requirements, habitat for SAR bats (Little Brown Myotis and Northern Myotis) is also assumed to be found within these vegetation communities. Bat cavity assessments documented the presence of 4 cavities within these communities (Map 3). No bats were observed on-site during field surveys, although specific bat monitoring was not completed. The design of Kirby Road should have consideration for these cavity trees and suitable habitats present.

5.6 Regionally Significant Species

Regionally significant plant and bird species were observed within the study area. A total of 10 regionally significant vegetation species were reported within the study area during NRSI field investigations. These 10 regionally significant vegetation species include Fragrant Sumac, which was noted to be anthropogenically planted and as such is not mapped or considered further. All other regionally significant plant species were documented within a relatively

concentrated area of the study area, primarily within the FOD1-1, FOM2, and SWD3 communities in the extreme eastern portion of the study area (Map 3).

Of the 9 regionally significant vegetation species given consideration, only Poke Milkweed and Thin-leaved Sedge have a low 'R#' number, indicating their general scarceness within the region. Generally, all of the regionally significant vegetation species have a high Coefficient of Conservation rating, indicating that they generally require higher quality and intact habitats. The development of Kirby Road should have consideration to these species' locations and the impacts that the widening may have on them.

A total of 4 regionally significant bird species were reported within the study area during NRSI field investigations. The following lists the species, along with the respective vegetation community from which they were observed: Black-billed Cuckoo (CUW), Chestnut-sided Warbler (FOM2), Eastern Towhee (CUM), and Vesper Sparrow (Ag Soy, outside of the study area).

The location of all regionally significant bird species was noted to be well outside of the Kirby Road ROW, however, the road design and construction practices should have consideration for the habitats these species are found in.

5.7 Headwater Drainage Feature Classification and Management Recommendations

In order to classify the HDFs within the study area and identify the function provided by the features, the methodology provided in the Headwater Guideline (CVC and TRCA 2014) was followed. The headwater feature was analyzed based on 4 categories: hydrology (i.e. flow conditions), riparian conditions, fish and fish habitat, and terrestrial function. Within each category the data collected in the field is classified based on the importance of the feature. The management recommendations are defined as follows:

- Protection – The feature serves an important function to all criteria
- Conservation – The feature serves a valued function to all criteria
- Mitigation – The feature serves a contributing function to all criteria
- Recharge protection – The feature serves a groundwater recharge function in which flow is absent over sandy or gravelly soils
- Maintain or replicate terrestrial linkage – for features with terrestrial function only
- No management required – for features with limited or no function

Table 7 summarizes the classifications and management recommendations based on category assigned to each segment.

Table 7. Summary of HDF Classification

HDF Segment	Hydrology	Riparian Condition	Fish and Fish Habitat	Terrestrial Function	Classification
HDF-001	Limited	Limited	Contributing	Limited	No Management Required
HDF-002	Contributing	Limited	Contributing	Limited	Mitigation
HDF-002-01	Contributing	Value	Contributing	Limited	Mitigation
HDF-003	Limited	Limited	Contributing	Limited	No Management Required
HDF-004	Limited	Limited	Contributing	Limited	No Management Required
HDF-005	Important	Important	Contributing	Valued	Protection

Based on the analysis of field data collected HDF-001, HDF-003, and HDF-004 require no management. HDFs with this characterization typically have limited flow with no terrestrial habitat due to agricultural planting.

HDF-002 and HDF-002-01 require that their contributing hydrological functions be maintained or enhanced. This can be done through the implementation of Low Impact Development (LID) stormwater drainage measures (e.g., bioswales, vegetated swales) that maintain or replicate flows to the connected natural features.

HDF-005 requires protection due to its categorization as a perennial wetland which stipulates that the feature should be protected or enhanced where possible and its hydroperiod maintained.

6.0 Impact Assessment

6.1 Description of the Proposed Works

The City has initiated a Schedule 'C' Class EA to undertake proposed road widening, urbanization, re-alignment of Kirby Road at Jane Street intersection, underpass at the Barrie GO Rail crossing, and active transportation improvements for Kirby Road, between Jane Street and Dufferin Street. A preferred Preliminary Design has been selected based on an evaluation of alternative designs. The preferred design is overlayed on Map 4. The widening will accommodate an expansion of the travelled road surface from two to four lanes. Both sides of the road will include a 2m wide sidewalk and a 2m wide cycle track. The jog in the Kirby Road alignment at the Jane Street intersection will be eliminated as part of the reconstruction. Street tree plantings will be established within a landscape corridor separating the travelled road surface from the cycle track, where this can be accommodated. The road improvements will incorporate a grade separation (underpass) from the existing Barrie GO Rail line crossing. The existing ROW will be widened to incorporate the new road infrastructure.

The existing culvert at the HDF3 crossing of Kirby Road will be replaced with two concrete box culvert structures. This will be undertaken to increase the flow capacity of the culvert to eliminate stormwater overtopping of the road and to avoid effects on the upstream Regional flood level (HDR 2021). A realignment of the HDF3 watercourse within the ROW will be required to accommodate the culvert replacement. The stormwater management strategy for the road improvements will also include the replacement of roadside drainage ditches with a series of catchbasins and storm sewers within the urbanized road cross-section. A series of bioretention cells will be installed as a form of LID to meet TRCA requirements for water quality, erosion control and water balance as discussed further below.

6.2 Approach to Impact Analysis

The impact analysis provided here is based on a high-level assessment of potential natural feature impacts based on a conceptual understanding of the proposed road widening of Kirby Road within the identified study area. Alterations and updates to this impact analysis are anticipated after a detailed design stage, once direct and indirect impacts can be identified. Characterization and identification of potentially significant areas and features is provided briefly as to assist in the design process for the proposed road works.

The following is a description of the types of impacts discussed:

- Direct Impacts – associated with the disruption or displacement of natural features, caused by the actual "footprint" of the undertaking;
- Indirect Impacts – associated with changes in site conditions such as drainage and water quantity/quality; and,
- Induced impacts – associated with impacts after the development is completed, such as increased pressures on natural areas.

6.3 Direct Impacts and Mitigation

6.3.1 Vegetation Removal and Site Grading

Based on the Preliminary Design, roadside grading for the planned road improvements will extend into adjacent natural features on both the north and south sides of the road. The majority of this encroachment will occur as part of road works planned between Keele Street and Dufferin Street, both due to the greater area and number of roadside natural features relative to the Jane Street-Keele Street segment, and due to the extent and width of grading from existing roadside areas.

The planned undertaking will require direct impacts to the following distinct natural features as shown on Map 4:

- PSW (0.01ha encroachment) at approximately Station 1-890 to 1-940 (Map 4d)
    - Comprises the Reed Canary Grass Mineral Meadow Marsh (MAM2-2) inclusion
- Unevaluated wetland that is presumed PSW at approximately Stations 2-960 to 3-060 (0.15ha encroachment); see Map 4g
    - Comprises the Mineral Meadow Marsh (MAM2) ecosite
- Significant Woodland at approximately Stations 3-400 to 3-620 (0.32ha encroachment); see Map 4h
    - Comprises the Dry-Fresh White Pine-Maple-Oak Mixed Forest (FOM2) ecosite
- Significant Woodland at approximately Stations 4-050 to 4-400, north of Kirby Road (0.42ha encroachment); see Maps 4i, j
    - Comprises the White Pine Coniferous Plantation (CUP3-2), FOM2 and Maple Mineral Deciduous Swamp (SWD3) ecosites
        - The SWD3 ecosite represents unevaluated wetland that is presumed PSW; 0.21ha encroachment into this feature specifically
- Significant Woodland at approximately Stations 4-220 to 4-400, south of Kirby Road (0.23ha encroachment); see Maps 4i, j

- Comprises the SWD3 and Cultural Woodland (CUW) ecosites
    - The SWD3 ecosite represents unevaluated wetland that is presumed PSW; 0.15ha encroachment into this feature specifically

The planned undertaking will also require direct impact to other natural feature designations comprising the following (see Map 1):

- Maple Uplands & Kettles Life Science ANSI/McGill Area ESA
    - Primarily includes, but is not limited to, Significant Woodland and wetland features listed above; see Map 4X)
- Growth Plan NHS
    - Comprising both natural features and adjacent agricultural lands
- Greenbelt Plan NHS
    - Associated with the HDF 3 watercourse channel and adjacent lands
- Oak Ridges Moraine Conservation Plan (ORMCP) Natural Core and Natural Linkage areas
- City of Vaughan Core Features (coincident with Significant Woodlands, ANSI and ESA features (Map 1))
- York Region Greenlands System (coincident with Greenbelt and ORMCP natural area designations listed above)

In accordance with Vaughan OP Section 3.4.10.2 and ORMCP Section 41.2 (respecting the ORMCP Natural Linkage Area) and Section 4.2.1.2 (e) of the Greenbelt Plan, the area of road infrastructure disturbance and proposed ROW limits into the adjacent natural features must be minimized to the extent feasible, and any impacts associated with design or construction practices must be minimized (City of Vaughan 2010, Government of Ontario 2017a, b). Additionally, for ORMCP Natural Core Areas, transportation infrastructure must be located as close to the edge of the designated area as possible in accordance with Section 3.4.10.3 (City of Vaughan 2010). Since the proposed undertaking occurs along an existing built road corridor, the undertaking can be considered to be located along the edge of these Core Natural Areas.

With the exception of the far eastern portion of the study area, the majority of the roadside lands within the ROW to be directly impacted by proposed road works are anthropogenically disturbed cultural meadows.

Natural vegetation communities, particularly woodlands and wetlands, should be avoided to the greatest extent possible. Efforts should be made during the Detailed Design stage to further reduce encroachments into significant natural features to the extent feasible. For example, this may be accomplished by altering the use of ROW design elements (e.g., cycle track, sidewalk) adjacent to significant natural features, minimizing grading widths through increases in degree of roadside slope or use of retaining walls. Mapped wetland and woodland dripline boundaries are to be refined during the Detailed Design stage. Wetland boundaries are to be delineated through use of the Ontario Wetland Evaluation System methodology (MNRF 2014). Wetland and woodland dripline boundaries will be staked, and reviewed and confirmed on-site with agency staff. Confirmed boundaries will be surveyed to refine natural feature encroachment requirements, and associated compensation requirements, based on the Detailed Design.

Removal of roadside portions of significant natural features (e.g., Significant Woodlands, wetlands, ANSI and ESA features) will require restoration and compensation plans in accordance with relevant policies (e.g., TRCA *Guideline for Determining Ecosystem Compensations* (TRCA 2018)) and based on agency consultation. Natural feature compensation plantings should be planned in accordance with municipal and TRCA policies and guidelines. A Woodland Compensation Plan will be required based on the policies of Section 2.2.49 of the Regional OP, which includes a net gain in woodland area relative to the area of woodland removed. The application of TRCA compensation guidelines (TRCA 2018), relative to any existing municipal compensation requirements, will be determined during Detailed Design in consultation with agency staff. Based on TRCA guidelines, compensation ratios may range from 1:1 (e.g., marsh habitats) to >2:1 for more mature wooded features depending on the basal area of trees within the impacted feature. Key principles to be incorporated into the compensation strategy are to compensate as close to the area of impact as possible (i.e., based on suitable areas within the municipal ROW to the extent feasible) and to incorporate the compensation area as an enhancement to an existing Natural Heritage System feature. Where full compensation requirements can’t be achieved within the Kirby Road ROW, other Regionally- or City-owned properties should be considered. Alternatively, the TRCA may allow for future allocation of the required compensation land areas toward future ecological offsetting and restoration initiatives, in accordance with their compensation practices for municipal infrastructure projects (TRCA 2018).

An Edge Management Plan will be required during the Detailed Design stage to describe the necessary management, restoration, enhancement and monitoring activities to be undertaken

for natural feature edges that are disturbed due to road widening and construction. Applicable policies and guidelines for edge management (e.g., TRCA 2004) should be followed in development of plans, in conjunction with agency consultation. At a minimum, edge management should include the following:

- establishment of native vegetation species within and adjacent to the disturbed feature edge, based on an approved Restoration Planting Plan or Landscape Plan;
- development and implementation of an invasive species management plan;
- stabilization of disturbed soils, such as through use of a nurse crop supplemented with or followed by application of a native herbaceous seed mix;
- development and implementation of a Monitoring Plan to track the success of these measures and to inform the need for any additional remedial actions.

See Section 7.0 for further discussion about Restoration and Enhancement recommendations.

No federally or provincially significant species will require removal as a result of the planned road improvements. The regionally significant plant species may be appropriately mitigated for or compensated if these species are to be removed based on the proposed road widening (Map 3). Should the proposed road impact the location of these species, they should be transplanted to another site within the same vegetation community. They should be monitored and managed for the first year to ensure their survival.

Tree Removal

Recommendations have been provided in the TPP (NRSI 2021) to protect trees to be retained through the use of tree protection fencing. Recommended measures have also been provided in the TPP to mitigate construction impacts to adjacent retained trees, and to inspect tree protection fencing and respond to instances of mortality or damage to retained trees.

Section 4.0 of the City of Vaughan Tree Protection Protocol (2018) addresses compensation differently for private trees and public trees. For private trees (excluding woodlots and edge restoration plans) the number of compensation trees depends on the diameter of the private tree to be removed, as detailed within the TPP. For public trees, the Tree Protection Protocol stipulates that the City will employ the Tree Valuation Formula to determine compensation. This formula "*considers the operational, environmental and social costs of trees based on the tree species, size and overall condition*", and incorporates removal and installation costs from previous City contracts or field data from City staff (City of Vaughan 2018). The Tree Protection

Protocol does not supply all of the information necessary to make these calculations; therefore, further compensation with City staff will be required during the Detailed Design stage to determine the appropriate compensation.

Compensation for woodland edge trees are to follow the TRCA *Guideline for Determining Ecosystem Compensation* (TRCA 2018). The Guideline recommends an areal compensation based on the basal area of each wooded vegetation community to be impacted, and prescribes a compensation ratio (hectares compensated to hectares impacted). Noting that compensation within linear ROWs may not always be feasible to achieve full compensation goals, the Guideline notes that the land area removed from natural systems by multiple infrastructure projects can be tracked by the TRCA and municipality so that cumulative losses can be understood and suitable compensation/restoration can be designed. Consultation may be held between the City and the TRCA to discuss whether compensation requirements for the Kirby Road improvements should be incorporated into other infrastructure project compensation requirements to address these at a broader scale. Furthermore, additional field survey work may be required during the Detailed Design stage to estimate tree basal areas within the wooded vegetation communities, to satisfy the TRCA compensation calculation requirements. Therefore, the final determination of tree and woodland compensation measures should be determined during the Detailed Design stage. As noted in Section 4.2.2, supplemental tree inventory work is also required during the Detailed Design stage, on which the tree compensation requirement will also be based.

Tree compensation plantings should be installed within the Kirby Road ROW to the extent possible, or otherwise as part of off-site natural feature compensation planting requirements. Compensation planting details will be provided within a future Landscape Plan to be provided during the Detailed Design stage.

6.3.2 Impacts to Terrestrial Wildlife and Their Habitats

Species at Risk Bats and Bat Maternity Colonies Candidate Significant Wildlife Habitat

All 11 of the mapped potential bat habitat trees (Map 4) inventoried within the study area, are anticipated to require removal based on the Preliminary Design. Following a precautionary approach, it is assumed that these may be used for roosting by bats, including SAR bats. The removal of these trees may therefore kill, harm or harass roosting bats, potentially resulting in ESA contravention, if not appropriately mitigated.

If it is determined through Detailed Design that these trees will require removal, the MECP must be consulted to confirm appropriate measures to suitably avoid impacts to SAR bats and to determine if any other measures to mitigate the habitat loss will be required. Consultation with the MECP's Species at Risk Branch must be completed by contacting SAROntario@ontario.ca.

As stated above, the proposed road construction work will require encroachment into two Dry-Fresh White Pine-Maple-Oak Mixed Forest (FOM2) communities (Maps 4h, i, j), and two Maple Mineral Deciduous Swamp (SWD3) communities (Maps 4i, j), which have been identified as Candidate SWH for Bat Maternity Colonies. It is recommended that additional measures be considered during the Detailed Design stage to avoid impacts to these woodlands if feasible. If tree removals along these woodland edges are unavoidable, further investigation of these woodland edges should be undertaken during the Detailed Design stage to determine if they meet MNRF criteria to be considered SWH based on the density of snags or cavity trees (MNRF 2015). If additional survey work cannot be completed (e.g., due to restricted site access), it is recommended that these woodlands be treated as confirmed Bat Maternity Colonies SWH. Appropriate habitat compensation and impact mitigation measures should be identified under this scenario.

At a minimum, to avoid injury or mortality to bats, and in combination with requirements to avoid contravention of the *Migratory Birds Convention Act* (MBCA; see below) trees within the FOM2 and SWD3 communities should be removed outside of the period April 1-September 30. It is recommended that tree removals within the Cultural Woodland (CUW) and hedgerows, as well as all identified Potential Bat Habitat Trees also be removed outside of this period as a precautionary measure to avoid potential injury or mortality of bat SAR.

Eastern Wood-Pewee Significant Wildlife Habitat

The FOM2 and SWD3 wooded features for which development encroachment is anticipated (Maps 4h, i, j) also represent SWH for Eastern Wood-Pewee. Eastern Wood-Pewees predominantly make use of intermediate-age to mature deciduous and mixed forests having a relatively open understorey. This species makes use of woodland edge habitats in proximity to its nest area for foraging purposes, and tends to select breeding territories with fewer pines (COSEWIC 2012). The relatively small areas of woodland edge to be removed within these features, relative to their overall size, are not expected to negatively impact the quality of the woodlands as breeding habitat for the species. Eastern Wood-Pewee is expected to maintain breeding territories within each of these features post-construction. The greatest potential for

impact to the species is likely to arise from construction-stage disturbances. These can be mitigated by avoiding any vegetation removal or grading activity within the bird nesting period as discussed below. As a species relatively tolerant of adjacent human occupied landscapes, it is expected that Eastern Wood-Pewee will persist within these woodlands during the construction period of the road improvements since they often occupy portions of woodlands more removed from the roadsides.

Other Wildlife Species

Most other wildlife species that occur within the study area are common and ubiquitous on the landscape, and are adapted to or have been habituated to urban environments. The majority of the ROW roadside lands to be directly are highly altered and ecologically disturbed, and do not provide important habitat functions beyond those described above. The planned undertaking will not negatively impact these local wildlife species or populations.

The road improvement works will require a widening of the existing ROW and grading limits that extend into some of the adjacent natural features, particularly within the eastern half of the study area. Affected habitats include woodland edge and wetland (swamp and meadow marsh) environments that support wildlife species adapted to those features types. The undertaking will also require removal of portions of the H4 hedgerow that lines the north edge of Kirby Road. Road construction will result in a loss of habitat for species that occupy these features, such as Downy Woodpecker (*Dryobates pubescens*), White-breasted Nuthatch (*Sitta carolinensis*), American Redstart (*Setophaga ruticilla*), and Common Yellowthroat (*Geothlypis trichas*). Woodland habitats occupied by the regionally-significant Chestnut-sided Warbler and Black-billed Cuckoo will also be impacted. However, it is anticipated that much of these areas of grading encroachment into adjacent natural features will be available for post-construction ecological restoration. Furthermore, none of the observed species are area-sensitive, intolerant of human occupied landscapes, or require interior forest environments. It is therefore expected that these species will persist within the study area over the long term and that permanent habitat removal will be minimal. Removal of open land habitats (e.g., Cultural Meadow (CUM), agricultural fields), including those that provide habitat for the regionally-significant Eastern Towhee and Vesper Sparrow, will be negligible and no impacts to these species will occur. Short-term disturbances to wildlife species may occur during construction. See Section 6.4.3 for further discussion and appropriate mitigations associated with this.

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. Vegetation clearing should therefore occur outside the bird nesting season of April 1-August 31 so as to limit disturbances to nesting activities of birds and to avoid destruction of active nests. Where SAR bat considerations are required, this window should be extended to April 1-September 30 (see above). The destruction of migratory birds and their nests is prohibited under the federal MBCA.

Ecological Linkages

A minor linkage for small wildlife may occur along the HDF3 corridor, crossing under Kirby Road via the existing twin corrugated steel pipe culverts. This minor linkage corresponds with the Greenbelt Plan Natural Heritage System corridor that crosses Kirby Road in this location (Map 1). However, this corridor is tilled for agriculture within the immediate vicinity of Kirby Road and it is unlikely that wildlife would specifically use this as a movement path. A second potential linkage is located where the Maple Spur Channel ESA and Maple Uplands and Kettles Life Science ANSI crosses Kirby Road between Keele Street and Foothills Road (Map 1). No cross-road culvert currently exists at the location of this potential linkage. However, the presence of natural lands on either side of the road, which are narrowed between adjacent agricultural and urban land uses (on the north and south sides of Kirby Road, respectively) may have the effect of funneling and directing wildlife movements across the road in this location. This potential linkage may provide a crossing location for small-, medium-, and large-sized (i.e., White-tailed Deer (*Odocoileus virginianus*)) wildlife. Finally, a third potential crossing for up to large-sized wildlife location occurs to the immediate west of Dufferin Street, where Significant Woodland associated with the ESA and ANSI occurs on both sides of the road.

Wildlife road-crossing data for Kirby Road within the study area was not available for the completion of this study. It is recommended that the section of road that falls within the ESA/ANSI crossings (between west of Radha Road and Dufferin Street) be further investigated in consultation with the TRCA and City to determine if there is suitable rationale to incorporate measures that would mitigate wildlife road crossing impacts and/or reduce hazards of motorist-wildlife collisions. For example, this may include consideration for deer crossing signs or other measures if existing data suggests that deer crossings are more concentrated at this location, or if deer-vehicle collisions have occurred there. It may also include the installation of one or two terrestrial ecopassages as part of the ROW Detailed Design if there is evidence that wildlife, particularly deer, do or may cross the road at this location. Based on the proposed road

elevations at the east end of the study area, west of Dufferin Street, a large mammal (deer) wildlife ecopassage can be accommodated at this location.

The existing twin culverts at the HDF3 crossing are recommended for replacement with two new pre-cast concrete box culverts at this crossing (HDR 2022). The proposed replacement culverts will be designed so as to maintain appropriate conditions to allow passage of small wildlife through the culverts. The replacement culvert on the east side of the crossing will have an openness ratio of 0.14, with a width and height of 3.9m and 1.2m, respectively. The replacement culvert on the west side of the crossing will have an openness ratio of 0.10, with a width and height of 3.6m and 0.9m, respectively. Both culverts will have a length of 33.6m. Based on these dimensions, the culverts will accommodate passage of small and medium-sized wildlife (CVC 2017).

6.3.3 Impacts to Fish and Aquatic Habitats

None of the HDF features within the study area provide direct habitat for fish. All are identified as providing contributing habitat. Therefore, the planned road improvements are not anticipated to cause the Harmful Alteration, Disruption or Destruction (HADD) of fish or fish habitat provided construction mitigation and BMP measures are implemented including the installation of erosion and sediment control measures. As identified in Table 7, no HDF management measures are required for HDF-001, -003 or -004. Mitigation measures are required to maintain or enhance the contributing hydrological functions of HDF-002 and 002-01. These roadside ditches will require removal to accommodate the road improvements. However, contributing flow functions can be replicated through use of LID systems such as the bioretention cells that are proposed as part of the road improvements. Other LID measures that can maintain or enhance the contributing flow functions currently provided by the HDF features, such as through use of vegetated swales, should be further explored during the Detailed Design stage.

HDF-005, which corresponds to the Mineral Meadow Marsh (MAM2) wetland, was classified for “protection” as indicated in Table 7. A portion of this feature along the roadside edge will require removal according to the preferred Preliminary Design. As stated above, opportunities to reduce construction and grading encroachments into this feature should be reviewed during the Detailed Design stage. For example, this may include eliminating certain ROW design elements where they occur adjacent to the wetland, revising grading requirements and/or incorporating a retaining wall.

The proposed replacement of the existing twin culverts at the HDF-003 crossing will require a watercourse channel realignment within the ROW to accommodate the wider flow path and increased hydraulic conductivity associated with two new concrete box culverts. Re-design of the watercourse channel within the ROW should follow natural channel design principles in consultation with the TRCA. This will allow for enhancements to the flow channel relative to existing conditions, such as the removal of barriers to upstream fish movement that may occur during seasonal higher-flow periods. Native vegetation seeding, and woody species plantings where they can be accommodated, should also be planned in conjunction with the watercourse realignment during the Detailed Design stage and in accordance with TRCA guidelines.

6.4 Indirect Impacts and Mitigation

6.4.1 Sediment and Erosion

A robust Erosion and Sediment Control (ESC) Plan should be developed at the Detailed Design stage, as the undertaking will involve works within the area regulated by the TRCA. Erosion and sediment control measures are recommended to be installed along the development limit, prior to any grading or digging within the area. The following recommendations with regards to erosion and sediment control are provided:

- Placement of sediment and erosion control fencing is to be installed prior to any construction to demarcate the development limit. Fencing is to be inspected for proper installation by a Certified Arborist, Landscape Architect, or otherwise qualified individual.
- Maintenance of machinery during construction should occur at a designated location away from the natural areas on-site.
- No storage of equipment, materials or fill is to occur within the natural areas.
- All erosion control measures are to be inspected and monitored, and repairs are to be completed immediately, as required.
- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any materials from leaving the site.
- Any areas of bare soil within the construction area are to be re-vegetated as soon as feasible to prevent erosion of soils and keep dust to a minimum.
- Following completion of construction and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed.

Please refer to the Drainage and Stormwater Management Report (HDR 2021) for further recommendations for erosion and sediment control measures to be implemented in completion of this work.

6.4.2 Water Quantity Control

No significant changes to the existing stormwater drainage patterns within the study area will occur as a result of the planned road improvements. Existing drainage catchments within the study area will continue to flow toward their current receivers (including the West Don River/HDF3 within the study area and the East Humber River immediately west of the study area). The exception is where the GO Rail underpass is proposed, where runoff will be directed to the low point of the road elevation. Stormwater collected at this point is proposed to be diverted to the West Don River (HDF3) receiver via storm sewer. See the Drainage and Stormwater Management Report (HDR 2021) for details of the existing and proposed study area drainage system.

The proposed widening of the road infrastructure (e.g., increase from two to four lanes, addition of sidewalk and cycle track) will increase the amount of impervious surface in the study area by 6.15ha. Unless appropriately mitigated, this increase in impervious surface will result in less overall infiltration of stormwater and increases in stormwater runoff into aquatic receivers. This can in turn result in erosion and sedimentation impacts and associated water quality degradation. In accordance with TRCA requirements, post-development peak flow rates must be controlled to pre-development flow rates for the full range of storm events up to and including the 100-year storm. However, due to limited space within the ROW, a “best efforts” approach will be used to achieve sufficient storage to attenuate flow rates to pre-development levels for all design storm events (HDR 2021). These measures are to be further refined during the Detailed Design stage. Consideration should be given to incorporating over-sized storage pipes with flow control devices (e.g., orifice plates) upstream of discharge locations to provide storage volume and peak flow control. Flow control can be provided as a combination of underground storage and surface ponding (HDR 2021).

Various other measures are proposed to control runoff flow rates and volume discharges into the receiving watercourse and other drainage catchments. This will include the use of pervious surfaces (e.g., grass, permeable pavement) within the boulevard and median areas outside of the active transportation facilities to minimize impervious surfaces within the ROW. This will also include the use of bioretention cells as a form of LID stormwater management within the

ROW. The bioretention cells will comprise subsurface modular units constructed as a trench and filled with a filter medium. The filter medium will comprise a mixture of sand, fines and organic material to support vegetation growth and evapotranspiration. A perforated underdrain distribution pipe will be incorporated into a granular layer for soils with low infiltration rates and will direct excess runoff to the existing storm sewer system. The bioretention cells will effectively function to capture and store runoff, promote evapotranspiration via the rooted vegetation, filter out suspended particulates through the soil medium and root zone flow, and provide extended detention and reduced flow velocities (HDR 2021).

The bioretention cells have been designed, such as in terms of their numbers, sizes and locations, to meet regulatory requirements for water balance and runoff storage, flow control and erosion control. The cells will be located where runoff discharges directly into a watercourse or drainage feature. See the Drainage and Stormwater Management Report (HDR 2021) for additional details about the proposed bioretention cell LID features.

Other LID measures to control water flow velocities, erosion potential and water quality will be considered during the Detailed Design stage based on the assessed feasibility. These may include the use of infiltration trenches, or vegetated filter strips and plunge pools (HDR 2021).

6.4.3 Water Quality Control

The LID bioretention measures described above will also function to treat stormwater runoff to an “Enhanced” level of water quality (80% Total Suspended Solids removal). It is recommended that stormwater directed toward the bioretention cells be pre-treated through the use of catchbasin inserts (e.g., CB Shield) (HDR 2021). The bioretention cells are only proposed for the subcatchments where runoff discharges directly into a natural watercourse. The bioretention cells were designed to treat pavement areas that are equivalent to the total increase in pavement area along the Kirby Road corridor. For the drainage catchment that drains to the West Don River/HDF3 (Area C), the bioretention cells are sized to provide treatment for the entire pavement area. For the drainage catchment that drains to the East Humber River (Area A), the bioretention cells are sized to provide treatment for the increased pavement area to meet the total increase in pavement area within the project limits (HDR 2021). Altogether, a total of 6.54ha of pavement will receive water quality treatment, exceeding the 6.15ha of treatment that is required according to regulatory requirements (HDR 2021).

Where runoff catchment areas are less than 2ha, oil-grit separator (OGS) units are also proposed as a means of water quality control. In order to achieve an "Enhanced" level of treatment, the OGS units will be located in series with additional water quality mitigation measures, such as the use of catchbasin inserts. The design of the water quality treatment system will be further refined during the Detailed Design stage.

Indirect impacts may also occur through faulty construction equipment. Machinery should arrive on site in clean condition and is to be checked and maintained free of fluid leaks. A Spill Response Plan (SRP) should be developed prior to commencement of construction if there is the potential for deleterious substance leaks during construction. This SRP should provide a detailed response system to deal with events such as the release of petroleum, oils and lubricants or other hazardous liquids and chemicals. A spill kit must also be kept on site at all times and on-site workers must be trained in the use of this kit and be fully aware of the SRP.

Indirect water quality impacts should be considered during the Detailed Design stage regarding the potential to negatively impact the existing water quality within the study area. Use of salt during winter should be minimized, or alternatives to road salt should be used to avoid water contamination. A Salt Management Plan should be prepared during Detailed Design.

6.4.4 Indirect Impacts to Natural Features and Wildlife Habitat

Potential indirect impacts to wildlife may arise from a variety of construction related activities. An outline of potential indirect impacts on significant features and activities is provided below.

Noise and Dust

Potential indirect impacts to wildlife may arise from noise and dust associated with construction activities, as well as unnatural lighting associated with the development. During construction activities, such as tree clearing and grubbing, dust can be created which can have a harmful effect on wildlife and vegetation, while excessive noise and human activity can cause wildlife to temporarily avoid the area. The following recommendations are provided:

- Best practices for limiting dust should be employed.
- Construction activity should be limited on a daily basis to daytime hours.
- Lighting designs should include shielding and directional lighting onto the road to avoid lightwash effects within adjacent natural features.

Dust and noise associated with construction is anticipated to be temporary. Significant effects on wildlife and vegetation from dust and noise are not expected.

Wetlands and Woodlands

The following recommendations with regards to woodlands and wetlands are provided:

- Storage of construction materials should be at least 30m from the location of any woodlands and wetlands.
- The limits of construction must be clearly demarcated with construction limit fencing (which may take the form of sediment and erosion control, tree protection, or other fencing types) to mitigate the potential for inadvertent damage to, or unauthorized encroachment into, adjacent vegetation and natural feature edges.
- Sediment and Erosion Fencing should be installed at the limit of development where required according to the ESC Plan.
- Construction completed in proximity to these features should be completed outside of the bat active window (May 1 to September 30) and breeding bird season (April 1 to August 31);

Significant Wildlife Habitat/Habitat of Significant Species

- Two SWH types were identified within the woodlands within the study area: Habitat for Species of Conservation Concern (Eastern Wood-Pewee) and Candidate SWH for Bat Maternity Colonies.
- Potential SAR habitat was also identified for SAR bats, associated with 11 identified roadside cavity trees and the woodland features that represent Candidate SWH for Bat Maternity Colonies.
- Recommendations provided above, with respect to wetlands and woodlands are sufficient to protect the habitats for both of these SWH types as well as individual trees that may provide bat SAR habitat (see Section 6.3.2 for additional information about mitigating impacts to bat SAR).

6.5 Induced Impacts

Induced impacts are described as those that are not directly related to the road construction, but rather arise from the use of the natural areas resulting from the development, such as the increased traffic along Kirby Road, encouraged by the widening of the road. Induced impacts are expected to be minimal, as the road already exists, although it will be widened.

Increased motorist use of the road will lead to increased potential for conflicts with crossing wildlife. Due to the lack of highly-defined vegetated corridors (e.g., permanent watercourse channels) that cross Kirby Road within the western end of the study area, wildlife crossings may occur across a broad front within the study area lands, particularly where agricultural fields or fragmented vegetated features exist on both sides of the road. However, as described in Section 6.3.1, potential wildlife linkages occur where the municipally-mapped ESA/ANSI lands cross Kirby Road between Keele and Dufferin Streets. As described above, consideration should be made at the Detailed Design stage for the need for measures that would mitigate wildlife road mortality as well as hazards to motorists, including but not limited to the use of wildlife ecopassages and deer crossing signage. Although no well-defined ecological corridors occur within the west end of the study area, the culvert replacement at HDF3 will be sized to accommodate at least small-sized mammals that may cross the road along the ephemeral drainage channel in that location.

6.6 Impact Assessment Summary

The following table provides a review of the applicable policy framework and summarizes the impact assessment on significant natural features and species found in the study area.

Table 8. Impact Assessment Summary

Policy/Legislation	Impact Summary
Provincial Policy Statement (PPS) (OMMAH 2020)	• Encroachment into natural features will be minimized. Sediment and Erosion Control Fencing will be erected to prohibit encroachment and minimize external inputs. • Compensation for tree removals within forested communities will be determined through a compensation plan, as confirmed with the City of Vaughan, Region of York and the TRCA. • Guidance from MECP, under the ESA, will be followed for protecting habitat for Endangered and Threatened species. • Wetland compensation will be required, as approved by the MNRF and TRCA. • Construction should be completed outside of the bat active window (May 1 – September 30) and breeding bird season (April 1 – August 31). • Storage of construction materials should be at least 30m from any significant natural feature.
Endangered Species Act (ESA) (Government of Ontario 2019)	Bats • Tree removal to occur outside of the bat active window (i.e. removals can occur October 1st – April 30th) • Consultation with the MECP will be required prior to the removal of identified potential habitat trees and woodland edges that are mapped as Candidate SWH for Bat Maternity Colonies, to determine appropriate next steps in accordance with the ESA.

Policy/Legislation	Impact Summary
	• Additional targeted surveys may be required by the MECP to assess the use of woodland edge features by SAR bats, prior to their removal.
Migratory Birds Convention Act (Government of Canada 2018)	• Timing of construction activities, especially vegetation clearing and site grading, must have consideration for the MBCA. • Habitat removal to occur outside of peak breeding bird window (April 1st – August 31st). • Habitat removal in simple habitat may occur within peak breeding bird window, where nest clearances confirm no breeding bird activity.
Fish and Wildlife Conservation Act (Government of Ontario 1997)	• Timing of construction activities, especially vegetation clearing and site grading, must have consideration for bird nesting and den sites of furbearing mammals. • Vegetation removals to adhere to MBCA. Site investigations to survey simple vegetated habitats for bird nesting, where removals must occur within the peak breeding bird window.
Fisheries Act	• A DFO Request for Review will not be required to undertake the planned road improvements, provided the standard and appropriate mitigation measures are implemented during construction to avoid negative impacts or degradation of the aquatic features (e.g., erosion and sediment control measures).
City of Vaughan Official Plan (2010)	• Encroachment into natural features will be minimized. Sediment and Erosion Control Fencing will be erected to prohibit encroachment and minimize external inputs. • Compensation for tree removals will follow guidance from the City of Vaughan. The Tree Protection Protocol (2018) is anticipated to form the major basis to help inform the calculations necessary for adequate compensation requirements (excluding woodland edge compensation). • Detailed landscaping plans will be required at the Detailed Design stage, and should be prepared with consideration for the calculated compensation requirements. • Storage of construction materials should be at least 30m from any significant natural feature.
York Region Official Plan (2019)	• Encroachment into natural features will be minimized. Sediment and Erosion Control Fencing will be erected to prohibit encroachment and minimize external inputs. • Compensation for tree removals within forested communities will follow guidance from the City of Vaughan, Region of York and the TRCA. • Detailed landscaping plans will be required at the Detailed Design stage, and should be prepared with consideration for the calculated compensation requirements. • A compensation and monitoring plan will be prepared to mitigate impacts associated with the widening of Kirby Road on the regionally significant plant species found within the ROW. • Monitoring must include at least 1 year of monitoring to ensure survival of regionally significant species. • Storage of construction materials should be at least 30m from any significant natural feature.
Growth Plan for the Greater Golden Horseshoe	• Encroachment into natural features will be minimized. Sediment and Erosion Control Fencing will be erected to prohibit encroachment and minimize external inputs.

Policy/Legislation	Impact Summary
(Government of Ontario 2019)	• Construction should be completed outside of the bat active window (May 1 – September 30) and breeding bird season (April 1 – August 31). • Storage of construction materials should be at least 30m from any significant natural feature. • Wetland compensation will be required, as approved by the MNRF and TRCA. • Compensation for tree removals within forested communities will follow guidance from the City of Vaughan and Region of York.
Ontario Reg. 166/06: Toronto and Region Conservation Authority (TRCA): Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (2013)	• Encroachment into natural features will be minimized. Sediment and Erosion Control Fencing will be erected to prohibit encroachment and minimize external inputs. • Erosion and sediment control measures are recommended to be installed along the development limit, prior to any grading or digging within the area. • Enhanced-level water quality, water balance and erosion control treatment will be provided for 6.54ha of pavement area, exceeding the MECP requirement of providing treatment to the increased pavement area. • A “best efforts” approach will be followed in controlling post-development peak flow rates to pre-development levels given the limited available space within the ROW. • Storage of construction materials should be at least 30m from any significant natural feature. • A Salt Management Plan will be required for approval at Detailed Design. • Wetland compensation will be required, as approved by the MNRF and TRCA.
Greenbelt Plan (2017)	• Encroachment into the Greenbelt Natural Heritage System (associated with the HDF3 corridor) has been minimized. Intrusion into the Natural Heritage System is limited to one watercourse crossing. • Ecological connectivity through the Natural Heritage System corridor will be maintained or improved by incorporating wildlife road crossing measures into the design planning for the road improvements. • Enhancement of the watercourse corridor, where it passes through the ROW, is recommended through the installation of native vegetation plantings. • Measures have been recommended (e.g., ESC, location of materials stockpiling) to mitigate negative impacts to the natural feature during construction.
Oak Ridges Moraine Conservation Plan (2017)	• Encroachment into the Natural Core Areas and Linkage Areas has been minimized. It is recommended that opportunities to further minimize encroachment into these areas be explored during Detailed Design. • Since the undertaking is to occur along an existing transportation corridor, potential impacts are limited to edges of the significant natural features, and no natural feature interior areas will be disturbed. • Opportunities to maintain and enhance ecological connectivity between Natural Core Areas will be realized where wildlife road crossing measures are proposed in locations where Natural Core Area has been mapped on both sides of Kirby Road, between

Policy/Legislation	Impact Summary
	Keele Street and Dufferin Street (coincident with municipally-mapped ESA/ANSI connections across the Kirby Road ROW). • Natural Core Areas and natural features within the Linkage Areas will be restored and enhanced where roadside construction encroachment is required, including plantings of suitable native vegetation species among other measures in accordance with an Edge Management Plan. • Measures have been recommended (e.g., ESC, location of materials stockpiling) to mitigate negative impacts to the natural features during construction.

7.0 Ecological Restoration and Enhancement

The preferred Preliminary Design of the road improvements will require encroachment into natural feature edges along the north and south sides of Kirby Road, especially within woodland and wetland features at the east end of the study area. Restoration of these disturbed feature edges will therefore be necessary to mitigate the associated negative effects, such as the colonization and spread of non-native/invasive species, erosion of disturbed soils, and increases in negative edge effects within woodlands. The road reconstruction also affords the opportunity to enhance the natural feature edges that will be retained.

A Restoration Planting Plan (RPP) or Landscape Plan should be prepared during the Detailed Design stage to direct the species types, locations, quantities, and other parameters associated with all restoration and enhancement zones within the study area. The RPP should address all areas of construction disturbance into natural features including woodland, wetland, savannah, meadow and hedgerow communities, as well as within the realigned segment of the HDF3 channel at the Kirby Road crossing. At a minimum, disturbed areas should be stabilized with an appropriate nurse cover crop (e.g., Annual Oats) supplemented with or followed by an application of native seed mix appropriate to the location. Seed mix selection and application rates must meet City and/or TRCA guidelines where applicable.

Treatment of the new woodland and wetland edges should be prescribed within the RPP and include management techniques to prevent and protect the retained features from further impacts. For wooded features this can include activities such as selective tree removal, pruning, pre-stressing and interplanting and should be designed by a qualified professional. Native woody vegetation plantings should also be established along the new created edges of the Dry-Fresh White Pine-Maple-Oak Mixed Forest (FOM2), Cultural Woodland (CUW), White Pine Coniferous Plantation (CUP3-2), and Maple Mineral Deciduous Swamp (SWD3) wooded features in accordance with the RPP. Additional tree plantings to reinstate hedgerows in place of trees requiring removal (e.g., H4) should also be completed to the extent feasible. Restoration of more open natural feature types (e.g., Mineral Meadow Marsh (MAM2), Cultural Meadow (CUM), Reed Canary Grass Mineral Meadow Marsh (MAM2-2), Cultural Savannah (CUS)) will primarily comprise native herbaceous seed mix application with occasional shrub/tree plantings. All seedings and plantings should be reflective of the existing species assemblage within the adjacent natural features, be suitable to the site conditions (e.g., accounting for sunlight exposure, moisture and soil conditions) and should comprise species native to York Region. Special consideration should be made for restoration species that are

tolerant of harsh roadside conditions, such as species that are hardy to the effects of road salt spray and pollution. The RPP can be considered a key component of the broader Edge Management Plan to be designed and implemented for the study area.

An updated assessment of non-native/invasive species growth within the natural features to be restored (e.g., within the woodland and wetland edge areas) should be undertaken during the Detailed Design stage. Based on these results, an Invasive Species Management Plan targeted to the non-native/invasive species at issue should be developed and incorporated into the Edge Management Plan.

The feasibility of transplanting or salvaging regionally rare plants or seeds from the impacted areas should be considered and included in the Edge Management Plan.

The Edge Management Plan will guide the implementation of all required natural feature edge restoration activities including planting installations, maintenance and monitoring.

The planned undertaking also provides the opportunity to establish a diverse assemblage of street tree plantings within the study area ROW, including species that are less susceptible to road salt and pollution toxicity effects. These ROW street tree and natural feature edge restoration plantings are expected to contribute toward the compensation requirements for anticipated tree removals as recommended in the TPP (NRSI 2021). ROW plantings, including the requirements for tree compensation, will be detailed in a future Landscape Planting Plan and/or RPP to be prepared during the Detailed Designs stage.

8.0 Monitoring

Monitoring is required to ensure that negative impacts to natural features and ecological functions are not occurring as a result of the design, construction or use of the road improvements. In particular, monitoring is necessary to ensure that implemented mitigation measures, best management practices and restoration plans are functioning as intended. A detailed Monitoring Plan is to be prepared during the Detailed Design stage in consultation with agency staff. An important aspect of the Monitoring Plan is that it follows an adaptive management framework, such that monitoring data is continuously reported and reviewed by regulatory agency staff and that mitigative or remedial actions are taken when warranted in a timely manner. The components, methodologies and timing considerations of the Monitoring Plan would itself be continually under review based on these results.

Recommended monitoring measures include those summarized below, subject to agency consultation and additional natural heritage information collected during the Detailed Design stage. Recommended monitoring tasks associated with this undertaking are primarily grouped into three categories: (a) compliance monitoring associated with the effective functioning of construction mitigation measures, (b) monitoring of terrestrial and aquatic restoration areas to ensure these features are successfully establishing as intended, and (c) effectiveness monitoring associated with wildlife road crossing mitigation measures, where warranted based on the types of measures recommended and in conjunction with agency consultation.

8.1 Construction-Stage Compliance Monitoring

8.1.1 Pre-Construction

Prior to any construction activity on-site, including vegetation clearing and grubbing, on-site inspections of the following should be undertaken to ensure proper installation:

- sediment and erosion control measures (e.g., silt fencing); and
- tree and natural feature protection measures, including proper installation of tree protection fencing as confirmed by a Certified Arborist or environmental inspector, or other construction limit fencing where tree protection fencing isn't required.

8.1.2 During Construction

Construction monitoring is the responsibility of the proponent and is tied to the specific undertaking. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits, and is to be undertaken by the environmental monitor.

- Periodic monitoring of the above measures to ensure maintenance and effectiveness.
- Pruning of any limbs or roots (of trees to be retained) damaged during construction by a Certified Arborist.
- Visual inspection of the adjacent natural features, to ensure no unauthorized construction encroachments, vegetation damage, or other disturbances caused by construction activities.
- Fueling of machinery to be undertaken at a designated location away from the adjacent natural areas.
- Storage of machinery and material, fill, etc. in designated areas away from the adjacent natural features.

8.2 Vegetative and Habitat Restoration Inspections

Inspections of restoration plantings and seeded areas should be completed to ensure survival and healthy establishment. The objective of this monitoring should be to validate that the intended ecological condition (e.g., restored woodland edge, restored meadow, restored HDF3 riparian habitat) is being achieved. This is expecting that some die-back of vegetation will occur due to a variety of causes (e.g., wildlife browsing). Remedial actions should be identified for implementation if/when necessary, such as efforts to reduce competition from adjacent vegetation (e.g., cutting back overcrowding vegetation, removing non-native growth), or installing new replacement plantings.

