APPENDIX D

Natural Heritage Memorandum

Stantec

Memo

To:	Mike Kocher	From:	Debbie Giesbrecht Sean Geddes
	Stantec - Waterloo		Stantec – Stoney Creek office Stantec – Guelph Office
File:	165640234	Date:	October 31, 2018

Reference: City of Hamilton New Waste Haulage Receiving Station Ecosystems Assessment

The City of Hamilton (City) has retained Stantec Consulting Ltd (Stantec) to complete a Schedule 'B' Municipal Class Environmental Assessment (EA) and Conceptual Design to determine the preferred location and conceptual design for a new waste haulage receiving station. A short-list of five candidate sites at three locations were selected during the initial phase of this project:

1. Airport (2 options; Option 1, 2)
2. Upper James St./Twenty Road (1 option)
3. Hannon (2 options, Option 1, 2)

The purpose of this memo is to summarize the results of a Natural Heritage background review and a fall field visit of the short-listed sites, including adjacent lands (within 120 m of the sites).

BACKGROUND REVIEW METHODS

Stantec conducted a background review of natural environment features, including potential Species at Risk (SAR) and Species of Conservation Concern (SOCC), for the five options. For this assessment, SAR are defined as species that are listed as Endangered or Threatened on the Species at Risk in Ontario List. SOCC are defined as species that are classified as Special Concern provincially or federally or ranked as S1-S3 in the Ministry of Natural Resources and Forestry's (MNRF) Natural Heritage Information Centre (NHIC) database. Sources reviewed included:

- NHIC database (MNRF 2018a)
- Land Information Ontario (LIO) database (MNRF 2018b)
- Species at Risk in Ontario List (MNRF 2018c)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- E-bird Canada (eBird 2018)
- Ontario Breeding Bird Atlas (Cadman et al 2007)

- Ontario Butterfly Atlas (Toronto Entomologist's Association 2018)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2018)
- Rural Hamilton Official Plan (City of Hamilton 2012) and Urban Hamilton Official Plan (City of Hamilton 2013) schedules
- Department of Fisheries and Oceans Canada Aquatic Species at Risk Mapping (DFO 2018)

The provincial databases and atlases named above were reviewed to identify SAR and SOCC with records in the vicinity and / or range overlap of each of the five sites. The LIO database was reviewed to identify presence of provincial planning designations such as the Greenbelt Natural Heritage System, provincially designated natural heritage features such as Provincially Significant Wetlands, and other features such as Wooded Areas and unevaluated wetlands. The Significant Wildlife Habitat (SWH) criteria schedule for Ecoregion 7E was reviewed to identify candidate SWH that may be present on the sites.

The Urban Hamilton Official Plan (UHOP) and Rural Hamilton Official Plan (RHOP) consolidates provincial and municipal planning objectives in a Natural Heritage System and provides policy directives to protect and restore natural features and functions. Schedule B of the OP designates the areas of the Natural Heritage System including land identified as Core Areas and Linkages. Core Areas include Key Natural Heritage Features (KNHF), Key Hydrological Features (KHF), associated vegetation protection zones, and provincially significant and Local Natural Areas, while Linkage areas provide connections between Core Areas. The Official Plans also provide guidance for minimum vegetation protection zones for KNHFs. The two plans and associated schedules were reviewed to identify KNHF and KHF for each site and on the adjacent lands (**Table 2**).

The City of Hamilton does not allow development and site alteration within provincially significant wetlands, significant coastal wetlands or significant habitat of threatened and endangered species or in Core Areas or on lands adjacent to Core Areas unless it has been proven that there will be no negative impacts on the features and their ecological functions.

BACKGROUND REVIEW RESULTS

There were no recent records of species at risk in the NHIC database for any of the properties. LIO mapping showed that there were watercourses, wooded areas and Provincially Significant Wetlands (PSW) on or adjacent to the proposed options (**Table 2, Figures 1.1-1.4**).