8.3 Wildlife Road Crossing Mitigation Monitoring

Depending on the nature of recommended measures to mitigate wildlife road crossing and ecological connectivity impacts, monitoring tasks tailored to those measures may be warranted as determined through consultation with agency staff. The monitoring measures are to be designed such that negative effects (e.g., as caused by ineffective mitigation) may be recognized through the data. To achieve this, baseline/pre-construction monitoring may be recommended where feasible against which to compare post-construction data. The need for and details of such monitoring measures are to be determined during the Detailed Design stage.

9.0 Recommendations

The following key recommendations are made:

- Efforts should be made during the Detailed Design stage to further minimize grading and construction encroachments into adjacent natural features.
- Road design and related construction activities (i.e. site access, grading, equipment movement) are to keep in mind the location of the identified plant species of regional concern (Map 3), as to limit direct impacts on these species. Should these species be impacted due to the widening of Kirby Road, these species should be relocated (i.e. transplanted) within the same vegetation community.
- Any tree that is removed should be replaced, following the applicable policies of the City of Vaughan, and should consider the recommendations in the TPP.
- Compensation for woodland removal is required through compensatory plantings in accordance with Regional and TRCA guidelines.
- Tree removal should occur between October 1 and March 31, to avoid impact to migratory birds or SAR bats.
- Tree removal, if necessary, should occur using best management practices and arboricultural techniques, protecting any trees that are to be retained.
- Wetland compensation is required. Compensation approval will be through the TRCA and MNRF.
- Natural channel design principles should be incorporated into realignment planning for the HDF3 channel at the Kirby Road crossing.
- All materials and equipment used for the purpose of site preparation and project completion should be operated and stored in a manner that prevents any materials from leaving the site. Equipment and material storage should be a minimum of 30m from woodlands, wetlands, and HDFs requiring retention.
- All erosion control measures are to be inspected and monitored, and repairs are to be completed as required.
- Following completion of construction and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed, and the area naturalized.
- Small wildlife movement functions should be maintained or enhanced as part of the HDF3 culvert replacement.

- Further investigation should be completed to determine the need for, and methods of, wildlife road crossing impact/motorist hazard mitigation measures where the ESA/ANSI and ORMCP Natural Core Area spans the Kirby Road corridor.
- An Edge Management Plan should be developed to detail the ecological restoration, enhancement, management and monitoring of disturbed natural feature edges within the ROW.
- A detailed Monitoring Plan should be developed to identify pre-, during-, and post-construction monitoring requirements.

10.0 Summary

NRSI was retained in September 2019 by HDR Inc. on behalf of the City of Vaughan to complete an EIS as part of a Schedule 'C' Class EA for the proposed road widening, urbanization, re-alignment of Kirby Road at Jane Street intersection, underpass at the Barrie GO Rail crossing, and active transportation improvements of Kirby Road between Jane Street and Dufferin Street. The intent of this report is to characterize important natural features and identify potential impacts associated with the proposed undertaking based on the preferred Preliminary Design.

The study area contains several significant natural features, including PSW, Significant Woodland, ANSIs, ESA, Candidate and Confirmed SWH, regionally significant bird and plant species, and SAR observations. Natural feature constraints were identified to guide the design plan as to avoid, limit, or mitigate impacts to natural heritage features. Recommendations have been made to protect these significant natural features and species and to limit the impact of road development on these features to the extent feasible. Where impacts cannot be avoided, compensation has been recommended in accordance with municipal and TRCA guidelines, and restoration of the disturbed features are to be undertaken based on a future Edge Management Plan.

This report provides recommendations to minimize impacts and ensure that mitigative measures are implemented and functioning properly. These include recommendations to mitigate direct, indirect, and induced impacts that may arise during and after the proposed development design is established and construction begins.

11.0 References

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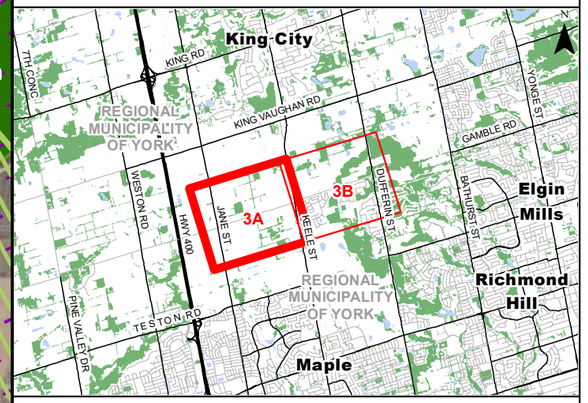
MAPS

Map 1A

Kirby Road Environmental Assessment

Study Area



Legend

- Study Area
- Provincially Significant Wetland (PSW)
- Unevaluated Wetland
- Significant Woodland
- Greenbelt Plan Area Boundary
- Oak Ridge Moraine (ORM) Conservation Plan Boundary
- Environmentally Significant Areas
- Growth Plan NHS

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Project: 2339 Date: July 15, 2021	NAD83 - UTM Zone 17 Size: 11x17" **1:8,000**

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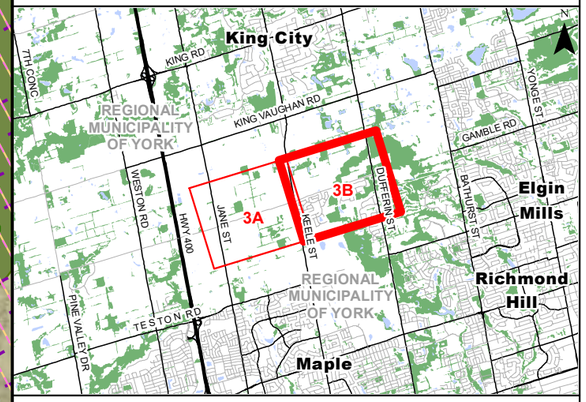
Map 1B

Kirby Road Environmental Assessment

Study Area



Legend

- Study Area
- Provincially Significant Wetland (PSW)
- Other Wetland (Non-PSW)
- Significant Woodland
- ANSI, Earth Science
- Candidate ANSI, Earth Science
- Candidate ANSI, Life Science
- Greenbelt Plan Area Boundary
- Oak Ridge Moraine (ORM) Conservation Plan Boundary
- Environmentally Significant Areas
- Growth Plan NHS

King-Vaughan Wetland Complex
Don River West Branch Headwater Wetland Complex
Maple Spur
Maple Spur Channel
Maple Uplands & Kettles
Keele Wetland
KEELE ST
KIRBY RD
BESTVIEW CRES
BEAVERBROOK CRES
RAVINEVIEW DR
VISTA GATE
LODGEWAY DR
VILLAGE VISTA WAY
CANYON GATE CRES
PEAK POINT BLVD
REGENCY VIEW HTS
GLACIER CRT
FOOTHILLS RD
ADIRONDACK DR
LAURENTIAN BLVD
KOKANEE CRT
NEVADA CRES
MATTERHORN RD
DUFFERIN ST
KOOTENAY RIDGE
APPALACHIAN RD
ATHABASCA DR
HUNTERWOOD CHASE
BEAKES CRES
CRESTBANK CRT
OAK PARK CRES
GREENVIEW CIR
MAPLE FOREST DR
SALAMANDER CRT

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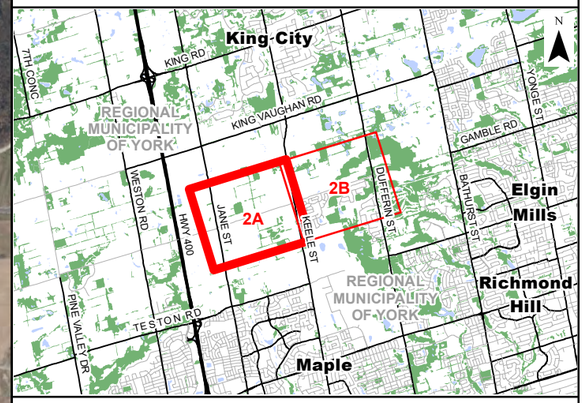
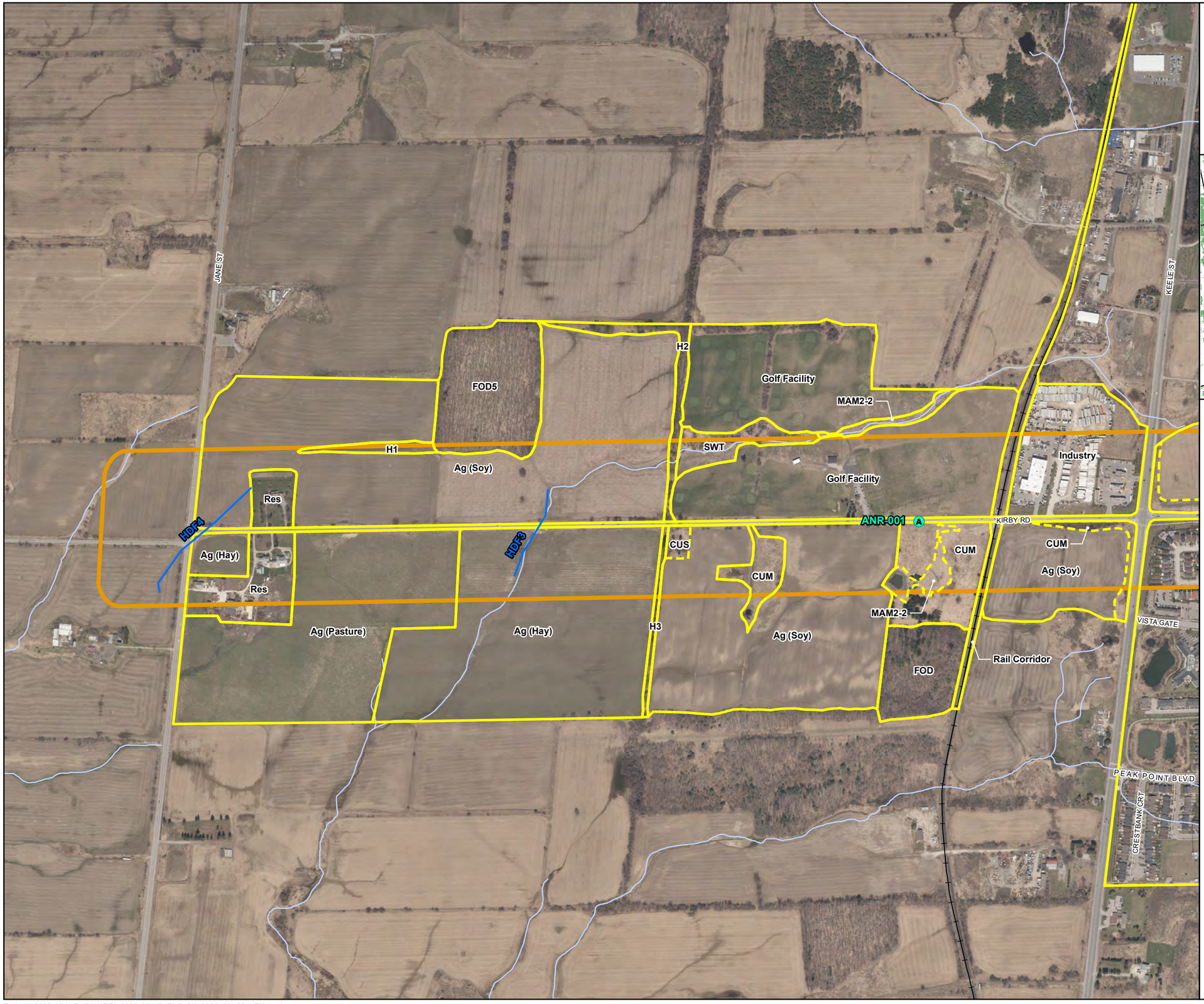
Map 2A

Kirby Road Environmental Assessment

Vegetation Communities and Monitoring Stations





Legend

- Study Area
- Headwater Drainage Feature (HDF)
- (A) Anuran Monitoring Station (ANR)
- Ecological Land Classification (ELC)
  - (Ag) Agriculture
  - (CUM) Cultural Meadow
  - (FOD) Deciduous Forest
  - (FOD5) Dry - Fresh Sugar Maple Deciduous Forest Ecosite
  - (H) Hedgerow
  - (MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type
  - (Res) Residential
  - (SWT) Thicket Swamp
- ELC Inclusion
  - (CUM) Cultural Meadow
  - (CUS) Cultural Savannah
  - (MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type

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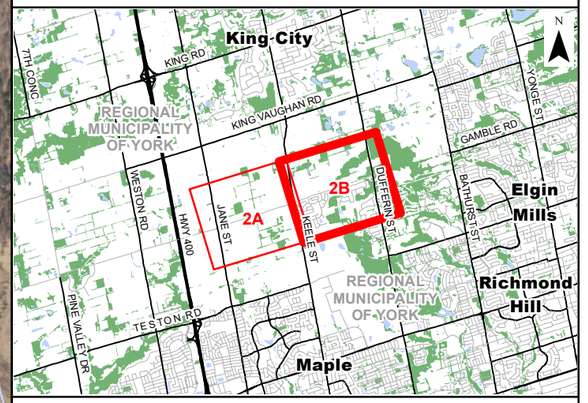
Map 2B

Kirby Road Environmental Assessment

Vegetation Communities and Monitoring Stations



Legend

- Study Area
- Headwater Drainage Feature (HDF)
- (A) Anuran Monitoring Station (ANR)
- Ecological Land Classification (ELC)

(Ag) Agriculture
(CUM) Cultural Meadow
(CUP3-2) White Pine Coniferous Plantation Type
(CUW) Cultural Woodland
(FOD) Deciduous Forest
(FOD1-1) Dry - Fresh Red Oak Deciduous Forest Type
(FOM2) Dry - Fresh White Pine - Maple - Oak Mixed Forest Ecosite
(H) Hedgerow
(MA) Marsh
(Res) Residential
(SWD3) Maple Mineral Deciduous Swamp Ecosite

- ELC Inclusion

(CUM) Cultural Meadow
(MAM2) Mineral Meadow Marsh Ecosite

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Date: September 8, 2020

NAD83 - UTM Zone 17
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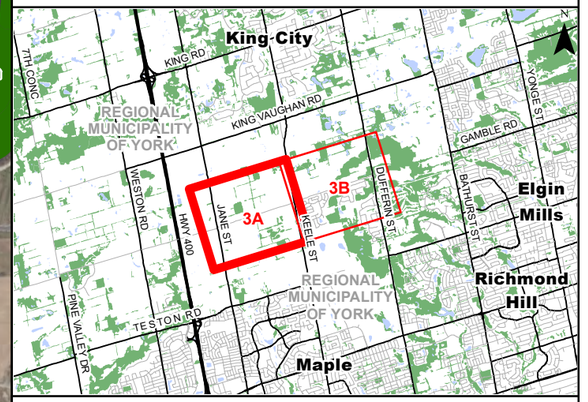
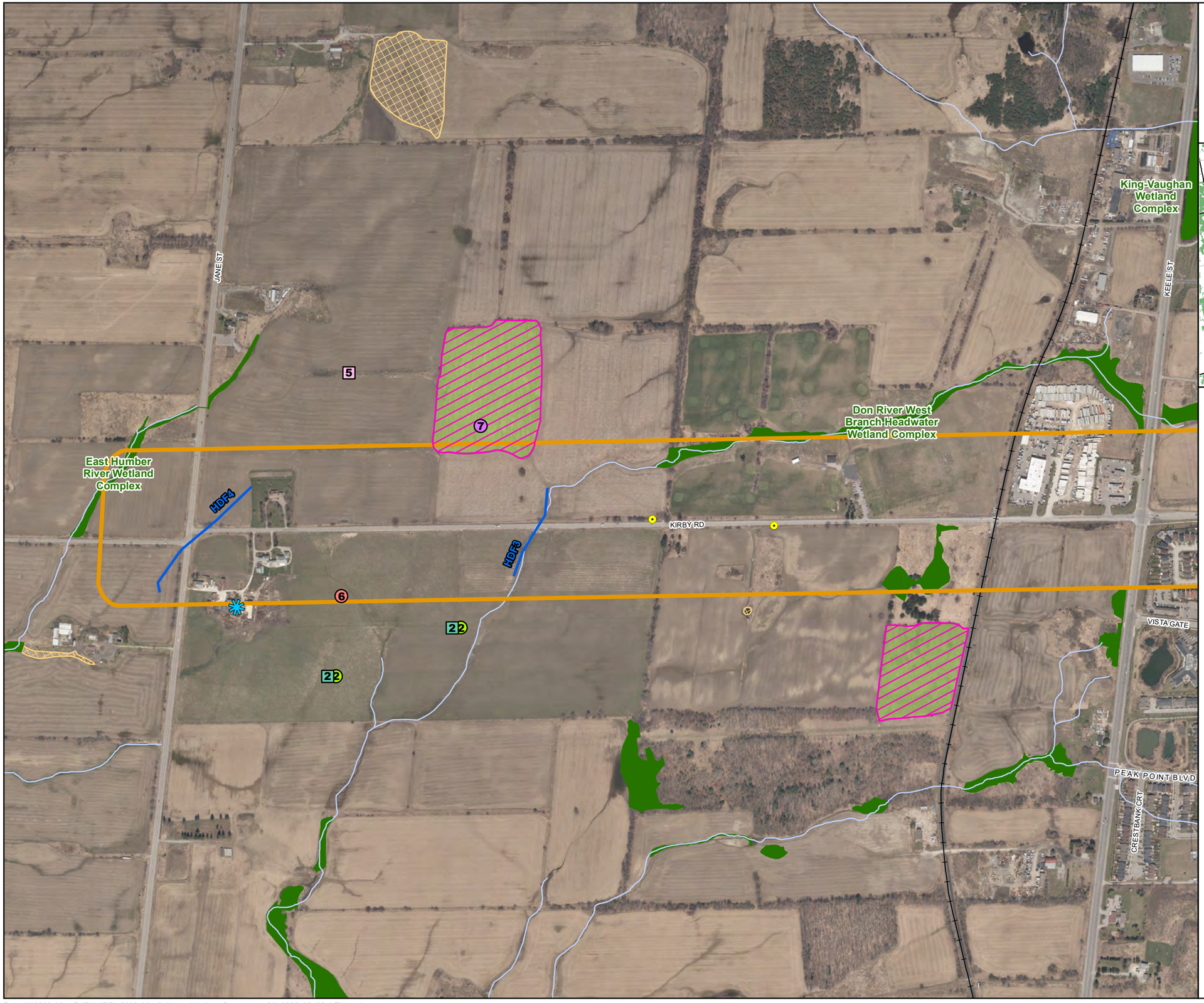
Map 3A

Kirby Road Environmental Assessment

Natural Heritage Features





Legend

- Study Area
- Provincially Significant Wetland (PSW)
- Unevaluated Wetland

Headwater Drainage Feature (HDF) Management Recommendations

- Mitigation
- Protection
- No Management Required

Significant Wildlife Habitat

- Special Concern and Rare Wildlife (Eastern Wood-Pewee)
- Bat Maternity SWH
- Potential Bat Cavity Tree
- Suitable Barn Swallow Nesting Location

Regionally Significant Bird Species

- 2 Bobolink
- 5 Vesper Sparrow

Species at Risk (SAR) and Species of Conservation Concern (SCC)

- 2 Bobolink
- 6 Barn Swallow
- 7 Eastern Wood-Pewee

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Project: 2339
Date: September 8, 2020

NAD83 - UTM Zone 17
Size: 11x17"
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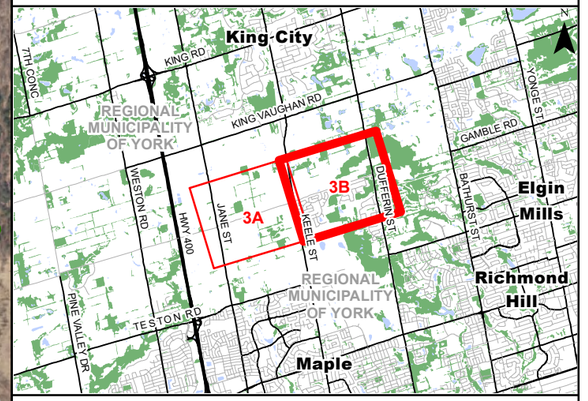
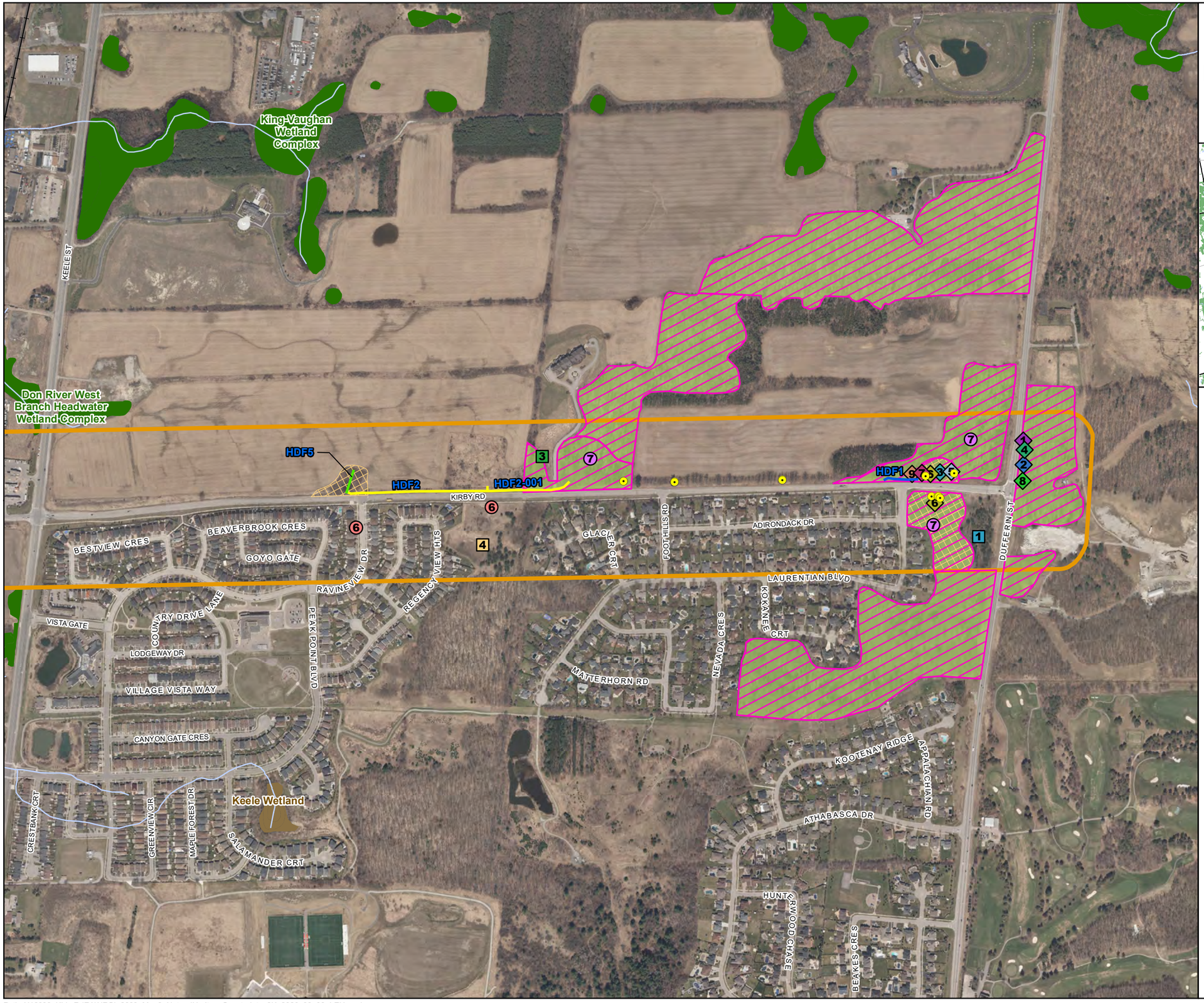
Map 3B

Kirby Road Environmental Assessment

Natural Heritage Features





Legend

- Study Area
- Provincially Significant Wetland (PSW)
- Other Wetland (Non-PSW)
- Unevaluated Wetland

Headwater Drainage Feature (HDF) Management Recommendations

- Mitigation
- Protection
- No Management Required

Significant Wildlife Habitat

- Special Concern and Rare Wildlife (Eastern Wood-Pewee)
- Bat Maternity SWH
- Potential Bat Cavity Tree
- Suitable Barn Swallow Nesting Location

Regionally Significant Bird Species

- 1 Black-billed Cuckoo
- 3 Chestnut-sided Warbler
- 4 Eastern Towhee

Species at Risk (SAR) and Species of Conservation Concern (SCC)

- 6 Barn Swallow
- 7 Eastern Wood-Pewee

Regionally Rare Plant Species

- 1 Bronze Sedge
- 2 Common Prickly-ash
- 3 Eastern Mannagrass
- 4 Large Tick-trefoil
- 5 New York Fern
- 6 Pale Dogwood
- 7 Poke Milkweed
- 8 Thin-leaved Sedge
- 9 Troublesome Sedge

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Project: 2339
Date: September 8, 2020

NAD83 - UTM Zone 17
Size: 11x17"
1:8,000

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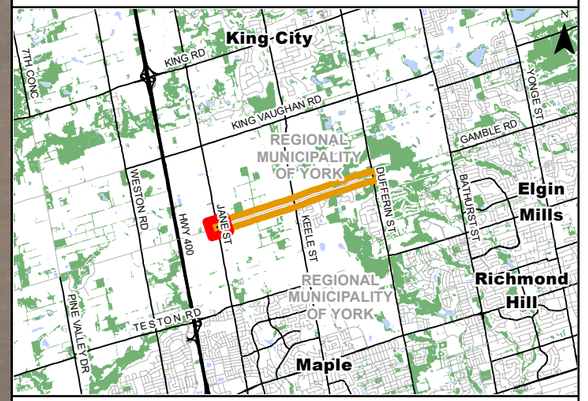
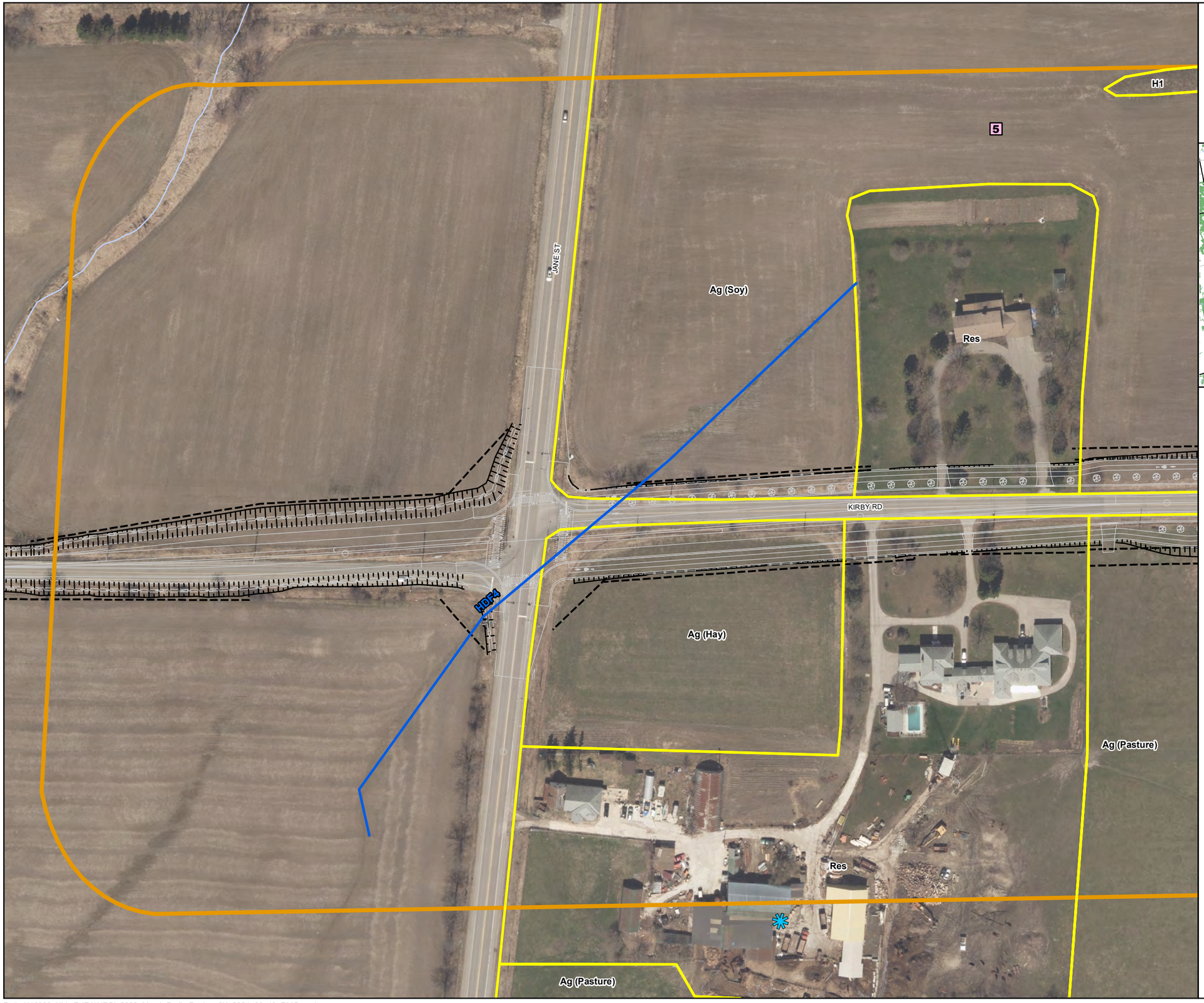
Map 4a

Kirby Road Environmental Assessment

Preliminary Design





Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design
- Suitable Barn Swallow Nesting Location

Headwater Drainage Feature (HDF) Management Recommendations

- No Management Required

Regionally Significant Bird Species

- 5 Vesper Sparrow

- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (H) Hedgerow
- (Res) Residential

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Aquatic, Terrestrial and Wetland Biologists

Project: 2339
Date: September 10, 2021

NAD83 - UTM Zone 17
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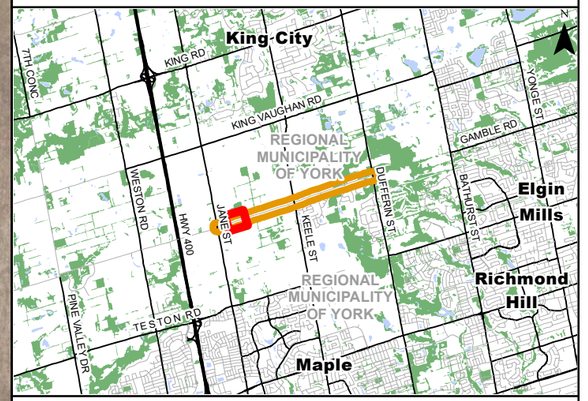
Map 4b

Kirby Road Environmental Assessment

Preliminary Design



Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design

Headwater Drainage Feature (HDF) Management Recommendations

- No Management Required

Significant Wildlife Habitat

- Special Concern and Rare Wildlife (Eastern Wood-Pewee)
- Bat Maternity SWH

Regionally Significant Bird Species

- 2 Bobolink

Species at Risk (SAR) and Species of Conservation Concern (SCC)

- 2 Bobolink
- 6 Barn Swallow
- 7 Eastern Wood-Pewee

- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (FOD5) Dry - Fresh Sugar Maple Deciduous Forest Ecosite
- (H) Hedgerow

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Project: 2339
Date: September 10, 2021

NAD83 - UTM Zone 17
Size: 11x17"
1:1,500

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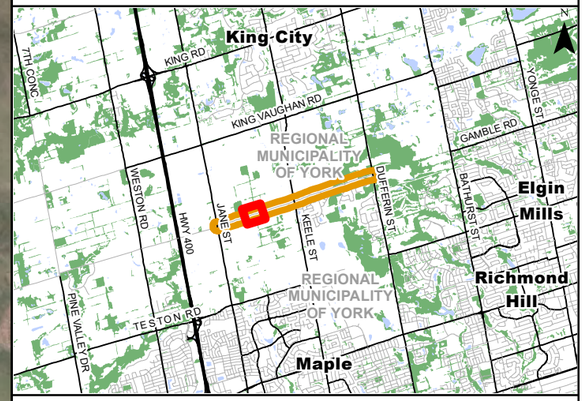
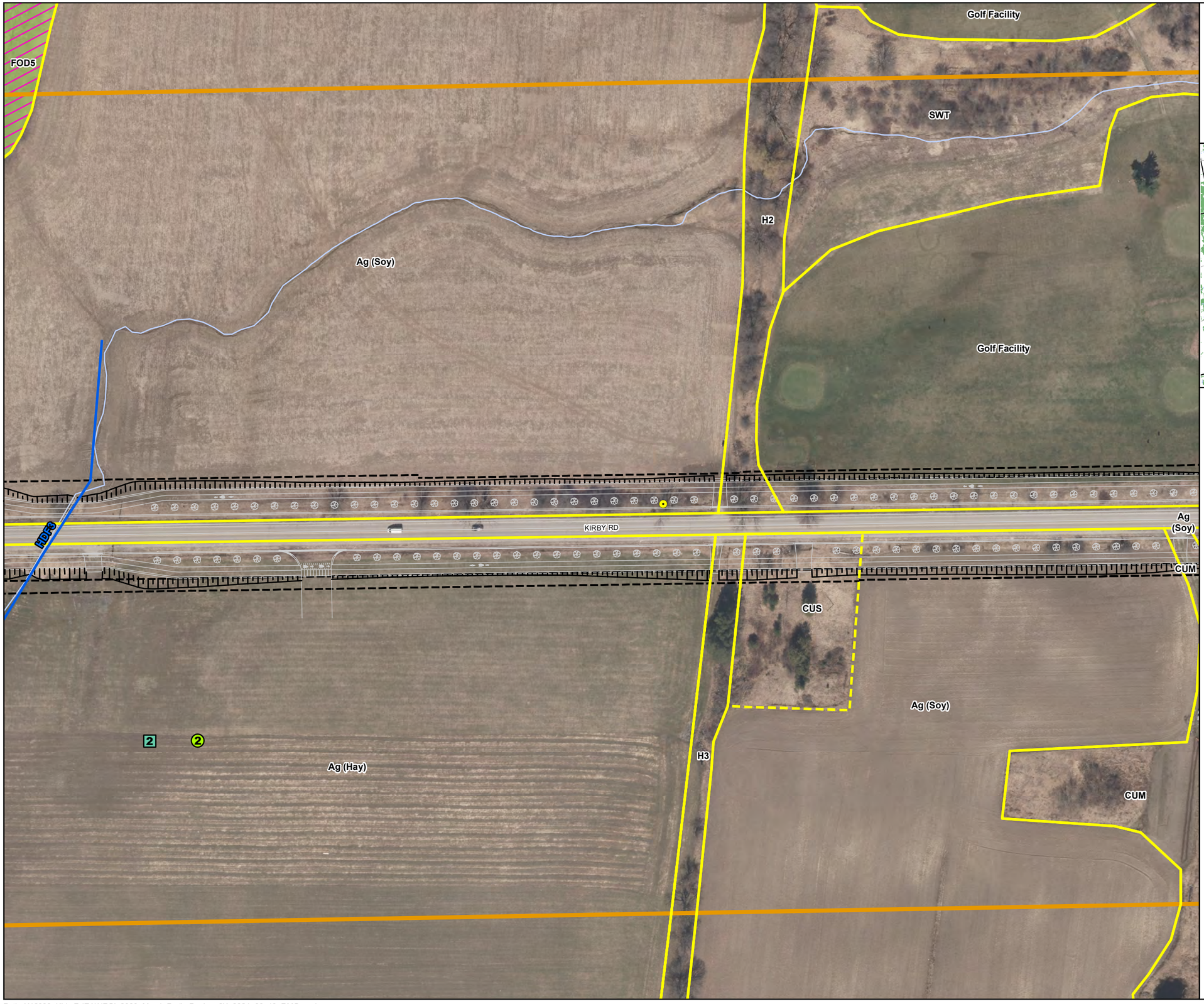
Map 4c

Kirby Road Environmental Assessment

Preliminary Design





Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design

Headwater Drainage Feature (HDF) Management Recommendations

- No Management Required

Significant Wildlife Habitat

- Special Concern and Rare Wildlife (Eastern Wood-Pewee)
- Bat Maternity SWH
- Potential Bat Cavity Tree

Regionally Significant Bird Species

- 2 Bobolink

Species at Risk (SAR) and Species of Conservation Concern (SCC)

- 2 Bobolink

- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM) Cultural Meadow
- (FOD5) Dry - Fresh Sugar Maple Deciduous Forest Ecosite
- (H) Hedgerow
- (SWT) Thicket Swamp
- ELC Inclusion
- (CUS) Cultural Savannah

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NAD83 - UTM Zone 17
Size: 11x17"
1:1,500

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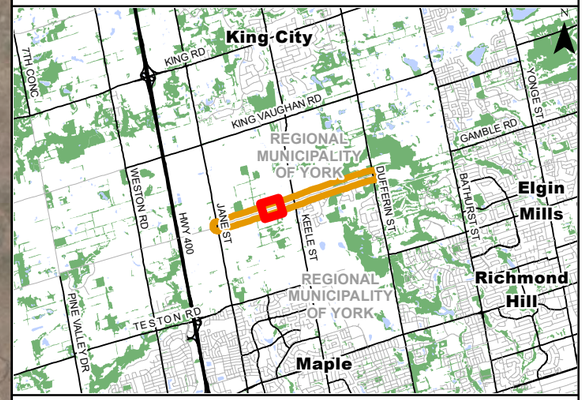
Map 4d

Kirby Road Environmental Assessment

Preliminary Design



Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design
- Potential Bat Cavity Tree
- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM) Cultural Meadow
- (MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type
- (SWT) Thicket Swamp
- ELC Inclusion
- (MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type

Golf Facility
MAM2-2
SWT
Golf Facility
KIRBY RD
Ag (Soy)
CUM
Ag (Soy)
CUM
MAM2-2
Ag (Soy)

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Project: 2339 Date: September 10, 2021	NAD83 - UTM Zone 17 Size: 11x17" **1:1,500**

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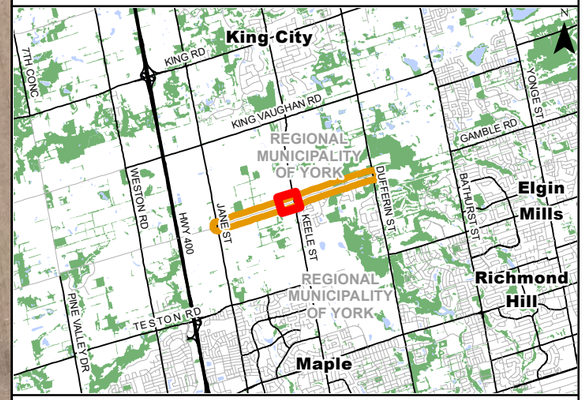
Map 4e

Kirby Road Environmental Assessment

Preliminary Design



Golf Facility

Rail Corridor

Industry

KEELE ST

Ag (soy)

CUM

KIRBY RD

CUM

CUM

Rail Corridor

Ag (Soy)

BESTVIEW CRES

Res

Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design
- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM) Cultural Meadow
- (Res) Residential
- ELC Inclusion
- (CUM) Cultural Meadow

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Project: 2339
Date: September 10, 2021

NAD83 - UTM Zone 17
Size: 11x17"
1:1,500

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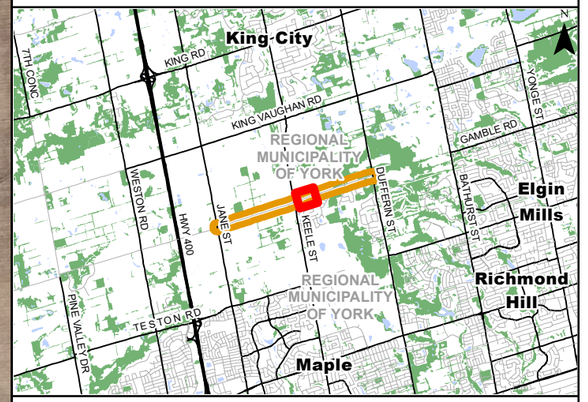
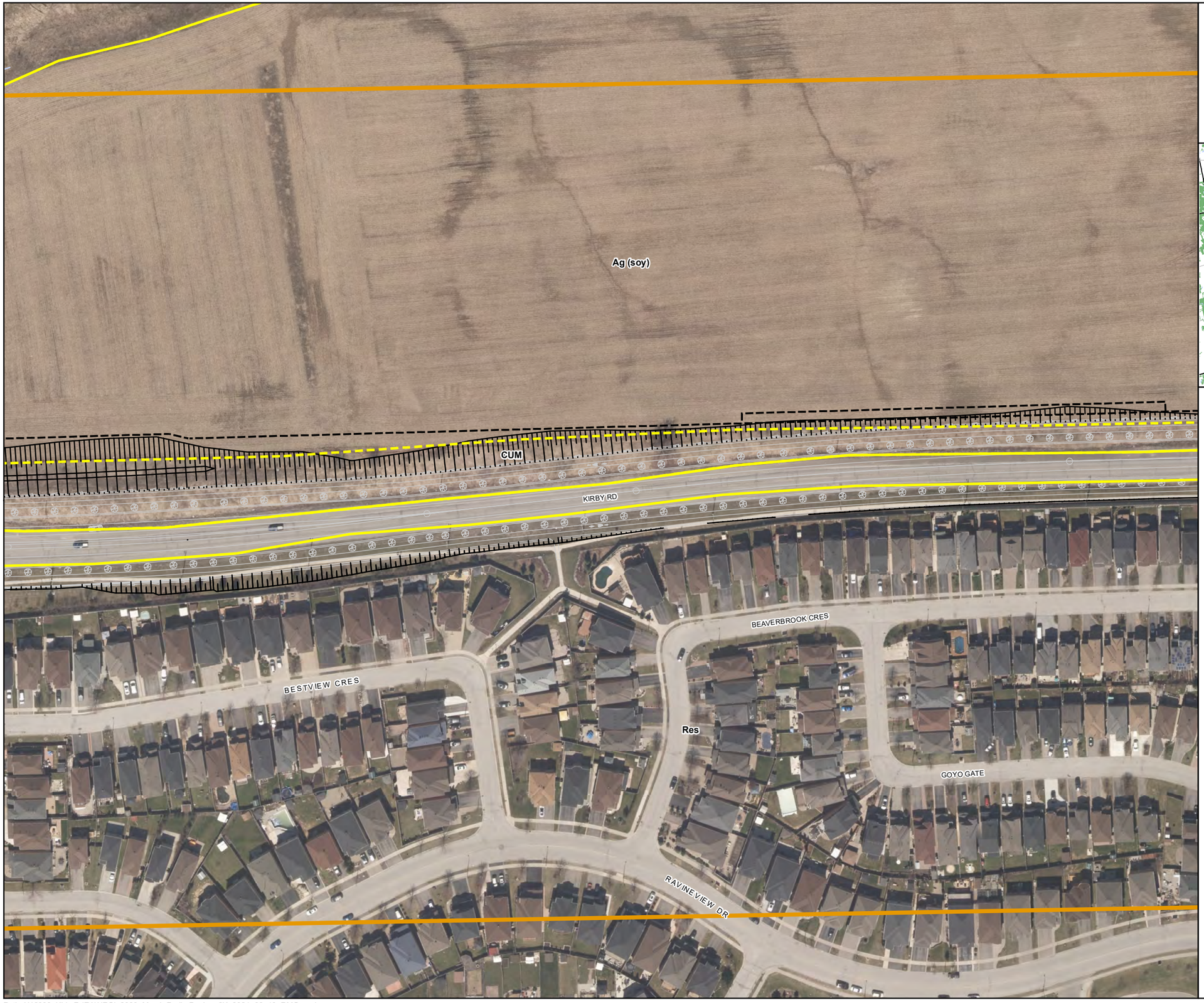
Map 4f

Kirby Road Environmental Assessment

Preliminary Design





Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design
- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (Res) Residential
- ELC Inclusion
- (CUM) Cultural Meadow

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Project: 2339 Date: September 10, 2021	NAD83 - UTM Zone 17 Size: 11x17" **1:1,500**

0 20 40 60 80 100 Metres

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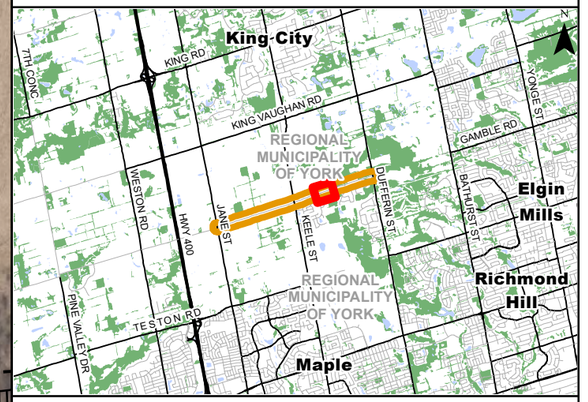
Map 4g

Kirby Road Environmental Assessment

Preliminary Design



Ag (soy)

MAM2

HDF53

HDF2

HDF2-001

CUM

KIRBY RD

RAVINEVIEW DR

REGENCY VIEW HTS

BEAVERBROOK CRES

GOYO GATE

BOTTERO DR

Res

CUM

6

4

Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design
- Unevaluated Wetland

Headwater Drainage Feature (HDF) Management Recommendations

- Mitigation
- Protection

Regionally Significant Bird Species

- 4 Eastern Towhee

Species at Risk (SAR) and Species of Conservation Concern (SCC)

- 6 Barn Swallow

- Ecological Land Classification (ELC)

(Ag) Agriculture
(CUM) Cultural Meadow
(Res) Residential

- ELC Inclusion

(CUM) Cultural Meadow
(MAM2) Mineral Meadow Marsh Ecosite

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Project: 2339
Date: September 10, 2021

NAD83 - UTM Zone 17
Size: 11x17"
1:1,500

0 20 40 60 80 100 Metres

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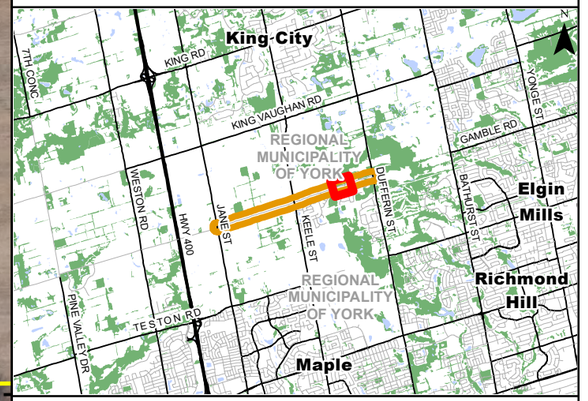
Map 4h

Kirby Road Environmental Assessment

Preliminary Design



Ag (soy)
Res
RADHA RD
FOD
CUP3-2
Ag (Corn)
3
7
FOM2
HDF2-001
H4
KIRBY RD
CUM
GLACIER CRT
Res
FOOT HILLS RD
ADIRONDACK DR
LAURENTIAN BLVD
NEVADA CRES

Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design

Headwater Drainage Feature (HDF) Management Recommendations

- Mitigation

Significant Wildlife Habitat

- Special Concern and Rare Wildlife (Eastern Wood-Pewee)
- Bat Maternity SWH
- Potential Bat Cavity Tree

Regionally Significant Bird Species

- 3 Chestnut-sided Warbler

Species at Risk (SAR) and Species of Conservation Concern (SCC)

- 7 Eastern Wood-Pewee

- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM) Cultural Meadow
- (CUP3-2) White Pine Coniferous Plantation Type
- (FOD) Deciduous Forest
- (FOM2) Dry - Fresh White Pine - Maple - Oak Mixed Forest Ecosite
- (H) Hedgerow
- (Res) Residential

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Project: 2339 Date: September 10, 2021	NAD83 - UTM Zone 17 Size: 11x17" **1:1,500**

0 20 40 60 80 100 Metres

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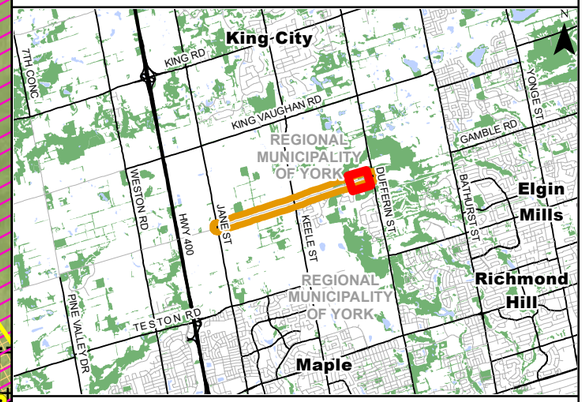
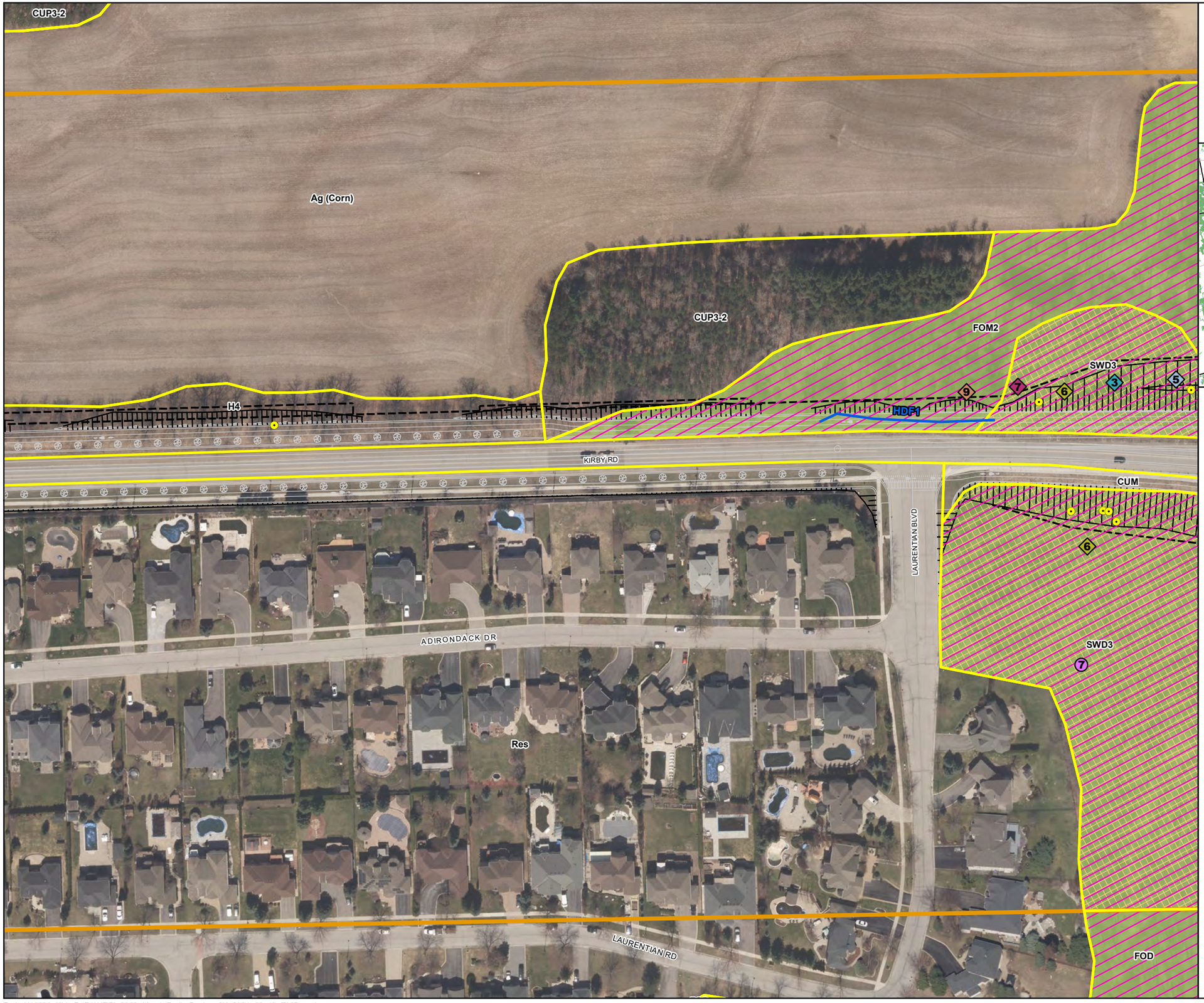
Map 4i

Kirby Road Environmental Assessment

Preliminary Design





Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design
- Unevaluated Wetland

Headwater Drainage Feature (HDF) Management Recommendations

- No Management Required

Significant Wildlife Habitat

- Special Concern and Rare Wildlife (Eastern Wood-Pewee)
- Bat Maternity SWH
- Potential Bat Cavity Tree

Species at Risk (SAR) and Species of Conservation Concern (SCC)

- 7 Eastern Wood-Pewee

Regionally Rare Plant Species

- 3 Eastern Mannagrass
- 5 New York Fern
- 6 Pale Dogwood
- 7 Poke Milkweed
- 9 Troublesome Sedge

- Ecological Land Classification (ELC)
- (Ag) Agriculture
- (CUM) Cultural Meadow
- (CUP3-2) White Pine Coniferous Plantation Type
- (FOD) Deciduous Forest
- (FOM2) Dry - Fresh White Pine - Maple - Oak Mixed Forest Ecosite
- (H) Hedgerow
- (Res) Residential
- (SWD3) Maple Mineral Deciduous Swamp Ecosite

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Aquatic, Terrestrial and Wetland Biologists

Project: 2339
Date: September 10, 2021

NAD83 - UTM Zone 17
Size: 11x17"
1:1,500

0 20 40 60 80 100 Metres

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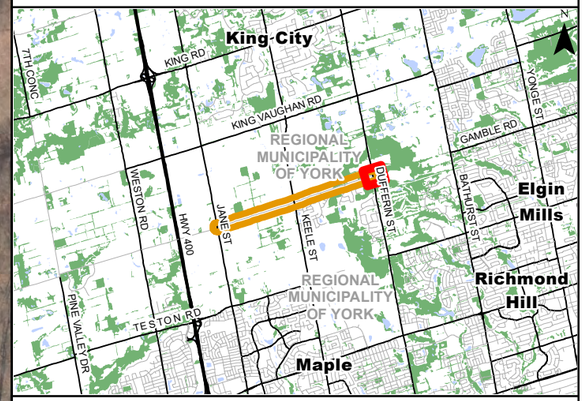
Map 4j

Kirby Road Environmental Assessment

Preliminary Design



Legend

- Study Area
- Right of Way (ROW)
- Grading
- Preliminary Design
- Unevaluated Wetland

Headwater Drainage Feature (HDF) Management Recommendations

- No Management Required

Significant Wildlife Habitat

- Special Concern and Rare Wildlife (Eastern Wood-Pewee)
- Bat Maternity SWH
- Potential Bat Cavity Tree

Regionally Significant Bird Species

1. Black-billed Cuckoo

Species at Risk (SAR) and Species of Conservation Concern (SCC)

7. Eastern Wood-Pewee

Regionally Rare Plant Species

1. Bronze Sedge
2. Common Prickly-ash
3. Eastern Mannagrass
4. Large Tick-trefoil
5. New York Fern
6. Pale Dogwood
7. Poke Milkweed
8. Thin-leaved Sedge
9. Troublesome Sedge

- Ecological Land Classification (ELC)

(Ag) Agriculture
(CUM) Cultural Meadow
(CUP3-2) White Pine Coniferous Plantation Type
(CUW) Cultural Woodland
(FOD) Deciduous Forest
(FOD1-1) Dry - Fresh Red Oak Deciduous Forest Type
(FOM2) Dry - Fresh White Pine - Maple - Oak Mixed Forest Ecosite
(Res) Residential
(SWD3) Maple Mineral Deciduous Swamp Ecosite

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2339
Date: September 10, 2021

NAD83 - UTM Zone 17
Size: 11x17"
1:1,500

0 20 40 60 80 100 Metres

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APPENDIX I

Species at Risk / Species of Conservation Concern Screening Assessment

SAR/SCC Screening Assessment

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Background Source	Habitat Preference[5]	Suitable Habitats within Study Area	Rationale
Birds									
Cardellina canadensis	Canada Warbler	S4B	SC	T	Schedule 1	BSC et al. 2008	Interior forest habitats with a dense, well-developed shrub and vegetation understory; along riparian zones or wet bottomland habitat. require tracts of land which are >30ha.	No	Suitable habitat is not present within the study area.
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1	BSC et al. 2008	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water.	No	Suitable habitat is not present within the study area.
Coccothraustes vespertinus	Evening Grosbeak	S4B	SC	SC	Schedule 1	BSC et al. 2008	Second-growth and mature coniferous woodland and spruce and mixed forest.	No	Suitable habitat is not present within the study area.
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		BSC et al. 2008	Predominantly found in deciduous forests, specifically along edge habitats and wet areas near bodies of water.	Yes	Suitable habitat is present within the study area. Breeding bird surveys documented the presence of this species at 4 locations.
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	BSC et al. 2008	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha.	Yes	Suitable habitat is present in the pasturelands at the extreme western edge of the study area. Breeding bird surveys documented the presence of 2 singing males in this habitat.
Empidonax virescens	Acadian Flycatcher	S2S3B	END	E	Schedule 1	BSC et al. 2008	Mature, shady, deciduous forests; heavily wooded ravines; creek bottoms or river swamps; availability of good quality habitat is limiting factor; needs at least 30 ha of forest.	No	Suitable habitat is not present within the study area.
Hirundo rustica	Barn Swallow	S4B	THR	T		BSC et al. 2008	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	Yes	Optimal foraging habitat is present wihtin the agricultural pasture at the extreme western edge of the study area. Structures providing suitable nesting habitat are present within the study area. Breeding bird surveys documented the presence of several foraging birds.
Hylocichla mustelina	Wood Thrush	S4B	SC	T		BSC et al. 2008	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have some trees higher than 12 m.	Yes	Suitable habitat is present within the study area. Breeding bird surveys did not document the presence of this species.

SAR/SCC Screening Assessment

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Background Source	Habitat Preference[5]	Suitable Habitats within Study Area	Rationale
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	T	Schedule 1	BSC et al. 2008	Open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges; groves of dead or dying trees; feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh; require about 4 ha for a territory.	Yes	Suitable habitat is present within the study area. Breeding bird surveys did not document the presence of this species.
Riparia riparia	Bank Swallow	S4B	THR	T		BSC et al. 2008	Suitable habitat is present within the study area. Breeding bird surveys did not document the presence of this species.	No	Suitable habitat is not present within the study area.
Setophaga cerulea	Cerulean Warbler	S3B	THR	E	Schedule 1	BSC et al. 2008	Mature deciduous woodland of Great Lakes- St. Lawrence and Carolinian forests, sometimes coniferous; swamps or bottomlands with large trees; area sensitive species needing extensive areas of forest (>100 ha).	No	Suitable habitat is not present within the study area.
Sturnella magna	Eastern Meadowlark	S4B	THR	T	No Schedule	BSC et al. 2008	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	Yes	Suitable habitat is present within the study area. Breeding bird surveys did not document the presence of this species.
Vermivora chrysoptera	Golden-winged Warbler	S4B	SC	T	Schedule 1	BSC et al. 2006	Early successional habitat; shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps; alder bogs; deciduous, damp woods; shrubbery clearings in deciduous woods with saplings and grasses; brier-woodland edges; requires >10 ha.	No	Suitable habitat is not present within the study area.
Herpetofauna									
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2019	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	No	Suitable habitat is not present within the study area.
Chrysemys picta marginata	Midland Painted Turtle	S4	SC	NS	No schedule	Ontario Nature 2019	Waterbordies, such as ponds, marshes, lakes, and slow-moving creeks, that have soft bottom and provide abundant basking sites and aquatic vegetation.	No	Suitable habitat is not present within the study area.
Lampropeltis t. triangulum	Eastern Milksnake	S4		SC	Schedule 1	Ontario Nature 2019	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites.	Yes	Suitable habitat is present within the study area. Incidental reptile searches did not document the species within the study area.
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	Schedule 1	Ontario Nature 2019	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs.	No	Suitable habitat is not present within the study area.

SAR/SCC Screening Assessment

Scientific Name	Common Name	SRANK[1]	COSSARO[2]	COSEWIC[3]	SARA Schedule[4]	Background Source	Habitat Preference[5]	Suitable Habitats within Study Area	Rationale
Pseudacris triseriata	Western Chorus Frog	S3	NAR	T	Schedule 1	Ontario Nature 2019	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools ponds and temporary pools	Yes	Suitable habitat is present within the study area. Anuran call surveys did not document the species within the study area.
Mammals									
Myotis lucifungus	Little Brown Myotis	S5	END	E	Schedule 1	Dobbyn 1994	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges.	Yes	Eleven trees were identified within the study area to have suitable cavities, which could provide roosting potential for the species. Recommendations for tree removal, if required would adhere to being removed outside of the bat active period (i.e. April 1-October 31).
Myotis septentrionalis	Northern Myotis	S3?	END	E	Schedule 1	Dobbyn 1994	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, man-made structures but prefers hollow trees or under loose bark; hunts within forest, below canopy	Yes	Eleven trees were identified within the study area to have suitable cavities, which could provide roosting potential for the species. Recommendations for tree removal, if required would adhere to being removed outside of the bat active period (i.e. April 1-October 31).
Insects									
Danaus plexippus	Monarch	S4	SC	E		Macnaughton et al. 2019	Open areas with milkweed species (*Asclepias spp.*).	No	Large concentrations of host plants (Milkweed species) are largely absent from the study area, due to the developed nature of the area (i.e. urban boundary and agriculturally). Field surveys did not document the presence of this species.

[1,2]MNRF 2019c; [3,4]Government of Canada 2019; [5]OMNR 2000

Legend		
SRANK	**COSSARO/COSEWIC**	**SARA Schedule**
S2 Imperiled	SC Special Concern	Schedule 1 Officially Protected under SARA
S3 Vulnerable	THR/T Threatened	
S4 Apparently Secure	END/E Endangered	
S5 Secure		

APPENDIX II

Significant Wildlife Habitat Screening Assessment

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					
Rationale: Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available[exlviii]. Information Sources • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat[cxlviii]. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMiST[cxlix] Index #7 provides development effects and mitigation measures.	Suitable habitat of sufficient size is not present within the study area. **Not SWH**
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					
Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Information Sources • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[l] or more of listed species for 7 days[l], results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH[cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH[cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG[cxlviii] Appendix K[cxlix] are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST[cxlix] Index #7 provides development effects and mitigation measures.	Suitable habitat of sufficient size is not present within the study area. **Not SWH**
Wildlife Habitat: Shorebird Migratory Stopover Area					

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	**Candidate SWH**		**Confirmed SWH**	**Subject Propety**
		ELC Ecosite Codes[1]	**Habitat Criteria and Information Sources**[1]	**Defining Criteria**[1]	**Assessment Details**
Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. Information Sources • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area[cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #8 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**
Wildlife Habitat: Raptor Wintering Area					
Rational: Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl Special Concern: Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha[cxlviii, cxlix] with a combination of forest and upland.[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands[cxlix] Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting Information Sources • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years)[cxlix] for a minimum of 20 days by the above number of birds • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #10 and #11 provides development effects and mitigation measures.	Suitable habitat of sufficient size is not present within the study area. **Not SWH**
Wildlife Habitat: Bat Hibernacula					

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Rationale Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. Information Sources • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum[cxlviii, ccvii] for most. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects"[ccv] • SWHMiST[cxlix] Index #1 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Maternity Colonies					
Rationale: Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings[xxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario[xxii] • Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii] • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3[ccxiv] or class 1 or 2[ccxii] • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx] Information Sources • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts.	• Maternity Colonies with confirmed use by: • >10 Big Brown Bats • >5 Adult Female Silver-haired Bats • The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects[ccv] • SWHMiS T[cxlix] Index #12 provides development effects and mitigation measures.	Suitable habitat is present within the study area. Cavity assessments were completed within the road right-of-way, however, access outside of this area was not granted. **Candidate SWH**

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Migratory Stopover Area					
	Hoary Bat Eastern Red Bat Silver-haired Bat	No specified ELC types.	Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown. Information Sources • OMNR for possible locations and contact for local experts • University of Waterloo, Biology Department	Long Point has been identified as a significant stopover habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration[ccxv] • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHDSS[cxlix] Index #38 provides development effects and mitigation measures	Criteria unavailable to assess significance of habitat within the subject property.
Wildlife Habitat: Turtle Wintering Area					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen[cix, cx, cxi, cxviii]. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. Information Sources • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May)[cvii] • Congregation of turtles is more common where wintering areas are limited and therefore significant[cix, cx, cxi, cxii]. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Suitable overwintering habitat not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Snake Hibernaculum					
Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Snakes: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake Special Concern: Milksnake Eastern Ribbonsnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, lii, cxii.] • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. • Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii. Information Sources • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). • Reports and other information from CAs. • Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs • Natural Heritage Information Center (NHIC) • OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). • Note: If there are Special Concern Species present, then site is SWH • Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWH[i] • SWHMiST[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Suitable habitat not present within the study area. **Not SWH**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					
Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources • Reports and other information available from CAs • Ontario Breeding Bird Atlas [ccv] • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Field Naturalist clubs	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii] • Field surveys to observe and count swallow nests are to be completed during the breeding season Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMiST[cxlix] Index #4 provides development effects and mitigation measures	Suitable habitat not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)					
Rationale: Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15m from ground, near the top of the tree. Information Sources • Ontario Breeding Bird Atlas[ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries • Reports and other information available from CAs • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5[i] or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH [cc, ccvii] • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMiST[cxlix] Index #5 provides development effects and mitigation measures.	Suitable habitat of sufficient size is not present within the study area. Breeding bird surveys did not document criterion species. **Not SWH**
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Ground)					
Rationale: Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. Information Sources • Ontario Breeding Bird Atlas[ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[i]. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH[cc, ccvii] • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #6 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Migratory Butterfly Stopover Areas					
Rationale: Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral Special Concern: Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: Field: CUM CUS CUT Forest: FOC FOM FOD CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario[cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south[xxxii, xxxiii, xxxiv, xxxv, xxxvi.] • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat cxlviii, cxlix. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes[xxxvii, xxxviii, xxxix, xl, xli.] Information Sources • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur between years and multiple years of sampling should occur [xl, xlii]. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • SWHMiST[cxlix] Index #16 provides development effects and mitigation measures.	Study area not located within 5 km of Lake Ontario. **Not SWH**
Wildlife Habitat: Landbird Migratory Stopover Areas					
Rationale: Sites with a high diversity of species as well as high number are most significant	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha[i] in size and within 5km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant[cxlix] • Sites have a variety of habitats; forest, grassland and wetland complexes[cxlix]. • The largest sites are more significant[cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario are Candidate SWH[cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #9 provides development effects and mitigation measures.	Study area not located within 5 km of Lake Ontario. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Propety
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Deer Yarding Areas					
Rationale: Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%[cxciv]. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"[cxcv] • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH[lvi, lvii, lviii, lix, lx, i]. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations[cxcv]. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within or adjacent to the study area. **Not SWH**
Wildlife Habitat: Deer Winter Congregation Areas					
Rationale: Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions[exlviii]	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands[cxlviii]. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha[ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant. Information Sources • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF[cxlviii]. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR[i]. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv] , ground or road surveys, or a pellet count deer density survey[ccxxv]. • If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #2 provides development effects and mitigation measures.	Deer overwintering habitat not identified by MNRF within or adjacent to the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Cliff and Talus Slopes					
Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. Information Sources • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes[lxxviii] • SWHMiST[cxlix] Index #21 provides development effects and mitigation measures.	Vegetation type not present within the study area. **Not SWH**
Sand Barrens					
Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area, >0.5ha in size. Information Sources • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens[lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[i]. • SWHMiST[cxlix] Index #20 provides development effects and mitigation measures.	Vegetation type not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Alvar					
Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleochairs compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover[lxxviii].	An Alvar site > 0.5 ha in size[lxxv]. Information Sources • Alvars of Ontario (2000), Federation of Ontario Naturalists[lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species[lxxv, cxlix] at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses[lxxv]. • SWHMiST[cxlix] Index #17 provides development effects and mitigation measures.	Vegetation type not present within the study area. **Not SWH**
Old Growth Forest					
Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. Information Sources • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat[cxlviii] • The stand will have experienced no recognizable forestry activities[cxlviii] • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand[lxxviii] • SWHDSS[cxlix] Index #23 provides development effects and mitigation measures.	Vegetation type not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Savannah					
Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in[lxxv] Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST[cxlix] Index #18 provides development effects and mitigation measures.	Vegetation type not present within the study area. **Not SWH**
Tallgrass Prairie					
Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. Information Sources • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in[lxxv] Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used[cxlviii]. • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST[cxlix] Index #19 provides development effects and mitigation measures.	Vegetation type not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Subject Property
	ELC Ecosite Codes[1]	Habitat Description[1]	Detailed Information and Sources[1]	Defining Criteria[1]	Assessment Details
Other Rare Vegetation Communities					
Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii]. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M[cxlviii] The OMNR/NHIC will have up to date listing for rare vegetation communities. Information Sources • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii]. • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Other rare vegetation types not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Nesting Area					
Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m[cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur[cxlix]. • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Information Sources • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m[cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST[cxlix] Index #25 provides development effects and mitigation measures.	Suitable habitat of sufficient size is not present within the study area. **Not SWH**
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					
Rationale: Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey Special Concern: Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). Information Sources • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii]. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWHccvii, maintaining undisturbed shorelines with large trees within this area is important[cxlviii]. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH[cvi], ccvii. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat[cvi]. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant[ccvii] • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #26 provides development effects and mitigation measures	Suitable habitat not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Woodland Raptor Nesting Habitat					
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat[lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii]. • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. Information Sources • OMNRF • Check the Ontario Breeding Bird Atlas[ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH[ccvii]. • Barred Owl – a 200m radius around the nest is the SWH[ccvii]. • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH[ccvii]. • Sharp-shinned Hawk – a 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST[cxlix] Index #27 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**
Wildlife Habitat: Turtle Nesting Area					
Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle Special Concern: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m)[cxlviii] or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Information Sources • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[i] • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH[cxlviii]. • Travel routes from wetland to nesting area are to be considered within the SWH[cxlix]. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST[cxlix] Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Suitable habitat of sufficient size is not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Seeps and Springs					
Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system[cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species[cxix, cxx, cxxi, cxxii, cxiii, cxiv] Information Sources • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat[cxlviii] • SWHMiST[cxlix] Index #30 provides development effects and mitigation measures	Suitable habitat not present within the study area. **Not SWH**
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) [ccvii] within or adjacent (within 120m) to a woodland (no minimum size)[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx] Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat[cxlviii] Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses)[lxxi] or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys[cviii] will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area[lxiii,lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi] if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST[cxlix] Index #14 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					
Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter)[ccvii] supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats[clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. Information Sources • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)[lxxi, lxxiii], or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys[cviii] will be required during spring March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST[cxlix] Index #15 provides development effects and mitigation measures.	Suitable wetland habitat not present within the study area. **Not SWH**
Woodland Area-Sensitive Bird Breeding Habitat					
Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.[cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix] • Interior forest habitats are at least 200m from forest edge habitat. Information Sources • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHMiST[cxlix] Index #34 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat					
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present[cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas[ccv]	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species[i]. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH[i]. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #35 provides development effects and mitigation measures	Suitable habitat of sufficient size is not present within the study area. **Not SWH**
Wildlife Habitat: Open Country Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)[i]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi]. • SWHMiST[cxlix] Index #32 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					
Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	Indicator spp.: Brown Thrasher Clay-coloured Sparrow Common spp.: Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large field areas succeeding to shrub and thicket habitats>10ha[clxiv] in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years)[í]. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species [clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas[ccv] • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species[í]. • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”[ccxi] • SWHMiST[cxlix] Index #33 provides development effects and mitigation measures.	Suitable habitat of sufficient size is not present within the study area. **Not SWH**
Wildlife Habitat: Terrestrial Crayfish					
Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. [ccii]	Chimney or Digger Crayfish: (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish: (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites[cci] • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult[cci] • SWHMiST[cxlix] Index #36 provides development effects and mitigation measures.	Suitable habitat of sufficient size is not present within the study area. **Not SWH**

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Special Concern and Rare Wildlife Species					
Rationale: These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites[lxxviii]. Information Sources • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas[ccv] • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST[cxlix] Index #37 provides development effects and mitigation measures.	Presence of Eastern Wood-Pewee is present in 4 forested patched within and adjacent to the study area. **Confirmed SWH**

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E.

	Wildlife Species[1]	Candidate SWH		Confirmed SWH	Subject Property
		ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors					
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat [clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule[i]. Information Sources • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Cooridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant[cxlix]. • Corridors should have at least 15m of vegetation on both sides of waterway [cxlix] or be up to 200m wide[cxlix] of woodland habitat and with gaps <20m [cxlix]. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHMiST[cxlix] Index #40 provides development effects and mitigation measures.	Amphibian Breeding Habitat (Wetland) not present within the subject property. Therefore, amphibian movement corridors are not applicable. **Not SWH**
Wildlife Habitat: Deer Movement Corridors					
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule[i]. • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion [clxxxii, clxxxiii, cxlix, cxciv]. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). Information Sources • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix] . Shorter corridors are more significant than longer corridors[cxlix] • SWHMiST[cxlix] Index #39 provides development effects and mitigation measures.	Deer Wintering Habitat not present within the subject property. Therefore, deer movement corridors are not applicable. **Not SWH**

[1]MNRF 2015

APPENDIX III
Species Lists

Plant Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	York Region	TRCA	NRSI Observed	CUM	CUP	CUW	FOD1-1	FOD5-1	H5	SWD3	FOM2	RES
		MNRF 2020a	Varga 2000	TRCA 2008		Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes
Pteridophytes	**Ferns & Allies**													
Dennstaedtiaceae	**Bracken Fern Family**													
Pteridium aquilinum	Bracken Fern	S5			X		X	X	X					
Dryopteridaceae	**Wood Fern Family**													
Athyrium filix-femina	Common Lady Fern	S5			X							X		
Dryopteris carthusiana	Spinulose Wood Fern	S5	X	L5	X								X	
Matteuccia struthiopteris	Ostrich Fern	S5			X							X		
Onoclea sensibilis	Sensitive Fern	S5	X	L5	X							X	X	
Polystichum acrostichoides	Christmas Fern	S5	X	L4	X								X	
Equisetaceae	**Horsetail Family**													
Equisetum arvense	Field Horsetail	S5	X	L5	X							X		
Osmundaceae	**Royal Fern Family**													
Claytosmunda claytoniana	Interrupted Fern	S5	U	L2	X							X		
Thelypteridaceae	**Beech Fern Family**													
Thelypteris noveboracensis	New York Fern	S4S5	R10	L2	X								X	
Gymnosperms	**Conifers**													
Cupressaceae	**Cypress Family**													
Thuja occidentalis	Eastern White Cedar	S5	X	L4	X		X							
Pinaceae	**Pine Family**													
Picea abies	Norway Spruce	SE3	X	L+	X									X
Picea glauca	White Spruce	S5	X	L3	X							X		X
Pinus strobus	Eastern White Pine	S5	X	L4	X			X		X	X		X	
Pinus sylvestris	Scots Pine	SE5	X	L+	X			X						
Tsuga canadensis	Eastern Hemlock	S5	X	L4	X								X	
Dicotyledons	**Dicots**													
Aceraceae	**Maple Family**													
Acer negundo	Manitoba Maple	S5	X	L+?	X	X								
Acer saccharum	Sugar Maple	S5	X	L5	X				X	X	X	X	X	
Acer x freemanii	*(Acer rubrum X Acer saccharinum)*	SNA	XSR	L4	X									X
Anacardiaceae	**Sumac or Cashew Family**													
Rhus aromatica	Fragrant Sumac	S4	R1	L+	X									X
Rhus typhina	Staghorn Sumac	S5	X	L5	X	X		X			X	X	X	
Toxicodendron radicans var. *rydbergii*	Western Poison Ivy	S5	X	L5	X							X		
Apiaceae	**Carrot or Parsley Family**													
Daucus carota	Wild Carrot	SE5	X	L+	X			X				X		
Sium suave	Hemlock Water-parsnip	S5	X	L4	X								X	
Apocynaceae	**Dogbane Family**													
Apocynum androsaemifolium	Spreading Dogbane	S5	X	L4 (L5)	X	X			X					
Araliaceae	**Ginseng Family**													
Aralia nudicaulis	Wild Sarsaparilla	S5	X	L5	X				X				X	
Asclepiadaceae	**Milkweed Family**													
Asclepias exaltata	Poke Milkweed	S4	R3	L2	X								X	
Asclepias syriaca	Common Milkweed	S5	X	L5	X	X	X							
Vincetoxicum rossicum	European Swallow-wort	SE5	X	L+	X			X	X					
Asteraceae	**Composite or Aster Family**													
Arctium minus	Common Burdock	SE5	X		X									X
Artemisia vulgaris	Common Wormwood	SE5	X	L+	X			X						
Cichorium intybus	Chicory	SE5	X	L+	X	X								

Plant Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	York Region	TRCA	NRSI Observed	CUM	CUP	CUW	FOD1-1	FOD5-1	H5	SWD3	FOM2	RES
		MNRF 2020a	Varga 2000	TRCA 2008		Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes
Cirsium arvense	Creeping Thistle	SE5	X	L+	X	X		X						
Erigeron annuus	Annual Fleabane	S5	X	L5	X	X								
Eurybia macrophylla	Large-leaved Aster	S5	X	L4	X				X		X			
Solidago altissima	Tall Goldenrod	S5			X							X		
Solidago caesia	Blue-stemmed Goldenrod	S5	X	L5	X								X	
Solidago canadensis	Canada Goldenrod	S5	X	L5	X	X		X				X		
Sonchus oleraceus	Common Sow-thistle	SE5	X	L+	X			X			X			X
Symphyotrichum novae-angliae	New England Aster	S5	X	L5	X	X		X						
Symphyotrichum pilosum	Old Field Aster	S5			X	X		X						
Taraxacum officinale	Common Dandelion	SE5	X	L+	X									X
Tragopogon dubius	Yellow Goat's-beard	SE5	X	L+	X			X						
Tussilago farfara	Colt's-foot	SE5	X	L+	X							X		
Betulaceae	**Birch Family**													
Betula papyrifera	Paper Birch	S5	X	L4	X							X	X	
Ostrya virginiana	Eastern Hop-hornbeam	S5	X	L5	X				X					
Brassicaceae	**Mustard Family**													
Alliaria petiolata	Garlic Mustard	SE5	X	L+	X	X								X
Caprifoliaceae	**Honeysuckle Family**													
Diervilla lonicera	Northern Bush-honeysuckle	S5	X	L4	X								X	
Lonicera dioica	Limber Honeysuckle	S5	X	L3	X								X	
Lonicera tatarica	Tartarian Honeysuckle	SE5	X	L+	X				X		X	X		
Sambucus canadensis	Common Elderberry	S5	X	L5	X							X		
Sambucus racemosa	Red Elderberry	S5			X		X							
Viburnum acerifolium	Maple-leaved Viburnum	S5	X	L3	X								X	
Viburnum lentago	Nannyberry	S5	X	L5	X						X			
Chenopodiaceae	**Goosefoot Family**													
Chenopodium album	White Goosefoot	SE5	X		X			X	X	X			X	
Clusiaceae	**St. John's-wort Family**													
Hypericum perforatum	Common St. John's-wort	SE5	X	L+	X				X					
Cornaceae	**Dogwood Family**													
Cornus alternifolia	Alternate-leaved Dogwood	S5	X	L5	X						X	X		
Cornus obliqua	Pale Dogwood	S5	R7	L3	X							X		
Cornus rugosa	Round-leaved Dogwood	S5	X	L4	X				X				X	
Cornus sericea	Red-osier Dogwood	S5	X	L5	X	X								
Crassulaceae	**Stonecrop Family**													
Penthorum sedoides	Ditch-stonecrop	S5	U	L4	X								X	
Dipsacaceae	**Teasel Family**													
Dipsacus fullonum	Common Teasel	SE5	X		X	X								X
Elaeagnaceae	**Oleaster Family**													
Elaeagnus umbellata	Autumn Olive	SE3	X	L+	X	X								X
Fabaceae	**Pea Family**													
Hylodesmum glutinosum	Large Tick-trefoil	S4	R6	L3	X				X				X	
Lotus corniculatus	Garden Bird's-foot Trefoil	SE5	X	L+	X	X								
Robinia pseudoacacia	Black Locust	SE5	X		X				X					
Trifolium pratense	Red Clover	SE5	X	L+	X									X
Trifolium repens	White Clover	SE5	X	L+	X	X								X
Vicia cracca	Tufted Vetch	SE5	X	L+	X	X								

Plant Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	York Region	TRCA	NRSI Observed	CUM	CUP	CUW	FOD1-1	FOD5-1	H5	SWD3	FOM2	RES
		MNRF 2020a	Varga 2000	TRCA 2008		Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes
Fagaceae	**Beech Family**													
Fagus grandifolia	American Beech	S4	X	L4	X								X	
Quercus rubra	Northern Red Oak	S5	X	L4	X			X	X	X	X	X	X	
Grossulariaceae	**Currant Family**													
Ribes cynosbati	Prickly Gooseberry	S5	X	L5	X								X	
Hamamelidaceae	**Witch-hazel Family**													
Hamamelis virginiana	American Witch-hazel	S4S5	U	L3	X								X	
Hydrophyllaceae	**Water-leaf Family**													
Hydrophyllum virginianum	Virginia Waterleaf	S5	X	L5	X								X	
Juglandaceae	**Walnut Family**													
Carya cordiformis	Bitternut Hickory	S5	X	L4	X								X	
Lamiaceae	**Mint Family**													
Leonurus cardiaca	Common Motherwort	SE5			X				X					
Scutellaria lateriflora	Mad Dog Skullcap	S5	X	L5	X								X	
Oleaceae	**Olive Family**													
Fraxinus americana	White Ash	S4	X	L5	X				X	X				
Fraxinus pennsylvanica	Green Ash	S4	X	L5	X							X		
Onagraceae	**Evening-primrose Family**													
Circaea canadensis ssp. *canadensis*	Canada Enchanter's Nightshade	S5	X		X							X		
Papaveraceae	**Poppy Family**													
Sanguinaria canadensis	Bloodroot	S5	X	L5	X				X				X	
Plantaginaceae	**Plantain Family**													
Plantago major	Common Plantain	SE5	X	L+	X	X								X
Polygonaceae	**Smartweed Family**													
Rumex crispus	Curly Dock	SE5	X	L+	X	X								
Pyrolaceae	**Wintergreen Family**													
Pyrola elliptica	Shinleaf	S5	X	L4	X							X		
Ranunculaceae	**Buttercup Family**													
Actaea pachypoda	White Baneberry	S5	X	L4	X								X	
Actaea rubra	Red Baneberry	S5	X	L5	X								X	
Anemone virginiana	Tall Anemone	S5			X				X					
Rhamnaceae	**Buckthorn Family**													
Rhamnus cathartica	Common Buckthorn	SE5	X	L+	X		X		X					
Rosaceae	**Rose Family**													
Filipendula ulmaria	Queen-of-the-meadow	SE1			X							X		
Prunus pensylvanica	Pin Cherry	S5	X	L4	X						X			
Prunus serotina	Black Cherry	S5	X	L5	X					X	X	X	X	
Prunus virginiana	Choke Cherry	S5	X	L5	X				X		X	X		
Rubus idaeus	Common Red Raspberry	S5			X			X				X		
Rubus odoratus	Purple-flowering Raspberry	S5	X	L5	X							X	X	
Rubiaceae	**Madder Family**													
Galium verum	Yellow Bedstraw	SE4	X	L+	X	X		X						
Rutaceae	**Rue Family**													
Zanthoxylum americanum	Common Prickly-ash	S5	R1	L3	X				X					
Salicaceae	**Willow Family**													
Populus grandidentata	Large-toothed Aspen	S5	X	L4	X						X	X	X	
Populus tremuloides	Trembling Aspen	S5	X	L5	X	X		X	X		X	X	X	

Plant Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	York Region	TRCA	NRSI Observed	CUM	CUP	CUW	FOD1-1	FOD5-1	H5	SWD3	FOM2	RES
		MNRF 2020a	Varga 2000	TRCA 2008		Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes
Scrophulariaceae	**Figwort Family**													
Verbascum thapsus	Common Mullein	SE5	X	L+	X			X			X	X		X
Tiliaceae	**Linden Family**													
Tilia americana	American Basswood	S5	X	L5	X				X	X	X		X	
Ulmaceae	**Elm Family**													
Ulmus americana	American Elm	S5	X	L5	X				X			X		
Verbenaceae	**Vervain Family**													
Phryma leptostachya	Lopseed	S4S5	X	L5	X								X	
Vitaceae	**Grape Family**													
Vitis riparia	Riverbank Grape	S5	X	L5	X			X	X	X	X		X	X
Araceae	**Arum Family**													
Arisaema triphyllum	Jack-in-the-pulpit	S5	X	L5	X							X		
Cyperaceae	**Sedge Family**													
Carex cephaloidea	Thin-leaved Sedge	S4	R3	L4	X				X					
Carex foenea	Bronze Sedge	S5			X								X	
Carex gracillima	Graceful Sedge	S5	X	L4	X						X	X		
Carex intumescens	Bladder Sedge	S5	X	L4	X							X		
Carex leptonervia	Finely-nerved Sedge	S5	X	L3	X								X	
Carex molesta	Troublesome Sedge	S4S5	R8	L3	X				X					
Carex pedunculata	Long-stalked Sedge	S5	X	L4	X				X					
Carex pensylvanica	Pennsylvania Sedge	S5	X	L4	X		X		X		X		X	
Carex projecta	Necklace Sedge	S5	X	L4	X							X		
Carex rosea	Rosy Sedge	S5	X	L5	X							X	X	
Liliaceae	**Lily Family**													
Clintonia borealis	Blue Bead-lily	S5	X	L3	X								X	
Maianthemum canadense	Wild Lily-of-the-valley	S5	X	L4	X								X	
Maianthemum stellatum	Star-flowered False Solomon's Seal	S5	X	L5	X				X			X	X	
Polygonatum pubescens	Hairy Solomon's Seal	S5	X	L4	X		X						X	
Trillium grandiflorum	White Trillium	S5	X	L4	X				X		X	X	X	
Uvularia grandiflora	Large-flowered Bellwort	S5	X	L3	X				X					
Poaceae	**Grass Family**													
Bromus inermis	Smooth Brome	SE5	X		X	X								
Dactylis glomerata	Orchard Grass	SE5	X	L+	X	X								
Danthonia spicata	Poverty Oatgrass	S5	X	L4	X				X					
Glyceria septentrionalis	Eastern Mannagrass	S4	R10	L3	X								X	
Oryzopsis asperifolia	White-grained Mountain-ricegrass	S5	X	L4	X								X	
Phalaris arundinacea	Reed Canary Grass	S5	X	L+?	X						X			
Phragmites australis ssp. *australis*	European Reed	SE5	X	L+	X						X			X
Poa palustris	Fowl Bluegrass	S5	X	L5	X							X		
Poa pratensis	Kentucky Bluegrass	S5			X	X								X
Smilacaceae	**Catbrier Family**													
Smilax tamnoides	Hispid Greenbrier	S5	U	L4	X				X					
Typhaceae	**Cattail Family**													
Typha angustifolia	Narrow-leaved Cattail	SE5	X	L+	X	X								
Total					**130**	**25**	**7**	**20**	**34**	**8**	**22**	**39**	**48**	**17**

Plant Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	York Region	TRCA	NRSI Observed	CUM	CUP	CUW	FOD1-1	FOD5-1	H5	SWD3	FOM2	RES
		MNRF 2020a	Varga 2000	TRCA 2008		Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes	Additional Notes

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Bird Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TRCA Status	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	TRCA 2019	Cadman et al. 2007	MNRF 2020b	NRSI Results from 2020
Anatidae	**Ducks, Geese & Swans**									
Aix sponsa	Wood Duck	S5					L4	CO		
Anas platyrhynchos	Mallard	S5					L5	CO		
Anas rubripes	American Black Duck	S4					L3	PO		
Branta canadensis	Canada Goose	S5					L5	CO		**OB**
Cygnus buccinator	Trumpeter Swan	S4	NAR	NAR	NS	No schedule	L+	CO		
Lophodytes cucullatus	Hooded Merganser	S5B,S5N					L3	CO		
Mareca strepera	Gadwall	S4					L4	CO		
Mergus merganser	Common Merganser	S5B,S5N					L3	PO		
Spatula clypeata	Northern Shoveler	S4						CO		
Spatula discors	Blue-winged Teal	S4					L2	CO		
Phasianidae	**Partridges, Grouse & Turkeys**									
Bonasa umbellus	Ruffed Grouse	S4					L2	CO		
Meleagris gallopavo	Wild Turkey	S5					L3	CO		
Podicipediformes	**Grebes**									
Podilymbus podiceps	Pied-billed Grebe	S4B,S4N					L3	CO		
Columbidae	**Pigeons & Doves**									
Columba livia	Rock Pigeon	SNA					L+	CO		**PO**
Zenaida macroura	Mourning Dove	S5					L5	CO		**PO**
Cuculiformes	**Cuckoos & Anis**									
Coccyzus americanus	Yellow-billed Cuckoo	S4B					L3	CO		
Coccyzus erythropthalmus	Black-billed Cuckoo	S5B					L3	CO		**PR**
Apodidae	**Swifts**									
Chaetura pelagica	Chimney Swift	S4B,S4N	THR	T	T	Schedule 1	L4	PR		
Trochilidae	**Hummingbirds**									
Archilochus colubris	Ruby-throated Hummingbird	S5B					L4	CO		
Rallidae	**Rails, Gallinules & Coots**									
Fulica americana	American Coot	S4B	NAR	NAR	NS	No schedule	L2	PO		
Porzana carolina	Sora	S4B					L3	PR		
Rallus limicola	Virginia Rail	S5B					L3	PR		
Charadriidae	**Plovers & Lapwings**									
Charadrius vociferus	Killdeer	S5B,S5N					L5	CO		**PO**
Scolopacidae	**Sandpipers & Allies**									
Actitis macularia	Spotted Sandpiper	S5					L4	PR		
Gallinago delicata	Wilson's Snipe	S5B					L3	PO		
Scolopax minor	American Woodcock	S4B					L3	PR		
Laridae	**Gulls, Terns & Skimmers**									
Larus delawarensis	Ring-billed Gull	S5B,S4N					L4			**OB**
Ardeidae	**Herons & Bitterns**									
Ardea herodias	Great Blue Heron	S4					L3	CO		**OB**
Botaurus lentiginosus	American Bittern	S4B					L2	PR		
Butorides virescens	Green Heron	S4B					L4	PO		

Bird Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TRCA Status	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	TRCA 2019	Cadman et al. 2007	MNRF 2020b	NRSI Results from 2020
Cathartidae	**Vultures**									
Cathartes aura	Turkey Vulture	S5B					L4	PR		**OB**
Pandionidae	**Osprey**									
Pandion haliaetus	Osprey	S5B					L3	CO		
Accipitridae	**Hawks, Kites, Eagles & Allies**									
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	L4	CO		
Accipiter gentilis	Northern Goshawk	S4	NAR				L2	CO		
Accipiter striatus	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	L3	PR		
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule	L5	CO		**PO**
Buteo lineatus	Red-shouldered Hawk	S4B	NAR	NAR	SC	Schedule 3	L2	PR		
Buteo platypterus	Broad-winged Hawk	S5B					L2	PR		
Circus hudsonius	Northern Harrier	S4B	NAR	NAR	NS	No schedule	L3	PR		
Strigidae	**Typical Owls**									
Aegolius acadicus	Northern Saw-whet Owl	S4					L3	PR		
Asio otus	Long-eared Owl	S4					L3	PO		
Bubo virginianus	Great Horned Owl	S4					L4	CO		
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule	L4	CO		
Strix varia	Barred Owl	S5					L2	PR		
Alcedinidae	**Kingfishers**									
Megaceryle alcyon	Belted Kingfisher	S4B					L4	CO		
Picidae	**Woodpeckers**									
Colaptes auratus	Northern Flicker	S4B					L4	CO		**PO**
Dryobates pubescens	Downy Woodpecker	S5					L5	CO		**PO**
Dryobates villosus	Hairy Woodpecker	S5					L4	CO		
Dryocopus pileatus	Pileated Woodpecker	S5					L3	CO		
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	E	T	Schedule 1	L3	CO		
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B					L3	CO		
Falconidae	**Caracaras & Falcons**									
Falco sparverius	American Kestrel	S4					L4	PR		
Tyrannidae	**Tyrant Flycatchers**									
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1	L4	CO		**PR**
Empidonax alnorum	Alder Flycatcher	S5B					L4	PR		
Empidonax minimus	Least Flycatcher	S4B					L4	PO		
Empidonax traillii	Willow Flycatcher	S5B					L4	CO		
Empidonax virescens	Acadian Flycatcher	S2S3B	END	E	E	Schedule 1	L3	PR		
Myiarchus crinitus	Great Crested Flycatcher	S4B					L4	CO		**PO**
Tyrannus tyrannus	Eastern Kingbird	S4B					L4	CO		**PO**
Vireonidae	**Vireos**									
Vireo flavifrons	Yellow-throated Vireo	S4B					L3	PR		
Vireo gilvus	Warbling Vireo	S5B					L5	PR		**PO**
Vireo olivaceus	Red-eyed Vireo	S5B					L4	CO		**PR**
Vireo solitarius	Blue-headed Vireo	S5B					L3	PR		