The Ontario Amphibian and Reptile Atlas, Ontario Breeding Bird Atlas and Ontario Butterfly Atlas reports data on a 10 km by 10 km square. Square 17NH88 covered the Airport and Upper James locations and square 17NH98 covered the Hannon locations. A habitat assessment was conducted for 14 birds, 2 amphibians, 2 reptiles, 5 mammals, 3 insects and 1 plant species, which were identified in the background review as potentially occurring. A field site visit was also conducted to determine whether suitable habitat was present (see below). The results of the habitat assessment for SAR and SOCC is provided in **Attachment B**.

Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Mapping (DFO 2018) indicated that watercourses supporting Grass Pickerel (Special Concern) are present on or near three of the properties (Airport Option 1 and 2 and Upper James/Twenty Road.

Correspondence with the City of Hamilton and an examination of the City's Official Plan's showed that the following KNHF and KHF were not present on any of the proposed sites or on any adjacent lands:

- Areas of Natural and Scientific Interest (ANSI)
- Lakes and Littoral Zones
- Locally Environmentally Significant Area
- Alvar and Tallgrass Prairie

Other KHNF and KHF including streams, significant woodlands, significant wetlands and linkages were present on or adjacent to the proposed sites. Further details are provided in **Table 2**.

TERRESTRIAL AND AQUATIC FIELD INVESTIGATION METHODS

A roadside review of aquatic habitat conditions, vegetation community inventory, a significant wildlife habitat (SWH) assessment and a species at risk (SAR) habitat assessment were conducted on October 3, 2018 for the various site options. Although there are 4 site options, the field investigations focused on the preferred option (Hannon Option 1), with a brief visit to each of the other 3 sites (Hannon Option 2, Upper James/Twenty Rd Option, Airport Option1 and Airport Option 2).

Vegetation community mapping was based on the Ecological Land Classification System for Southern Ontario (Lee et. al 1998). Provincial significance of vegetation communities was based on the rankings assigned by the Natural Heritage Information Centre (MNRF 2018).

The SWH assessment was based on the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF 2015), which provides guidelines for assessing four general types of SWH: seasonal concentration areas, rare or specialized habitat, habitat for species of conservation concern, and wildlife movement corridors. Based on the results

of the preliminary SWH screening for the proposed options, the SWH assessment included a search for potential reptile hibernacula features, turtle overwintering areas, turtle nesting areas and amphibian breeding habitat.

The SAR assessment involved searching for potential SAR and SAR habitat. Based on the results of the preliminary SAR screening for the proposed options, the SAR assessment included a search for potential occurrences of Butternut, and recording potential habitat for SAR bats, Eastern Meadowlark, Bobolink and Barn Swallow.

Survey details are listed below in **Table 1**.

Table 1: Survey Details and Summary

Survey Date	Surveyor	Weather Conditions
October 8, 2018	J. Ball, N. Burnett	18oC, light wind, overcast, periods of light rain

TERRESTRIAL FIELD INVESTIGATION RESULTS

Results of the vegetation community inventory, SWH assessment and SAR assessment are summarized in **Table 2** and **Figures 1.1-1.4 and 2.1-2.4** and described below.

Airport Option 1

This area was comprised of recently disturbed soils that have been left to naturalize to a Mineral Cultural Meadow (CUM1). Species consisted of forbs including wild carrot, goldenrod, sow thistle and asters. Narrow-leaved cattails surrounded a drainage feature on the northern border of this area. Two small Cattail Mineral Shallow Marsh (MAS2-1) communities have formed in a low area downstream from the drainage feature near the southwest corner of Dickenson Road West and Upper James Street. LIO mapping showed a hydrologic connection between the Airport 1 Option and the Upper Twenty Mile Creek PSW Complex on the northwest corner of the intersection of Dickensen Rd. Upper James St (**Figure 1.1**). There were tree cavities observed in the sugar maple trees that comprised the Deciduous Hedgerow (HR) along Upper James Street in the south section of this area.