Bird Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TRCA Status	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	TRCA 2019	Cadman et al. 2007	MNRF 2020b	NRSI Results from 2020
Corvidae	**Crows & Jays**									
Corvus brachyrhynchos	American Crow	S5B					L5	CO		**PO**
Cyanocitta cristata	Blue Jay	S5					L5	CO		**PO**
Alaudidae	**Larks**									
Eremophila alpestris	Horned Lark	S5B					L4	CO		**PO**
Hirundinidae	**Swallows**									
Hirundo rustica	Barn Swallow	S5B	THR	T	T	Schedule 1	L4	CO		**PR**
Petrochelidon pyrrhonota	Cliff Swallow	S4B					L4	CO		
Progne subis	Purple Martin	S3S4B					L4	PR		
Riparia riparia	Bank Swallow	S4B	THR	T	T	Schedule 1	L4	PR		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B					L4	PR		
Tachycineta bicolor	Tree Swallow	S4B					L4	CO		
Paridae	**Chickadees & Titmice**									
Poecile atricapillus	Black-capped Chickadee	S5					L5	CO		**PO**
Sittidae	**Nuthatches**									
Sitta canadensis	Red-breasted Nuthatch	S5					L4	CO		
Sitta carolinensis	White-breasted Nuthatch	S5					L4	CO		**PO**
Certhiidae	**Creepers**									
Certhia americana	Brown Creeper	S5B					L3	CO		
Troglodytidae	**Wrens**									
Cistothorus palustris	Marsh Wren	S4B					L3	PR		
Cistothorus platensis	Sedge Wren	S4B	NAR	NAR	NS	No schedule	L3	PO		
Thryothorus ludovicianus	Carolina Wren	S4					L4	PO		
Troglodytes aedon	House Wren	S5B					L5	CO		**PO**
Troglodytes hiemalis	Winter Wren	S5B					L3	CO		
Regulidae	**Kinglets**									
Regulus satrapa	Golden-crowned Kinglet	S5B					L3	PO		
Turdidae	**Thrushes**									
Catharus fuscescens	Veery	S4B					L3	PR		
Catharus guttatus	Hermit Thrush	S5B					L3	PR		
Hylocichla mustelina	Wood Thrush	S4B	SC	T	T	Schedule 1	L3	CO		
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR	NS	No schedule	L4	CO		
Turdus migratorius	American Robin	S5B					L5	CO		**PR**
Mimidae	**Mockingbirds, Thrashers & Allies**									
Dumetella carolinensis	Gray Catbird	S4B					L4	CO		**PO**
Mimus polyglottos	Northern Mockingbird	S4					L5	PR		
Toxostoma rufum	Brown Thrasher	S4B					L3	PR		
Sturnidae	**Starlings**									
Sturnus vulgaris	European Starling	SNA					L+	CO		**PO**
Bombycillidae	**Waxwings**									
Bombycilla cedrorum	Cedar Waxwing	S5B					L5	CO		**PO**
Passeridae	**Old World Sparrows**									

Bird Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TRCA Status	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	TRCA 2019	Cadman et al. 2007	MNRF 2020b	NRSI Results from 2020
Passer domesticus	House Sparrow	SNA					L+	CO		**PR**
Fringillidae	**Finches & Allies**									
Coccothraustes vespertinus	Evening Grosbeak	S4B		SC	SC	Schedule 1		PO		
Haemorhous mexicanus	House Finch	SNA					L+	CO		**PO**
Haemorhous purpureus	Purple Finch	S4B					L4	PO		
Spinus pinus	Pine Siskin	S4B					L4	PR		
Spinus tristis	American Goldfinch	S5B					L5	CO		**PR**
Emberizidae	**New World Sparrows & Allies**									
Melospiza georgiana	Swamp Sparrow	S5B					L4	CO		
Melospiza melodia	Song Sparrow	S5B					L5	CO		**PR**
Passerculus sandwichensis	Savannah Sparrow	S4B					L4	CO		**PR**
Pipilo erythrophthalmus	Eastern Towhee	S4B					L3	PR		**PO**
Pooecetes gramineus	Vesper Sparrow	S4B					L3	PR		**PO**
Spizella pallida	Clay-colored Sparrow	S4B					L3	PO		
Spizella passerina	Chipping Sparrow	S5B					L5	CO		**PR**
Spizella pusilla	Field Sparrow	S4B					L4	CO		**PO**
Zonotrichia albicollis	White-throated Sparrow	S5B					L3	PR		
Icteridae	**Troupials & Allies**									
Agelaius phoeniceus	Red-winged Blackbird	S4					L5	CO		**PO**
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	T	Schedule 1	L3	CO		**PR**
Icterus galbula	Baltimore Oriole	S4B					L5	CO		**PO**
Molothrus ater	Brown-headed Cowbird	S4B					L5	CO		**PO**
Quiscalus quiscula	Common Grackle	S5B					L5	CO		**CO**
Sturnella magna	Eastern Meadowlark	S4B	THR	T	T	Schedule 1	L4	PR		
Parulidae	**Wood Warblers**									
Cardellina canadensis	Canada Warbler	S4B	SC	T	T	Schedule 1	L2	CO		
Geothlypis philadelphia	Mourning Warbler	S4B					L3	CO		
Geothlypis trichas	Common Yellowthroat	S5B					L4	CO		**PO**
Leiothlypis ruficapilla	Nashville Warbler	S5B					L3	PR		
Mniotilta varia	Black-and-white Warbler	S5B					L2	PR		
Parkesia noveboracensis	Northern Waterthrush	S5B					L3	PR		
Seiurus aurocapilla	Ovenbird	S4B					L3	CO		
Setophaga caerulescens	Black-throated Blue Warbler	S5B					L3	PR		
Setophaga cerulea	Cerulean Warbler	S3B	THR	E	E	Schedule 1	LX	PR		
Setophaga citrina	Hooded Warbler	S4B	NAR	NAR	NS	No schedule	L3	CO		
Setophaga coronata	Yellow-rumped Warbler	S5B					L3	PO		
Setophaga fusca	Blackburnian Warbler	S5B					L3	PR		
Setophaga magnolia	Magnolia Warbler	S5B					L3	PO		
Setophaga pensylvanica	Chestnut-sided Warbler	S5B					L3	CO		**PO**
Setophaga petechia	Yellow Warbler	S5B					L5	CO		
Setophaga pinus	Pine Warbler	S5B					L3	CO		
Setophaga ruticilla	American Redstart	S5B					L4	CO		**PO**

Bird Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TRCA Status	OBBA*	NHIC Data**	NRSI Observed: Highest Level of Breeding Evidence
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	TRCA 2019	Cadman et al. 2007	MNRF 2020b	NRSI Results from 2020
Setophaga virens	Black-throated Green Warbler	S5B					L3	CO		
Vermivora chrysoptera	Golden-winged Warbler	S4B	SC	T	T	Schedule 1	L2	PR		
Vermivora cyanoptera	Blue-winged Warbler	S4B					L2	PO		
Cardinalidae	**Cardinals, Grosbeaks & Allies**									
Cardinalis cardinalis	Northern Cardinal	S5					L5	CO		**PO**
Passerina cyanea	Indigo Bunting	S4B					L4	CO		**PR**
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B					L4	CO		
Piranga olivacea	Scarlet Tanager	S4B					L3	CO		
Total								**135**	**0**	**46**

*OBBA Atlas Squares: 17PJ16, 17PJ26

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Ministry of Natural Resources and Forestry (MNRF). 2020a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2020-01-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Reptile and Amphibian Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TRCA Status	ORAA*	NHIC Data**	NRSI Observed
		MNRF 2019a	MNRF 2019a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	TRCA 2019	Ontario Nature 2019	MNRF 2020b	NRSI Results from 2020
Turtles										
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	L3	X		
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	NS	No schedule	L3	X		
Snakes										
Lampropeltis triangulum	Milksnake	S4	NAR	SC	SC	Schedule 1	L3	X		
Opheodrys vernalis	Smooth Greensnake	S4					L2	X		
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule	L4	X		
Storeria occipitomaculata	Red-bellied Snake	S5					L3	X		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					L4	X		
Salamanders										
Ambystoma sp.	Jefferson/Blue-spotted Salamander Compl	NP					L1	X		
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	E	E	Schedule 1	L1	X		
Ambystoma laterale - (2) jeffersonianum	Unisexual Ambystoma (Jefferson Salaman	S2	END	E	NS	No schedule	L1	X		
Ambystoma (2) laterale - jeffersonianum	Unisexual Ambystoma (Blue-spotted Salan	S4	NAR	NAR	NS	No schedule	L1	X		
Ambystoma laterale	Blue-spotted Salamander	S4					LX	X		
Ambystoma maculatum	Spotted Salamander	S4					L1	X		
Notophthalmus viridescens viridescens	Red-spotted Newt	S5					L2	X		
Plethodon cinereus	Eastern Red-backed Salamander	S5					L3	X		
Frogs and Toads										
Anaxyrus americanus	American Toad	S5					L4	X		
Hyla versicolor	Gray Treefrog	S5					L2	X		**X**
Pseudacris triseriata pop. 2	Western Chorus Frog (Great Lakes / St. La	S4	NAR	T	T	Schedule 1	L2	X		
Pseudacris crucifer	Spring Peeper	S5					L2	X		**X**
Lithobates catesbeianus	American Bullfrog	S4					L2	X		
Lithobates clamitans	Green Frog	S5					L4	X		
Lithobates palustris	Pickerel Frog	S4	NAR	NAR	NS	No schedule	L2	X		
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	L3	X		
Lithobates sylvaticus	Wood Frog	S5					L2	X		
Total								**23**	**0**	**2**

*ORAA Atlas Squares: 17PJ16, 17PJ26

References

Ministry of Natural Resources and Forestry (MNRF). 2020a. Natural Heritage Information Centre (NHIC): Species List for Ontario. Published: 2014-07-17. All Species List Updated: 2020-01-17. Available: https://www.ontario.ca/page/get-natural-heritage-information

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Butterfly Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339A)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TEA Atlas*	NHIC Data**	NRSI Observed
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	Macnaughton et al. 2020	MNRF 2020b	NRSI Results from 2020
Hesperiidae	**Skippers**								
Anatrytone logan	Delaware Skipper	S4					X		
Ancyloxypha numitor	Least Skipper	S5					X		
Carterocephalus palaemon	Arctic Skipper	S5					X		
Epargyreus clarus	Silver-spotted Skipper	S4					X		
Erynnis baptisiae	Wild Indigo Duskywing	S4					X		
Erynnis icelus	Dreamy Duskywing	S5					X		
Erynnis juvenalis	Juvenal's Duskywing	S5					X		
Euphyes bimacula	Two-spotted Skipper	S4					X		
Euphyes vestris	Dun Skipper	S5					X		
Hylephila phyleus	Fiery Skipper	SNA					X		
Poanes hobomok	Hobomok Skipper	S5					X		
Polites mystic	Long Dash Skipper	S5					X		
Polites peckius	Peck's Skipper	S5					X		
Polites themistocles	Tawny-edged Skipper	S5					X		
Pompeius verna	Little Glassywing	S4					X		
Thorybes pylades	Northern Cloudywing	S5					X		
Thymelicus lineola	European Skipper	SNA					X		
Wallengrenia egeremet	Northern Broken Dash	S5					X		
Papilionidae	**Swallowtails**								
Papilio polyxenes	Black Swallowtail	S5					X		
Pieridae	**Whites and Sulphurs**								
Colias philodice	Clouded Sulphur	S5					X		X
Pieris oleracea	Mustard White	S4					X		
Pieris rapae	Cabbage White	SNA					X		X
Lycaenidae	**Harvesters, Coppers, Hairstreaks, Blues**								
Callophrys niphon	Eastern Pine Elfin	S5					X		
Celastrina lucia	Northern Spring Azure	S5					X		
Celastrina sp.	Azure species	SNA					X		
Cupido comyntas	Eastern Tailed Blue	S5					X		
Glaucopsyche lygdamus	Silvery Blue	S5					X		
Lycaena phlaeas	American Copper	S5					X		
Satyrium acadica	Acadian Hairstreak	S4					X		
Satyrium liparops	Striped Hairstreak	S5					X		
Nymphalidae	**Brush-footed Butterflies**								
Cercyonis pegala	Common Wood-Nymph	S5					X		X
Chlosyne harrisii	Harris's Checkerspot	S4					X		
Chlosyne nycteis	Silvery Checkerspot	S5					X		
Coenonympha tullia	Common Ringlet	S5					X		X
Danaus plexippus	Monarch	S2N,S4B	SC	E	SC	Schedule 1	X		
Junonia coenia	Common Buckeye	SNA					X		
Lethe anthedon	Northern Pearly-Eye	S5					X		
Lethe eurydice	Eyed Brown	S5					X		
Limenitis archippus	Viceroy	S5					X		
Limenitis arthemis arthemis	White Admiral	S5					X		
Limenitis arthemis astyanax	Red-spotted Purple	S5					X		
Megisto cymela	Little Wood-Satyr	S5					X		

Nymphalis antiopa	Mourning Cloak	S5					X		
Phyciodes cocyta	Northern Crescent	S5					X		
Phyciodes tharos	Pearl Crescent	S4					X		
Polygonia comma	Eastern Comma	S5					X		
Polygonia interrogationis	Question Mark	S5					X		
Polygonia progne	Gray Comma	S5					X		
Speyeria aphrodite	Aphrodite Fritillary	S5					X		
Speyeria cybele	Great Spangled Fritillary	S5					X		
Vanessa atalanta	Red Admiral	S5					X		
Vanessa virginiensis	American Lady	S5					X		
Total							**52**	**0**	**4**

*TEA Atlas Squares: 17PJ16, 17PJ26

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Mammal Species Reported from the Study Area - Kirby Road Environmental Assessment (Project #2339)

Scientific Name	Common Name	SRANK	SARO	COSEWIC	SARA	SARA Schedule	TRCA Status	Ontario Mammal Atlas	NHIC Data**	NRSI Observed
		MNRF 2020a	MNRF 2020a	Government of Canada 2019	Government of Canada 2019	Government of Canada 2019	TRCA 2019	Dobbyn 1994	MNRF 2020b	NRSI Results from 2020
Didelphimorphia	**Opossums**									
Didelphis virginiana	Virginia Opossum	S4					L4	X		
Eulipotyphla	**Shrews, Moles, Hedgehogs, and Allies**									
Blarina brevicauda	Northern Short-tailed Shrew	S5					L3	X		
Condylura cristata	Star-nosed Mole	S5					L3	X		
Parascalops breweri	Hairy-tailed Mole	S4					L3	X		
Sorex cinereus	Masked Shrew	S5					L3	X		
Sorex fumeus	Smoky Shrew	S5						X		
Sorex hoyi	Pygmy Shrew	S4						X		
Sorex palustris	Water Shrew	S5						X		
Chiroptera	**Bats**									
Eptesicus fuscus	Big Brown Bat	S4					L4	X		
Lasionycteris noctivagans	Silver-haired Bat	S4						X		
Lasiurus borealis	Eastern Red Bat	S4					LX	X		
Lasiurus cinereus	Hoary Bat	S4					LX	X		
Myotis lucifugus	Little Brown Myotis	S3	END	E	E	Schedule 1	L4	X		
Myotis septentrionalis	Northern Myotis	S3	END	E	E	Schedule 1		X		
Lagomorpha	**Rabbits and Hares**									
Lepus americanus	Snowshoe Hare	S5					LX	X		
Lepus europaeus	European Hare	SNA					LX	X		
Sylvilagus floridanus	Eastern Cottontail	S5					L4	X		X
Rodentia	**Rodents**									
Castor canadensis	Beaver	S5					L4	X		
Erethizon dorsatum	Porcupine	S5					L2	X		
Glaucomys sabrinus	Northern Flying Squirrel	S5					L2	X		
Marmota monax	Woodchuck	S5					L5	X		
Microtus pennsylvanicus	Meadow Vole	S5					L4	X		
Mus musculus	House Mouse	SNA					L+	X		
Ondatra zibethicus	Muskrat	S5					L4	X		
Peromyscus leucopus	White-footed Mouse	S5					L4	X		
Peromyscus maniculatus	Deer Mouse	S5					L4	X		
Rattus norvegicus	Norway Rat	SNA					L+	X		
Sciurus carolinensis	Eastern Gray Squirrel	S5					L5	X		X
Tamias striatus	Eastern Chipmunk	S5					L4	X		X
Tamiasciurus hudsonicus	Red Squirrel	S5					L4	X		
Zapus hudsonius	Meadow Jumping Mouse	S5					L3	X		
Canidae	**Canines**									
Canis latrans	Coyote	S5					L5	X		
Vulpes vulpes	Red Fox	S5					L4	X		
Mephitidae	**Skunks and Stink Badgers**									
Mephitis mephitis	Striped Skunk	S5					L5	X		
Mustelidae	**Weasels and Allies**									
Lontra canadensis	North American River Otter	S5					L2	X		
Mustela erminea	Ermine	S5					L3	X		
Mustela frenata	Long-tailed Weasel	S4					LX	X		
Neovison vison	American Mink	S4					L4	X		

Procyonidae	**Raccoons and Allies**									
Procyon lotor	Northern Raccoon	S5					L5	X		X
Ursidae	**Bears**									
Ursus americanus	American Black Bear	S5	NAR	NAR	NS	No schedule		X		
Artiodactyla	**Deer and Bison**									
Alces americanus	Moose	S5						X		
Odocoileus virginianus	White-tailed Deer	S5					L4	X		
Total								**42**	**0**	**4**

*Mammal Atlas Square Numbers: PU

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APPENDIX IV
Tree Protection Plan

Kirby Road Environmental Assessment

Tree Protection Plan

Prepared for:

HDR Inc.
100 York Blvd., Suite 300
Richmond Hill, ON
L4B 1J8

Project No. 2339A | August 2021

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Kirby Road Environmental Assessment

Tree Protection Plan

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by HDR Inc. (the "Client"), on behalf of the City of Vaughan, to complete natural heritage assessments in support of a Schedule 'C' Environmental Assessment (EA) related to the widening of Kirby Road between Jane Street and Dufferin Street in Vaughan, Ontario (i.e., the "study area"). In completion of this work, a comprehensive inventory of trees within the study area was completed, followed by the preparation of a Tree Protection Plan (TPP). The study area includes the public right-of-way (ROW) along the 4.1km section of Kirby Road and approximately 20m beyond the intersecting roads of Jane Street and Dufferin Street. In the east end of the study area there are Natural Core Areas and Natural Linkage Areas designated in the Oak Ridges Moraine Conservation Plan.

The City of Vaughan's Public Property Tree Protection By-law (95-2005) and the Private Property Tree Protection By-law (185-2007) exempt activities or matters undertaken by a municipality. Furthermore, the City's Tree Protection Protocol (2018) describes tree permitting categories and the City departments responsible for approvals, but municipal infrastructure projects are not listed as requiring tree removal permits. However, this TPP has been prepared in accordance with the Request for Proposal (RFP19-114) for this EA, wherein the need for a TPP is stipulated.

This report summarizes the following:

- Findings of the tree inventory;
- Assessment of overall health and potential for structural failure of inventoried trees;
- Tree retention analysis based on details of the proposed works;
- Protection measures for trees to be retained; and
- Recommended mitigation and compensation measures.

2.0 Tree Inventory and Methods

A comprehensive inventory of trees ≥10cm in Diameter at Breast Height (DBH) within the Kirby Road study area ROW was completed by NRSI Certified Arborists on December 10, 11, and 12, 2019. Since the inventory was conducted in the leaf-off period, NRSI was able to assess the overall health and potential for structural failure of trees within the subject property, but not the foliar characteristics of deciduous trees. The tree inventory included trees with crowns intersecting the study area and any adjacent trees that could potentially be impacted by construction within the ROW (up to approximately 6m).

Publicly-owned individual trees ≥10cm in DBH were tagged with a pre-numbered aluminum forestry tag, while privately-owned trees were assigned an alpha-identifier for mapping purposes in place of a tag. Tree ownership judgments were made based on the ROW limit that was provided by HDR and the GPS accuracy in the field; confirmation of tree ownership by an Ontario Land Surveyor or City staff may be necessary. With multi-stemmed trees, the diameter of each stem was measured and DBH is represented here as the sum of the largest three stems, as recommended by the City of Vaughan in their Tree Protection Protocol (2018). The location of inventoried trees was surveyed by the Certified Arborists using an SXBlue II GNSS GPS unit, as shown on Map 1. A complete list of the trees that were assessed and their overall health and potential for structural failure is included in Appendix I.

The following information was recorded for each tree:

- Tree location;
- Species;
- DBH (centimetres);
- Crown radius (metres);
- General health (excellent, good, fair, poor, very poor, dead);
- Potential for structural failure (improbable, possible, probable, imminent);
- Potential cavities that could be used for Species at Risk (SAR) bats; and
- General comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development).

The overall health of each tree and potential for structural failure was assessed based on the criteria outlined in Appendix II. In carrying out these assessments, NRSI has

exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out these assessments. The assessments have been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. None of the trees examined were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken. The conditions for this assessment, including restrictions, professional responsibility, and third-party liability can be found in the Conditions of Tree Assessment (Appendix III).

2.1 Bat Habitat Assessment Methods

Two bat species reported from the general vicinity of, and with potential habitat in, the study area (Environment and Climate Change Canada 2018) are listed as Endangered provincially and are afforded general habitat protection under the *Endangered Species Act* (2007). These include Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*). These species are known to roost in tree cavities, hollows, or under loose bark, as well as within buildings (MNR 2000, MNRF 2017). In conjunction with the tree inventory, NRSI biologists who are trained and experienced in the Ontario Ministry of Natural Resources and Forestry (MNRF) *Survey Protocol for Species at Risk Bats within Treed Habitats* (MNRF 2017) visually scanned all trees ≥10cm DBH for the presence of cavities that may provide bat maternity colony habitat for SAR bats.

Information considered (and recorded, where applicable) for cavity trees included tree species, location, DBH, canopy cover, tree height, decay class according to Watt and Caceres (1999), and number of potentially suitable features. Other criteria were also considered, including the use of cavities by other wildlife, the potential for cavities to be used by predators, supporting/surrounding habitat, temperature regulation and other characteristics which may contribute to the habitat requirements of these species.

3.0 Summary of Tree Inventory Findings

In total, 466 trees were inventoried within the study area, comprising 45 species. Of the trees inventoried and assessed, 360 (77%) are native species and 106 (23%) are non-native. Inventoried trees are concentrated in the eastern end of the study area where forests, hedgerows and street trees border Kirby Road, whereas trees west of Ravineview Drive are more scattered in their distribution. A large proportion of trees inventoried are outside of the current ROW limits. A complete list of inventoried trees is provided in Appendix I and tree locations within the study area are shown on Map 1.

Of the native species observed, Eastern Red Cedar (*Juniperus virginiana*) and Slippery Elm (*Ulmus rubra*) are listed as uncommon in York Region (Varga 2000). No SAR trees were observed within the study area.

The diversity in species of inventoried trees is, in part, due to the study area encompassing ornamental street and yard plantings, forested areas, old hedgerows, and naturalized roadside specimens. Thirty-one species are represented in the inventory data by fewer than 10 individual trees. Conversely, just nine species represent 59% of the trees inventoried, in descending order of quantity: Red Oak (*Quercus rubra*), Large-tooth Aspen (*Populus grandidentata*), White Spruce (*Picea glauca*), Sugar Maple (*Acer saccharum* ssp. *saccharum*), Black Cherry (*Prunus serotina*), Colorado Spruce (*Picea pungens*), Silver Maple (*Acer saccharinum*), Trembling Aspen (*Populus tremuloides*), and Black Locust (*Robinia pseudoacacia*).

Appendix IV provides two tables summarizing the tree inventory data: one lists tree species inventoried within the study area, whether they are native or non-native and their overall health; the other provides a summary of the overall health of trees inventoried within the study area, along with their potential for structural failure. A majority (66%) of the trees inventoried are in good or fair health with an improbable potential for structural failure.

3.1 Bat Habitat Findings

Bat maternity colony habitat assessments found 11 trees that have cavities, cracks or loose bark that may provide suitable maternal roosting habitat for Little Brown Myotis or Northern Myotis. Seven of these trees are part of woodlands adjacent to the study area, and the other four are either in a hedgerow or isolated along the Kirby Road ROW.

Trees with features suitable for maternal roosting habitat for SAR bats are identified on Map 1. Consultation with the Ministry of the Environment, Conservation, and Parks (MECP) may be required to determine mitigation actions for habitat trees that are identified for removal to accommodate the planned road improvement works. Please refer to the Environmental Impact Study report (NRSI 2021) for additional details about SAR bat habitat and mitigation recommendations.

4.0 Tree Removal and Retention Analysis

Tree removal and retention was based on two considerations:

1) Trees identified as having a probable or imminent potential for structural failure or poor to very poor health, or dead. The removal of some of these trees may be recommended for safety, especially if they are located within striking distance of a component of the proposed project, or existing off-site sidewalks, roads or buildings.
2) Trees that require removal based on the extent of proposed construction and site grading. This was determined by comparing the location of inventoried trees to the location of the components of the infrastructure work in the 30% Preliminary Design, as shown on Map 1.

Of the 466 trees inventoried, 265 are anticipated to be removed. Of the 265 anticipated to be removed, just four ('er', 'et', 'fk', 'fn') are recommended for removal as a result of their condition and position which may pose a public hazard.

The remaining 261 trees require removal based on the extent of the proposed construction and site grading within the ROW. The ROW limits in the 30% Preliminary Design differ from the existing limits used during the tree inventory, and reflect planned land acquisitions to facilitate the proposed works (the proposed ROW limits are shown in Maps 1 and 2).

The 30% Preliminary Design includes widening the ROW to accommodate road works as well as boulevard cycle tracks, sidewalks, utility corridors and amenity space. Therefore, many of the inventoried trees are situated well within the proposed construction area. Other trees are positioned along the grading limit or in close proximity and may incur severe root damage as a result of grading. Where root damage is likely to be too severe for the tree to withstand, these have been recommended for removal. In an effort to maximize tree retention and the mature canopy along the multi-use paths, 13 large trees in good or fair condition (i.e. trees 'ad', 'ae', 'af', 'ah', 'aq', 'cf', 'cg', 'ch', 'cn', 'ee', 'eg', 'ei', 'ek') have been recommended to be retained from near the edge of grading areas since it is assumed that the grade change in those areas will be minimal. Mitigation measures for these are discussed in Section 6.2.

Most of the trees anticipated for removal on account of the proposed works are in good to fair health with an improbable potential for structural failure, and range in size from 10.1cm DBH to a multi-stemmed tree at 242cm DBH (tree #199). Approximately 85% of trees to be removed are native species, dominated by Large-tooth Aspen, Red Oak, and Silver Maple.

It should be noted that additional landscape trees less than 10cm DBH may require removal due to conflicts with the proposed undertaking, but these smaller trees were outside the scope of the inventory and are not addressed in the discussion or mapping of this report. Since many trees have not been identified in the field with forestry tags, it is recommended that, prior to removals beginning, trees be clearly marked for removal by a Certified Arborist.

In the case of trees requiring removal, a compensation strategy is discussed further in Section 5.0. Appendix I provides details of trees inventoried, including tree preservation analysis and rationale for removal. Map 1 identifies trees proposed to be retained or removed based on the 30% Preliminary Design and grading requirements.

4.1 Impacts Beyond the Scope of Tree Inventory

The tree inventory field work was completed within the limits of the publicly accessible existing ROW. Since the preferred Preliminary Design proposes the widening of the existing ROW in places, some trees that were not recorded during the tree inventory may be impacted by the proposal. It is recommended that supplementary tree inventory take place in support of the Detailed Design in order to fully assess impacts to trees in the study area. The specific areas in which further impact or removals may occur include:

- At the edges of woodland features on either side of Kirby Road, to the west of Dufferin Street;
- at the edges of woodland features on either side of the entrance at Radha Road;
- in front of 2939 Kirby Road; and
- within the proposed ROW to the west of Jane Street.

5.0 Tree Compensation Plan

As stated in Section 1.0, the City of Vaughan's Public Property Tree Protection By-law (95-2005) and Private Property Tree Protection By-law (185-2007) exempt activities or matters undertaken by a municipality from the requirement for a tree removal permit, as does York Region's Forest Conservation By-law (2013-68). Regardless of whether a permit is needed to remove trees for a public works project, both the City and the Region have stated interests in preserving or enhancing the urban forest, as expressed in the above ordinances as well as within the City of Vaughan's Tree Protection Protocol (2018). Therefore, it is recommended that for trees removed or harmed by the proposed works, efforts be made to compensate with new trees planted.

Compensation guidelines are provided in section 3.3 of York Region's Street Tree Preservation and Planting Design Guidelines (2013). However, since Kirby Road is not a regional road, it is anticipated that the City of Vaughan's guidelines will take precedence. Section 4.0 of the City's Tree Protection Protocol (2018) addresses compensation differently for private trees and public trees. For private trees (though, notably excluding woodlots and edge restoration plans) the number of compensation trees depends on the diameter of the private tree to be removed, as described below in Table 1.

Table 1. Ratio of Tree Replacement for Private Trees

DBH of Tree to be Cut or Removed	Number of Replacement Trees Required
20-30cm	1
31-40cm	2
41-50cm	3
≥ 51cm	4

City of Vaughan (2018).

For public trees, the Tree Protection Protocol (2018) stipulates that the Forestry and Horticulture Division will employ the Tree Valuation Formula to determine compensation. This formula "considers the operational, environmental and social costs of trees based on the tree species, size and overall condition", and incorporates removal and installation costs from previous City contracts or field data from City staff (City of Vaughan 2018). The Tree Protection Protocol (City of Vaughan 2018) does not supply all of the information necessary to make these calculations; therefore, it will be incumbent upon City staff to determine the appropriate compensation.

For the purposes of determining tree compensation measures, ownership was assigned based on the limits of the proposed ROW as presented in Map 1; refer to the 'Location' column in Appendix I.

5.1 Woodland Compensation

Woodlands are adjacent to the ROW in the east end of study area, from about Radha Road to Dufferin Street. City of Vaughan Planning staff have indicated that compensation for removals from woodlands should follow the TRCA Guideline for Determining Ecosystem Compensation (2018) (pers. comm. R. Rendon 2021). To compensate for impacts to woodlands the TRCA Guideline (2018) recommends an areal compensation based on the basal area of each wooded vegetation community to be impacted. Based on basal areas, and making an effort to account for lag time between installation and the time when that installation may provide similar ecosystem services as the community impacted, Table 1 of the TRCA Guideline (2018) prescribes a compensation ratio (hectares compensated to hectares impacted).

Section 2.2.1 of the TRCA Guideline (2018) speaks to land base and municipal infrastructure projects, recognizing that both investment in infrastructure and protection of natural systems contribute to the public good. Because ROWs typically are not larger than the area required by the infrastructure they contain, compensation area contiguous to the natural system may not be available. In these cases, the TRCA Guideline (2018) notes that the land area removed from natural systems by multiple infrastructure projects can be tracked by the TRCA and municipality so that cumulative losses can be understood and suitable compensation/restoration can be designed.

As a municipal infrastructure project with potential to impact adjacent woodlands, the TRCA Guideline anticipates that the municipality (in this case, the City of Vaughan) and TRCA may consider these impacts in the local context of other infrastructure projects to determine compensation measures that address these projects on a broader scale. Furthermore, because the scope of the tree inventory in 2019 was to gather information about individual trees (not basal area of different vegetation communities) and was limited to within the existing ROW, more field surveys would be required in order to determine woodland compensation requirements based on the TRCA Guideline (2018). Therefore, the final determination of tree and woodland compensation measures should be deferred to the Detailed Design stage and will require additional field work in the areas mentioned in Section 4.1.

Notwithstanding the discussion of woodland compensation above, Table 2 outlines preliminary compensation requirements resulting from tree removals associated with the proposed widening in the study area. Trees <20cm DBH do not require compensation, as per Table 1. It is further recommended that trees assessed to be in poor or very poor health, or dead, be exempt from compensation requirements. The number of compensation plantings cannot be calculated at this time for public trees or for trees in woodlots. As per the Tree Protection Protocol (City of Vaughan 2018) and the discussion in Section 5.1, above, trees in these circumstances will be reviewed by City staff to determine compensation requirements (these are marked 'For Review' in Appendix I).

Table 2: Summary of Trees to be Removed and Recommended Compensation Plan

Tree Inventory	**Total**
Total number of trees inventoried	466
Total number of inventoried trees to be removed	265
Tree Compensation	
Number of trees exempted by poor to very poor health or dead, and/or a probable potential for structural failure	48
Number of trees exempted by DBH <20cm	62
Number of trees to be reviewed by City staff for compensation, perhaps in conjunction with TRCA	**158**
Number of private trees subject to ratio compensation	
Number of trees to compensated for at 1:1	7
Number of trees to compensated for at 2:1	5
Number of trees to compensated for at 3:1	4
Number of trees to compensated for at 4:1	13
Minimum number of compensation plantings	**81**

Detailed landscaping plans will be required for the project during the Detailed Design stage and should be prepared with consideration to the calculated compensation requirements along with input from Forestry and Horticulture Division staff members (the results of the Tree Valuation Formula), and City planning staff as to woodland compensation.

6.0 Tree Protection Measures and Recommended Mitigation

Throughout all stages of development, all effort should be made to retain, and protect the health and root systems of trees within and in close proximity to the ROWs that are marked for retention in this TPP. The City or their designate (e.g. construction inspector or site manager) should ensure that all employees and contractors are informed of the meaning and importance of tree protection measures and the ways in which trees to be retained are identified.

6.1 Tree Protection Zones

The City's Tree Protection Protocol document sets out the minimum setback from a tree to maintain the structural integrity of anchor roots. This is termed the Tree Protection Zone (TPZ) and is based on the DBH of the tree. Section 3.1.2 of the Protocol (2018) indicates that trees in "naturalized areas" are afforded greater protection than trees on a city street, in parks, or on private property subject to By-law 185-2007. The TPZ for each tree is displayed on Maps 1 and 2, and those trees located in a woodland are shown with a TPZ for "naturalized areas" (i.e. twice the setback radius length for other trees).

TPZs have been considered in the analysis of whether a tree can be retained through the proposed works; some incursions into the TPZ of trees have been accepted where it is anticipated that the tree may survive the impact, with the goal of retaining more trees.

6.2 Prior to Construction and Site Alteration

Tree Protection Fencing (TPF) will be installed along the limit of disturbance in order to prevent detrimental impacts to trees from development activities. The City's standard drawing number ULA 110B states that TPF should be installed 1.8m outside the dripline for trees to be protected in order that wooden support stakes can be placed at or outside the dripline (McIlroy 2018). This distance may not be feasible for many trees because the preference to retain trees will result in cases where the proposed construction activities will be within their driplines. Where trees are to be retained but where it is not feasible to afford the full extent of the City's recommended TPF dripline offset, it is with the intent of retaining as many trees as possible, and anticipating that the affected trees will tolerate the proposed impacts. Trees will be afforded as much protection as is possible within the proposed grading and reconstruction plan. Some inventoried trees to

be retained are behind existing fences in private yards and do not require additional protective measures.

A number of trees are recommended for removal due to adjacent grading impacts that are anticipated to severely damage their root systems, but are located in areas that also contain trees to be retained. Additionally, two large Black Cherry trees that pose a potential hazard to future uses of the road corridor ('fk', 'fn') are recommended to be removed from beyond the limit of grading in order to eliminate the risk posed by their poor condition. As such, prior to installation of the TPF, these trees should be clearly marked for removal by a Certified Arborist. The trees should then be felled and removed with minimal disturbance to neighbouring trees and other vegetation. It is recommended that a site meeting between the Certified Arborist and the tree removal contractor take place to discuss the removal approach (i.e. retaining stumps, equipment being utilized, etc.) and timing so that adequate tree protection can be coordinated.

The recommended position of TPF is shown on Map 2. The TPF is to be installed prior to any construction activities, and after selective removal of trees near to those being retained, and is to be maintained by the contractor or their agents. Standard drawing ULA 110B (McIlroy 2018) stipulates that 1.2m snow fencing be supported by 2" x 4" wooden support stakes at 2.5m on-centre. Every second upright stake shall be supported by an angled support stake that extends toward the tree(s) to be protected but should be installed so as to minimize root damage. Given the length of the study area and the intention to retain as many trees as possible, the City may opt to approve TPF materials or methods that differ from the standard drawing while providing adequate protection. For example, paige-wire fencing or snow fencing supported by metal t-bar stakes may be appropriate. An Erosion and Sediment Control (ESC) Plan will be prepared at the Detailed Design stage, and may be implemented in combination with the TPF.

Complete protection of the root zone cannot be achieved for the 13 large trees listed in Section 4.0 that are within or very close to proposed grading but recommended for retention. In some cases, the TPF installed at the limit of grading will be beyond the stem of these trees, offering little protective function. To minimize impact to these trees, grading in their vicinity should be performed with hand tools or, at most, light machinery such as a skid-steer; heavy machinery traffic must be restricted within the dripline area

of these trees. Furthermore, to protect the stems of these 13 trees from inadvertent damage from construction activities, it is recommended that wooden 2" by 4" boards be affixed vertically around the stem. These boards should be installed no more than approximately 10cm apart from one another without using any intrusive means that may damage bark or branches. The boards may be affixed using ratchet straps, large clamps, strong tape, or the like. York Region's specification drawing NHF-405 can be used as an example of this technique.

Prior to works commencing on-site, a Certified Arborist or Landscape Architect is to inspect and provide written certification to the City that all protective measures have been satisfactorily installed. Signage indicating the purpose of the protection fencing is to be attached to the TPF a minimum of every 100m. The signage is to identify the function of the TPF and that no dumping or storing of materials or equipment, soil grade changes or compaction, damage to tree parts, vehicle/machine traffic or refueling within the tree protection areas are to occur.

6.2.1 Migratory Birds Convention Act

The removal of trees within the study area has the potential to disrupt nesting birds. The federal *Migratory Birds Convention Act* (MBCA, 1994) identifies a list of migratory bird species that are protected. It prohibits the destruction of nests, individuals and activities that would cause an adult bird to abandon a nest. Tree removal is to occur outside of the core nesting period for migratory birds as established by the Canadian Wildlife Service (CWS 2012) which extends from approximately April 1 through August 31. Every developer/consultant/contractor, etc. is legally obliged to carry out due diligence to protect migratory birds from harm during all construction projects.

Historically, the implementation policies of the MBCA provided for biologists to conduct nest searches when vegetation removals were to occur during the nesting period. These provisions were revoked in 2014. One exception is for when the removals are to occur in simple habitats which are characterized in the MBCA (e.g. bridge structures, isolated trees, vacant lot; CWS 2014). Some parts of the study area may be classified as a 'simple habitat' (e.g. isolated street or yard trees), but not those areas with woodland adjacent to the ROW. Should tree removal be required to occur within the peak breeding window, nest surveys may be conducted by a qualified biologist just prior to the removal activity (less than 48 hours prior to) to ensure that nesting birds are not

present. Should a nest be identified within a tree(s) to be removed, the tree shall be protected with a buffer and there shall be no removal or construction activity within that area until sign-off is obtained from the qualified biologist that the nest is no longer active. Trees identified as having no nesting activity can be removed; however, tree removal is to occur within 48 hours of the nest search. If tree removal does not occur within this time frame, additional nest searches are to be conducted.

In the event a nest survey is conducted, a clearance letter is to be prepared by the qualified biologist that undertook the surveys and submitted to the City for their files in the event a record of due diligence is requested by CWS.

6.3 During Construction

The TPF is to be maintained by the contractor or their agents during the entire construction period to ensure that trees being retained and their root systems are protected. Any minimal damage (i.e. damage to limbs or roots) to trees to be retained during construction must be pruned using proper arboricultural techniques.

Should any trees identified to be retained in this report be seriously damaged or die as a result of construction activities, the City will be consulted and presented with a proposed plan of action, such as treatment or replacement. Any replacement species are to be reviewed by a member in good standing with the Ontario Association of Landscape Architects (OALA) or Certified Arborist.

6.4 Post-Construction

To ensure that fencing is not abandoned to degrade into the environment over time, the TPF is to be removed upon completion of construction activities and stabilization of the site. Watering and pruning of newly planted trees will be carried out by the owner/contractor as required during the warranty period (approximately two years). Any areas of bare soil within the construction area are to be re-vegetated (e.g., sod in urban areas, or otherwise application of a suitable native herbaceous seed mix or nurse crop) as soon as feasible to prevent erosion of soils and keep dust to a minimum.

Where possible, species used for compensation plantings should be native to York Region and not include any species that are listed as introduced. The use of hardy species will ensure successful early establishment and minimize the potential for invasive species proliferation. For street tree plantings, the use of non-native species

that are sometimes more tolerant of urban conditions (i.e. salt and drought tolerant) may be suitable as long as they do not include invasive species such as the often-planted Norway Maple (*Acer platanoides*).

At the Detailed Design stage, it is recommended that the following criteria be followed during the development of proposed planting plans:

- Tree species to be situated in close proximity to roads should be salt tolerant,
- Avoid ash (*Fraxinus* spp.) species due to the risk posed by Emerald Ash Borer (*Agrilus planipennis*);
- All plant material is to conform to the latest edition of the *Canadian Nursery Trades Association Specifications and Standards*;
- Plantings installed as per specifications outlined in planting plans to be prepared by a member in good standing of the OALA or Certified Arborist (e.g. place a minimum of 10cm of shredded pine-bark mulch or equivalent around all planted material);
- Spacing of plant material should account for the ultimate size and form of the selected species and also the purpose of the planting, whether it be for screening, shade, naturalizing, rehabilitation, etc.;
- Special attention to location and height of trees in proximity to utilities; and
- Ensure that there is sufficient soil volume for all plantings.

7.0 References

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Appendix I
Tree Inventory Data

Kirby Road EA Tree Protection Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
40	White Spruce	*Picea glauca*	Native	1	18.9	2.5	Improbable	Good	Public	Remove	Grading	No	Light pruning; asymmetrical crown due west.
41	White Spruce	*Picea glauca*	Native	1	28.0	3.0	Improbable	Good	Public	Retain			Light pruning, asymmetrical; fungi in root zone, may not be associated with this tree; strong central leader.
42	White Spruce	*Picea glauca*	Native	1	27.5	3.5	Improbable	Good	Public	Remove	Grading	For Review	Light pruning.
43	White Spruce	*Picea glauca*	Native	2	33.5	3.0	Improbable	Fair	Public	Remove	Grading	For Review	Minor foliar necrosis; secondary stem subordinate.
44	White Spruce	*Picea glauca*	Native	1	20.0	3.0	Improbable	Fair	Public	Retain			Light pruning; asymmetrical crown due west.
45	White Spruce	*Picea glauca*	Native	2	39.1	3.5	Improbable	Fair	Public	Remove	Grading	For Review	Codominant stems with included bark; good form; good fruit set.
46	White Spruce	*Picea glauca*	Native	1	13.1	2.0	Possible	Poor	Private	Retain			Light pruning; asymmetrical crown due west; stem lean; dieback.
47	Trembling Aspen	*Populus tremuloides*	Native	1	13.9	3.0	Improbable	Fair	Private	Retain			Slight lean north, phototrophic growth; large basal shoot twisting around stem.
48	White Spruce	*Picea glauca*	Native	1	15.4	3.0	Possible	Fair	Private	Retain			Light pruning; asymmetrical crown due north; dieback.
49	Black Cherry	*Prunus serotina*	Native	1	12.5	2.5	Possible	Poor	Private	Retain			Asymmetrical crown due north; stem lean north; wounds, rot; gummosis.
50	White Spruce	*Picea glauca*	Native	1	20.1	3.0	Improbable	Fair	Public	Remove	Grading	For Review	Light pruning; minor foliar necrosis.
51	White Spruce	*Picea glauca*	Native	1	23.3	2.5	Improbable	Fair	Private	Remove	Grading	1:1	Asymmetrical crown due north; light pruning; downslope of ROW.
52	Trembling Aspen	*Populus tremuloides*	Native	1	31.1	4.5	Improbable	Fair	Boundary	Remove	Grading	For Review	2 broken branches; 1 dead branch.
53	Common Apple	*Malus domestica*	Non-Native	2	50.1	4.5	Possible	Poor	Public	Remove	Grading	For Review	Branch rub; many leaders, one dead; epicormic growth; rot.
54	Crack Willow	*Salix fragilis*	Non-Native	1	45.7	6.0	Possible	Fair	Public	Remove	Grading	For Review	Slight lean toward road and power lines, reaction wood; history of branch failure, water sprouts; some pruning for line clearing.
55	Crack Willow	*Salix fragilis*	Non-Native	1	13.1	2.0	Possible	Fair	Boundary	Remove	Grading	For Review	Asymmetrical crown due north; stem lean north.
56	Crack Willow	*Salix fragilis*	Non-Native	1	17.8	3.0	Possible	Poor	Private	Remove	Grading	For Review	Fruiting bodies on stem; sparse crown.
57	Green Ash	*Fraxinus pennsylvanica*	Native	1	21.4	0.5	Possible	Dead	Private	Remove	Grading	For Review	EAB; crack along stem; no crown. Potential bat roosting habitat.
58	Crack Willow	*Salix fragilis*	Non-Native	1	24.8	4.0	Improbable	Fair	Private	Remove	Grading	For Review	Strong central leader; irregular crown; epicormic growth.
59	Crack Willow	*Salix fragilis*	Non-Native	1	22.0	3.0	Possible	Fair	Boundary	Remove	Grading	For Review	Lean towards power lines; broken top.
60	Crack Willow	*Salix fragilis*	Non-Native	1	11.4	1.0	Possible	Fair	Public	Remove	Grading	For Review	Asymmetrical crown due north; stem lean north; phototrophic growth; water sprouts.
61	Crack Willow	*Salix fragilis*	Non-Native	1	14.1	2.5	Possible	Poor	Public	Remove	Grading	For Review	Asymmetrical crown due north; stem lean north; phototrophic growth; top broken off; apical growth comprises crown; vines.
62	Green Ash	*Fraxinus pennsylvanica*	Native	1	29.1		Probable	Dead	Private	Remove	Grading	For Review	Basal rot; no top; shedding bark; no galleries visible.
63	Green Ash	*Fraxinus pennsylvanica*	Native	1	32.5	0.5	Possible	Dead	Public	Remove	Grading	For Review	No crown; loose bark; crack. Potential bat roosting habitat.
64	Green Ash	*Fraxinus pennsylvanica*	Native	1	26.2		Probable	Dead	Private	Remove	Grading	For Review	Basal rot; no top; longitudinal crack; no galleries visible.
65	Green Ash	*Fraxinus pennsylvanica*	Native	1	27.3		Probable	Dead	Boundary	Remove	Grading	For Review	Basal rot; no top; shedding bark; no galleries visible. Potential bat roosting habitat.
66	Cherry species	*Prunus sp.*	Native	1	11.6	2.5	Possible	Poor	Private	Remove	Grading	For Review	Open basal wound with woundwood; 20% dieback.
67	White Elm	*Ulmus americana*	Native	1	18.4	3.0	Improbable	Fair	Public	Remove	Grading	For Review	Vines; codominant leaders; included bark.
68	Siberian Elm	*Ulmus pumila*	Non-Native	1	19.5	3.0	Possible	Fair	Public	Remove	Grading	For Review	Broken top; couple poor branch attachments; vine in crown.
69	Trembling Aspen	*Populus tremuloides*	Native	1	23.3	4.5	Possible	Fair	Public	Remove	Construction	For Review	Cracked lower branch, rot; topped by hydro; epicormic growth.
70	Trembling Aspen	*Populus tremuloides*	Native	1	14.8	3.0	Improbable	Fair	Public	Retain			Codominant leaders; basal shoot; healthy crown.
71	Crack Willow	*Salix fragilis*	Non-Native	1	35.3	5.0	Possible	Fair	Public	Retain			Codominant leaders' tops both broke in past; pruning cuts; water sprouts.
72	Black Locust	*Robinia pseudoacacia*	Non-Native	1	18.1	2.5	Improbable	Fair	Public	Retain			Asymmetrical crown due south; vines; light pruning.
73	Black Locust	*Robinia pseudoacacia*	Non-Native	1	19.0	2.5	Improbable	Fair	Public	Retain			Asymmetrical crown due west; vines; light pruning.
74	Black Locust	*Robinia pseudoacacia*	Non-Native	1	20.3	4.0	Improbable	Good	Public	Retain			Included bark at tight union with scaffold branch; vine in lower crown.
75	Black Locust	*Robinia pseudoacacia*	Non-Native	2	30.4	2.5	Possible	Poor	Public	Retain			Asymmetrical crown due west; vines; light pruning; dieback; phototrophic growth.
76	Black Locust	*Robinia pseudoacacia*	Non-Native	3	44.9	4.0	Improbable	Fair	Public	Retain			Strong taper on all stems; vine in lower crown.
77	Black Locust	*Robinia pseudoacacia*	Non-Native	1	21.0	3.5	Improbable	Fair	Public	Retain			Vines; light pruning; slope crest.
78	White Ash	*Fraxinus americana*	Native	1	21.5	3.5	Possible	Poor	Public	Retain			EAB exit holes; bark cracks; epicormic growth; seed set this year.
79	Black Locust	*Robinia pseudoacacia*	Non-Native	2	29.9	3.5	Improbable	Good	Public	Retain			Included bark; light pruning; vines.
80	Black Locust	*Robinia pseudoacacia*	Non-Native	1	13.5	3.0	Improbable	Good	Public	Retain			Slight pistol butt; vines in crown.
81	Black Locust	*Robinia pseudoacacia*	Non-Native	1	21.9	2.5	Improbable	Fair	Public	Remove	Future Construction	For Review	Dead lower branches; tight union; gypsy moth egg sac.
82	Black Locust	*Robinia pseudoacacia*	Non-Native	1	16.2	4.5	Improbable	Fair	Public	Remove	Future Construction	For Review	Asymmetrical crown due south; vines; stem lean south; slightly suppressed.
83	Black Locust	*Robinia pseudoacacia*	Non-Native	1	17.3	4.0	Improbable	Fair	Public	Remove	Future Construction	For Review	Pistol butt; low vigour.
84	Black Locust	*Robinia pseudoacacia*	Non-Native	1	22.5	4.0	Possible	Fair	Public	Remove	Future Construction	For Review	Sapwood decay visible at stem wound; asymmetrical crown; 2 dead branches.
85	Black Locust	*Robinia pseudoacacia*	Non-Native	1	26.6	5.0	Improbable	Fair	Public	Remove	Future Construction	For Review	Asymmetrical crown due west; vines; upslope.
86	Black Locust	*Robinia pseudoacacia*	Non-Native	1	10.6	2.5	Improbable	Good	Public	Remove	Future Construction	For Review	Tight union at low branch.
87	Black Locust	*Robinia pseudoacacia*	Non-Native	2	50.1	4.0	Improbable	Fair	Public	Remove	Future Construction	For Review	Asymmetrical crown due west; vines; included bark; upslope.
88	Black Locust	*Robinia pseudoacacia*	Non-Native	2	32.7	4.0	Possible	Good	Public	Remove	Future Construction	For Review	Codominant stems with included bark; good structure in each stem separately.
89	Black Locust	*Robinia pseudoacacia*	Non-Native	1	24.7	4.0	Improbable	Fair	Public	Retain			Asymmetrical crown due west; broken branch; improper branch pruning by hydro.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
90	Black Locust	*Robinia pseudoacacia*	Non-Native	1	15.6	3.0	Possible	Fair	Public	Retain			Significant stem wound shows deadwood; included bark.
91	Black Locust	*Robinia pseudoacacia*	Non-Native	1	15.6	2.0	Improbable	Fair	Public	Retain			Improper branch pruning; included bark; branch rub.
92	White Ash	*Fraxinus americana*	Native	1	11.2	2.0	Possible	Poor	Public	Remove	Grading	For Review	Asymmetrical crown due south; stem lean south; canker; vines; dieback.
93	Large-tooth Aspen	*Populus grandidentata*	Native	1	10.5	2.0	Improbable	Good	Public	Remove	Construction	No	Small stem wound closed.
94	Large-tooth Aspen	*Populus grandidentata*	Native	1	13.0	1.5	Possible	Good	Public	Remove	Construction	No	Light pruning; erosion downslope; hanger.
95	Large-tooth Aspen	*Populus grandidentata*	Native	1	16.2	3.0	Improbable	Fair	Public	Remove	Construction	No	Once lost leader.
96	Crack Willow	*Salix fragilis*	Non-Native	4	45.4	4.5	Possible	Fair	Public	Remove	Construction	For Review	Codominant stems, 1 broken.
97	Willow species	*Salix sp.*	Native	1	13.3	2.0	Improbable	Good	Public	Remove	Construction	For Review	Asymmetrical crown due south; stem lean south; vines.
98	Crack Willow	*Salix fragilis*	Non-Native	1	14.0	2.5	Improbable	Fair	Public	Remove	Construction	No	Asymmetrical crown; minor epicormic growth.
99	Crack Willow	*Salix fragilis*	Non-Native	2	15.8	3.5	Improbable	Fair	Public	Remove	Construction	No	Secondary stem suppressed; 1 broken branch; water sprouts.
100	Crack Willow	*Salix fragilis*	Non-Native	1	16.3	2.5	Possible	Fair	Public	Remove	Construction	No	Lower stem wound mostly closed; vine in crown.
101	Large-tooth Aspen	*Populus grandidentata*	Native	1	10.5	2.0	Possible	Very Poor	Public	Remove	Construction	No	Dead top; peeling bark.
102	Large-tooth Aspen	*Populus grandidentata*	Native	1	11.9	2.0	Improbable	Fair	Public	Remove	Construction	No	Asymmetrical crown due south; stem lean south; light pruning.
103	Trembling Aspen	*Populus tremuloides*	Native	1	11.5	2.5	Improbable	Fair	Public	Remove	Construction	No	Asymmetrical crown due south; light pruning.
104	Trembling Aspen	*Populus tremuloides*	Native	1	12.6	2.5	Improbable	Good	Public	Remove	Construction	No	Asymmetrical crown due south; light pruning.
105	Trembling Aspen	*Populus tremuloides*	Native	1	12.3	3.0	Improbable	Good	Public	Remove	Construction	No	Asymmetrical crown; basal shoot; vigorous.
106	Manitoba Maple	*Acer negundo*	Native	3	21.9	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due south; included bark; vines.
107	Large-tooth Aspen	*Populus grandidentata*	Native	1	10.7	2.0	Improbable	Fair	Public	Remove	Construction	No	Asymmetrical crown due south; vines; canker.
108	Manitoba Maple	*Acer negundo*	Native	2	12.1	2.5	Improbable	Fair	Public	Remove	Construction	No	Asymmetrical crown due south; stem lean south; epicormic growth; suckers.
109	Manitoba Maple	*Acer negundo*	Native	2	20.7	3.5	Improbable	Fair	Public	Remove	Construction	For Review	Arches towards Kirby Road; basal shoots.
110	Manitoba Maple	*Acer negundo*	Native	1	23.4	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Codominant leaders arch towards Kirby Road; epicormic growth; 1 branch wound.
111	Manitoba Maple	*Acer negundo*	Native	1	14.2	4.0	Improbable	Fair	Public	Remove	Construction	No	Slight lean towards Kirby Road; some dieback; vine in crown.
112	Large-tooth Aspen	*Populus grandidentata*	Native	1	10.3	1.0	Improbable	Good	Public	Remove	Construction	No	Asymmetrical crown due south; branch rub; compartmentalized wounds.
113	Large-tooth Aspen	*Populus grandidentata*	Native	1	13.2	2.0	Improbable	Good	Public	Remove	Construction	No	Asymmetrical crown due south; light pruning; branch rub.
114	Large-tooth Aspen	*Populus grandidentata*	Native	1	12.6	2.0	Improbable	Good	Public	Remove	Construction	No	Asymmetrical crown due south; branch rub; light pruning.
115	Large-tooth Aspen	*Populus grandidentata*	Native	1	14.8	2.5	Improbable	Good	Public	Remove	Construction	No	1 poor attachment.
116	White Elm	*Ulmus americana*	Native	2	78.1	7.0	Improbable	Good	Boundary	Remove	Grading	4:1	Included bark, otherwise good structure; vase-like form; minor epicormic growth; few small dead branches.
117	American Basswood	*Tilia americana*	Native	4	43.9	2.5	Improbable	Fair	Public	Remove	Grading	For Review	Asymmetrical crown due south; vines; branch rub; included bark.
118	American Basswood	*Tilia americana*	Native	1	14.4	2.5	Improbable	Fair	Public	Remove	Grading	No	Branch rub; included bark; multiple stems under 10 DBH.
119	American Basswood	*Tilia americana*	Native	3	13.7	3.0	Improbable	Good	Public	Remove	Grading	No	Subordinate stems originated as basal shoots.
120	American Basswood	*Tilia americana*	Native	1	12.9	1.0	Improbable	Fair	Public	Remove	Grading	No	Included bark; branch rub.
121	American Basswood	*Tilia americana*	Native	3	10.2	2.5	Improbable	Good	Public	Remove	Grading	No	Codominant stems; basal shoots; branch crossing.
122	American Basswood	*Tilia americana*	Native	2	13.8	1.0	Improbable	Fair	Public	Remove	Grading	No	Included bark; branch rub; second stem under 10 DBH.
123	Common Apple	*Malus domestica*	Non-Native	2	13.7	3.0	Improbable	Good	Public	Remove	Grading	No	Codominant stems; vine in crown; 2 past failures of small branches; good fruit set past season.
124	European Ash	*Fraxinus excelsior*	Non-Native	1	11.9	1.0	Possible	Very Poor	Public	Retain			EAB; dieback; epicormic growth; canker; peeled bark.
125	European Ash	*Fraxinus excelsior*	Non-Native	1	16.5	2.5	Possible	Poor	Public	Retain			Basal , insect galleries; bark staining; many live buds.
126	Austrian Pine	*Pinus nigra*	Non-Native	1	13.9	1.5	Improbable	Good	Public	Retain			Stem lean east; planted above root collar.
127	Austrian Pine	*Pinus nigra*	Non-Native	1	15.0	2.0	Improbable	Good	Public	Retain			Full crown, to the ground.
128	Austrian Pine	*Pinus nigra*	Non-Native	1	14.6	1.5	Improbable	Fair	Public	Retain			Slight lean west; planted above root collar; insect damage.
129	Austrian Pine	*Pinus nigra*	Non-Native	1	13.3	2.0	Improbable	Good	Public	Retain			Good form.
130	Freeman's Maple	*Acer X freemanii*	Native	1	10.8	1.0	Improbable	Fair	Public	Retain			Basal wound with some rot; epicormic growth.
131	Austrian Pine	*Pinus nigra*	Non-Native	1	11.0	1.5	Improbable	Fair	Public	Retain			Good form; fungi in root zone.
132	European Ash	*Fraxinus excelsior*	Non-Native	1	19.9	1.0	Improbable	Poor	Public	Retain			EAB; epicormic growth; canker.
133	Balsam Fir	*Abies balsamea*	Native	1	10.1	1.0	Improbable	Fair	Public	Retain			Sparse crown with vines throughout; root ball was planted a bit high.
134	Austrian Pine	*Pinus nigra*	Non-Native	1	13.6	2.0	Improbable	Fair	Public	Remove	Grading	No	Fungi in root zone; healthy crown; good form.
135	Austrian Pine	*Pinus nigra*	Non-Native	1	14.0	1.5	Improbable	Good	Public	Remove	Grading	No	Sapsucker holes; cement block at base.
136	Austrian Pine	*Pinus nigra*	Non-Native	1	13.2	2.0	Improbable	Fair	Public	Remove	Grading	No	Minor dieback; leader may get superseded.
137	Austrian Pine	*Pinus nigra*	Non-Native	1	10.7	1.0	Improbable	Good	Public	Remove	Grading	No	Improper branch pruning.
138	Amur Maple	*Acer ginnala*	Non-Native	1	10.6	1.0	Improbable	Good	Private	Retain			Basal wound, compartmentalized; branch rub; codominant leaders split at DBH; included bark.
139	Amur Maple	*Acer ginnala*	Non-Native	1	10.1	1.5	Improbable	Good	Boundary	Remove	Construction	No	Good form; heavy seed set.
140	Siberian Elm	*Ulmus pumila*	Non-Native	1	12.3	0.5	Improbable	Fair	Private	Retain			Included bark; branch rub.
141	Amur Maple	*Acer ginnala*	Non-Native	1	11.6	1.0	Improbable	Fair	Private	Remove	Construction	No	Included bark; branch rub; epicormic growth; basal wound compartmentalized.
142	Freeman's Maple	*Acer X freemanii*	Native	3	31.7	2.5	Possible	Fair	Private	Retain			Codominant stems with included bark; guywire girdled 1 stem; topped for power lines.
143	Green Ash	*Fraxinus pennsylvanica*	Native	1	10.3	2.0	Possible	Very Poor	Private	Retain			Topped for power lines; EAB exit holes; bark cracks; insect galleries.
144	Green Ash	*Fraxinus pennsylvanica*	Native	1	13.5	2.0	Possible	Poor	Private	Retain			Insect galleries; topped for power lines.
145	White Birch	*Betula papyrifera*	Native	3	21.1	2.5	Possible	Fair	Private	Retain			1 stem topped; 2 stem wounds.

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146	Green Ash	*Fraxinus pennsylvanica*	Native	1	13.3	3.0	Probable	Very Poor	Private	Retain			Insect galleries; epicormic growth; leaning towards Kirby Road; loose bark; topped for power lines.
147	White Birch	*Betula papyrifera*	Native	3	10.6	2.5	Possible	Fair	Private	Retain			Included bark; topped for power lines; asymmetrical crown to north; stem wound.
148	Freeman's Maple	*Acer X freemanii*	Native	4	39.9	2.5	Improbable	Fair	Private	Retain			Stems tightly upright, included bark; topped for power lines; vine in crown.
149	Green Ash	*Fraxinus pennsylvanica*	Native	1	12.5	2.5	Possible	Poor	Private	Retain			EAB exit holes; insectivore action; epicormic growth; codominant leaders; basal shoots.
150	White Spruce	*Picea glauca*	Native	1	24.3	2.5	Improbable	Fair	Private	Retain			Minor crown thinning; stem wrapped by landscape fabric; heavy fruit set.
151	White Spruce	*Picea glauca*	Native	1	21.9	2.5	Improbable	Fair	Private	Retain			Light pruning; slightly suppressed; history of branch pruning.
152	White Spruce	*Picea glauca*	Native	1	25.9	3.0	Improbable	Fair	Boundary	Retain			Light pruning; slightly suppressed; history of branch pruning; branch rub; dried sap on stem.
153	White Spruce	*Picea glauca*	Native	1	20.2	2.0	Improbable	Fair	Boundary	Retain			Crown thinning.
154	White Spruce	*Picea glauca*	Native	1	18.5	2.0	Improbable	Fair	Boundary	Retain			Light pruning on north side because of sumacs; heavy fruit set.
155	White Spruce	*Picea glauca*	Native	1	21.0	3.0	Improbable	Fair	Public	Retain			Light pruning; slightly suppressed; branch rub; landscape cloth wrapped around base.
156	White Spruce	*Picea glauca*	Native	1	21.3	2.5	Improbable	Good	Public	Retain			Healthy crown asymmetrical to northeast due to neighbouring tree; heavy fruit set.
157	White Spruce	*Picea glauca*	Native	1	22.0	2.5	Improbable	Fair	Private	Retain			Light pruning; slightly suppressed; branch rub; dried sap on stem.
158	White Spruce	*Picea glauca*	Native	1	26.9	2.5	Improbable	Fair	Private	Retain			Light pruning; slightly suppressed; branch rub; dried sap on stem.
159	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	19.0	2.5	Possible	Fair	Public	Retain			Lacking root flare; past pruning cuts not closed; 1 past failure; couple poor attachments; minor epicormic growth.
160	White Spruce	*Picea glauca*	Native	1	26.0	2.0	Improbable	Fair	Private	Retain			Light pruning; slightly suppressed; branch rub; dried sap on stem; lower branches cut back along the sidewalk.
161	Freeman's Maple	*Acer X freemanii*	Native	1	23.6	2.0	Possible	Poor	Public	Retain			Large open wound along stem, compartmentalized; multi stems pruned at base; mower damage.
162	Silver Maple	*Acer saccharinum*	Native	1	36.4	4.5	Possible	Fair	Public	Remove	Construction	For Review	Asymmetrical crown to the south due to heading cuts fir power lines; stem wound with woundwood; basal shoots; codominant leaders; some epicormic growth.
163	Silver Maple	*Acer saccharinum*	Native	1	34.3	5.0	Improbable	Fair	Public	Remove	Construction	For Review	Asymmetrical crown to the south due to heading cuts fir power lines; stem wound nearly closed; codominant leaders; water sprouts.
164	Silver Maple	*Acer saccharinum*	Native	1	18.1	3.0	Improbable	Good	Public	Remove	Construction	No	Few heading cuts on this tree younger than neighbours; exposed roots with lawnmower damage.
165	Silver Maple	*Acer saccharinum*	Native	1	28.9	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Asymmetrical crown to the south due to heading cuts for power lines; basal shoots.
166	Silver Maple	*Acer saccharinum*	Native	1	32.0	4.5	Improbable	Good	Public	Remove	Construction	For Review	Irregular crown due to heading cuts for power lines; codominant leaders; basal shoots.
167	Silver Maple	*Acer saccharinum*	Native	1	35.7	4.0	Improbable	Good	Public	Remove	Construction	For Review	Irregular crown due to heading cuts for power lines; good wound closure in stem; gypsy moth egg sacs.
168	Silver Maple	*Acer saccharinum*	Native	1	34.8	3.5	Possible	Fair	Public	Remove	Construction	For Review	Asymmetrical crown to the south due to heading cuts for power lines; girdling root; stem wound open but with much woundwood; codominant leaders.
169	Silver Maple	*Acer saccharinum*	Native	1	41.9	4.0	Possible	Good	Public	Remove	Construction	For Review	Asymmetrical crown to the south due to heading cuts for power lines; 3 codominant leaders; epicormic growth; many gypsy moth egg sacs.
170	White Spruce	*Picea glauca*	Native	1	24.1	2.5	Improbable	Good	Private	Remove	Construction	1:1	Light pruning; branch rub; branches abut fence; raised planting.
171	White Spruce	*Picea glauca*	Native	1	24.7	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Irregular crown due to heading cuts for power lines; topped.
172	White Spruce	*Picea glauca*	Native	1	21.7	3.0	Improbable	Fair	Private	Remove	Construction	1:1	Irregular crown due to pruning for power lines; sparse crown; light pruning; wrapped by landscape fabric.
173	White Spruce	*Picea glauca*	Native	1	34.0	3.0	Improbable	Good	Private	Retain			Light pruning; branch rub; branches abut fence; raised planting; landscape cloth wrapped around base.
174	White Spruce	*Picea glauca*	Native	1	36.3	3.0	Improbable	Good	Private	Remove	Construction	2:1	Light pruning; branch rub; branches abut fence; raised planting; landscape cloth wrapped around base.
175	White Spruce	*Picea glauca*	Native	1	30.9	3.5	Improbable	Good	Private	Remove	Construction	2:1	1 girdling root over root flare; wrapped by landscape fabric; good fruit set.
176	Silver Maple	*Acer saccharinum*	Native	1	49.1	5.0	Possible	Fair	Public	Remove	Construction	For Review	3 codominant leaders, 2 with heading cuts; basal shoots; water sprouts; large exposed root with lawnmower damage.
177	Silver Maple	*Acer saccharinum*	Native	1	44.9	4.5	Possible	Fair	Public	Remove	Construction	For Review	Irregular crown due to heading cuts for power lines; vigorous lateral scaffold branch; basal shoots; large exposed root with lawnmower damage.
178	Silver Maple	*Acer saccharinum*	Native	1	36.7	4.0	Improbable	Fair	Public	Remove	Construction	For Review	Irregular crown due to heading cuts for power lines; codominant leaders; water sprouts; many gypsy moth egg sacs.
179	Silver Maple	*Acer saccharinum*	Native	1	28.1	3.0	Possible	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due to pruning cuts for power lines; basal shoots; gypsy moth egg sacs.
180	Silver Maple	*Acer saccharinum*	Native	1	38.2	5.0	Possible	Fair	Public	Remove	Construction	For Review	Irregular crown due to heading cuts for power lines; epicormic growth; many gypsy moth egg sacs.

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181	Silver Maple	*Acer saccharinum*	Native	1	44.4	5.0	Possible	Fair	Public	Remove	Construction	For Review	Completely asymmetrical crown due to heading cuts for power lines; large cut surface from leader removed; upper stem slightly leaning over backyard; basal shoots; many gypsy moth egg sacs.
182	Silver Maple	*Acer saccharinum*	Native	1	40.5	4.5	Improbable	Good	Public	Remove	Construction	For Review	Asymmetrical crown due to pruning cuts for power lines; basal shoots; gypsy moth egg sacs.
183	Silver Maple	*Acer saccharinum*	Native	1	50.3	5.0	Possible	Fair	Public	Remove	Construction	For Review	Asymmetrical crown t the south due to pruning cuts for power lines; oversized scaffold branch; water sprouts; 1 branch wound partly closed; many gypsy moth egg sacs.
184	Silver Maple	*Acer saccharinum*	Native	1	34.6	4.5	Possible	Fair	Public	Remove	Construction	For Review	Sharply asymmetrical crown t the south due to heading cuts for power lines; decent wound closure; exposed root with lawnmower damage; basal shoots; many gypsy moth egg sacs.
185	Silver Maple	*Acer saccharinum*	Native	1	43.8	6.0	Possible	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due south; codominant leaders; included bark; topped; minor branch rub; water sprouts.
186	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	29.7	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Many heading cuts for power lines; upright form; epicormic growth beginning; gypsy moth egg sacs.
187	Colorado Spruce	*Picea pungens*	Non-Native	1	59.8	4.0	Improbable	Good	Public	Remove	Construction	For Review	Few broken branches; vine in lower crown.
188	Colorado Spruce	*Picea pungens*	Non-Native	1	64.4	5.0	Improbable	Fair	Public	Remove	Construction	For Review	Vines; light pruning; branch rub; good branch closure; drooping branches.
189	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	102.1	8.0	Possible	Fair	Public	Remove	Construction	For Review	Stem compartmentalized around fence; branch rub; history of branch pruning; compartmentalized wounds; knot hole cavity; included bark; hangers.
190	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	80.4	6.0	Probable	Poor	Public	Remove	Construction	No	Dead leader; 40% live crown lost; 5 dead branches, several broken branches.
191	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	117.6	6.5	Possible	Fair	Boundary	Remove	Construction	4:1	1 leader dead; potential basal decay; short stem, round crown.
192	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	83.0	0.5	Improbable	Dead	Public	Remove	Construction	No	No crown; all branches pruned.
193	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	85.9	8.5	Improbable	Fair	Public	Remove	Construction	For Review	Branch rub; included bark; small dead branches; compartmentalized wounds; rotted branch stubs with insect damage; knot hole cavities. Potential bat roosting habitat.
194	American Basswood	*Tilia americana*	Native	2	15.3	2.5	Improbable	Good	Public	Remove	Construction	For Review	Subordinate stem is basal shoot; vines throughout crown.
195	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	35.6	3.0	Improbable	Good	Boundary	Remove	Construction	2:1	Codominant stems spit at 1m height; minor epicormic growth; live buds all through crown.
196	White Ash	*Fraxinus americana*	Native	2	39.8	4.5	Possible	Poor	Public	Remove	Construction	No	EAB; included bark; canker; woodpecker damage; crown dieback.
197	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	35.6	4.0	Improbable	Good	Boundary	Remove	Construction	2:1	3 tight unions; included bark; branching begins very low, open-grown; 1 broken branch.
198	Freeman's Maple	*Acer X freemanii*	Native	1	106.0	10.0	Possible	Fair	Public	Remove	Construction	For Review	DBH measured near base; branch rub; included bark; hangers; compartmentalized wounds; rotted leader with broken top; hangers; good branch closure.
199	Freeman's Maple	*Acer X freemanii*	Native	4	242.0	9.0	Possible	Fair	Boundary	Remove	Construction	4:1	Large, diverging stems; included bark; broad crown; 5% live crown lost;4 broken branches.
200	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	43.0	7.0	Possible	Very Poor	Public	Remove	Construction	No	Asymmetrical crown due east; suppressed; large hangers; history of branch failure; topped; rot.
203	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	84.0	7.5	Probable	Poor	Public	Remove	Construction	No	Large branch pruned, potentially branch failed and tore bark; centre rot; 40% live crown lost; history of branch failure. Potential bat roosting habitat.
204	Hawthorn species	*Crataegus sp.*	Native	2	27.4	2.0	Possible	Fair	Public	Remove	Construction	For Review	Codominant stems, 1 broken; whole crown arches east, poor form.
205	Hawthorn species	*Crataegus sp.*	Native	3	40.6	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Spreading crown.
206	Hawthorn species	*Crataegus sp.*	Native	4	33.0	4.0	Possible	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due north; branch rub; vines; slightly suppressed.
207	Hawthorn species	*Crataegus sp.*	Native	1	11.2	3.0	Possible	Poor	Public	Remove	Construction	No	Asymmetrical crown due south; branch rub; vines; suppressed.
208	Hawthorn species	*Crataegus sp.*	Native	1	15.2	2.5	Improbable	Fair	Public	Remove	Construction	For Review	Asymmetrical crown north; 1 broken branch.
209	Hawthorn species	*Crataegus sp.*	Native	2	24.0	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Included bark; dense branching.
210	Hawthorn species	*Crataegus sp.*	Native	2	22.0	3.0	Possible	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due north; slightly suppressed; larger stem leaning north; branch rub.
211	Hawthorn species	*Crataegus sp.*	Native	2	26.9	2.5	Improbable	Good	Public	Remove	Construction	For Review	Asymmetrical crown north and west.
212	Hawthorn species	*Crataegus sp.*	Native	5	58.9	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Spreading crown of twisting branches; typical form; centre rot in 1 stem.
213	Hawthorn species	*Crataegus sp.*	Native	1	17.5	5.0	Possible	Poor	Public	Remove	Construction	No	Asymmetrical crown due south; second stem rotted away; compartmentalized wound; vines; rot; cavities.
214	Hawthorn species	*Crataegus sp.*	Native	1	13.1	0.5	Probable	Very Poor	Public	Remove	Construction	No	Broken top; rot; epicormic growth; vines.
215	Hawthorn species	*Crataegus sp.*	Native	3	74.6	4.0	Improbable	Good	Public	Remove	Construction	For Review	Spreading crown of twisting branches; typical form; few broken branches.
216	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	57.0	10.0	Probable	Very Poor	Public	Remove	Construction	No	History of branch failure; dead top; vines; basal fungus; woodpecker damage; rot.
217	Black Cherry	*Prunus serotina*	Native	1	82.8	6.5	Probable	Poor	Public	Remove	Construction	No	Some dead sapwood visible at base, woundwood; 2 large codominant leaders; 60% live crown lost.

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218	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	27.3	8.0	Improbable	Fair	Public	Remove	Construction	For Review	Included bark; branch rub; abuts adjacent tree; asymmetrical crown due south; slightly suppressed.
219	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	3	88.6	5.0	Possible	Fair	Public	Remove	Construction	For Review	Included bark; vines; bark staining; reaction wood; branch rub; dead leader; insect damage; compartmentalized wounds; small dead branches.
220	White Ash	*Fraxinus americana*	Native	3	107.5	5.5	Probable	Very Poor	Public	Remove	Construction	No	EAB exit holes; insect galleries; shedding bark; live epicormic growth.
221	Manitoba Maple	*Acer negundo*	Native	5	90.8	6.5	Possible	Poor	Public	Remove	Construction	No	Stems diverge from base; sapwood decay; basal rot; included bark.
222	Norway Maple	*Acer platanoides*	Non-Native	1	31.9	6.0	Improbable	Fair	Public	Remove	Construction	For Review	Stem lean south; branch rub; vines; erosion downslope; bark staining.
223	Slippery Elm	*Ulmus rubra*	Native	4	107.5	9.0	Improbable	Fair	Boundary	Remove	Construction	4:1	Included bark; epicormic growth; branch rub; codominant leaders; minor rot on lower stem; small dead branches.
224	Slippery Elm	*Ulmus rubra*	Native	1	36.7	6.0	Improbable	Fair	Boundary	Remove	Construction	2:1	Codominant leaders, oriented north-south; much epicormic growth; 1 dead branch; gypsy moth egg sac.
225	Slippery Elm	*Ulmus rubra*	Native	1	43.2	9.0	Improbable	Good	Boundary	Remove	Construction	3:1	Included bark; epicormic growth; branch rub; codominant leaders; small dead branches.
226	Norway Maple	*Acer platanoides*	Non-Native	3	67.5	5.0	Possible	Fair	Public	Remove	Construction	For Review	Compartmentalized wounds on lower stems, some rot; history of branch pruning; codominant leaders; included bark; branch rub; small dead branch branches; improper branch cuts, water sprouts and suckers.
227	Scots Pine	*Pinus sylvestris*	Non-Native	1	39.6	6.0	Improbable	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due south; history of branch pruning; good branch closure; sapsucker holes; codominant leaders, third leader broke off; branch rub.
228	Scots Pine	*Pinus sylvestris*	Non-Native	1	50.3	6.0	Improbable	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due south; history of branch pruning; branch rub; split in one large branch; sapsucker holes; girdling root.
229	Silver Maple	*Acer saccharinum*	Native	6	82.9	7.5	Improbable	Good	Public	Remove	Construction	For Review	Branch rub; included bark; drooping branches; codominant leaders; water sprouts; suckers.
230	Silver Maple	*Acer saccharinum*	Native	4	104.3	8.0	Improbable	Good	Public	Remove	Construction	For Review	Branch rub; included bark; drooping branches; codominant leaders; improper branch pruning, water sprouts; broken branch; compartmentalized wounds.
231	Silver Maple	*Acer saccharinum*	Native	8	68.7	8.0	Possible	Fair	Public	Remove	Construction	For Review	Branch rub; included bark; drooping branches; codominant leaders; improper branch pruning, water sprouts; broken branch; compartmentalized wounds; hangers; leaders with broken tops.
232	American Basswood	*Tilia americana*	Native	3	12.4	1.5	Improbable	Fair	Public	Remove	Construction	No	Asymmetrical crown due south; stem compartmentalized around fence; suckers; branch rub; included bark; other stems under 10 DBH.
233	Black Cherry	*Prunus serotina*	Native	1	16.4	2.5	Improbable	Fair	Public	Remove	Construction	No	Included bark; browse, water sprouts; under power line.
234	Black Cherry	*Prunus serotina*	Native	1	16.3	2.0	Improbable	Fair	Public	Remove	Construction	No	Codominant leaders with included bark; vigorous growth, under power lines; epicormic growth.
235	Mountain-Ash species	*Sorbus sp.*	Native	2	10.2	2.0	Improbable	Fair	Public	Remove	Construction	No	Branch rub; compartmentalized wound; canker.
236	Black Cherry	*Prunus serotina*	Native	1	10.9	2.5	Improbable	Fair	Public	Remove	Construction	No	Vigorous; water sprouts; basal shoot; dead twigs.
237	Mountain-Ash species	*Sorbus sp.*	Native	2	14.0	2.0	Improbable	Fair	Public	Retain			Codominant leaders; included bark; branch rub; canker; under power line.
238	Black Cherry	*Prunus serotina*	Native	1	12.0	3.0	Improbable	Fair	Public	Retain			Few tight unions.
239	White Ash	*Fraxinus americana*	Native	1	10.3	2.5	Improbable	Good	Public	Retain			Good structure; minor epicormic growth.
240	Black Cherry	*Prunus serotina*	Native	1	20.0	4.0	Improbable	Good	Boundary	Retain			Asymmetrical crown due south; branch rub; vines.
241	Russian Olive	*Elaeagnus angustifolia*	Non-Native	1	19.4	3.5	Possible	Fair	Public	Retain			1 past failure is still alive, water sprouts; centre rot visible.
242	Black Cherry	*Prunus serotina*	Native	1	11.1	4.0	Improbable	Fair	Public	Retain			Asymmetrical crown due south; canker; gummosis; light pruning; vines.
243	Black Cherry	*Prunus serotina*	Native	1	14.8	2.5	Improbable	Fair	Public	Remove	Construction	No	Crooked stem; low branching; growing near power lines.
244	Black Cherry	*Prunus serotina*	Native	1	10.5	1.5	Improbable	Fair	Public	Remove	Construction	No	Deer browse, water sprouts; gummosis; branch rub; under power line.
245	Mountain-Ash species	*Sorbus sp.*	Native	1	10.1	2.0	Possible	Fair	Public	Remove	Construction	No	Codominant leaders with included bark; vines throughout crown; growing near power lines.
246	Mountain-Ash species	*Sorbus sp.*	Native	2	10.3	1.0	Probable	Dead	Public	Remove	Construction	No	Crown intact.
247	European Ash	*Fraxinus excelsior*	Non-Native	2	12.1	2.5	Probable	Very Poor	Public	Remove	Construction	No	EAB exit holes; insect galleries; loose bark; live epicormic growth; under power lines.
aa	Trembling Aspen	*Populus tremuloides*	Native	1	26.7	4.5	Improbable	Fair	Private	Retain			Few dead branches; light pruning.
ab	Trembling Aspen	*Populus tremuloides*	Native	1	31.8	4.0	Possible	Poor	Private	Retain			Dieback; compartmentalized wounds; rot; fungus.
ac	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	73.9	5.5	Possible	Fair	Private	Remove	Grading	For Review	Branch rub; asymmetrical crown due north; included bark; loose bark; crown dieback. Potential bat roosting habitat.
ad	Red Oak	*Quercus rubra*	Native	1	55.4	7.0	Improbable	Good	Private	Retain			Irregular crown couple dead branches; gypsy moth egg sac.
ae	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	15.2	3.5	Improbable	Good	Private	Retain			Leader suppressed, 1 vigorous lateral.
af	White Elm	*Ulmus americana*	Native	1	17.1	8.0	Possible	Fair	Private	Retain			Suppressed; phototrophic growth; asymmetrical crown due north; branch rub; broken top; crown composed of apical growth.
ag	Green Ash	*Fraxinus pennsylvanica*	Native	1	16.4	2.5	Possible	Poor	Private	Remove	Grading	For Review	EAB; woodpecker holes; epicormic growth; asymmetrical crown due north.

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ah	Red Oak	*Quercus rubra*	Native	1	59.5	9.0	Possible	Fair	Private	Retain			Bark seam, bark staining at root flare; 2 dead scaffold branches; epicormic growth; few poor branch attachments; gypsy moth egg sac.
ai	Trembling Aspen	*Populus tremuloides*	Native	2	33.9	2.5	Improbable	Fair	Private	Remove	Grading	For Review	Light pruning; compartmentalized wounds; asymmetrical crown due north; stem lean north; included bark.
aj	Trembling Aspen	*Populus tremuloides*	Native	1	17.3	4.0	Improbable	Fair	Private	Remove	Grading	For Review	Arching lean toward power lines.
ak	Trembling Aspen	*Populus tremuloides*	Native	1	14.0	1.5	Improbable	Fair	Private	Remove	Grading	For Review	Asymmetrical crown due north; dieback; light pruning.
al	Trembling Aspen	*Populus tremuloides*	Native	1	15.7		Possible	Dead	Private	Remove	Grading	For Review	Broken top; shedding bark.
am	Trembling Aspen	*Populus tremuloides*	Native	1	15.0	2.0	Possible	Fair	Private	Remove	Grading	For Review	Stem lean north; asymmetrical crown due north; phototrophic growth; light pruning; minor dieback.
an	Trembling Aspen	*Populus tremuloides*	Native	1	26.7	4.0	Possible	Fair	Private	Remove	Grading	For Review	Once lost leader, new leaders have poor attachments.
ao	Manitoba Maple	*Acer negundo*	Native	3	54.7	4.5	Improbable	Good	Private	Remove	Grading	For Review	Codominant stems diverge from base; included bark.
ap	Eastern White Pine	*Pinus strobus*	Native	1	32.5	4.0	Improbable	Fair	Private	Remove	Grading	For Review	Crooked stem at base; once lost leader, large scaffold branches compensate.
aq	Eastern White Pine	*Pinus strobus*	Native	1	32.1	4.0	Improbable	Good	Private	Retain			Branch rub; vines.
ar	Trembling Aspen	*Populus tremuloides*	Native	1	13.5	2.5	Improbable	Good	Private	Retain			Light pruning.
as	Trembling Aspen	*Populus tremuloides*	Native	3	14.8	3.0	Improbable	Fair	Boundary	Retain			Primary stem twisting; 2 subordinate stems; light pruning.
at	Trembling Aspen	*Populus tremuloides*	Native	1	13.5	0.5	Possible	Fair	Private	Retain			History of branch failure.
au	Trembling Aspen	*Populus tremuloides*	Native	1	11.5	1.5	Improbable	Fair	Private	Retain			Oyster shell scale; vines; light pruning.
av	Eastern White Pine	*Pinus strobus*	Native	1	19.1	3.0	Improbable	Good	Private	Retain			Asymmetrical crown due east; light pruning.
aw	Red Oak	*Quercus rubra*	Native	2	27.0	4.0	Improbable	Good	Private	Retain			Codominant stems with included bark; asymmetrical crown due to neighbouring trees; gypsy moth egg sacs.
ax	Eastern White Pine	*Pinus strobus*	Native	1	36.0	3.5	Improbable	Good	Boundary	Retain			Asymmetrical crown due south; light pruning; sign affixed to stem.
ay	Red Oak	*Quercus rubra*	Native	1	63.0	9.0	Possible	Fair	Boundary	Retain			Bark seam lower stem ; 4 dead branches ; leader lacking vigour.
az	Red Maple	*Acer rubrum*	Native	2	62.0	9.0	Improbable	Good	Private	Retain			Included bark; small dead branches; asymmetrical crown due south.
ba	Red Maple	*Acer rubrum*	Native	1	35.0	6.0	Improbable	Fair	Private	Retain			Leaning toward Kirby Road; crooked stem; 2 broken branches.
bb	American Beech	*Fagus grandifolia*	Native	1	42.0	6.5	Possible	Fair	Public	Retain			Asymmetrical crown due south; phototrophic growth; minor dieback.
bc	Large-tooth Aspen	*Populus grandidentata*	Native	1	16.7	3.5	Possible	Fair	Public	Remove	Grading	For Review	Pronounced pistol butt; leader being superseded by lateral; poor attachment.
bd	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	53.0	8.5	Possible	Good	Public	Remove	Grading	For Review	Asymmetrical crown due south; compartmentalized wounds; hangers.
be	Eastern Hemlock	*Tsuga canadensis*	Native	1	26.0	4.0	Improbable	Fair	Private	Remove	Grading	For Review	Ram's horn closed basal wound.
bf	American Beech	*Fagus grandifolia*	Native	1	53.0	10.0	Possible	Fair	Boundary	Remove	Grading	For Review	Signs of potential beech bark disease; arching lean towards Kirby Road; history of branch failures in upper crown.
bg	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	2	72.0	6.0	Possible	Poor	Public	Remove	Grading	For Review	Asymmetrical crown due south; shelf fungus; extensive rot on lower stem; epicormic growth.
bh	American Beech	*Fagus grandifolia*	Native	1	34.0	7.0	Possible	Fair	Public	Remove	Grading	For Review	Early signs of beech bark disease; 2 stems split around breast height; many gypsy moth egg sacs; stems arch towards Kirby Road.
bi	American Beech	*Fagus grandifolia*	Native	1	20.0	4.0	Improbable	Fair	Boundary	Remove	Grading	For Review	Compartmentalized wounds; asymmetrical crown due south; slightly suppressed.
bj	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	38.0	8.0	Possible	Fair	Public	Remove	Grading	For Review	Base abuts neighbouring tree; loose bark on stem; dead leader.
bk	American Beech	*Fagus grandifolia*	Native	1	22.0	5.0	Possible	Fair	Public	Remove	Grading	For Review	Asymmetrical crown due south; suppressed; phototrophic growth; stem lean south.
bl	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	27.0	5.0	Improbable	Good	Boundary	Remove	Grading	For Review	Strong leader; 2 small dead branches.
bm	Red Maple	*Acer rubrum*	Native	1	65.0	8.5	Improbable	Good	Public	Remove	Grading	For Review	2 broken branches; 2 dead branches; dominant canopy tree; irregular crown.
bn	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	17.0	4.0	Improbable	Good	Public	Remove	Grading	For Review	Good structure; gypsy moth egg sac.
bo	Red Maple	*Acer rubrum*	Native	2	51.0	3.5	Possible	Poor	Public	Remove	Grading	For Review	Included bark; secondary stem dead; asymmetrical crown due south; dieback.
bp	Red Maple	*Acer rubrum*	Native	2	140.0	9.0	Possible	Poor	Private	Remove	Grading	For Review	Codominant stems, each with history of significant failure; loose bark; 20% live crown lost; fruiting bodies on 1 stem. Potential bat roosting habitat.
bq	White Elm	*Ulmus americana*	Native	1	18.0	2.5	Improbable	Fair	Public	Remove	Grading	For Review	Asymmetrical crown due south; vines; included bark.
br	Crack Willow	*Salix fragilis*	Non-Native	1	21.0	4.0	Improbable	Fair	Public	Remove	Grading	For Review	Broken top; water sprouts; sapsucker holes.
bs	Willow species	*Salix sp.*	Native	1	20.0	2.5	Improbable	Fair	Public	Remove	Grading	For Review	Asymmetrical crown due south; epicormic growth.
bt	Crack Willow	*Salix fragilis*	Non-Native	1	15.0	3.0	Possible	Fair	Public	Remove	Grading	For Review	Secondary stem dead; epicormic growth.
bu	Willow species	*Salix sp.*	Native	3	85.0	6.0	Improbable	Good	Public	Remove	Grading	For Review	Asymmetrical crown due south; included bark; small broken branches.
bv	Crack Willow	*Salix fragilis*	Non-Native	1	20.0	6.0	Possible	Fair	Private	Remove	Grading	For Review	Upper stem severely bent; water sprouts; leader superseded.
bw	Red Oak	*Quercus rubra*	Native	1	42.2	5.5	Improbable	Good	Public	Remove	Grading	For Review	Upright form; fencewire through stem; history of 1 branch failure.
bx	Large-tooth Aspen	*Populus grandidentata*	Native	1	17.0	3.0	Improbable	Good	Private	Remove	Grading	For Review	Strong taper; good form.
by	Red Maple	*Acer rubrum*	Native	2	61.0	4.0	Possible	Very Poor	Public	Remove	Grading	For Review	Broken top; branch rub; compartmentalized wounds; cavities; loose bark; asymmetrical crown due south; rot. Potential bat roosting habitat.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
bz	Large-tooth Aspen	*Populus grandidentata*	Native	1	13.0	2.5	Improbable	Good	Public	Retain			Slightly asymmetrical crown.
ca	Large-tooth Aspen	*Populus grandidentata*	Native	1	15.0	2.5	Improbable	Good	Public	Retain			Light pruning; vines.
cb	Black Cherry	*Prunus serotina*	Native	1	32.0	5.0	Improbable	Fair	Private	Retain			Former secondary stem dead; 2 dead branches.
cc	Large-tooth Aspen	*Populus grandidentata*	Native	1	19.0	2.5	Improbable	Good	Public	Remove	Construction	For Review	Light pruning; vines.
cd	Large-tooth Aspen	*Populus grandidentata*	Native	1	13.8	3.0	Possible	Fair	Public	Remove	Construction	For Review	Crooked stem, once lost leader.
ce	Large-tooth Aspen	*Populus grandidentata*	Native	1	12.0	2.0	Improbable	Good	Public	Remove	Construction	For Review	Asymmetrical crown due south; light pruning; vines.
cf	Red Oak	*Quercus rubra*	Native	1	43.0	8.0	Improbable	Good	Private	Retain			4 small dead branches; asymmetrical crown due to neighbouring tree; 1 tight union.
cg	Red Oak	*Quercus rubra*	Native	1	51.0	7.0	Improbable	Good	Private	Retain			Good structure; 1 broken branch.
ch	Red Oak	*Quercus rubra*	Native	1	58.0	3.5	Improbable	Fair	Private	Retain			Asymmetrical crown due south; branch rub; sign affixed to stem; compartmentalized wounds; small dead branches.
ci	Red Oak	*Quercus rubra*	Native	2	91.0	8.0	Improbable	Good	Public	Remove	Construction	For Review	Codominant stems with included bark; crossing branches; 1 dead branch; fencewire through stem.
cj	Willow species	*Salix sp.*	Native	2	42.6	3.5	Improbable	Fair	Public	Remove	Grading	For Review	Asymmetrical crown due south; stem lean south; vines; water sprouts from broken top.
ck	Large-tooth Aspen	*Populus grandidentata*	Native	1	12.0	3.0	Improbable	Fair	Public	Remove	Grading	For Review	Crown asymmetrical and suppressed.
cl	Willow species	*Salix sp.*	Native	1	17.1	2.5	Improbable	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due south; stem lean south; vines; water sprouts.
cm	Large-tooth Aspen	*Populus grandidentata*	Native	1	17.0	3.0	Improbable	Good	Public	Remove	Grading	For Review	Asymmetrical crown due south; light pruning; stem lean.
cn	Red Maple	*Acer rubrum*	Native	2	98.0	5.0	Improbable	Fair	Private	Retain			Asymmetrical crown due south; epicormic growth; branch rub; included bark.
co	Large-tooth Aspen	*Populus grandidentata*	Native	1	13.1	3.0	Improbable	Good	Public	Remove	Construction	For Review	Closed stem wound; slightly asymmetrical crown.
cp	Willow species	*Salix sp.*	Native	1	62.0	3.0	Improbable	Fair	Boundary	Retain			Asymmetrical crown due south; broken branch; water sprouts; cavities.
cq	Large-tooth Aspen	*Populus grandidentata*	Native	1	11.0	2.5	Improbable	Good	Public	Remove	Construction	For Review	2 dead branches, otherwise healthy.
cr	Large-tooth Aspen	*Populus grandidentata*	Native	1	14.0	2.5	Improbable	Good	Public	Remove	Grading	For Review	Growing through wire fence; vine in crown.
cs	Large-tooth Aspen	*Populus grandidentata*	Native	1	12.1	3.0	Improbable	Good	Public	Remove	Construction	For Review	Asymmetrical crown.
ct	Red Oak	*Quercus rubra*	Native	1	69.0	7.0	Possible	Fair	Public	Remove	Grading	For Review	Dead branches; asymmetrical crown due south; epicormic growth; sign affixed to stem; stem compartmentalized around fence.
cu	Large-tooth Aspen	*Populus grandidentata*	Native	1	10.5	2.0	Improbable	Good	Public	Remove	Construction	For Review	1 small dead branch; strong taper.
cv	Large-tooth Aspen	*Populus grandidentata*	Native	1	11.9	2.5	Possible	Fair	Public	Remove	Construction	For Review	Growing through wire fence; arching lean towards road; vine in crown.
cw	Large-tooth Aspen	*Populus grandidentata*	Native	1	10.7	1.0	Improbable	Good	Public	Remove	Grading	For Review	Light pruning; stem abuts wire fence.
cx	Large-tooth Aspen	*Populus grandidentata*	Native	1	15.0	2.5	Improbable	Good	Public	Remove	Grading	For Review	Asymmetrical crown due south; stem lean south; light pruning.
cy	Large-tooth Aspen	*Populus grandidentata*	Native	1	16.5	3.0	Improbable	Excellent	Public	Remove	Grading	For Review	Good form; strong taper.
cz	Large-tooth Aspen	*Populus grandidentata*	Native	1	13.0	3.5	Improbable	Fair	Public	Remove	Grading	For Review	Sparse crown.
da	Large-tooth Aspen	*Populus grandidentata*	Native	1	12.4	2.5	Improbable	Fair	Public	Remove	Grading	For Review	Asymmetrical crown due south; stem lean south; light pruning; phototrophic growth; vines.
db	Large-tooth Aspen	*Populus grandidentata*	Native	1	12.0	3.0	Improbable	Fair	Public	Remove	Grading	For Review	Swollen tissues where stem grew around wire fence; suppressed by large white pine.
dc	Eastern White Pine	*Pinus strobus*	Native	1	105.0	8.0	Possible	Fair	Public	Remove	Construction	For Review	Open wound in stem, sapwood decay; dead lower branches; 2 broken branches.
dd	Trembling Aspen	*Populus tremuloides*	Native	1	12.4	2.5	Improbable	Good	Public	Remove	Construction	For Review	Slightly asymmetrical crown ; light pruning.
de	Large-tooth Aspen	*Populus grandidentata*	Native	1	22.0	4.0	Improbable	Good	Public	Remove	Construction	For Review	Asymmetrical crown due south; light pruning.
df	Large-tooth Aspen	*Populus grandidentata*	Native	3	42.0	4.5	Improbable	Good	Boundary	Remove	Construction	For Review	Codominant stems.
dg	Large-tooth Aspen	*Populus grandidentata*	Native	1	11.0	3.0	Possible	Fair	Private	Remove	Grading	No	Crooked stem, once lost leader.
dh	Red Oak	*Quercus rubra*	Native	1	26.0	5.0	Improbable	Excellent	Private	Remove	Grading	1:1	Good structure, good root flare; gypsy moth egg sac.
di	Trembling Aspen	*Populus tremuloides*	Native	1	22.0	4.0	Improbable	Fair	Private	Remove	Grading	1:1	2 dead branches; crooked stem.
dj	Black Cherry	*Prunus serotina*	Native	1	50.0	6.0	Possible	Poor	Public	Remove	Construction	No	Vines; dieback; improper branch pruning; water sprouts; compartmentalized wounds; basal wound compartmentalized, some rot.
dk	Red Oak	*Quercus rubra*	Native	1	71.0	5.0	Possible	Good	Public	Remove	Construction	For Review	Stem compartmentalized around fence and sign fixtures; small dead branches; branch rub.
dl	Large-tooth Aspen	*Populus grandidentata*	Native	1	22.0	3.5	Improbable	Good	Private	Retain			Closed basal wound; couple dead branches.
dm	Red Oak	*Quercus rubra*	Native	1	27.0	5.5	Improbable	Good	Public	Remove	Construction	For Review	Codominant leaders; included bark; branch rub; stem compartmentalized around fence.
dn	Red Oak	*Quercus rubra*	Native	2	61.0	4.0	Possible	Fair	Public	Remove	Construction	For Review	Included bark; branch rub; basal rot; compartmentalized wounds; small dead branches.
do	Red Oak	*Quercus rubra*	Native	1	95.0	9.0	Improbable	Good	Private	Remove	Construction	4:1	Strong central leader, good structure; fencewire through stem; 1 dead scaffold branch, 3 dead smaller branches; some epicormic growth; many gypsy moth egg sacs.
dp	Black Cherry	*Prunus serotina*	Native	1	35.0	3.0	Improbable	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due south; phototrophic growth; compartmentalized wounds; branch rub; light pruning.
dq	Red Oak	*Quercus rubra*	Native	1	48.0	6.0	Possible	Fair	Private	Remove	Construction	3:1	Bark seam in lower stem/root flare; good branch stub closure; 6 dead branches; epicormic growth; unbalanced crown.
dr	Red Oak	*Quercus rubra*	Native	1	48.0	5.5	Possible	Fair	Public	Remove	Construction	For Review	Epicormic growth; good branch stub closure; compartmentalized wounds; branch rub; stem compartmentalized around fence; small dead branches.