Although tree cavities were observed in the deciduous hedgerow in this area, it is unlikely that they would provide habitat for SAR bats since bats prefer to roost in tall, large-diameter snags that are in the early to middle stages of decay and located in open areas within mature-over mature forest (Jung *et al*. 2004). The cultural meadow community did not provide suitable habitat for Bobolink due to the lack of an abundance of grasses that this species prefers; however, the cultural meadow community may provide suitable habitat for Eastern Meadowlark. No other potential SAR or SAR habitat was identified in this area.

The cattail marsh communities may provide amphibian breeding habitat; however, there was no standing water in the feature to support overwintering amphibians. No other potential SWH was identified in this area.

Airport Option 2

This area was comprised of Mineral Cultural Meadow (CUM1) dominated by Kentucky bluegrass and New England aster, with occasional goldenrod, teasel and sweet clover. Ground cover was not very dense. There was a low area dominated by highly invasive common reed (Common Reed Mineral Shallow Marsh; MASM1-12) at the southeast corner of Dickenson Road West and Upper James Street. LIO mapping showed a hydrological connection along a drainage feature through the marsh to the Upper Twenty Mile Creek PSW Complex on the north side of Dickensen Rd. E. (**Figure 1.1**).

Although this area has an abundance of grasses preferred by Eastern Meadowlark and Bobolink, the area is not likely to attract these species due its small size and lack of density. No SAR or SAR habitat was identified in this area.

No potential SWH was identified in this area.

Upper James St./Twenty Road Option

Approximately half of this area was comprised of an old homestead with young to mid-aged black locust, Manitoba maple and black walnut scattered throughout. This community was classified as a Mineral Cultural Savannah (CUS1). The ground cover of the cultural savannah community was comprised of cultural meadow species dominated by Canada Goldenrod.

The other half of the area was comprised of a Mineral Cultural Meadow (CUM1) that was dominated by Canada Goldenrod. There was a section of the Upper Twenty Mile Creek PSW Complex comprised of Cattail Mineral Shallow Marsh (MAS2-1) along the southern border of the cultural meadow that extended into the southwest corner of the site (**Figure 1.2**). The cattail marsh surrounded a drainage feature that originated from an on-line pond immediately upstream from this area.

A small building on the old homestead had the potential to provide breeding habitat for Barn Swallow. The cultural meadow community did not provide suitable habitat for Bobolink due to the lack of an abundance of grasses that this species prefers; however, the cultural meadow community may provide suitable habitat for Eastern Meadowlark. No other SAR or SAR habitat was identified in this area. None of the trees provided suitable SAR bat habitat.

The shallow water pond immediately west of this area may provide amphibian breeding habitat and turtle overwintering habitat. No other potential SWH was identified in this area.

Hannon Option 1 (Preferred)

The area to the west of Dartnall Road was highly disturbed; the lands are currently occupied by an asphalt manufacturing facility. Lands to the north and south of the facility were comprised of Mineral Cultural Meadow (CUM1) dominated by Canada goldenrod and other forb species.

The lands to the east of Dartnall Road consisted mainly of Mineral Cultural Meadow (CUM1) dominated by Canada goldenrod and other forb species including asters and teasel. There was a Gray Dogwood Cultural Thicket (CUT1-4) and a Reed Canary Grass Meadow Marsh (MAM2-2) adjacent to Dartnall Road in the northern section of the area. Narrow-leaved cattails lined the drainage feature close to the road immediately south of this feature.

The cultural meadow community did not provide suitable habitat for Bobolink due to the lack of an abundance of grasses that this species prefers; however, the cultural meadow community may provide suitable habitat for Eastern Meadowlark. No other SAR or SAR habitat was identified in this area.

The watercourse to the south does not provide suitable turtle habitat (water only appeared to be present at the culvert and was not deep enough to curtail freezing). It is unknown whether the MAM2-2 community provides amphibian breeding habitat; however, there was no standing water in the feature to support overwintering amphibians. No other potential SWH was identified in this area.