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ds	Red Oak	*Quercus rubra*	Native	1	35.0	4.0	Improbable	Fair	Public	Remove	Construction	For Review	Stem compartmentalized around fence; improper branch pruning; water sprouts; small dead branches.
dt	Red Oak	*Quercus rubra*	Native	1	43.0	5.0	Possible	Fair	Boundary	Remove	Construction	3:1	4 dead branches (1 scaffold); couple poor branch attachments; shedding outer bark in a few places.
du	Red Oak	*Quercus rubra*	Native	1	48.0	6.5	Possible	Fair	Private	Remove	Construction	3:1	Strange woundwood on lower stem; 8 dead branches; 2 broken branches; basal shoots; fencewire through stem; good structure.
dv	Black Cherry	*Prunus serotina*	Native	3	105.0	3.5	Possible	Poor	Public	Remove	Construction	No	Compartmentalized wounds; basal rot; cavities; loose bark; history of branch failure; phototrophic growth; epicormic growth. Potential bat roosting habitat.
dw	Red Oak	*Quercus rubra*	Native	1	38.0	3.5	Possible	Fair	Public	Remove	Construction	For Review	Epicormic growth; hangers; branch rub; small dead branches.
dx	Red Oak	*Quercus rubra*	Native	1	27.0	6.5	Possible	Fair	Public	Remove	Construction	For Review	Asymmetrical crown due south; dead branches; slightly suppressed.
dy	Red Oak	*Quercus rubra*	Native	1	62.0	9.0	Possible	Fair	Boundary	Remove	Construction	4:1	Some basal rot visible; 3 dead branches; 2 broken scaffold branches; crown asymmetrical towards Kirby Road.
dz	Red Oak	*Quercus rubra*	Native	1	65.0	4.5	Possible	Good	Boundary	Remove	Construction	4:1	Small dead branches; hangers; good branch closure; large dead structural branch.
ea	Red Oak	*Quercus rubra*	Native	1	90.0	8.0	Improbable	Fair	Boundary	Remove	Construction	4:1	Pronounced root flare supporting large stem; 1 dead and broken scaffold branch; retaining leaves; many gypsy moth egg sacs.
eb	Large-tooth Aspen	*Populus grandidentata*	Native	1	16.0	3.5	Improbable	Good	Public	Remove	Construction	No	Asymmetrical crown due south.
ec	Red Oak	*Quercus rubra*	Native	1	19.0	4.5	Improbable	Fair	Boundary	Remove	Construction	No	Vines; slightly suppressed; branch rub.
ed	Large-tooth Aspen	*Populus grandidentata*	Native	1	14.0	3.0	Improbable	Fair	Private	Remove	Grading	No	Bark seam at base; 1 dead branch.
ee	Red Oak	*Quercus rubra*	Native	1	33.0	6.0	Improbable	Good	Private	Retain			Good root flare; good structure but codominant leaders in top; 1 dead branch.
ef	Red Oak	*Quercus rubra*	Native	3	70.0	6.0	Possible	Poor	Boundary	Remove	Construction	No	Small stem dead; 2 smaller stems with broken tops; rot; branch rub; epicormic growth; dead branches; hangers.
eg	Red Oak	*Quercus rubra*	Native	1	62.0	7.5	Possible	Fair	Private	Retain			Basal decay visible; 5 dead branches; good branch stub closure.
eh	American Basswood	*Tilia americana*	Native	2	54.0	4.6	Possible	Poor	Private	Remove	Grading	No	Branch rub; canker; suppressed; small dead branches; phototrophic growth; some rot; stem lean east; small stem leaning down, broken top.
ei	Red Oak	*Quercus rubra*	Native	1	110.0	8.5	Possible	Fair	Private	Retain			Codominant leaders, possible included bark; fencewire through stem; round crown; 4 dead branches.
ej	White Ash	*Fraxinus americana*	Native	1	14.0	5.0	Improbable	Fair	Private	Remove	Grading	No	Asymmetrical crown due south; vines; phototrophic growth; slightly suppressed.
ek	Red Oak	*Quercus rubra*	Native	1	70.0	7.5	Possible	Good	Private	Retain			Good branch closure; woundwood; dead branches; hangers.
el	Red Oak	*Quercus rubra*	Native	1	52.0	5.5	Possible	Good	Boundary	Remove	Construction	4:1	Codominant leaders; small dead branches; branch rub.
em	Red Oak	*Quercus rubra*	Native	1	66.0	8.5	Possible	Good	Private	Remove	Construction	4:1	Good branch closure; large dead branches, rot; branch rub; woundwood; stem compartmentalized around fence.
en	Black Cherry	*Prunus serotina*	Native	2	85.0	7.0	Possible	Poor	Private	Remove	Construction	No	Codominant stems with included bark; basal rot visible; history of branch failure; a few poor branch attachments; 3 dead branches; gypsy moth egg sacs.
eo	Red Oak	*Quercus rubra*	Native	1	28.0	5.0	Improbable	Good	Private	Retain			Wound in lower stem partially closed, woundwood; strong central leader; healthy crown.
ep	Red Oak	*Quercus rubra*	Native	1	78.0	7.0	Improbable	Fair	Private	Remove	Construction	4:1	History of branch failure; codominant leaders; included bark; branch rub; large compartmentalized wound on lower stem where leader failed, some rot.
eq	Red Oak	*Quercus rubra*	Native	1	19.0	5.5	Possible	Fair	Private	Retain			Long frost crack up stem; codominant leaders, 1 broken; remaining leader leaning southeast; poor structure.
er	White Ash	*Fraxinus americana*	Native	1	19.0	2.5	Possible	Poor	Private	Remove	Condition	No	Dieback; epicormic growth; EAB; woodpecker damage.
es	Eastern White Pine	*Pinus strobus*	Native	1	64.0	7.5	Improbable	Good	Private	Remove	Construction	4:1	2 dead branches; few past failures.
et	White Ash	*Fraxinus americana*	Native	1	32.0	0.5	Probable	Dead	Private	Remove	Condition	No	Basal rot; cavities; woodpecker damage; resting on adjacent tree. Potential bat roosting habitat.
eu	Red Oak	*Quercus rubra*	Native	2	21.0	3.0	Improbable	Good	Boundary	Remove	Construction	1:1	Codominant stems; suppressed crown with vines.
ev	White Ash	*Fraxinus americana*	Native	1	12.0	2.5	Possible	Fair	Public	Remove	Construction	No	Asymmetrical crown due south; phototrophic growth; canker; vines.
ew	Large-tooth Aspen	*Populus grandidentata*	Native	1	18.0	4.0	Possible	Fair	Private	Remove	Grading	No	Once lost leader, still hung up; lateral became leader.
ex	Large-tooth Aspen	*Populus grandidentata*	Native	1	18.5	3.0	Improbable	Good	Public	Remove	Construction	No	Asymmetrical crown due south; branch rub; phototrophic growth.
ey	Large-tooth Aspen	*Populus grandidentata*	Native	1	17.0	4.0	Improbable	Good	Private	Remove	Construction	No	Good structure.
ez	Large-tooth Aspen	*Populus grandidentata*	Native	1	19.0	4.0	Improbable	Fair	Boundary	Remove	Construction	No	Basal shoot; asymmetrical crown due to neighbouring tree; gypsy moth egg sacs.
fa	Large-tooth Aspen	*Populus grandidentata*	Native	1	28.0	5.0	Possible	Fair	Private	Retain			Centre rot visible through basal wound; crooked upper stem; sign affixed.
fb	Large-tooth Aspen	*Populus grandidentata*	Native	3	14.0	2.5	Improbable	Good	Public	Remove	Construction	No	2 stems under 10 DBH; asymmetrical crown due south; phototrophic growth.
fc	Large-tooth Aspen	*Populus grandidentata*	Native	1	15.0	3.0	Improbable	Good	Public	Remove	Construction	No	Strong central leader.
fd	Large-tooth Aspen	*Populus grandidentata*	Native	1	11.7	2.0	Improbable	Poor	Public	Remove	Construction	No	Canker; rot; poorly compartmentalized around canker; asymmetrical crown due south.
fe	Eastern White Pine	*Pinus strobus*	Native	1	115.0	7.5	Improbable	Fair	Private	Remove	Construction	4:1	Many old pruning cuts, some of large-diameter branches; weak leader, 2 huge laterals arch upward from 2-3m height; fairly healthy crown.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
ff	Large-tooth Aspen	*Populus grandidentata*	Native	1	11.9	2.0	Improbable	Fair	Public	Remove	Grading	For Review	Asymmetrical crown due south; stem abuts wire fence; vines; phototrophic growth.
fg	Large-tooth Aspen	*Populus grandidentata*	Native	1	18.0	4.0	Improbable	Good	Private	Remove	Grading	For Review	Crooked stem, phototrophic growth; vigorous lateral; gypsy moth egg sac.
fh	Large-tooth Aspen	*Populus grandidentata*	Native	1	16.0	2.0	Improbable	Good	Public	Remove	Grading	For Review	Asymmetrical crown due south; vines; phototrophic growth.
fi	Large-tooth Aspen	*Populus grandidentata*	Native	1	14.0	3.0	Improbable	Good	Private	Remove	Grading	For Review	Codominant leaders; vine in lower crown.
fj	Large-tooth Aspen	*Populus grandidentata*	Native	1	11.7	3.0	Improbable	Good	Public	Remove	Grading	For Review	Asymmetrical crown due south; branch rub; phototrophic growth.
fk	Black Cherry	*Prunus serotina*	Native	2	55.0	6.0	Possible	Poor	Private	Remove	Condition	For Review	Codominant stems with included bark; basal rot visible; crown dieback; fencewire through stem; gypsy moth egg sacs.
fl	Red Oak	*Quercus rubra*	Native	1	21.0	4.5	Improbable	Fair	Private	Retain			3 small dead branches; codominant leaders in top.
fm	White Birch	*Betula papyrifera*	Native	1	14.0	3.5	Improbable	Good	Private	Retain			High crown; crooked stem.
fn	Black Cherry	*Prunus serotina*	Native	1	60.0	11.0	Probable	Very Poor	Private	Remove	Condition	For Review	Asymmetrical crown due southwest; cavities; rot; peeled bark; large dead branches; basal rot; major crown dieback; woodpecker damage. Potential bat roosting habitat.
fo	Red Oak	*Quercus rubra*	Native	1	25.8	4.0	Improbable	Good	Private	Retain			Good structure though asymmetrical due to neighbouring tree; many gypsy moth egg sacs.
fp	Red Oak	*Quercus rubra*	Native	1	18.5	4.0	Improbable	Good	Private	Retain			Tight union with primary scaffold branch; small dead branches; gypsy moth egg sacs.
fq	Red Oak	*Quercus rubra*	Native	1	19.8	5.0	Improbable	Fair	Private	Retain			Vines; asymmetrical crown due south; slightly suppressed.
fr	Red Oak	*Quercus rubra*	Native	1	17.0	4.5	Improbable	Good	Private	Retain			Good structure but somewhat sparsely branched; gypsy moth egg sac.
fs	Red Oak	*Quercus rubra*	Native	1	13.5	4.0	Improbable	Fair	Private	Retain			Growing through wire fence; healthy crown, asymmetrical due to neighbouring tree.
ft	Red Oak	*Quercus rubra*	Native	2	28.1	4.5	Improbable	Fair	Private	Retain			Asymmetrical crown due south; included bark; branch rub.
fu	Red Oak	*Quercus rubra*	Native	1	10.3	1.5	Improbable	Fair	Boundary	Retain			Asymmetrical crown due south; slightly suppressed.
fv	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	20.0	4.5	Improbable	Excellent	Private	Retain			Good structure, strong central leader; slightly asymmetrical.
fw	Black Cherry	*Prunus serotina*	Native	1	38.0	4.0	Possible	Fair	Private	Retain			Asymmetrical crown due south; light pruning; history of branch failure; stem lean south.
fx	White Birch	*Betula papyrifera*	Native	1	29.0	6.0	Probable	Very Poor	Private	Retain			Former second stem died and failed; remaining stem leans southeast; 80% live crown lost through failures; dieback.
fy	Red Oak	*Quercus rubra*	Native	1	21.0	4.0	Improbable	Fair	Private	Retain			Asymmetrical crown due south; some dieback.
fz	Red Oak	*Quercus rubra*	Native	1	33.7	6.0	Improbable	Fair	Private	Remove	Grading	For Review	Few small dead branches; epicormic growth; fencewire through stem.
ga	White Birch	*Betula papyrifera*	Native	1	37.0	8.5	Possible	Poor	Private	Retain			Asymmetrical crown due southeast; codominant leaders; one leader with broken top; included bark; stem lean southeast.
gb	Black Cherry	*Prunus serotina*	Native	1	35.0	4.5	Possible	Poor	Private	Retain			Swollen root flare; leaning southwest towards Kirby Road; high crown, dead leader; dieback.
gc	White Birch	*Betula papyrifera*	Native	1	30.0	0.5	Probable	Dead	Private	Remove	Grading	For Review	Basal rot; stem lean south; no crown.
gd	White Ash	*Fraxinus americana*	Native	1	18.2	3.0	Improbable	Fair	Private	Remove	Grading	For Review	Asymmetrical crown due south; codominant leaders; included bark; woodpecker damage; vines.
ge	Black Cherry	*Prunus serotina*	Native	2	49.0	5.0	Probable	Dead	Private	Remove	Grading	For Review	Codominant stems; dead crown; patchy bark.
gf	Black Cherry	*Prunus serotina*	Native	1	23.0	3.5	Possible	Poor	Private	Retain			Dieback; epicormic growth; history of branch failure; dead branches.
gg	Red Oak	*Quercus rubra*	Native	1	37.1	5.5	Improbable	Good	Private	Retain			Couple tight unions; 1 dead branch.
gh	Black Cherry	*Prunus serotina*	Native	1	23.0	5.5	Possible	Very Poor	Private	Retain			Basal rot, fruiting bodies; open stem wound; 50% live crown lost.
gi	Bitternut Hickory	*Carya cordiformis*	Native	1	17.0	3.5	Improbable	Fair	Private	Retain			Asymmetrical crown due south; branch rub; slightly suppressed.
gj	Black Cherry	*Prunus serotina*	Native	1	18.0	0.5	Probable	Dead	Private	Remove	Grading	For Review	Basal rot; upslope of ROW.
gk	Pussy Willow	*Salix discolor*	Native	1	12.0	3.0	Improbable	Fair	Private	Retain			Branch rub; included bark.
gl	Red Oak	*Quercus rubra*	Native	1	14.0	3.5	Improbable	Fair	Private	Retain			Good structure; some epicormic growth; strong taper.
gm	Cypress species	*Cupressaceae sp.*	Non-Native	1	12.0	1.0	Improbable	Good	Private	Retain			Good form; healthy crown.
gn	English Oak	*Quercus robur*	Non-Native	1	12.0	1.0	Improbable	Good	Private	Retain			Fastigiate; slightly asymmetrical; retaining leaves.
go	English Oak	*Quercus robur*	Non-Native	1	10.0	0.5	Improbable	Good	Private	Retain			No visible defects.
gp	Norway Maple	*Acer platanoides*	Non-Native	1	14.0	2.0	Improbable	Good	Private	Retain			Well-spaced branches.
gq	Bitternut Hickory	*Carya cordiformis*	Native	2	51.5	2.5	Possible	Fair	Private	Retain			Vines; suppressed; some dieback; included bark.
gr	Freeman's Maple	*Acer X freemanii*	Native	2	33.2	3.0	Improbable	Fair	Private	Retain			Codominant stems with included bark; guywire through stem; vine in narrow crown.
gs	Green Ash	*Fraxinus pennsylvanica*	Native	1	15.1	2.5	Possible	Poor	Private	Retain			Sharp arching lean away from Kirby Road; loose bark; insect galleries; water sprouts.
gt	Green Ash	*Fraxinus pennsylvanica*	Native	1	12.3	3.0	Possible	Poor	Private	Retain			Leaning towards Kirby Road; EAB exit holes; insect galleries; epicormic growth; topped.
gu	Green Ash	*Fraxinus pennsylvanica*	Native	1	13.9	2.0	Possible	Poor	Private	Retain			Once lost leader, crooked stem; epicormic growth; bark cracks.
gv	Green Ash	*Fraxinus pennsylvanica*	Native	1	11.1	0.5	Possible	Poor	Private	Retain			EAB exit holes; insectivore action; topped for power lines; epicormic growth.
gw	White Birch	*Betula papyrifera*	Native	3	10.6	3.0	Improbable	Fair	Private	Retain			Codominant stems; past pruning.
gx	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	13.2	2.5	Improbable	Fair	Private	Retain			Reaction wood at base and in stem where guywire is girdling.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
gy	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	16.8	3.5	Improbable	Fair	Private	Retain			Woundwood around guywire site; 1 tight union; decent form; small dead branches.
gz	Green Ash	*Fraxinus pennsylvanica*	Native	1	11.2	2.5	Probable	Very Poor	Private	Retain			EAB; loose bark; insect galleries; epicormic growth; topped.
ha	Green Ash	*Fraxinus pennsylvanica*	Native	1	15.6	2.0	Probable	Very Poor	Private	Retain			EAB exit holes; epicormic growth; dieback; insect galleries; basal shoots.
hb	Red Oak	*Quercus rubra*	Native	1	25.2	3.5	Improbable	Good	Private	Retain			Good structure; retaining leaves; very minor epicormic growth.
hc	White Spruce	*Picea glauca*	Native	1	18.0	2.5	Improbable	Good	Private	Retain			Good form; good fruit set; vine in crown.
hd	Norway Spruce	*Picea abies*	Non-Native	1	20.0	2.5	Improbable	Good	Private	Retain			Light pruning.
he	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-Native	1	17.0	3.0	Improbable	Good	Private	Retain			Crown appears healthy; vine in crown.
hf	Red Oak	*Quercus rubra*	Native	1	25.0	4.0	Improbable	Good	Private	Retain			Included bark; branch rub; small dead branches.
hg	Mountain-Ash species	*Sorbus sp.*	Native	1	15.0	2.0	Improbable	Good	Private	Retain			Included bark; branch rub; small dead branches.
hh	Norway Spruce	*Picea abies*	Non-Native	1	20.0	4.0	Improbable	Good	Private	Retain			Light pruning; branch rub; vines.
hi	Norway Spruce	*Picea abies*	Non-Native	1	21.0	3.5	Improbable	Fair	Private	Retain			Crown thinning with vine throughout.
hj	Colorado Spruce	*Picea pungens*	Non-Native	1	21.0	3.0	Improbable	Good	Private	Retain			Interior thinning.
hk	White Mulberry	*Morus alba*	Non-Native	1	20.0	4.5	Improbable	Fair	Private	Retain			Branch rub; improper branch pruning; epicormic growth; abuts fence.
hl	Siberian Elm	*Ulmus pumila*	Non-Native	1	14.0	3.0	Possible	Fair	Private	Retain			Stem lean north; branch rub.
hm	Colorado Spruce	*Picea pungens*	Non-Native	1	18.0	2.5	Improbable	Good	Private	Retain			Light pruning.
hn	Colorado Spruce	*Picea pungens*	Non-Native	1	19.0	3.5	Improbable	Fair	Private	Retain			Interior thinning; weak leader.
ho	Colorado Spruce	*Picea pungens*	Non-Native	1	22.0	3.5	Improbable	Fair	Private	Retain			Interior thinning; irregular crown.
hp	Colorado Spruce	*Picea pungens*	Non-Native	1	24.0	4.0	Improbable	Fair	Private	Retain			Light pruning; branch rub; slightly suppressed.
hq	White Birch	*Betula papyrifera*	Native	2	10.0	3.5	Improbable	Fair	Private	Retain			Small dead branches; one leader with broken top.
hr	Russian Olive	*Elaeagnus angustifolia*	Non-Native	1	20.0	3.0	Improbable	Fair	Private	Retain			Asymmetrical crown due north; branch rub; stem abuts fence.
hs	Russian Olive	*Elaeagnus angustifolia*	Non-Native	3	11.0	4.0	Improbable	Good	Private	Retain			Shrubby growth in backyard.
ht	Freeman's Maple	*Acer X freemanii*	Native	1	30.0	6.0	Improbable	Fair	Private	Retain			Branch rub; history of branch pruning; included bark.
hu	Norway Maple	*Acer platanoides*	Non-Native	1	19.0	3.5	Improbable	Good	Private	Retain			Healthy crown slightly asymmetrical due to neighbouring tree; codominant leaders.
hv	Siberian Elm	*Ulmus pumila*	Non-Native	1	19.0	4.0	Improbable	Fair	Private	Retain			Included bark; branch rub; branch resting on fence; broken leader.
hw	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-Native	1	25.0	4.5	Improbable	Good	Private	Retain			2 small dead branches; heading cuts on some branches; codominant leaders.
hx	Red Pine	*Pinus resinosa*	Native	1	16.0	3.0	Improbable	Fair	Private	Retain			Branch rub; included bark; light pruning.
hy	White Spruce	*Picea glauca*	Native	1	28.5	2.5	Improbable	Good	Private	Retain			Healthy crown asymmetrical to southwest due to neighbouring tree; interior thinning.
hz	Norway Spruce	*Picea abies*	Non-Native	1	15.0	2.0	Improbable	Good	Private	Retain			Interior needles browning.
ia	White Spruce	*Picea glauca*	Native	1	15.0	2.0	Improbable	Good	Private	Retain			Good form.
ib	Norway Spruce	*Picea abies*	Non-Native	1	15.0	2.0	Improbable	Good	Private	Retain			Irregular crown, phototrophic growth.
ic	White Spruce	*Picea glauca*	Native	1	20.0	2.5	Improbable	Good	Private	Retain			Light pruning; lower branch pruning; slightly suppressed.
id	White Spruce	*Picea glauca*	Native	1	22.0	3.0	Improbable	Good	Private	Retain			Good form; heavy fruit set; minor browning of interior needles.
ie	White Spruce	*Picea glauca*	Native	2	20.0	2.5	Improbable	Good	Private	Retain			Light pruning; lower branch pruning; codominant leaders.
if	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	25.0	3.0	Improbable	Good	Private	Retain			No visible defects.
ig	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	1	22.0	3.0	Improbable	Good	Private	Retain			Branch rub.
ih	Eastern Red Cedar	*Juniperus virginiana*	Native	1	10.0	1.0	Improbable	Good	Private	Retain			No visible defects.
ii	Eastern Red Cedar	*Juniperus virginiana*	Native	1	10.0	1.0	Improbable	Good	Private	Retain			No visible defects.
ij	Colorado Spruce	*Picea pungens*	Non-Native	1	25.0	2.5	Improbable	Good	Private	Retain			Light pruning.
ik	Colorado Spruce	*Picea pungens*	Non-Native	1	22.0	2.5	Improbable	Fair	Private	Retain			Light pruning; slightly suppressed.
il	Colorado Spruce	*Picea pungens*	Non-Native	1	24.0	2.5	Improbable	Good	Private	Retain			Light pruning.
im	Colorado Spruce	*Picea pungens*	Non-Native	1	25.0	2.5	Improbable	Good	Private	Retain			Light pruning.
in	Colorado Spruce	*Picea pungens*	Non-Native	1	25.0	2.5	Improbable	Good	Private	Retain			Light pruning; codominant leaders; branch rub.
io	Colorado Spruce	*Picea pungens*	Non-Native	1	27.0	2.5	Improbable	Good	Private	Retain			Light pruning.
ip	Colorado Spruce	*Picea pungens*	Non-Native	1	14.0	2.0	Improbable	Good	Private	Retain			No visible defects.
iq	Eastern Red Cedar	*Juniperus virginiana*	Native	1	10.0	0.5	Improbable	Good	Private	Retain			No visible defects.
ir	Colorado Spruce	*Picea pungens*	Non-Native	1	27.0	2.0	Improbable	Good	Private	Retain			No visible defects.
is	White Birch	*Betula papyrifera*	Native	4	33.0	3.0	Improbable	Good	Private	Retain			Branch rub.
it	White Birch	*Betula papyrifera*	Native	1	10.0	3.0	Improbable	Good	Private	Retain			Stem lean south.
iu	Colorado Spruce	*Picea pungens*	Non-Native	1	21.0	2.5	Improbable	Good	Private	Retain			No visible defects.
iv	Colorado Spruce	*Picea pungens*	Non-Native	1	18.0	2.5	Improbable	Good	Private	Retain			No visible defects.
iw	Colorado Spruce	*Picea pungens*	Non-Native	1	24.0	2.5	Improbable	Good	Private	Retain			No visible defects.
ix	Colorado Spruce	*Picea pungens*	Non-Native	1	22.0	2.5	Improbable	Good	Private	Retain			No visible defects.
iy	Eastern Hemlock	*Tsuga canadensis*	Native	2	10.0	1.0	Improbable	Good	Private	Retain			No visible defects.
iz	Eastern Red Cedar	*Juniperus virginiana*	Native	1	10.0	1.0	Improbable	Good	Private	Retain			No visible defects.
ja	Eastern Red Cedar	*Juniperus virginiana*	Native	1	10.0	0.5	Improbable	Good	Private	Retain			No visible defects.

Tree Number	Common Name	Scientific Name	Native / Non-native	Stem Count	DBH (cm)	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Rationale for Removal	Compensation Required	Comments
jb	Eastern Red Cedar	*Juniperus virginiana*	Native	1	10.0	0.5	Improbable	Good	Private	Retain			No visible defects.
jc	Colorado Spruce	*Picea pungens*	Non-Native	1	19.0	2.0	Improbable	Good	Private	Retain			No visible defects.
jd	Alaska Yellow Cedar	*Cupressus nootkatensis*	Non-Native	1	10.0	0.5	Improbable	Good	Private	Retain			No visible defects.
je	Alaska Yellow Cedar	*Cupressus nootkatensis*	Non-Native	1	10.0	1.5	Improbable	Good	Private	Retain			No visible defects.
jf	Alaska Yellow Cedar	*Cupressus nootkatensis*	Non-Native	1	12.0	1.5	Improbable	Fair	Private	Retain			Codominant leaders; branch rub; fungus.
jg	Alaska Yellow Cedar	*Cupressus nootkatensis*	Non-Native	1	10.0	1.5	Improbable	Good	Private	Retain			No visible defects.
jh	Black Locust	*Robinia pseudoacacia*	Non-Native	1	15.0	2.0	Improbable	Fair	Private	Retain			Branch rub; included bark; small hanger.
ji	Willow species	*Salix sp.*	Native	3	55.0	4.0	Improbable	Fair	Private	Retain			Asymmetrical crown due south; stem lean south.
jj	Norway Maple	*Acer platanoides*	Non-Native	1	20.0	3.5	Improbable	Fair	Private	Retain			Included bark; slightly suppressed; codominant leaders.
jk	Freeman's Maple	*Acer X freemanii*	Native	1	28.0	2.5	Improbable	Good	Private	Retain			Included bark; codominant leaders.
jl	White Spruce	*Picea glauca*	Native	1	25.0	2.5	Improbable	Good	Private	Retain			No visible defects.
jm	White Spruce	*Picea glauca*	Native	1	20.0	2.0	Improbable	Good	Private	Retain			No visible defects.
jn	White Spruce	*Picea glauca*	Native	1	28.0	2.5	Improbable	Good	Private	Retain			No visible defects.
jo	White Spruce	*Picea glauca*	Native	1	26.0	2.5	Improbable	Good	Private	Retain			No visible defects.
jp	White Spruce	*Picea glauca*	Native	1	22.0	2.5	Improbable	Good	Private	Retain			No visible defects.
jq	White Spruce	*Picea glauca*	Native	1	25.0	3.0	Improbable	Good	Private	Retain			No visible defects.
jr	White Spruce	*Picea glauca*	Native	1	22.0	2.5	Improbable	Good	Private	Retain			No visible defects.
js	White Spruce	*Picea glauca*	Native	1	27.0	2.5	Improbable	Good	Private	Retain			Interior needle thinning.
jt	Colorado Spruce	*Picea pungens*	Non-Native	1	12.0	1.5	Improbable	Good	Private	Retain			Good form.
ju	Colorado Spruce	*Picea pungens*	Non-Native	1	14.0	1.5	Improbable	Good	Private	Retain			Good form.
jv	Common Apple	*Malus domestica*	Non-Native	2	33.5	3.0	Possible	Poor	Private	Remove	Grading	No	Codominant stems with basal decay; former third stem failed, opening space between stems; 10% dieback; vine in crown.
jw	Norway Maple	*Acer platanoides*	Non-Native	1	25.8	4.0	Possible	Fair	Private	Remove	Construction	1:1	Asymmetrical crown due south; branch rub; included bark; hanger; history of branch pruning; compartmentalized wounds; epicormic growth; multi leaders.
jx	White Ash	*Fraxinus americana*	Native	1	14.0	2.5	Probable	Dead	Boundary	Remove	Construction	No	EAB exit holes; shedding bark; broken top; near power lines.
jy	White Ash	*Fraxinus americana*	Native	3	14.0	2.5	Probable	Dead	Boundary	Remove	Construction	No	EAB exit holes; insect galleries; shedding bark; topped, near power lines.
jz	White Ash	*Fraxinus americana*	Native	1	13.0	2.0	Probable	Dead	Boundary	Remove	Construction	No	EAB exit holes; insect galleries; near power lines.

Appendix II

Tree Health and Potential for Structural Failure Assessment Criteria

Tree Health Assessment Criteria

Assessment Criteria	Definition[1]
Excellent	Represents a tree in near perfect form, health, and vigour. This tree would exhibit no deadwood, no decline, and no visible defects.
Good	Represents a tree ranging from a generally healthy tree to a near perfect tree in terms of health, vigour and structure. This tree exhibits a complete, balanced crown structure with little to no deadwood and minimal defects as well as a properly formed root flare.
Fair	Represents a tree with minor health, balance or structural issues with minimal to moderate deadwood. Branching structure shows signs of included bark or minor rot within the branch connections or trunk wood. The root flare shows minimal signs of mechanical injury, decay, poor callusing, or girdling roots. Trees in the category require minor remedial actions to improve the vigour and structure of the tree.
Poor	Represents a tree that exhibits a poor vigour, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown imbalance, or extensive rot in the branching and trunk wood. Fungus could be seen from these rotting areas, suggesting further decay. These trees have extensive crown die back with a large amount of deadwood, and possibly dead sections. These weakened areas can lead to a potential failure of tree sections. Rooting zones show signs of extensive root decay or damage (fruiting bodies or mechanical damage) or girdling roots. Trees in this category require more extensive actions to prevent failure. A tree identified as poor would be a candidate for removal in the near future.
Very Poor	Represents a tree that exhibits major health and structural defects. Quite often the defects or diseases affecting this tree will be fatal. Large quantities of fungus, large dead sections with possible cavities and bark falling off all are signs that a tree is in a major state of decline and would be identified as very poor. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal.
Dead	Represents a tree that exhibits no sign of new growth, including buds, foliage, or shoot growth. These trees have a probable or imminent potential for structural failure. These trees should be identified for removal.

[1] (Dunster 2009)

Potential for Structural Failure Assessment Criteria

Assessment Criteria*	Definition[1]
Improbable	The tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame.
Possible	Failure could occur, but it is unlikely during normal weather conditions within the specified time frame.
Probable	Failure may be expected under normal weather conditions within the specified time frame.
Imminent	Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. This is a rare occurrence for an assessor to encounter, and it may require immediate action to protect people from harm.
*A specified time frame of 2 years will be used when assessing potential for structural failure.	

[1] (Dunster et al. 2013)

Appendix III
Conditions of Tree Assessment

Conditions of Tree Assessment

Limitations

This tree inventory and assessment is based on the circumstances and observations by Natural Resource Solutions Inc. (NRSI) as they existed at the time of the site inspection(s) of the study area as described in this report (the “Property”) and the trees situated thereon, and upon information provided by the Client to NRSI. The opinions in this assessment are based on observations made and using professional judgment, however, because trees are living organisms and subject to change, damage and disease, the analysis and recommendations as set out in this assessment are valid for 2 years from the date any such observations and assessment took place. As a result, the Client shall not rely upon this assessment, save and except for representing the circumstances and observations at the date of site inspection(s), and the analysis and recommendations made in relation to the proposed undertaking. It is recommended that the inventoried trees discussed in this assessment should be re-assessed periodically, where required (i.e. after 2 years).

Further Services

Neither NRSI, nor any assessor employed or retained by NRSI (the "Assessor") for the purpose of preparing or assisting in the preparation of this assessment shall be required to provide any further consultation or services to the Client including, without limitation, acting as an expert witness or witness in any court in any jurisdiction unless the Client has first made specific arrangements with respect to such further services, including providing payment of the Assessor’s regular hourly billing fees.

NRSI accepts no responsibility for the implementation of all or any part of this report, unless specifically requested to examine the implementation of such activities recommended herein. Any request for the inspection or supervision of all or part of the implementation shall be made in writing and the details agreed to in writing by both parties.

Assumptions

The Client is hereby notified that where any of the information set out and referenced in this assessment are based on assumptions, facts or information provided to NRSI, NRSI

will in no way be responsible for the veracity or accuracy of any such information. Further, the Client acknowledges and agrees that NRSI has, for the purposes of preparing their assessment, assumed that the Property is in full compliance with all applicable federal, provincial, municipal and local statutes, regulations, by-laws, guidelines and other related laws. NRSI explicitly denies any legal liability for any and all issues with respect to non-compliance with any of the above-referenced statutes, regulations, by-laws, guidelines and laws as it may pertain to or affect the Property.

Restriction of Assessment

The assessment carried out was restricted to the study area as described in this report, including trees up to approximately 6m beyond the right-of-way. No assessment of any other trees has been undertaken by NRSI. NRSI is not legally liable for any other trees except those expressly discussed herein. The conclusions of this assessment do not apply to any areas, trees, or any other property not covered or referenced in this assessment.

Professional Responsibility

In carrying out this assessment, NRSI and any Assessor appointed for and on behalf of NRSI to perform and carry out the assessment has exercised a reasonable standard of care, skill and diligence. The assessment has been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discolored foliage (during the leaf-on period), the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. Except where specifically noted in the assessment, none of the trees examined on the property were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

No guarantees are offered, or implied, that trees recommended for retention, or all parts of them, will remain standing. It is professionally impossible to predict with absolute certainty the behaviour of any single tree or group of trees, or all their component parts, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential to fall, lean, or otherwise pose a danger to property and persons

in the event of extreme weather conditions, and this risk can only be eliminated if the tree is removed.

Without limiting the foregoing, no liability is assumed by NRSI or its directors, officers, employers, contractors, agents or Assessors for:

a) any legal description provided with respect to the Property;
b) issues of title and/or ownership with respect to the Property;
c) the accuracy of the Property line locations or boundaries with respect to the Property; and
d) the accuracy of any other information provided to NRSI by the Client or third parties;
e) any consequential loss, injury or damages suffered by the Client or any third parties, including but not limited to replacement costs, loss of use, earnings and business interruption; and
f) the unauthorized distribution of the assessment.

Third Party Liability

This assessment was prepared by NRSI for the Client. The data collected reflect NRSI's best assessment of the inventoried trees situated on the Property with the information available at the time of observation. Data analysis and the assessment of potential impacts to inventoried trees is specific to the proposed undertaking as described in this report. NRSI accepts no responsibility for any damages or loss suffered by any third party or by the Client as a result of decisions made or actions based upon the use of this assessment for purposes unrelated to the proposed undertaking.

General

Any plans and/or illustrations in this assessment are included only to help the Client visualize the issues in this assessment and shall not be relied upon for any other purpose.

This report shall be considered as a whole, no sections are severable, and the assessment shall be considered incomplete if any pages are missing.

Appendix IV
Tree Data and Summary Tables

Summary of Inventoried Trees

Common Name	Scientific Name	Excellent	Good	Fair	Poor	Very Poor	Dead	Total
Native Species								
American Basswood	*Tilia americana*		3	5	1			9
American Beech	*Fagus grandifolia*			5				5
Balsam Fir	*Abies balsamea*			1				1
Bitternut Hickory	*Carya cordiformis*			2				2
Black Cherry	*Prunus serotina*		1	10	8	2	2	23
Cherry species	*Prunus* sp.				1			1
Eastern Hemlock	*Tsuga canadensis*		1	1				2
Eastern Red Cedar	*Juniperus virginiana*		6					6
Eastern White Pine	*Pinus strobus*		4	3				7
Freeman's Maple	*Acer* X *freemanii*		1	7	1			9
Green Ash	*Fraxinus pennsylvanica*				7	4	5	16
Hawthorn species	*Crataegus* sp.		2	7	2	1		12
Large-tooth Aspen	*Populus grandidentata*	1	31	16	1	1		50
Manitoba Maple	*Acer negundo*		1	5	1			7
Mountain-Ash species	*Sorbus* sp.		1	3			1	5
Pussy Willow	*Salix discolor*			1				1
Red Maple	*Acer rubrum*		2	2	2	1		7
Red Oak	*Quercus rubra*	1	22	27	1			51
Red Pine	*Pinus resinosa*			1				1
Silver Maple	*Acer saccharinum*		7	14				21
Slippery Elm	*Ulmus rubra*		1	2				3
Sugar Maple	*Acer saccharum* ssp. *saccharum*	1	8	11	3	2	1	26
Trembling Aspen	*Populus tremuloides*		4	15	1		1	21
White Ash	*Fraxinus americana*		1	3	4	1	4	13
White Birch	*Betula papyrifera*		3	4	1	1	1	10
White Elm	*Ulmus americana*		1	3				4
White Spruce	*Picea glauca*		22	17	1			40
Willow species	*Salix* sp.		2	5				7
Subtotal		*3*	*124*	*170*	*35*	*13*	*15*	*360*
Non-Native Species								
Alaska Yellow Cedar	*Cupressus nootkatensis*		3	1				4
Amur Maple	*Acer ginnala*		2	1				3
Austrian Pine	*Pinus nigra*		5	4				9
Black Locust	*Robinia pseudoacacia*		5	14	1			20
Colorado Spruce	*Picea pungens*		17	5				22
Common Apple	*Malus domestica*		1		2			3
Crack Willow	*Salix fragilis*			13	2			15
Cypress sp.	*Cupressaceae* sp.		1					1
English Oak	*Quercus robur*		2					2
European Ash	*Fraxinus excelsior*				2	2		4
Norway Maple	*Acer platanoides*		2	4				6

Norway Spruce	*Picea abies*		4	1				5
Russian Olive	*Elaeagnus angustifolia*		1	2				3
Scots Pine	*Pinus sylvestris*			2				2
Siberian Elm	*Ulmus pumila*			4				4
Thornless Honey Locust	*Gleditsia triacanthos* var. *inermis*		2					2
White Mulberry	*Morus alba*			1				1
Subtotal			*45*	*52*	*7*	*2*		*106*
Overall Total		**3**	**169**	**222**	**42**	**15**	**15**	**466**

Overall Condition of Trees Inventoried

Potential for Structural Failure Rating	**Overall Condition**						**Total**
	Excellent	Good	Fair	Poor	Very Poor	Dead	
Improbable	3	160	146	2		1	312
Possible		9	75	37	6	3	130
Probable			1	3	9	11	24
Imminent							0
Total	**3**	**169**	**222**	**42**	**15**	**15**	**466**

Maps

Section 1

JANE ST

KIRBY RD

232 231 230 229 228 227 226 225 224 223

Section 2

KIRBY RD

Don River West Branch

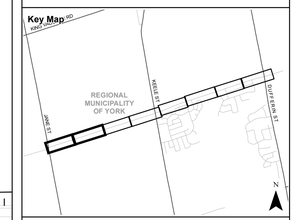
222 221 220 219 218 217 216 215 214 213 212 211 210 209 208 207 206 205 204 203 202 201 200 199 198

Map 1a

Kirby Road EA

Tree Inventory and Preservation Plan

Key Map



Legend

- Parcel Boundary
- Right of Way (ROW)
- Grading
- Preliminary Design
- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Cavity Tree
- Minimum Tree Protection Zone (TPZ)
- Permanent Watercourse
- Wooded Area

Oak Ridges Moraine Land Use Designation

- Natural Core Area
- Natural Linkage Area
- Settlement Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2339
Date: July 16, 2021

NAD83 - UTM Zone 17
Size: 24x36"
1:600

0 10 20 30 40 Metres

N

Section 3

KIRBY RD

98 197 196 195 194 193 192 191 190 189 188 187 186 185

Section 4

KIRBY RD

KEELE ST

BESTVIEW CRES

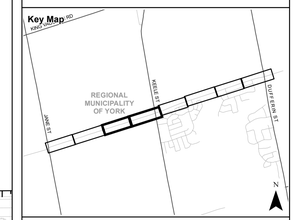
233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 lilu 124 125 126 127 128 129 130

Map 1b

Kirby Road EA

Tree Inventory and Preservation Plan

Key Map NTS



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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2339
Date: July 16, 2021

NAD83 - UTM Zone 17
Size: 24x36"
1:600

0 10 20 30 40 Metres

N

Section 5

KIRBY RD

BESTVIEW CRES

BEAVERBROOK CRES

GOYO GATE

Section 6

KIRBY RD

BEAVERBROOK CRES

RAVINEVIEW DR

REGENCY VIEW HTS

GLACIER CRT

Map 1c

Kirby Road EA

Tree Inventory and Preservation Plan

Key Map

REGIONAL MUNICIPALITY OF YORK

KIRBY RD

KEELE ST

DUFFERIN ST

N

Legend

- Parcel Boundary
- Right of Way (ROW)
- Grading
- Preliminary Design
- Inventoried Tree to be Retained (Crown to Scale)
- Inventoried Tree to be Removed (Crown to Scale)
- Potential Bat Cavity Tree
- Minimum Tree Protection Zone (TPZ)
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Oak Ridges Moraine Land Use Designation

- Natural Core Area
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- Settlement Area

NATURAL RESOURCE SOLUTIONS INC.
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Project: 2339
Date: July 16, 2021

NAD83 - UTM Zone 17
Size: 24x36"
1:600

0 10 20 30 40 Metres

N

Section 7

KIRBY RD

FOOT HILLS RD

GLACIER CRT

ADIRONDACK DR

Section 8

KIRBY RD

LAURENTIAN BLVD

ADIRONDACK DR

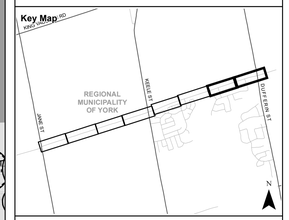
DUFFERIN ST

Map 1d

Kirby Road EA

Tree Inventory and Preservation Plan

Key Map



Legend

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2339
Date: July 16, 2021

NAD83 - UTM Zone 17
Size: 24x36"
1:600

0 10 20 30 40 Metres

N

Kirby Road EA Tree Protection Plan

Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native / Non-native	DBH (cm)	Stem Count	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Comments
40	White Spruce	*Picea glauca*	Native	18.9	1	2.5	Improbable	Good	Public	Remove	Light pruning; asymmetrical crown due west.
41	White Spruce	*Picea glauca*	Native	28.0	1	3.0	Improbable	Good	Public	Retain	Light pruning, asymmetrical; fungi in root zone, may not be associated with this tree; strong central leader.
42	White Spruce	*Picea glauca*	Native	27.5	1	3.5	Improbable	Good	Public	Remove	Light pruning.
43	White Spruce	*Picea glauca*	Native	33.5	2	3.0	Improbable	Fair	Public	Remove	Minor foliar necrosis; secondary stem subordinate.
44	White Spruce	*Picea glauca*	Native	20.0	1	3.0	Improbable	Fair	Public	Retain	Light pruning; asymmetrical crown due west.
45	White Spruce	*Picea glauca*	Native	39.1	2	3.5	Improbable	Fair	Public	Remove	Codominant stems with included bark; good form; good fruit set.
46	White Spruce	*Picea glauca*	Native	13.1	1	2.0	Possible	Poor	Private	Retain	Light pruning; asymmetrical crown due west; stem lean; dieback.
47	Trembling Aspen	*Populus tremuloides*	Native	13.9	1	3.0	Improbable	Fair	Private	Retain	Slight lean north, phototrophic growth; large basal shoot twisting around stem.
48	White Spruce	*Picea glauca*	Native	15.4	1	3.0	Possible	Fair	Private	Retain	Light pruning; asymmetrical crown due north; dieback.
49	Black Cherry	*Prunus serotina*	Native	12.5	1	2.5	Possible	Poor	Private	Retain	Asymmetrical crown due north; stem lean north; wounds, rot; gummosis.
50	White Spruce	*Picea glauca*	Native	20.1	1	3.0	Improbable	Fair	Public	Remove	Light pruning; minor foliar necrosis.
51	White Spruce	*Picea glauca*	Native	23.3	1	2.5	Improbable	Fair	Private	Remove	Asymmetrical crown due north; light pruning; downslope of ROW.
52	Trembling Aspen	*Populus tremuloides*	Native	31.1	1	4.5	Improbable	Fair	Boundary	Remove	2 broken branches; 1 dead branch.
53	Common Apple	*Malus domestica*	Non-Native	50.1	2	4.5	Possible	Poor	Public	Remove	Branch rub; many leaders, one dead; epicormic growth; rot.
54	Crack Willow	*Salix fragilis*	Non-Native	45.7	1	6.0	Possible	Fair	Public	Remove	Slight lean toward road and power lines, reaction wood; history of branch failure, water sprouts; some pruning for line clearing.
55	Crack Willow	*Salix fragilis*	Non-Native	13.1	1	2.0	Possible	Fair	Boundary	Remove	Asymmetrical crown due north; stem lean north.
56	Crack Willow	*Salix fragilis*	Non-Native	17.8	1	3.0	Possible	Poor	Private	Remove	Fruiting bodies on stem; sparse crown.
57	Green Ash	*Fraxinus pennsylvanica*	Native	21.4	1	0.5	Possible	Dead	Private	Remove	EAB; crack along stem; no crown. Potential bat roosting habitat.
58	Crack Willow	*Salix fragilis*	Non-Native	24.8	1	4.0	Improbable	Fair	Private	Remove	Strong central leader; irregular crown; epicormic growth.
59	Crack Willow	*Salix fragilis*	Non-Native	22.0	1	3.0	Possible	Fair	Boundary	Remove	Lean towards power lines; broken top.
60	Crack Willow	*Salix fragilis*	Non-Native	11.4	1	1.0	Possible	Fair	Public	Remove	Asymmetrical crown due north; stem lean north; phototrophic growth; water sprouts.
61	Crack Willow	*Salix fragilis*	Non-Native	14.1	1	2.5	Possible	Poor	Public	Remove	Asymmetrical crown due north; stem lean north; phototrophic growth; top broken off; apical growth comprises crown; vines.
62	Green Ash	*Fraxinus pennsylvanica*	Native	29.1	1		Probable	Dead	Private	Remove	Basal rot; no top; shedding bark; no galleries visible.
63	Green Ash	*Fraxinus pennsylvanica*	Native	32.5	1	0.5	Possible	Dead	Public	Remove	No crown; loose bark; crack. Potential bat roosting habitat.
64	Green Ash	*Fraxinus pennsylvanica*	Native	26.2	1		Probable	Dead	Private	Remove	Basal rot; no top; longitudinal crack; no galleries visible.
65	Green Ash	*Fraxinus pennsylvanica*	Native	27.3	1		Probable	Dead	Boundary	Remove	Basal rot; no top; shedding bark; no galleries visible. Potential bat roosting habitat.
66	Cherry species	*Prunus sp.*	Native	11.6	1	2.5	Possible	Poor	Private	Remove	Open basal wound with woundwood; 20% dieback.
67	White Elm	*Ulmus americana*	Native	18.4	1	3.0	Improbable	Fair	Public	Remove	Vines; codominant leaders; included bark.
68	Siberian Elm	*Ulmus pumila*	Non-Native	19.5	1	3.0	Possible	Fair	Public	Remove	Broken top; couple poor branch attachments; vine in crown.
69	Trembling Aspen	*Populus tremuloides*	Native	23.3	1	4.5	Possible	Fair	Public	Remove	Cracked lower branch, rot; topped by hydro; epicormic growth.
70	Trembling Aspen	*Populus tremuloides*	Native	14.8	1	3.0	Improbable	Fair	Public	Retain	Codominant leaders; basal shoot; healthy crown.
71	Crack Willow	*Salix fragilis*	Non-Native	35.3	1	5.0	Possible	Fair	Public	Retain	Codominant leaders' tops both broke in past; pruning cuts; water sprouts.
72	Black Locust	*Robinia pseudoacacia*	Non-Native	18.1	1	2.5	Improbable	Fair	Public	Retain	Asymmetrical crown due south; vines; light pruning.
73	Black Locust	*Robinia pseudoacacia*	Non-Native	19.0	1	2.5	Improbable	Fair	Public	Retain	Asymmetrical crown due west; vines; light pruning.
74	Black Locust	*Robinia pseudoacacia*	Non-Native	20.3	1	4.0	Improbable	Good	Public	Retain	Included bark at tight union with scaffold branch; vine in lower crown.
75	Black Locust	*Robinia pseudoacacia*	Non-Native	30.4	2	2.5	Possible	Poor	Public	Retain	Asymmetrical crown due west; vines; light pruning; dieback; phototrophic growth.
76	Black Locust	*Robinia pseudoacacia*	Non-Native	44.9	3	4.0	Improbable	Fair	Public	Retain	Strong taper on all stems; vine in lower crown.
77	Black Locust	*Robinia pseudoacacia*	Non-Native	21.0	1	3.5	Improbable	Fair	Public	Retain	Vines; light pruning; slope crest.
78	White Ash	*Fraxinus americana*	Native	21.5	1	3.5	Possible	Poor	Public	Retain	EAB exit holes; bark cracks; epicormic growth; seed set this year.
79	Black Locust	*Robinia pseudoacacia*	Non-Native	29.9	2	3.5	Improbable	Good	Public	Retain	Included bark; light pruning; vines.
80	Black Locust	*Robinia pseudoacacia*	Non-Native	13.5	1	3.0	Improbable	Good	Public	Retain	Slight pistol butt; vines in crown.
81	Black Locust	*Robinia pseudoacacia*	Non-Native	21.9	1	2.5	Improbable	Fair	Public	Remove	Dead lower branches; tight union; gypsy moth egg sac.
82	Black Locust	*Robinia pseudoacacia*	Non-Native	16.2	1	4.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; vines; stem lean south; slightly suppressed.
83	Black Locust	*Robinia pseudoacacia*	Non-Native	17.3	1	4.0	Improbable	Fair	Public	Remove	Pistol butt; low vigour.
84	Black Locust	*Robinia pseudoacacia*	Non-Native	22.5	1	4.0	Possible	Fair	Public	Remove	Sapwood decay visible at stem wound; asymmetrical crown; 2 dead branches.
85	Black Locust	*Robinia pseudoacacia*	Non-Native	26.6	1	5.0	Improbable	Fair	Public	Remove	Asymmetrical crown due west; vines; upslope.
86	Black Locust	*Robinia pseudoacacia*	Non-Native	10.6	1	2.5	Improbable	Good	Public	Remove	Tight union at low branch.
87	Black Locust	*Robinia pseudoacacia*	Non-Native	50.1	2	4.0	Improbable	Fair	Public	Remove	Asymmetrical crown due west; vines; included bark; upslope.
88	Black Locust	*Robinia pseudoacacia*	Non-Native	32.7	2	4.0	Possible	Good	Public	Remove	Codominant stems with included bark; good structure in each stem separately.
89	Black Locust	*Robinia pseudoacacia*	Non-Native	24.7	1	4.0	Improbable	Fair	Public	Retain	Asymmetrical crown due west; broken branch; improper branch pruning by hydro.
90	Black Locust	*Robinia pseudoacacia*	Non-Native	15.6	1	3.0	Possible	Fair	Public	Retain	Significant stem wound shows deadwood; included bark.
91	Black Locust	*Robinia pseudoacacia*	Non-Native	15.6	1	2.0	Improbable	Fair	Public	Retain	Improper branch pruning; included bark; branch rub.
92	White Ash	*Fraxinus americana*	Native	11.2	1	2.0	Possible	Poor	Public	Remove	Asymmetrical crown due south; stem lean south; canker; vines; dieback.
93	Large-tooth Aspen	*Populus grandidentata*	Native	10.5	1	2.0	Improbable	Good	Public	Remove	Small stem wound closed.
94	Large-tooth Aspen	*Populus grandidentata*	Native	13.0	1	1.5	Possible	Good	Public	Remove	Light pruning; erosion downslope; hanger.
95	Large-tooth Aspen	*Populus grandidentata*	Native	16.2	1	3.0	Improbable	Fair	Public	Remove	Once lost leader.
96	Crack Willow	*Salix fragilis*	Non-Native	45.4	4	4.5	Possible	Fair	Public	Remove	Codominant stems, 1 broken.
97	Willow species	*Salix sp.*	Native	13.3	1	2.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; stem lean south; vines.
98	Crack Willow	*Salix fragilis*	Non-Native	14.0	1	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown; minor epicormic growth.
99	Crack Willow	*Salix fragilis*	Non-Native	15.8	2	3.5	Improbable	Fair	Public	Remove	Secondary stem suppressed; 1 broken branch; water sprouts.
100	Crack Willow	*Salix fragilis*	Non-Native	16.3	1	2.5	Possible	Fair	Public	Remove	Lower stem wound mostly closed; vine in crown.
101	Large-tooth Aspen	*Populus grandidentata*	Native	10.5	1	2.0	Possible	Very Poor	Public	Remove	Dead top; peeling bark.
102	Large-tooth Aspen	*Populus grandidentata*	Native	11.9	1	2.0	Improbable	Fair	Public	Remove	Asymmetrical crown due south; stem lean south; light pruning.
103	Trembling Aspen	*Populus tremuloides*	Native	11.5	1	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; light pruning.
104	Trembling Aspen	*Populus tremuloides*	Native	12.6	1	2.5	Improbable	Good	Public	Remove	Asymmetrical crown due south; light pruning.
105	Trembling Aspen	*Populus tremuloides*	Native	12.3	1	3.0	Improbable	Good	Public	Remove	Asymmetrical crown; basal shoot; vigorous.
106	Manitoba Maple	*Acer negundo*	Native	21.9	3	3.0	Improbable	Fair	Public	Remove	Asymmetrical crown due south; included bark; vines.
107	Large-tooth Aspen	*Populus grandidentata*	Native	10.7	1	2.0	Improbable	Fair	Public	Remove	Asymmetrical crown due south; vines; canker.
108	Manitoba Maple	*Acer negundo*	Native	12.1	2	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; stem lean south; epicormic growth; suckers.
109	Manitoba Maple	*Acer negundo*	Native	20.7	2	3.5	Improbable	Fair	Public	Remove	Arches towards Kirby Road; basal shoots.
110	Manitoba Maple	*Acer negundo*	Native	23.4	1	3.0	Improbable	Fair	Public	Remove	Codominant leaders arch towards Kirby Road; epicormic growth; 1 branch wound.
111	Manitoba Maple	*Acer negundo*	Native	14.2	1	4.0	Improbable	Fair	Public	Remove	Slight lean towards Kirby Road; some dieback; vine in crown.
112	Large-tooth Aspen	*Populus grandidentata*	Native	10.3	1	1.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; branch rub; compartmentalized wounds.
113	Large-tooth Aspen	*Populus grandidentata*	Native	13.2	1	2.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; light pruning; branch rub.
114	Large-tooth Aspen	*Populus grandidentata*	Native	12.6	1	2.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; branch rub; light pruning.
115	Large-tooth Aspen	*Populus grandidentata*	Native	14.8	1	2.5	Improbable	Good	Public	Remove	1 poor attachment.
116	White Elm	*Ulmus americana*	Native	78.1	2	7.0	Improbable	Good	Boundary	Remove	Included bark, otherwise good structure; vase-like form; minor epicormic growth; few small dead branches.
117	American Basswood	*Tilia americana*	Native	43.9	4	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; vines; branch rub; included bark.
118	American Basswood	*Tilia americana*	Native	14.4	1	2.5	Improbable	Fair	Public	Remove	Branch rub; included bark; multiple stems under 10 DBH.
119	American Basswood	*Tilia americana*	Native	13.7	3	3.0	Improbable	Good	Public	Remove	Subordinate stems originated as basal shoots.
120	American Basswood	*Tilia americana*	Native	12.9	1	1.0	Improbable	Fair	Public	Remove	Included bark; branch rub.
121	American Basswood	*Tilia americana*	Native	10.2	3	2.5	Improbable	Good	Public	Remove	Codominant stems; basal shoots; branch crossing.
122	American Basswood	*Tilia americana*	Native	13.8	2	1.0	Improbable	Fair	Public	Remove	Included bark; branch rub; second stem under 10 DBH.
123	Common Apple	*Malus domestica*	Non-Native	13.7	2	3.0	Improbable	Good	Public	Remove	Codominant stems; vine in crown; 2 past failures of small branches; good fruit set past season.
124	European Ash	*Fraxinus excelsior*	Non-Native	11.9	1	1.0	Possible	Very Poor	Public	Retain	EAB; dieback; epicormic growth; canker; peeled bark.
125	European Ash	*Fraxinus excelsior*	Non-Native	16.5	1	2.5	Possible	Poor	Public	Retain	Basal , insect galleries; bark staining; many live buds.
126	Austrian Pine	*Pinus nigra*	Non-Native	13.9	1	1.5	Improbable	Good	Public	Retain	Stem lean east; planted above root collar.
127	Austrian Pine	*Pinus nigra*	Non-Native	15.0	1	2.0	Improbable	Good	Public	Retain	Full crown, to the ground.
128	Austrian Pine	*Pinus nigra*	Non-Native	14.6	1	1.5	Improbable	Fair	Public	Retain	Slight lean west; planted above root collar; insect damage.
129	Austrian Pine	*Pinus nigra*	Non-Native	13.3	1	2.0	Improbable	Good	Public	Retain	Good form.
130	Freeman's Maple	*Acer X freemanii*	Native	10.8	1	1.0	Improbable	Fair	Public	Retain	Basal wound with some rot; epicormic growth.
131	Austrian Pine	*Pinus nigra*	Non-Native	11.0	1	1.5	Improbable	Fair	Public	Retain	Good form; fungi in root zone.
132	European Ash	*Fraxinus excelsior*	Non-Native	19.9	1	1.0	Improbable	Poor	Public	Retain	EAB; epicormic growth; canker.
133	Balsam Fir	*Abies balsamea*	Native	10.1	1	1.0	Improbable	Fair	Public	Retain	Sparse crown with vines throughout; root ball was planted a bit high.
134	Austrian Pine	*Pinus nigra*	Non-Native	13.6	1	2.0	Improbable	Fair	Public	Remove	Fungi in root zone; healthy crown; good form.
135	Austrian Pine	*Pinus nigra*	Non-Native	14.0	1	1.5	Improbable	Good	Public	Remove	Sapsucker holes; cement block at base.
136	Austrian Pine	*Pinus nigra*	Non-Native	13.2	1	2.0	Improbable	Fair	Public	Remove	Minor dieback; leader may get superseded.
137	Austrian Pine	*Pinus nigra*	Non-Native	10.7	1	1.0	Improbable	Good	Public	Remove	Improper branch pruning.
138	Amur Maple	*Acer ginnala*	Non-Native	10.6	1	1.0	Improbable	Good	Private	Retain	Basal wound, compartmentalized; branch rub; codominant leaders split at DBH; included bark.
139	Amur Maple	*Acer ginnala*	Non-Native	10.1	1	1.5	Improbable	Good	Boundary	Remove	Good form; heavy seed set.
140	Siberian Elm	*Ulmus pumila*	Non-Native	12.3	1	0.5	Improbable	Fair	Private	Retain	Included bark; branch rub.
141	Amur Maple	*Acer ginnala*	Non-Native	11.6	1	1.0	Improbable	Fair	Private	Remove	Included bark; branch rub; epicormic growth; basal wound compartmentalized.
142	Freeman's Maple	*Acer X freemanii*	Native	31.7	3	2.5	Possible	Fair	Private	Retain	Codominant stems with included bark; guywire girdled 1 stem; topped for power lines.
143	Green Ash	*Fraxinus pennsylvanica*	Native	10.3	1	2.0	Possible	Very Poor	Private	Retain	Topped for power lines; EAB exit holes; bark cracks; insect galleries.
144	Green Ash	*Fraxinus pennsylvanica*	Native	13.5	1	2.0	Possible	Poor	Private	Retain	Insect galleries; topped for power lines.
145	White Birch	*Betula papyrifera*	Native	21.1	3	2.5	Possible	Fair	Private	Retain	1 stem topped; 2 stem wounds.
146	Green Ash	*Fraxinus pennsylvanica*	Native	13.3	1	3.0	Probable	Very Poor	Private	Retain	Insect galleries; epicormic growth; leaning towards Kirby Road; loose bark; topped for power lines.
147	White Birch	*Betula papyrifera*	Native	10.6	3	2.5	Possible	Fair	Private	Retain	Included bark; topped for power lines; asymmetrical crown to north; stem wound.
148	Freeman's Maple	*Acer X freemanii*	Native	39.9	4	2.5	Improbable	Fair	Private	Retain	Stems tightly upright, included bark; topped for power lines; vine in crown.
149	Green Ash	*Fraxinus pennsylvanica*	Native	12.5	1	2.5	Possible	Poor	Private	Retain	EAB exit holes; insectivore action; epicormic growth; codominant leaders; basal shoots.
150	White Spruce	*Picea glauca*	Native	24.3	1	2.5	Improbable	Fair	Private	Retain	Minor crown thinning; stem wrapped by landscape fabric; heavy fruit set.
151	White Spruce	*Picea glauca*	Native	21.9	1	2.5	Improbable	Fair	Private	Retain	Light pruning; slightly suppressed; history of branch pruning.
152	White Spruce	*Picea glauca*	Native	25.9	1	3.0	Improbable	Fair	Boundary	Retain	Light pruning; slightly suppressed; history of branch pruning; branch rub; dried sap on stem.
153	White Spruce	*Picea glauca*	Native	20.2	1	2.0	Improbable	Fair	Boundary	Retain	Crown thinning.
154	White Spruce	*Picea glauca*	Native	18.5	1	2.0	Improbable	Fair	Boundary	Retain	Light pruning on north side because of sumacs; heavy fruit set.
155	White Spruce	*Picea glauca*	Native	21.0	1	3.0	Improbable	Fair	Public	Retain	Light pruning; slightly suppressed; branch rub; landscape cloth wrapped around base.
156	White Spruce	*Picea glauca*	Native	21.3	1	2.5	Improbable	Good	Public	Retain	Healthy crown asymmetrical to northeast due to neighbouring tree; heavy fruit set.
157	White Spruce	*Picea glauca*	Native	22.0	1	2.5	Improbable	Fair	Private	Retain	Light pruning; slightly suppressed; branch rub; dried sap on stem.
158	White Spruce	*Picea glauca*	Native	26.9	1	2.5	Improbable	Fair	Private	Retain	Light pruning; slightly suppressed; branch rub; dried sap on stem.
159	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	19.0	1	2.5	Possible	Fair	Public	Retain	Lacking root flare; past pruning cuts not closed; 1 past failure; couple poor attachments; minor epicormic growth.
160	White Spruce	*Picea glauca*	Native	26.0	1	2.0	Improbable	Fair	Private	Retain	Light pruning; slightly suppressed; branch rub; dried sap on stem; lower branches cut back along the sidewalk.
161	Freeman's Maple	*Acer X freemanii*	Native	23.6	1	2.0	Possible	Poor	Public	Retain	Large open wound along stem, compartmentalized; multi stems pruned at base; mower damage.
162	Silver Maple	*Acer saccharinum*	Native	36.4	1	4.5	Possible	Fair	Public	Remove	Asymmetrical crown to the south due to heading cuts fir power lines; stem wound with woundwood; basal shoots; codominant leaders; some epicormic growth.
163	Silver Maple	*Acer saccharinum*	Native	34.3	1	5.0	Improbable	Fair	Public	Remove	Asymmetrical crown to the south due to heading cuts fir power lines; stem wound nearly closed; codominant leaders; water sprouts.
164	Silver Maple	*Acer saccharinum*	Native	18.1	1	3.0	Improbable	Good	Public	Remove	Few heading cuts on this tree younger than neighbours; exposed roots with lawnmower damage.
165	Silver Maple	*Acer saccharinum*	Native	28.9	1	3.0	Improbable	Fair	Public	Remove	Asymmetrical crown to the south due to heading cuts for power lines; basal shoots.
166	Silver Maple	*Acer saccharinum*	Native	32.0	1	4.5	Improbable	Good	Public	Remove	Irregular crown due to heading cuts for power lines; codominant leaders; basal shoots.
167	Silver Maple	*Acer saccharinum*	Native	35.7	1	4.0	Improbable	Good	Public	Remove	Irregular crown due to heading cuts for power lines; good wound closure in stem; gypsy moth egg sacs.
168	Silver Maple	*Acer saccharinum*	Native	34.8	1	3.5	Possible	Fair	Public	Remove	Asymmetrical crown to the south due to heading cuts for power lines; girdling root; stem wound open but with much woundwood; codominant leaders.
169	Silver Maple	*Acer saccharinum*	Native	41.9	1	4.0	Possible	Good	Public	Remove	Asymmetrical crown to the south due to heading cuts for power lines; 3 codominant leaders; epicormic growth; many gypsy moth egg sacs.
170	White Spruce	*Picea glauca*	Native	24.1	1	2.5	Improbable	Good	Private	Remove	Light pruning; branch rub; branches abut fence; raised planting.
171	White Spruce	*Picea glauca*	Native	24.7	1	3.0	Improbable	Fair	Public	Remove	Irregular crown due to heading cuts for power lines; topped.
172	White Spruce	*Picea glauca*	Native	21.7	1	3.0	Improbable	Fair	Private	Remove	Irregular crown due to pruning for power lines; sparse crown; light pruning; wrapped by landscape fabric.
173	White Spruce	*Picea glauca*	Native	34.0	1	3.0	Improbable	Good	Private	Retain	Light pruning; branch rub; branches abut fence; raised planting; landscape cloth wrapped around base.
174	White Spruce	*Picea glauca*	Native	36.3	1	3.0	Improbable	Good	Private	Remove	Light pruning; branch rub; branches abut fence; raised planting; landscape cloth wrapped around base.
175	White Spruce	*Picea glauca*	Native	30.9	1	3.5	Improbable	Good	Private	Remove	1 girdling root over root flare; wrapped by landscape fabric; good fruit set.
176	Silver Maple	*Acer saccharinum*	Native	49.1	1	5.0	Possible	Fair	Public	Remove	3 codominant leaders, 2 with heading cuts; basal shoots; water sprouts; large exposed root with lawnmower damage.
177	Silver Maple	*Acer saccharinum*	Native	44.9	1	4.5	Possible	Fair	Public	Remove	Irregular crown due to heading cuts for power lines; vigorous lateral scaffold branch; basal shoots; large exposed root with lawnmower damage.
178	Silver Maple	*Acer saccharinum*	Native	36.7	1	4.0	Improbable	Fair	Public	Remove	Irregular crown due to heading cuts for power lines; codominant leaders; water sprouts; many gypsy moth egg sacs.
179	Silver Maple	*Acer saccharinum*	Native	28.1	1	3.0	Possible	Fair	Public	Remove	Asymmetrical crown due to pruning cuts for power lines; basal shoots; gypsy moth egg sacs.
180	Silver Maple	*Acer saccharinum*	Native	38.2	1	5.0	Possible	Fair	Public	Remove	Irregular crown due to heading cuts for power lines; epicormic growth; many gypsy moth egg sacs.
181	Silver Maple	*Acer saccharinum*	Native	44.4	1	5.0	Possible	Fair	Public	Remove	Completely asymmetrical crown due to heading cuts for power lines; large cut surface from leader removed; upper stem slightly leaning over backyard; basal shoots; many gypsy moth egg sacs.
182	Silver Maple	*Acer saccharinum*	Native	40.5	1	4.5	Improbable	Good	Public	Remove	Asymmetrical crown due to pruning cuts for power lines; basal shoots; gypsy moth egg sacs.
183	Silver Maple	*Acer saccharinum*	Native	50.3	1	5.0	Possible	Fair	Public	Remove	Asymmetrical crown t the south due to pruning cuts for power lines; oversized scaffold branch; water sprouts; 1 branch wound partly closed; many gypsy moth egg sacs.
184	Silver Maple	*Acer saccharinum*	Native	34.6	1	4.5	Possible	Fair	Public	Remove	Sharply asymmetrical crown t the south due to heading cuts for power lines; decent wound closure; exposed root with lawnmower damage; basal shoots; many gypsy moth egg sacs.
185	Silver Maple	*Acer saccharinum*	Native	43.8	1	6.0	Possible	Fair	Public	Remove	Asymmetrical crown due south; codominant leaders; included bark; topped; minor branch rub; water sprouts.
186	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	29.7	1	3.0	Improbable	Fair	Public	Remove	Many heading cuts for power lines; upright form; epicormic growth beginning; gypsy moth egg sacs.
187	Colorado Spruce	*Picea pungens*	Non-Native	59.8	1	4.0	Improbable	Good	Public	Remove	Few broken branches; vine in lower crown.
188	Colorado Spruce	*Picea pungens*	Non-Native	64.4	1	5.0	Improbable	Fair	Public	Remove	Vines; light pruning; branch rub; good branch closure; drooping branches.
189	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	102.1	1	8.0	Possible	Fair	Public	Remove	Stem compartmentalized around fence; branch rub; history of branch pruning; compartmentalized wounds; knot hole cavity; included bark; hangers.
190	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	80.4	1	6.0	Probable	Poor	Public	Remove	Dead leader; 40% live crown lost; 5 dead branches, several broken branches.
191	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	117.6	1	6.5	Possible	Fair	Boundary	Remove	1 leader dead; potential basal decay; short stem, round crown.
192	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	83.0	1	0.5	Improbable	Dead	Public	Remove	No crown; all branches pruned.
193	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	85.9	1	8.5	Improbable	Fair	Public	Remove	Branch rub; included bark; small dead branches; compartmentalized wounds; rotted branch stubs with insect damage; knot hole cavities. Potential bat roosting habitat.
194	American Basswood	*Tilia americana*	Native	15.3	2	2.5	Improbable	Good	Public	Remove	Subordinate stem is basal shoot; vines throughout crown.
195	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	35.6	2	3.0	Improbable	Good	Boundary	Remove	Codominant stems spit at 1m height; minor epicormic growth; live buds all through crown.
196	White Ash	*Fraxinus americana*	Native	39.8	2	4.5	Possible	Poor	Public	Remove	EAB; included bark; canker; woodpecker damage; crown dieback.
197	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	35.6	1	4.0	Improbable	Good	Boundary	Remove	3 tight unions; included bark; branching begins very low, open-grown; 1 broken branch.
198	Freeman's Maple	*Acer X freemanii*	Native	106.0	1	10.0	Possible	Fair	Public	Remove	DBH measured near base; branch rub; included bark; hangers; compartmentalized wounds; rotted leader with broken top; hangers; good branch closure.
199	Freeman's Maple	*Acer X freemanii*	Native	242.0	4	9.0	Possible	Fair	Boundary	Remove	Large, diverging stems; included bark; broad crown; 5% live crown lost;4 broken branches.
200	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	43.0	1	7.0	Possible	Very Poor	Public	Remove	Asymmetrical crown due east; suppressed; large hangers; history of branch failure; topped; rot.
203	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	84.0	1	7.5	Probable	Poor	Public	Remove	Large branch pruned, potentially branch failed and tore bark; centre rot; 40% live crown lost; history of branch failure. Potential bat roosting habitat.
204	Hawthorn species	*Crataegus sp.*	Native	27.4	2	2.0	Possible	Fair	Public	Remove	Codominant stems, 1 broken; whole crown arches east, poor form.
205	Hawthorn species	*Crataegus sp.*	Native	40.6	3	3.0	Improbable	Fair	Public	Remove	Spreading crown.
206	Hawthorn species	*Crataegus sp.*	Native	33.0	4	4.0	Possible	Fair	Public	Remove	Asymmetrical crown due north; branch rub; vines; slightly suppressed.
207	Hawthorn species	*Crataegus sp.*	Native	11.2	1	3.0	Possible	Poor	Public	Remove	Asymmetrical crown due south; branch rub; vines; suppressed.
208	Hawthorn species	*Crataegus sp.*	Native	15.2	1	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown north; 1 broken branch.
209	Hawthorn species	*Crataegus sp.*	Native	24.0	2	3.0	Improbable	Fair	Public	Remove	Included bark; dense branching.
210	Hawthorn species	*Crataegus sp.*	Native	22.0	2	3.0	Possible	Fair	Public	Remove	Asymmetrical crown due north; slightly suppressed; larger stem leaning north; branch rub.
211	Hawthorn species	*Crataegus sp.*	Native	26.9	2	2.5	Improbable	Good	Public	Remove	Asymmetrical crown north and west.
212	Hawthorn species	*Crataegus sp.*	Native	58.9	5	3.0	Improbable	Fair	Public	Remove	Spreading crown of twisting branches; typical form; centre rot in 1 stem.
213	Hawthorn species	*Crataegus sp.*	Native	17.5	1	5.0	Possible	Poor	Public	Remove	Asymmetrical crown due south; second stem rotted away; compartmentalized wound; vines; rot; cavities.
214	Hawthorn species	*Crataegus sp.*	Native	13.1	1	0.5	Probable	Very Poor	Public	Remove	Broken top; rot; epicormic growth; vines.
215	Hawthorn species	*Crataegus sp.*	Native	74.6	3	4.0	Improbable	Good	Public	Remove	Spreading crown of twisting branches; typical form; few broken branches.
216	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	57.0	1	10.0	Probable	Very Poor	Public	Remove	History of branch failure; dead top; vines; basal fungus; woodpecker damage; rot.
217	Black Cherry	*Prunus serotina*	Native	82.8	1	6.5	Probable	Poor	Public	Remove	Some dead sapwood visible at base, woundwood; 2 large codominant leaders; 60% live crown lost.
218	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	27.3	1	8.0	Improbable	Fair	Public	Remove	Included bark; branch rub; abuts adjacent tree; asymmetrical crown due south; slightly suppressed.
219	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	88.6	3	5.0	Possible	Fair	Public	Remove	Included bark; vines; bark staining; reaction wood; branch rub; dead leader; insect damage; compartmentalized wounds; small dead branches.
220	White Ash	*Fraxinus americana*	Native	107.5	3	5.5	Probable	Very Poor	Public	Remove	EAB exit holes; insect galleries; shedding bark; live epicormic growth.
221	Manitoba Maple	*Acer negundo*	Native	90.8	5	6.5	Possible	Poor	Public	Remove	Stems diverge from base; sapwood decay; basal rot; included bark.
222	Norway Maple	*Acer platanoides*	Non-Native	31.9	1	6.0	Improbable	Fair	Public	Remove	Stem lean south; branch rub; vines; erosion downslope; bark staining.
223	Slippery Elm	*Ulmus rubra*	Native	107.5	4	9.0	Improbable	Fair	Boundary	Remove	Included bark; epicormic growth; branch rub; codominant leaders; minor rot on lower stem; small dead branches.
224	Slippery Elm	*Ulmus rubra*	Native	36.7	1	6.0	Improbable	Fair	Boundary	Remove	Codominant leaders, oriented north-south; much epicormic growth; 1 dead branch; gypsy moth egg sac.
225	Slippery Elm	*Ulmus rubra*	Native	43.2	1	9.0	Improbable	Good	Boundary	Remove	Included bark; epicormic growth; branch rub; codominant leaders; small dead branches.
226	Norway Maple	*Acer platanoides*	Non-Native	67.5	3	5.0	Possible	Fair	Public	Remove	Compartmentalized wounds on lower stems, some rot; history of branch pruning; codominant leaders; included bark; branch rub; small dead branch branches; improper branch cuts, water sprouts and suckers.
227	Scots Pine	*Pinus sylvestris*	Non-Native	39.6	1	6.0	Improbable	Fair	Public	Remove	Asymmetrical crown due south; history of branch pruning; good branch closure; sapsucker holes; codominant leaders, third leader broke off; branch rub.
228	Scots Pine	*Pinus sylvestris*	Non-Native	50.3	1	6.0	Improbable	Fair	Public	Remove	Asymmetrical crown due south; history of branch pruning; branch rub; split in one large branch; sapsucker holes; girdling root.
229	Silver Maple	*Acer saccharinum*	Native	82.9	6	7.5	Improbable	Good	Public	Remove	Branch rub; included bark; drooping branches; codominant leaders; water sprouts; suckers.
230	Silver Maple	*Acer saccharinum*	Native	104.3	4	8.0	Improbable	Good	Public	Remove	Branch rub; included bark; drooping branches; codominant leaders; improper branch pruning, water sprouts; broken branch; compartmentalized wounds.
231	Silver Maple	*Acer saccharinum*	Native	68.7	8	8.0	Possible	Fair	Public	Remove	Branch rub; included bark; drooping branches; codominant leaders; improper branch pruning, water sprouts; broken branch; compartmentalized wounds; hangers; leaders with broken tops.
232	American Basswood	*Tilia americana*	Native	12.4	3	1.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; stem compartmentalized around fence; suckers; branch rub; included bark; other stems under 10 DBH.
233	Black Cherry	*Prunus serotina*	Native	16.4	1	2.5	Improbable	Fair	Public	Remove	Included bark; browse, water sprouts; under power line.
234	Black Cherry	*Prunus serotina*	Native	16.3	1	2.0	Improbable	Fair	Public	Remove	Codominant leaders with included bark; vigorous growth, under power lines; epicormic growth.
235	Mountain-Ash species	*Sorbus sp.*	Native	10.2	2	2.0	Improbable	Fair	Public	Remove	Branch rub; compartmentalized wound; canker.
236	Black Cherry	*Prunus serotina*	Native	10.9	1	2.5	Improbable	Fair	Public	Remove	Vigorous; water sprouts; basal shoot; dead twigs.
237	Mountain-Ash species	*Sorbus sp.*	Native	14.0	2	2.0	Improbable	Fair	Public	Retain	Codominant leaders; included bark; branch rub; canker; under power line.
238	Black Cherry	*Prunus serotina*	Native	12.0	1	3.0	Improbable	Fair	Public	Retain	Few tight unions.
239	White Ash	*Fraxinus americana*	Native	10.3	1	2.5	Improbable	Good	Public	Retain	Good structure; minor epicormic growth.
240	Black Cherry	*Prunus serotina*	Native	20.0	1	4.0	Improbable	Good	Boundary	Retain	Asymmetrical crown due south; branch rub; vines.
241	Russian Olive	*Elaeagnus angustifolia*	Non-Native	19.4	1	3.5	Possible	Fair	Public	Retain	1 past failure is still alive, water sprouts; centre rot visible.
242	Black Cherry	*Prunus serotina*	Native	11.1	1	4.0	Improbable	Fair	Public	Retain	Asymmetrical crown due south; canker; gummosis; light pruning; vines.
243	Black Cherry	*Prunus serotina*	Native	14.8	1	2.5	Improbable	Fair	Public	Remove	Crooked stem; low branching; growing near power lines.
244	Black Cherry	*Prunus serotina*	Native	10.5	1	1.5	Improbable	Fair	Public	Remove	Deer browse, water sprouts; gummosis; branch rub; under power line.
245	Mountain-Ash species	*Sorbus sp.*	Native	10.1	1	2.0	Possible	Fair	Public	Remove	Codominant leaders with included bark; vines throughout crown; growing near power lines.
246	Mountain-Ash species	*Sorbus sp.*	Native	10.3	2	1.0	Probable	Dead	Public	Remove	Crown intact.
247	European Ash	*Fraxinus excelsior*	Non-Native	12.1	2	2.5	Probable	Very Poor	Public	Remove	EAB exit holes; insect galleries; loose bark; live epicormic growth; under power lines.
aa	Trembling Aspen	*Populus tremuloides*	Native	26.7	1	4.5	Improbable	Fair	Private	Retain	Few dead branches; light pruning.
ab	Trembling Aspen	*Populus tremuloides*	Native	31.8	1	4.0	Possible	Poor	Private	Retain	Dieback; compartmentalized wounds; rot; fungus.
ac	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	73.9	2	5.5	Possible	Fair	Private	Remove	Branch rub; asymmetrical crown due north; included bark; loose bark; crown dieback. Potential bat roosting habitat.
ad	Red Oak	*Quercus rubra*	Native	55.4	1	7.0	Improbable	Good	Private	Retain	Irregular crown couple dead branches; gypsy moth egg sac.
ae	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	15.2	1	3.5	Improbable	Good	Private	Retain	Leader suppressed, 1 vigorous lateral.
af	White Elm	*Ulmus americana*	Native	17.1	1	8.0	Possible	Fair	Private	Retain	Suppressed; phototrophic growth; asymmetrical crown due north; branch rub; broken top; crown composed of apical growth.
ag	Green Ash	*Fraxinus pennsylvanica*	Native	16.4	1	2.5	Possible	Poor	Private	Remove	EAB; woodpecker holes; epicormic growth; asymmetrical crown due north.
ah	Red Oak	*Quercus rubra*	Native	59.5	1	9.0	Possible	Fair	Private	Retain	Bark seam, bark staining at root flare; 2 dead scaffold branches; epicormic growth; few poor branch attachments; gypsy moth egg sac.
ai	Trembling Aspen	*Populus tremuloides*	Native	33.9	2	2.5	Improbable	Fair	Private	Remove	Light pruning; compartmentalized wounds; asymmetrical crown due north; stem lean north; included bark.
aj	Trembling Aspen	*Populus tremuloides*	Native	17.3	1	4.0	Improbable	Fair	Private	Remove	Arching lean toward power lines.
ak	Trembling Aspen	*Populus tremuloides*	Native	14.0	1	1.5	Improbable	Fair	Private	Remove	Asymmetrical crown due north; dieback; light pruning.
al	Trembling Aspen	*Populus tremuloides*	Native	15.7	1		Possible	Dead	Private	Remove	Broken top; shedding bark.
am	Trembling Aspen	*Populus tremuloides*	Native	15.0	1	2.0	Possible	Fair	Private	Remove	Stem lean north; asymmetrical crown due north; phototrophic growth; light pruning; minor dieback.
an	Trembling Aspen	*Populus tremuloides*	Native	26.7	1	4.0	Possible	Fair	Private	Remove	Once lost leader, new leaders have poor attachments.
ao	Manitoba Maple	*Acer negundo*	Native	54.7	3	4.5	Improbable	Good	Private	Remove	Codominant stems diverge from base; included bark.
ap	Eastern White Pine	*Pinus strobus*	Native	32.5	1	4.0	Improbable	Fair	Private	Remove	Crooked stem at base; once lost leader, large scaffold branches compensate.
aq	Eastern White Pine	*Pinus strobus*	Native	32.1	1	4.0	Improbable	Good	Private	Retain	Branch rub; vines.
ar	Trembling Aspen	*Populus tremuloides*	Native	13.5	1	2.5	Improbable	Good	Private	Retain	Light pruning.
as	Trembling Aspen	*Populus tremuloides*	Native	14.8	3	3.0	Improbable	Fair	Boundary	Retain	Primary stem twisting; 2 subordinate stems; light pruning.
at	Trembling Aspen	*Populus tremuloides*	Native	13.5	1	0.5	Possible	Fair	Private	Retain	History of branch failure.
au	Trembling Aspen	*Populus tremuloides*	Native	11.5	1	1.5	Improbable	Fair	Private	Retain	Oyster shell scale; vines; light pruning.
av	Eastern White Pine	*Pinus strobus*	Native	19.1	1	3.0	Improbable	Good	Private	Retain	Asymmetrical crown due east; light pruning.
aw	Red Oak	*Quercus rubra*	Native	27.0	2	4.0	Improbable	Good	Private	Retain	Codominant stems with included bark; asymmetrical crown due to neighbouring trees; gypsy moth egg sacs.
ax	Eastern White Pine	*Pinus strobus*	Native	36.0	1	3.5	Improbable	Good	Boundary	Retain	Asymmetrical crown due south; light pruning; sign affixed to stem.
ay	Red Oak	*Quercus rubra*	Native	63.0	1	9.0	Possible	Fair	Boundary	Retain	Bark seam lower stem ; 4 dead branches ; leader lacking vigour.
az	Red Maple	*Acer rubrum*	Native	62.0	2	9.0	Improbable	Good	Private	Retain	Included bark; small dead branches; asymmetrical crown due south.
ba	Red Maple	*Acer rubrum*	Native	35.0	1	6.0	Improbable	Fair	Private	Retain	Leaning toward Kirby Road; crooked stem; 2 broken branches.
bb	American Beech	*Fagus grandifolia*	Native	42.0	1	6.5	Possible	Fair	Public	Retain	Asymmetrical crown due south; phototrophic growth; minor dieback.
bc	Large-tooth Aspen	*Populus grandidentata*	Native	16.7	1	3.5	Possible	Fair	Public	Remove	Pronounced pistol butt; leader being superseded by lateral; poor attachment.
bd	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	53.0	1	8.5	Possible	Good	Public	Remove	Asymmetrical crown due south; compartmentalized wounds; hangers.
be	Eastern Hemlock	*Tsuga canadensis*	Native	26.0	1	4.0	Improbable	Fair	Private	Remove	Ram's horn closed basal wound.
bf	American Beech	*Fagus grandifolia*	Native	53.0	1	10.0	Possible	Fair	Boundary	Remove	Signs of potential beech bark disease; arching lean towards Kirby Road; history of branch failures in upper crown.
bg	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	72.0	2	6.0	Possible	Poor	Public	Remove	Asymmetrical crown due south; shelf fungus; extensive rot on lower stem; epicormic growth.
bh	American Beech	*Fagus grandifolia*	Native	34.0	1	7.0	Possible	Fair	Public	Remove	Early signs of beech bark disease; 2 stems split around breast height; many gypsy moth egg sacs; stems arch towards Kirby Road.
bi	American Beech	*Fagus grandifolia*	Native	20.0	1	4.0	Improbable	Fair	Boundary	Remove	Compartmentalized wounds; asymmetrical crown due south; slightly suppressed.
bj	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	38.0	1	8.0	Possible	Fair	Public	Remove	Base abuts neighbouring tree; loose bark on stem; dead leader.
bk	American Beech	*Fagus grandifolia*	Native	22.0	1	5.0	Possible	Fair	Public	Remove	Asymmetrical crown due south; suppressed; phototrophic growth; stem lean south.
bl	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	27.0	1	5.0	Improbable	Good	Boundary	Remove	Strong leader; 2 small dead branches.
bm	Red Maple	*Acer rubrum*	Native	65.0	1	8.5	Improbable	Good	Public	Remove	2 broken branches; 2 dead branches; dominant canopy tree; irregular crown.
bn	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	17.0	1	4.0	Improbable	Good	Public	Remove	Good structure; gypsy moth egg sac.
bo	Red Maple	*Acer rubrum*	Native	51.0	2	3.5	Possible	Poor	Public	Remove	Included bark; secondary stem dead; asymmetrical crown due south; dieback.
bp	Red Maple	*Acer rubrum*	Native	140.0	2	9.0	Possible	Poor	Private	Remove	Codominant stems, each with history of significant failure; loose bark; 20% live crown lost; fruiting bodies on 1 stem. Potential bat roosting habitat.
bq	White Elm	*Ulmus americana*	Native	18.0	1	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; vines; included bark.
br	Crack Willow	*Salix fragilis*	Non-Native	21.0	1	4.0	Improbable	Fair	Public	Remove	Broken top; water sprouts; sapsucker holes.
bs	Willow species	*Salix sp.*	Native	20.0	1	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; epicormic growth.
bt	Crack Willow	*Salix fragilis*	Non-Native	15.0	1	3.0	Possible	Fair	Public	Remove	Secondary stem dead; epicormic growth.
bu	Willow species	*Salix sp.*	Native	85.0	3	6.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; included bark; small broken branches.
bv	Crack Willow	*Salix fragilis*	Non-Native	20.0	1	6.0	Possible	Fair	Private	Remove	Upper stem severely bent; water sprouts; leader superseded.
bw	Red Oak	*Quercus rubra*	Native	42.2	1	5.5	Improbable	Good	Public	Remove	Upright form; fencewire through stem; history of 1 branch failure.
bx	Large-tooth Aspen	*Populus grandidentata*	Native	17.0	1	3.0	Improbable	Good	Private	Remove	Strong taper; good form.
by	Red Maple	*Acer rubrum*	Native	61.0	2	4.0	Possible	Very Poor	Public	Remove	Broken top; branch rub; compartmentalized wounds; cavities; loose bark; asymmetrical crown due south; rot. Potential bat roosting habitat.
bz	Large-tooth Aspen	*Populus grandidentata*	Native	13.0	1	2.5	Improbable	Good	Public	Retain	Slightly asymmetrical crown.
ca	Large-tooth Aspen	*Populus grandidentata*	Native	15.0	1	2.5	Improbable	Good	Public	Retain	Light pruning; vines.
cb	Black Cherry	*Prunus serotina*	Native	32.0	1	5.0	Improbable	Fair	Private	Retain	Former secondary stem dead; 2 dead branches.
cc	Large-tooth Aspen	*Populus grandidentata*	Native	19.0	1	2.5	Improbable	Good	Public	Remove	Light pruning; vines.
cd	Large-tooth Aspen	*Populus grandidentata*	Native	13.8	1	3.0	Possible	Fair	Public	Remove	Crooked stem, once lost leader.
ce	Large-tooth Aspen	*Populus grandidentata*	Native	12.0	1	2.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; light pruning; vines.
cf	Red Oak	*Quercus rubra*	Native	43.0	1	8.0	Improbable	Good	Private	Retain	4 small dead branches; asymmetrical crown due to neighbouring tree; 1 tight union.
cg	Red Oak	*Quercus rubra*	Native	51.0	1	7.0	Improbable	Good	Private	Retain	Good structure; 1 broken branch.
ch	Red Oak	*Quercus rubra*	Native	58.0	1	3.5	Improbable	Fair	Private	Retain	Asymmetrical crown due south; branch rub; sign affixed to stem; compartmentalized wounds; small dead branches.
ci	Red Oak	*Quercus rubra*	Native	91.0	2	8.0	Improbable	Good	Public	Remove	Codominant stems with included bark; crossing branches; 1 dead branch; fencewire through stem.
cj	Willow species	*Salix sp.*	Native	42.6	2	3.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; stem lean south; vines; water sprouts from broken top.
ck	Large-tooth Aspen	*Populus grandidentata*	Native	12.0	1	3.0	Improbable	Fair	Public	Remove	Crown asymmetrical and suppressed.
cl	Willow species	*Salix sp.*	Native	17.1	1	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; stem lean south; vines; water sprouts.
cm	Large-tooth Aspen	*Populus grandidentata*	Native	17.0	1	3.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; light pruning; stem lean.
cn	Red Maple	*Acer rubrum*	Native	98.0	2	5.0	Improbable	Fair	Private	Retain	Asymmetrical crown due south; epicormic growth; branch rub; included bark.
co	Large-tooth Aspen	*Populus grandidentata*	Native	13.1	1	3.0	Improbable	Good	Public	Remove	Closed stem wound; slightly asymmetrical crown.
cp	Willow species	*Salix sp.*	Native	62.0	1	3.0	Improbable	Fair	Boundary	Retain	Asymmetrical crown due south; broken branch; water sprouts; cavities.
cq	Large-tooth Aspen	*Populus grandidentata*	Native	11.0	1	2.5	Improbable	Good	Public	Remove	2 dead branches, otherwise healthy.
cr	Large-tooth Aspen	*Populus grandidentata*	Native	14.0	1	2.5	Improbable	Good	Public	Remove	Growing through wire fence; vine in crown.
cs	Large-tooth Aspen	*Populus grandidentata*	Native	12.1	1	3.0	Improbable	Good	Public	Remove	Asymmetrical crown.
ct	Red Oak	*Quercus rubra*	Native	69.0	1	7.0	Possible	Fair	Public	Remove	Dead branches; asymmetrical crown due south; epicormic growth; sign affixed to stem; stem compartmentalized around fence.
cu	Large-tooth Aspen	*Populus grandidentata*	Native	10.5	1	2.0	Improbable	Good	Public	Remove	1 small dead branch; strong taper.
cv	Large-tooth Aspen	*Populus grandidentata*	Native	11.9	1	2.5	Possible	Fair	Public	Remove	Growing through wire fence; arching lean towards road; vine in crown.
cw	Large-tooth Aspen	*Populus grandidentata*	Native	10.7	1	1.0	Improbable	Good	Public	Remove	Light pruning; stem abuts wire fence.
cx	Large-tooth Aspen	*Populus grandidentata*	Native	15.0	1	2.5	Improbable	Good	Public	Remove	Asymmetrical crown due south; stem lean south; light pruning.
cy	Large-tooth Aspen	*Populus grandidentata*	Native	16.5	1	3.0	Improbable	Excellent	Public	Remove	Good form; strong taper.
cz	Large-tooth Aspen	*Populus grandidentata*	Native	13.0	1	3.5	Improbable	Fair	Public	Remove	Sparse crown.
da	Large-tooth Aspen	*Populus grandidentata*	Native	12.4	1	2.5	Improbable	Fair	Public	Remove	Asymmetrical crown due south; stem lean south; light pruning; phototrophic growth; vines.
db	Large-tooth Aspen	*Populus grandidentata*	Native	12.0	1	3.0	Improbable	Fair	Public	Remove	Swollen tissues where stem grew around wire fence; suppressed by large white pine.
dc	Eastern White Pine	*Pinus strobus*	Native	105.0	1	8.0	Possible	Fair	Public	Remove	Open wound in stem, sapwood decay; dead lower branches; 2 broken branches.
dd	Trembling Aspen	*Populus tremuloides*	Native	12.4	1	2.5	Improbable	Good	Public	Remove	Slightly asymmetrical crown ; light pruning.
de	Large-tooth Aspen	*Populus grandidentata*	Native	22.0	1	4.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; light pruning.
df	Large-tooth Aspen	*Populus grandidentata*	Native	42.0	3	4.5	Improbable	Good	Boundary	Remove	Codominant stems.
dg	Large-tooth Aspen	*Populus grandidentata*	Native	11.0	1	3.0	Possible	Fair	Private	Remove	Crooked stem, once lost leader.

Map 1

Kirby Road EA

Tree Tables
(Part One)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2339	Date: July 16, 2021

Map 1

Kirby Road EA

Tree Tables (Part Two)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2339	Date: July 16, 2021

Kirby Road EA Tree Protection Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native / Non-native	DBH (cm)	Stem Count	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Comments
dh	Red Oak	*Quercus rubra*	Native	26.0	1	5.0	Improbable	Excellent	Private	Remove	Good structure, good root flare; gypsy moth egg sac.
di	Trembling Aspen	*Populus tremuloides*	Native	22.0	1	4.0	Improbable	Fair	Private	Remove	2 dead branches; crooked stem.
dj	Black Cherry	*Prunus serotina*	Native	50.0	1	6.0	Possible	Poor	Public	Remove	Vines; dieback; improper branch pruning; water sprouts; compartmentalized wounds; basal wound compartmentalized, some rot.
dk	Red Oak	*Quercus rubra*	Native	71.0	1	5.0	Possible	Good	Public	Remove	Stem compartmentalized around fence and sign fixtures; small dead branches; branch rub.
dl	Large-tooth Aspen	*Populus grandidentata*	Native	22.0	1	3.5	Improbable	Good	Private	Retain	Closed basal wound; couple dead branches.
dm	Red Oak	*Quercus rubra*	Native	27.0	1	5.5	Improbable	Good	Public	Remove	Codominant leaders; included bark; branch rub; stem compartmentalized around fence.
dn	Red Oak	*Quercus rubra*	Native	61.0	2	4.0	Possible	Fair	Public	Remove	Included bark; branch rub; basal rot; compartmentalized wounds; small dead branches.
do	Red Oak	*Quercus rubra*	Native	95.0	1	9.0	Improbable	Good	Private	Remove	Strong central leader, good structure; fencewire through stem; 1 dead scaffold branch, 3 dead smaller branches; some epicormic growth; many gypsy moth egg sacs.
dp	Black Cherry	*Prunus serotina*	Native	35.0	1	3.0	Improbable	Fair	Public	Remove	Asymmetrical crown due south; phototrophic growth; compartmentalized wounds; branch rub; light pruning.
dq	Red Oak	*Quercus rubra*	Native	48.0	1	6.0	Possible	Fair	Private	Remove	Bark seam in lower stem/root flare; good branch stub closure; 6 dead branches; epicormic growth; unbalanced crown.
dr	Red Oak	*Quercus rubra*	Native	48.0	1	5.5	Possible	Fair	Public	Remove	Epicormic growth; good branch stub closure; compartmentalized wounds; branch rub; stem compartmentalized around fence; small dead branches.
ds	Red Oak	*Quercus rubra*	Native	35.0	1	4.0	Improbable	Fair	Public	Remove	Stem compartmentalized around fence; improper branch pruning; water sprouts; small dead branches.
dt	Red Oak	*Quercus rubra*	Native	43.0	1	5.0	Possible	Fair	Boundary	Remove	4 dead branches (1 scaffold); couple poor branch attachments; shedding outer bark in a few places.
du	Red Oak	*Quercus rubra*	Native	48.0	1	6.5	Possible	Fair	Private	Remove	Strange woundwood on lower stem; 8 dead branches; 2 broken branches; basal shoots; fencewire through stem; good structure.
dv	Black Cherry	*Prunus serotina*	Native	105.0	3	3.5	Possible	Poor	Public	Remove	Compartmentalized wounds; basal rot; cavities; loose bark; history of branch failure; phototrophic growth; epicormic growth. Potential bat roosting habitat.
dw	Red Oak	*Quercus rubra*	Native	38.0	1	3.5	Possible	Fair	Public	Remove	Epicormic growth; hangers; branch rub; small dead branches.
dx	Red Oak	*Quercus rubra*	Native	27.0	1	6.5	Possible	Fair	Public	Remove	Asymmetrical crown due south; dead branches; slightly suppressed.
dy	Red Oak	*Quercus rubra*	Native	62.0	1	9.0	Possible	Fair	Boundary	Remove	Some basal rot visible; 3 dead branches; 2 broken scaffold branches; crown asymmetrical towards Kirby Road.
dz	Red Oak	*Quercus rubra*	Native	65.0	1	4.5	Possible	Good	Boundary	Remove	Small dead branches; hangers; good branch closure; large dead structural branch.
ea	Red Oak	*Quercus rubra*	Native	90.0	1	8.0	Improbable	Fair	Boundary	Remove	Pronounced root flare supporting large stem; 1 dead and broken scaffold branch; retaining leaves; many gypsy moth egg sacs.
eb	Large-tooth Aspen	*Populus grandidentata*	Native	16.0	1	3.5	Improbable	Good	Public	Remove	Asymmetrical crown due south.
ec	Red Oak	*Quercus rubra*	Native	19.0	1	4.5	Improbable	Fair	Boundary	Remove	Vines; slightly suppressed; branch rub.
ed	Large-tooth Aspen	*Populus grandidentata*	Native	14.0	1	3.0	Improbable	Fair	Private	Remove	Bark seam at base; 1 dead branch.
ee	Red Oak	*Quercus rubra*	Native	33.0	1	6.0	Improbable	Good	Private	Retain	Good root flare; good structure but codominant leaders in top; 1 dead branch.
ef	Red Oak	*Quercus rubra*	Native	70.0	3	6.0	Possible	Poor	Boundary	Remove	Small stem dead; 2 smaller stems with broken tops; rot; branch rub; epicormic growth; dead branches; hangers.
eg	Red Oak	*Quercus rubra*	Native	62.0	1	7.5	Possible	Fair	Private	Retain	Basal decay visible; 5 dead branches; good branch stub closure.
eh	American Basswood	*Tilia americana*	Native	54.0	2	4.6	Possible	Poor	Private	Remove	Branch rub; canker; suppressed; small dead branches; phototrophic growth; some rot; stem lean east; small stem leaning down, broken top.
ei	Red Oak	*Quercus rubra*	Native	110.0	1	8.5	Possible	Fair	Private	Retain	Codominant leaders, possible included bark; fencewire through stem; round crown; 4 dead branches.
ej	White Ash	*Fraxinus americana*	Native	14.0	1	5.0	Improbable	Fair	Private	Remove	Asymmetrical crown due south; vines; phototrophic growth; slightly suppressed.
ek	Red Oak	*Quercus rubra*	Native	70.0	1	7.5	Possible	Good	Private	Retain	Good branch closure; woundwood; dead branches; hangers.
el	Red Oak	*Quercus rubra*	Native	52.0	1	5.5	Possible	Good	Boundary	Remove	Codominant leaders; small dead branches; branch rub.
em	Red Oak	*Quercus rubra*	Native	66.0	1	8.5	Possible	Good	Private	Remove	Good branch closure; large dead branches, rot; branch rub; woundwood; stem compartmentalized around fence.
en	Black Cherry	*Prunus serotina*	Native	85.0	2	7.0	Possible	Poor	Private	Remove	Codominant stems with included bark; basal rot visible; history of branch failure; a few poor branch attachments; 3 dead branches; gypsy moth egg sacs.
eo	Red Oak	*Quercus rubra*	Native	28.0	1	5.0	Improbable	Good	Private	Retain	Wound in lower stem partially closed, woundwood; strong central leader; healthy crown.
ep	Red Oak	*Quercus rubra*	Native	78.0	1	7.0	Improbable	Fair	Private	Remove	History of branch failure; codominant leaders; included bark; branch rub; large compartmentalized wound on lower stem where leader failed, some rot.
eq	Red Oak	*Quercus rubra*	Native	19.0	1	5.5	Possible	Fair	Private	Retain	Long frost crack up stem; codominant leaders, 1 broken; remaining leader leaning southeast; poor structure.
er	White Ash	*Fraxinus americana*	Native	19.0	1	2.5	Possible	Poor	Private	Remove	Dieback; epicormic growth; EAB; woodpecker damage.
es	Eastern White Pine	*Pinus strobus*	Native	64.0	1	7.5	Improbable	Good	Private	Remove	2 dead branches; few past failures.
et	White Ash	*Fraxinus americana*	Native	32.0	1	0.5	Probable	Dead	Private	Remove	Basal rot; cavities; woodpecker damage; resting on adjacent tree. Potential bat roosting habitat.
eu	Red Oak	*Quercus rubra*	Native	21.0	2	3.0	Improbable	Good	Boundary	Remove	Codominant stems; suppressed crown with vines.
ev	White Ash	*Fraxinus americana*	Native	12.0	1	2.5	Possible	Fair	Public	Remove	Asymmetrical crown due south; phototrophic growth; canker; vines.
ew	Large-tooth Aspen	*Populus grandidentata*	Native	18.0	1	4.0	Possible	Fair	Private	Remove	Once lost leader, still hung up; lateral became leader.
ex	Large-tooth Aspen	*Populus grandidentata*	Native	18.5	1	3.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; branch rub; phototrophic growth.
ey	Large-tooth Aspen	*Populus grandidentata*	Native	17.0	1	4.0	Improbable	Good	Private	Remove	Good structure.
ez	Large-tooth Aspen	*Populus grandidentata*	Native	19.0	1	4.0	Improbable	Fair	Boundary	Remove	Basal shoot; asymmetrical crown due to neighbouring tree; gypsy moth egg sacs.
fa	Large-tooth Aspen	*Populus grandidentata*	Native	28.0	1	5.0	Possible	Fair	Private	Retain	Centre rot visible through basal wound; crooked upper stem; sign affixed.
fb	Large-tooth Aspen	*Populus grandidentata*	Native	14.0	3	2.5	Improbable	Good	Public	Remove	2 stems under 10 DBH; asymmetrical crown due south; phototrophic growth.
fc	Large-tooth Aspen	*Populus grandidentata*	Native	15.0	1	3.0	Improbable	Good	Public	Remove	Strong central leader.
fd	Large-tooth Aspen	*Populus grandidentata*	Native	11.7	1	2.0	Improbable	Poor	Public	Remove	Canker; rot; poorly compartmentalized around canker; asymmetrical crown due south.
fe	Eastern White Pine	*Pinus strobus*	Native	115.0	1	7.5	Improbable	Fair	Private	Remove	Many old pruning cuts, some of large-diameter branches; weak leader, 2 huge laterals arch upward from 2-3m height; fairly healthy crown.
ff	Large-tooth Aspen	*Populus grandidentata*	Native	11.9	1	2.0	Improbable	Fair	Public	Remove	Asymmetrical crown due south; stem abuts wire fence; vines; phototrophic growth.
fg	Large-tooth Aspen	*Populus grandidentata*	Native	18.0	1	4.0	Improbable	Good	Private	Remove	Crooked stem, phototrophic growth; vigorous lateral; gypsy moth egg sac.
fh	Large-tooth Aspen	*Populus grandidentata*	Native	16.0	1	2.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; vines; phototrophic growth.
fi	Large-tooth Aspen	*Populus grandidentata*	Native	14.0	1	3.0	Improbable	Good	Private	Remove	Codominant leaders; vine in lower crown.
fj	Large-tooth Aspen	*Populus grandidentata*	Native	11.7	1	3.0	Improbable	Good	Public	Remove	Asymmetrical crown due south; branch rub; phototrophic growth.
fk	Black Cherry	*Prunus serotina*	Native	55.0	2	6.0	Possible	Poor	Private	Remove	Codominant stems with included bark; basal rot visible; crown dieback; fencewire through stem; gypsy moth egg sacs.
fl	Red Oak	*Quercus rubra*	Native	21.0	1	4.5	Improbable	Fair	Private	Retain	3 small dead branches; codominant leaders in top.
fm	White Birch	*Betula papyrifera*	Native	14.0	1	3.5	Improbable	Good	Private	Retain	High crown; crooked stem.
fn	Black Cherry	*Prunus serotina*	Native	60.0	1	11.0	Probable	Very Poor	Private	Remove	Asymmetrical crown due southwest; cavities; rot; peeled bark; large dead branches; basal rot; major crown dieback; woodpecker damage. Potential bat roosting habitat.
fo	Red Oak	*Quercus rubra*	Native	25.8	1	4.0	Improbable	Good	Private	Retain	Good structure though asymmetrical due to neighbouring tree; many gypsy moth egg sacs.
fp	Red Oak	*Quercus rubra*	Native	18.5	1	4.0	Improbable	Good	Private	Retain	Tight union with primary scaffold branch; small dead branches; gypsy moth egg sacs.
fq	Red Oak	*Quercus rubra*	Native	19.8	1	5.0	Improbable	Fair	Private	Retain	Vines; asymmetrical crown due south; slightly suppressed.
fr	Red Oak	*Quercus rubra*	Native	17.0	1	4.5	Improbable	Good	Private	Retain	Good structure but somewhat sparsely branched; gypsy moth egg sac.
fs	Red Oak	*Quercus rubra*	Native	13.5	1	4.0	Improbable	Fair	Private	Retain	Growing through wire fence; healthy crown, asymmetrical due to neighbouring tree.
ft	Red Oak	*Quercus rubra*	Native	28.1	2	4.5	Improbable	Fair	Private	Retain	Asymmetrical crown due south; included bark; branch rub.
fu	Red Oak	*Quercus rubra*	Native	10.3	1	1.5	Improbable	Fair	Boundary	Retain	Asymmetrical crown due south; slightly suppressed.
fv	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	20.0	1	4.5	Improbable	Excellent	Private	Retain	Good structure, strong central leader; slightly asymmetrical.
fw	Black Cherry	*Prunus serotina*	Native	38.0	1	4.0	Possible	Fair	Private	Retain	Asymmetrical crown due south; light pruning; history of branch failure; stem lean south.
fx	White Birch	*Betula papyrifera*	Native	29.0	1	6.0	Probable	Very Poor	Private	Retain	Former second stem died and failed; remaining stem leans southeast; 80% live crown lost through failures; dieback.
fy	Red Oak	*Quercus rubra*	Native	21.0	1	4.0	Improbable	Fair	Private	Retain	Asymmetrical crown due south; some dieback.
fz	Red Oak	*Quercus rubra*	Native	33.7	1	6.0	Improbable	Fair	Private	Remove	Few small dead branches; epicormic growth; fencewire through stem.
ga	White Birch	*Betula papyrifera*	Native	37.0	1	8.5	Possible	Poor	Private	Retain	Asymmetrical crown due southeast; codominant leaders; one leader with broken top; included bark; stem lean southeast.
gb	Black Cherry	*Prunus serotina*	Native	35.0	1	4.5	Possible	Poor	Private	Retain	Swollen root flare; leaning southwest towards Kirby Road; high crown, dead leader; dieback.
gc	White Birch	*Betula papyrifera*	Native	30.0	1	0.5	Probable	Dead	Private	Remove	Basal rot; stem lean south; no crown.
gd	White Ash	*Fraxinus americana*	Native	18.2	1	3.0	Improbable	Fair	Private	Remove	Asymmetrical crown due south; codominant leaders; included bark; woodpecker damage; vines.
ge	Black Cherry	*Prunus serotina*	Native	49.0	2	5.0	Probable	Dead	Private	Remove	Codominant stems; dead crown; patchy bark.
gf	Black Cherry	*Prunus serotina*	Native	23.0	1	3.5	Possible	Poor	Private	Retain	Dieback; epicormic growth; history of branch failure; dead branches.
gg	Red Oak	*Quercus rubra*	Native	37.1	1	5.5	Improbable	Good	Private	Retain	Couple tight unions; 1 dead branch.
gh	Black Cherry	*Prunus serotina*	Native	23.0	1	5.5	Possible	Very Poor	Private	Retain	Basal rot, fruiting bodies; open stem wound; 50% live crown lost.
gi	Bitternut Hickory	*Carya cordiformis*	Native	17.0	1	3.5	Improbable	Fair	Private	Retain	Asymmetrical crown due south; branch rub; slightly suppressed.
gj	Black Cherry	*Prunus serotina*	Native	18.0	1	0.5	Probable	Dead	Private	Remove	Basal rot; upslope of ROW.
gk	Pussy Willow	*Salix discolor*	Native	12.0	1	3.0	Improbable	Fair	Private	Retain	Branch rub; included bark.
gl	Red Oak	*Quercus rubra*	Native	14.0	1	3.5	Improbable	Fair	Private	Retain	Good structure; some epicormic growth; strong taper.
gm	Cypress species	*Cupressaceae sp.*	Non-Native	12.0	1	1.0	Improbable	Good	Private	Retain	Good form; healthy crown.
gn	English Oak	*Quercus robur*	Non-Native	12.0	1	1.0	Improbable	Good	Private	Retain	Fastigiate; slightly asymmetrical; retaining leaves.
go	English Oak	*Quercus robur*	Non-Native	10.0	1	0.5	Improbable	Good	Private	Retain	No visible defects.
gp	Norway Maple	*Acer platanoides*	Non-Native	14.0	1	2.0	Improbable	Good	Private	Retain	Well-spaced branches.
gq	Bitternut Hickory	*Carya cordiformis*	Native	51.5	2	2.5	Possible	Fair	Private	Retain	Vines; suppressed; some dieback; included bark.
gr	Freeman's Maple	*Acer X freemanii*	Native	33.2	2	3.0	Improbable	Fair	Private	Retain	Codominant stems with included bark; guywire through stem; vine in narrow crown.
gs	Green Ash	*Fraxinus pennsylvanica*	Native	15.1	1	2.5	Possible	Poor	Private	Retain	Sharp arching lean away from Kirby Road; loose bark; insect galleries; water sprouts.
gt	Green Ash	*Fraxinus pennsylvanica*	Native	12.3	1	3.0	Possible	Poor	Private	Retain	Leaning towards Kirby Road; EAB exit holes; insect galleries; epicormic growth; topped.
gu	Green Ash	*Fraxinus pennsylvanica*	Native	13.9	1	2.0	Possible	Poor	Private	Retain	Once lost leader, crooked stem; epicormic growth; bark cracks.
gv	Green Ash	*Fraxinus pennsylvanica*	Native	11.1	1	0.5	Possible	Poor	Private	Retain	EAB exit holes; insectivore action; topped for power lines; epicormic growth.
gw	White Birch	*Betula papyrifera*	Native	10.6	3	3.0	Improbable	Fair	Private	Retain	Codominant stems; past pruning.
gx	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	13.2	1	2.5	Improbable	Fair	Private	Retain	Reaction wood at base and in stem where guywire is girdling.
gy	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	16.8	1	3.5	Improbable	Fair	Private	Retain	Woundwood around guywire site; 1 tight union; decent form; small dead branches.
gz	Green Ash	*Fraxinus pennsylvanica*	Native	11.2	1	2.5	Probable	Very Poor	Private	Retain	EAB; loose bark; insect galleries; epicormic growth; topped.

Kirby Road EA Tree Protection Plan
Tree Inventory Data

Tree Number	Common Name	Scientific Name	Native / Non-native	DBH (cm)	Stem Count	Crown Radius (m)	Potential for Structural Failure Rating	Overall Condition	Location	Proposed Action	Comments
ha	Green Ash	*Fraxinus pennsylvanica*	Native	15.6	1	2.0	Probable	Very Poor	Private	Retain	EAB exit holes; epicormic growth; dieback; insect galleries; basal shoots.
hb	Red Oak	*Quercus rubra*	Native	25.2	1	3.5	Improbable	Good	Private	Retain	Good structure; retaining leaves; very minor epicormic growth.
hc	White Spruce	*Picea glauca*	Native	18.0	1	2.5	Improbable	Good	Private	Retain	Good form; good fruit set; vine in crown.
hd	Norway Spruce	*Picea abies*	Non-Native	20.0	1	2.5	Improbable	Good	Private	Retain	Light pruning.
he	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-Native	17.0	1	3.0	Improbable	Good	Private	Retain	Crown appears healthy; vine in crown.
hf	Red Oak	*Quercus rubra*	Native	25.0	1	4.0	Improbable	Good	Private	Retain	Included bark; branch rub; small dead branches.
hg	Mountain-Ash species	*Sorbus sp.*	Native	15.0	1	2.0	Improbable	Good	Private	Retain	Included bark; branch rub; small dead branches.
hh	Norway Spruce	*Picea abies*	Non-Native	20.0	1	4.0	Improbable	Good	Private	Retain	Light pruning; branch rub; vines.
hi	Norway Spruce	*Picea abies*	Non-Native	21.0	1	3.5	Improbable	Fair	Private	Retain	Crown thinning with vine throughout.
hj	Colorado Spruce	*Picea pungens*	Non-Native	21.0	1	3.0	Improbable	Good	Private	Retain	Interior thinning.
hk	White Mulberry	*Morus alba*	Non-Native	20.0	1	4.5	Improbable	Fair	Private	Retain	Branch rub; improper branch pruning; epicormic growth; abuts fence.
hl	Siberian Elm	*Ulmus pumila*	Non-Native	14.0	1	3.0	Possible	Fair	Private	Retain	Stem lean north; branch rub.
hm	Colorado Spruce	*Picea pungens*	Non-Native	18.0	1	2.5	Improbable	Good	Private	Retain	Light pruning.
hn	Colorado Spruce	*Picea pungens*	Non-Native	19.0	1	3.5	Improbable	Fair	Private	Retain	Interior thinning; weak leader.
ho	Colorado Spruce	*Picea pungens*	Non-Native	22.0	1	3.5	Improbable	Fair	Private	Retain	Interior thinning; irregular crown.
hp	Colorado Spruce	*Picea pungens*	Non-Native	24.0	1	4.0	Improbable	Fair	Private	Retain	Light pruning; branch rub; slightly suppressed.
hq	White Birch	*Betula papyrifera*	Native	10.0	2	3.5	Improbable	Fair	Private	Retain	Small dead branches; one leader with broken top.
hr	Russian Olive	*Elaeagnus angustifolia*	Non-Native	20.0	1	3.0	Improbable	Fair	Private	Retain	Asymmetrical crown due north; branch rub; stem abuts fence.
hs	Russian Olive	*Elaeagnus angustifolia*	Non-Native	11.0	3	4.0	Improbable	Good	Private	Retain	Shrubby growth in backyard.
ht	Freeman's Maple	*Acer X freemanii*	Native	30.0	1	6.0	Improbable	Fair	Private	Retain	Branch rub; history of branch pruning; included bark.
hu	Norway Maple	*Acer platanoides*	Non-Native	19.0	1	3.5	Improbable	Good	Private	Retain	Healthy crown slightly asymmetrical due to neighbouring tree; codominant leaders.
hv	Siberian Elm	*Ulmus pumila*	Non-Native	19.0	1	4.0	Improbable	Fair	Private	Retain	Included bark; branch rub; branch resting on fence; broken leader.
hw	Thornless Honey Locust	*Gleditsia triacanthos var. inermis*	Non-Native	25.0	1	4.5	Improbable	Good	Private	Retain	2 small dead branches; heading cuts on some branches; codominant leaders.
hx	Red Pine	*Pinus resinosa*	Native	16.0	1	3.0	Improbable	Fair	Private	Retain	Branch rub; included bark; light pruning.
hy	White Spruce	*Picea glauca*	Native	28.5	1	2.5	Improbable	Good	Private	Retain	Healthy crown asymmetrical to southwest due to neighbouring tree; interior thinning.
hz	Norway Spruce	*Picea abies*	Non-Native	15.0	1	2.0	Improbable	Good	Private	Retain	Interior needles browning.
ia	White Spruce	*Picea glauca*	Native	15.0	1	2.0	Improbable	Good	Private	Retain	Good form.
ib	Norway Spruce	*Picea abies*	Non-Native	15.0	1	2.0	Improbable	Good	Private	Retain	Irregular crown, phototrophic growth.
ic	White Spruce	*Picea glauca*	Native	20.0	1	2.5	Improbable	Good	Private	Retain	Light pruning; lower branch pruning; slightly suppressed.
id	White Spruce	*Picea glauca*	Native	22.0	1	3.0	Improbable	Good	Private	Retain	Good form; heavy fruit set; minor browning of interior needles.
ie	White Spruce	*Picea glauca*	Native	20.0	2	2.5	Improbable	Good	Private	Retain	Light pruning; lower branch pruning; codominant leaders.
if	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	25.0	1	3.0	Improbable	Good	Private	Retain	No visible defects.
ig	Sugar Maple	*Acer saccharum ssp. saccharum*	Native	22.0	1	3.0	Improbable	Good	Private	Retain	Branch rub.
ih	Eastern Red Cedar	*Juniperus virginiana*	Native	10.0	1	1.0	Improbable	Good	Private	Retain	No visible defects.
ii	Eastern Red Cedar	*Juniperus virginiana*	Native	10.0	1	1.0	Improbable	Good	Private	Retain	No visible defects.
ij	Colorado Spruce	*Picea pungens*	Non-Native	25.0	1	2.5	Improbable	Good	Private	Retain	Light pruning.
ik	Colorado Spruce	*Picea pungens*	Non-Native	22.0	1	2.5	Improbable	Fair	Private	Retain	Light pruning; slightly suppressed.
il	Colorado Spruce	*Picea pungens*	Non-Native	24.0	1	2.5	Improbable	Good	Private	Retain	Light pruning.
im	Colorado Spruce	*Picea pungens*	Non-Native	25.0	1	2.5	Improbable	Good	Private	Retain	Light pruning.
in	Colorado Spruce	*Picea pungens*	Non-Native	25.0	1	2.5	Improbable	Good	Private	Retain	Light pruning; codominant leaders; branch rub.
io	Colorado Spruce	*Picea pungens*	Non-Native	27.0	1	2.5	Improbable	Good	Private	Retain	Light pruning.
ip	Colorado Spruce	*Picea pungens*	Non-Native	14.0	1	2.0	Improbable	Good	Private	Retain	No visible defects.
iq	Eastern Red Cedar	*Juniperus virginiana*	Native	10.0	1	0.5	Improbable	Good	Private	Retain	No visible defects.
ir	Colorado Spruce	*Picea pungens*	Non-Native	27.0	1	2.0	Improbable	Good	Private	Retain	No visible defects.
is	White Birch	*Betula papyrifera*	Native	33.0	4	3.0	Improbable	Good	Private	Retain	Branch rub.
it	White Birch	*Betula papyrifera*	Native	10.0	1	3.0	Improbable	Good	Private	Retain	Stem lean south.
iu	Colorado Spruce	*Picea pungens*	Non-Native	21.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
iv	Colorado Spruce	*Picea pungens*	Non-Native	18.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
iw	Colorado Spruce	*Picea pungens*	Non-Native	24.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
ix	Colorado Spruce	*Picea pungens*	Non-Native	22.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
iy	Eastern Hemlock	*Tsuga canadensis*	Native	10.0	2	1.0	Improbable	Good	Private	Retain	No visible defects.
iz	Eastern Red Cedar	*Juniperus virginiana*	Native	10.0	1	1.0	Improbable	Good	Private	Retain	No visible defects.
ja	Eastern Red Cedar	*Juniperus virginiana*	Native	10.0	1	0.5	Improbable	Good	Private	Retain	No visible defects.
jb	Eastern Red Cedar	*Juniperus virginiana*	Native	10.0	1	0.5	Improbable	Good	Private	Retain	No visible defects.
jc	Colorado Spruce	*Picea pungens*	Non-Native	19.0	1	2.0	Improbable	Good	Private	Retain	No visible defects.
jd	Alaska Yellow Cedar	*Cupressus nootkatensis*	Non-Native	10.0	1	0.5	Improbable	Good	Private	Retain	No visible defects.
je	Alaska Yellow Cedar	*Cupressus nootkatensis*	Non-Native	10.0	1	1.5	Improbable	Good	Private	Retain	No visible defects.
jf	Alaska Yellow Cedar	*Cupressus nootkatensis*	Non-Native	12.0	1	1.5	Improbable	Fair	Private	Retain	Codominant leaders; branch rub; fungus.
jg	Alaska Yellow Cedar	*Cupressus nootkatensis*	Non-Native	10.0	1	1.5	Improbable	Good	Private	Retain	No visible defects.
jh	Black Locust	*Robinia pseudoacacia*	Non-Native	15.0	1	2.0	Improbable	Fair	Private	Retain	Branch rub; included bark; small hanger.
ji	Willow species	*Salix sp.*	Native	55.0	3	4.0	Improbable	Fair	Private	Retain	Asymmetrical crown due south; stem lean south.
jj	Norway Maple	*Acer platanoides*	Non-Native	20.0	1	3.5	Improbable	Fair	Private	Retain	Included bark; slightly suppressed; codominant leaders.
jk	Freeman's Maple	*Acer X freemanii*	Native	28.0	1	2.5	Improbable	Good	Private	Retain	Included bark; codominant leaders.
jl	White Spruce	*Picea glauca*	Native	25.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
jm	White Spruce	*Picea glauca*	Native	20.0	1	2.0	Improbable	Good	Private	Retain	No visible defects.
jn	White Spruce	*Picea glauca*	Native	28.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
jo	White Spruce	*Picea glauca*	Native	26.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
jp	White Spruce	*Picea glauca*	Native	22.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
jq	White Spruce	*Picea glauca*	Native	25.0	1	3.0	Improbable	Good	Private	Retain	No visible defects.
jr	White Spruce	*Picea glauca*	Native	22.0	1	2.5	Improbable	Good	Private	Retain	No visible defects.
js	White Spruce	*Picea glauca*	Native	27.0	1	2.5	Improbable	Good	Private	Retain	Interior needle thinning.
jt	Colorado Spruce	*Picea pungens*	Non-Native	12.0	1	1.5	Improbable	Good	Private	Retain	Good form.
ju	Colorado Spruce	*Picea pungens*	Non-Native	14.0	1	1.5	Improbable	Good	Private	Retain	Good form.
jv	Common Apple	*Malus domestica*	Non-Native	33.5	2	3.0	Possible	Poor	Private	Remove	Codominant stems with basal decay; former third stem failed, opening space between stems; 10% dieback; vine in crown.
jw	Norway Maple	*Acer platanoides*	Non-Native	25.8	1	4.0	Possible	Fair	Private	Remove	Asymmetrical crown due south; branch rub; included bark; hanger; history of branch pruning; compartmentalized wounds; epicormic growth; multi leaders.
jx	White Ash	*Fraxinus americana*	Native	14.0	1	2.5	Probable	Dead	Boundary	Remove	EAB exit holes; shedding bark; broken top; near power lines.
jy	White Ash	*Fraxinus americana*	Native	14.0	3	2.5	Probable	Dead	Boundary	Remove	EAB exit holes; insect galleries; shedding bark; topped, near power lines.
jz	White Ash	*Fraxinus americana*	Native	13.0	1	2.0	Probable	Dead	Boundary	Remove	EAB exit holes; insect galleries; near power lines.

Section 1

KIRBY RD

JANE ST

Section 2

KIRBY RD

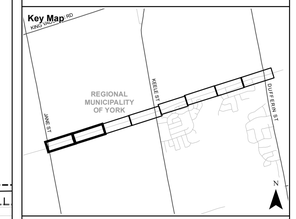
Don River West Branch

Map 2a

Kirby Road EA

Tree Protection Fencing Plan

Key Map



Legend

- Parcel Boundary
- Right of Way (ROW)
- Grading
- Preliminary Design
- Inventoried Tree to be Retained (Crown to Scale)
- Minimum Tree Protection Zone (TPZ)
- Tree Protection Fencing (TPF)
- Permanent Watercourse
- Wooded Area

Oak Ridges Moraine Land Use Designation

- Natural Core Area
- Natural Linkage Area
- Settlement Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 2339
Date: July 16, 2021

NAD83 - UTM Zone 17
Size: 24x36"
1:650

0 10 20 30 40 Metres

N

Section 3

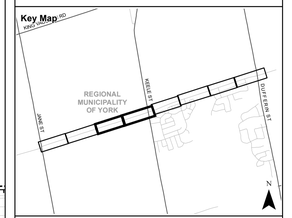
KIRBY RD

Map 2b

Kirby Road EA

Tree Protection Fencing Plan

Key Map NTS



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Project: 2339 Date: July 16, 2021	NAD83 - UTM Zone 17 Size: 24x36" 1:650

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Section 4

KIRBY RD

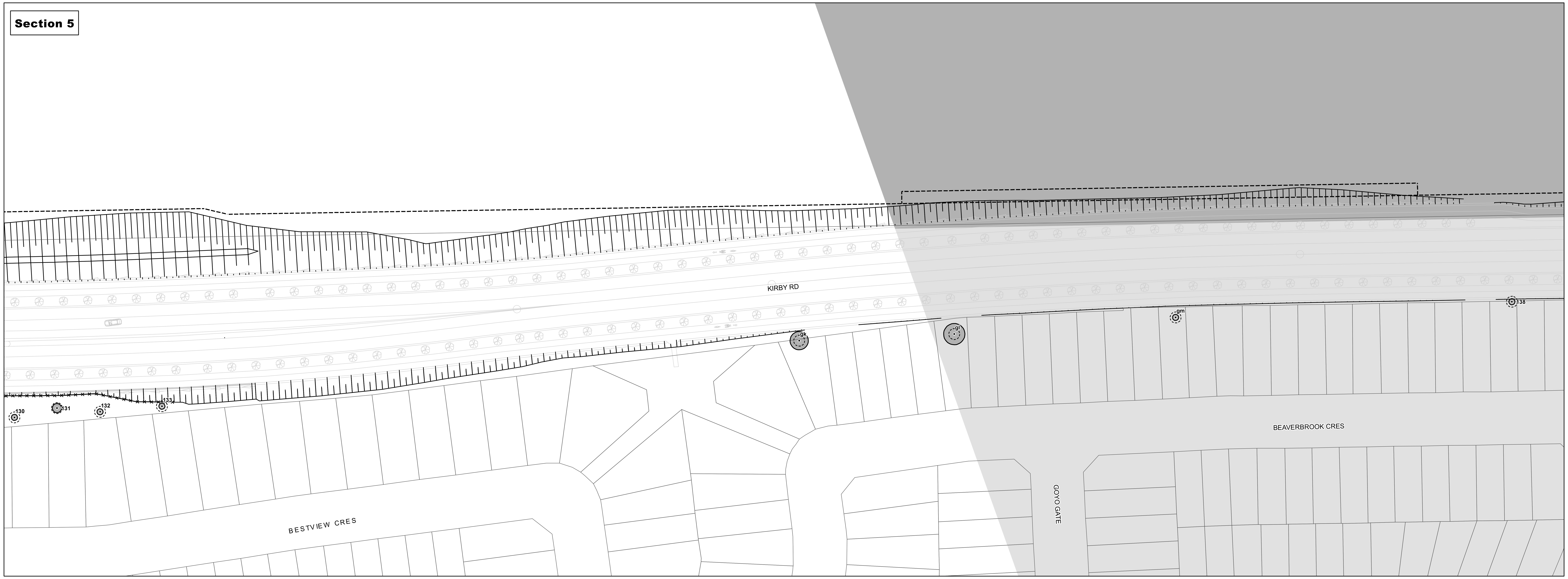
KEELE ST

BESTVIEW CRES

Map 2c

Kirby Road EA

Tree Protection Fencing Plan



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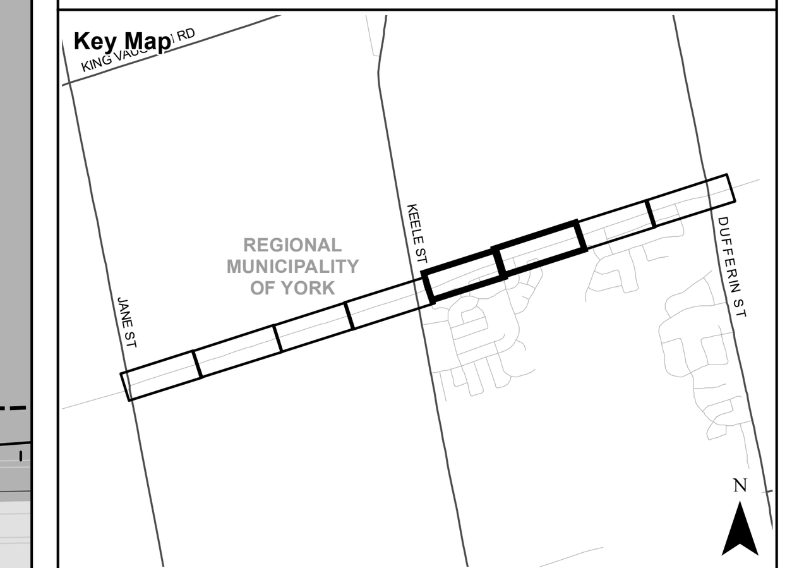

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Natural Resource Solutions Inc.
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NAD83 - UTM Zone 17
Size: 24x36"
1:650

0 10 20 30 40 Metres

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Section 7

KIRBY RD

FOOT HILLS RD

ADIRONDACK DR

GLACIER CRT

Section 8

KIRBY RD

LAURENTIAN BLVD

ADIRONDACK DR

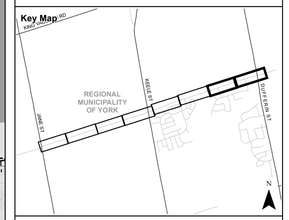
DUFFERIN ST

Map 2d

Kirby Road EA

Tree Protection Fencing Plan

Key Map



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