Hannon Option 2

This area was similar in composition to the Mineral Cultural Meadow (CUM1) community in Hannon Option 1, with Canada goldenrod and forb species dominating.

The cultural meadow community did not provide suitable habitat for Bobolink due to the lack of an abundance of grasses that this species prefers; however, the cultural meadow community may provide suitable habitat for Eastern Meadowlark. No other SAR or SAR habitat was identified in this area.

No potential SWH was identified in this area.

AQUATIC FIELD INVESTIGATION RESULTS

Airport Option 1

A drainage feature that is mapped by DFO as supporting habitat for Grass Pickerel (SAR) was observed on the north west corner of the site. Based on aerial photos from 2018, it appears that this feature may have been realigned into a different configuration than is currently shown on mapping. This feature drains southeast into low areas on the site that are dominated by cattail and phragmites and then continues through culverts under Upper James Street. The feature is likely ephemeral and functions to convey flow to downstream areas that support fish.

Airport Option 2

A drainage feature that is mapped by DFO as supporting habitat for Grass Pickerel was observed along the perimeter of the northwest corner and north boundary of this site. The feature was dominated by phragmites or common reed. The feature drains north under Dickenson Road East. The feature is likely ephemeral and functions to convey flow to downstream areas that support fish.

Upper James/Twenty Rd. Option

A drainage feature was observed on the southwest corner of the site and is mapped by DFO as supporting aquatic habitat for Grass Pickerel. The feature flows south under 20 Road West and exhibited active flow on October 3, 2018. The feature potentially supports permanent fish habitat.

Hannon Option 1 (Preferred)

A drainage feature traverses the site east of Dartnall Road in a southwest to northeast direction. Drainage flows from lands west of Dartnall Road and cross under Dartnall Road in a large concrete box culvert. From the culvert, the flow path extends northeasterly through the proposed site. Pooled water was present in the culvert at Dartnall Road on October 3, 2018

Previous investigations documented in the *Upper Hannon Creek Master Drainage Plan Municipal Class Environmental Assessment* (Aecom 2017) identified that tributaries of Hannon Creek are generally intermittent in nature. Studies were completed in August 2002, April 2005, May 2010 and August 2010 and no fish were observed or captured during the field investigations. The report noted that several barriers to upstream fish movement were located downstream of Rymal Road, and there was generally short duration of flow and absence of persistent pools. The report concluded that the likelihood of fish moving through the Rymal Road culvert would be low during low flow periods.

Stream classifications were applied to all reaches of Hannon Creek, and the reach crossing the Site was identified as *High Constraint – Potential to Rehabilitate* (Aecom 2017). Reaches in this category are to be protected but require enhancement. Enhancement can include relocation of the reach as an open channel, depending on the stream characteristics (Aecom 2017).

Hannon Option 2

The mapped aquatic feature was not observed on this Site. Ephemeral sheet drainage may occur over the Site in periods of high flow such as spring freshet, however aquatic vegetation was not observed indicating lack of sustained flow or water holding capability on the site.

SUMMARY

The results of the terrestrial and aquatic field investigations have been summarized in **Table 2** below. These results have been assessed using the scoring system outlined in **Table 3** to rank the sites from the lowest ecological impact (Rank 1) to the highest ecological impact (Rank 5). The scoring system incorporates a score of 5 for little to no impacts, 3 for impacts that can be mitigated, and a score of 0 for permanent impacts to ecological features. **Table 4** provides the results of the ecological score of each of the sites based on this ranking system.

Table 2: Ecological Characteristics of the 5 Short-listed Sites

Natural heritage feature	Assessment criteria	Airport 1	Airport 2	Upper James/Twenty Rd.	Hannon 1	Hannon 2
Vegetation	Potential impact on woodlands and other areas of natural vegetation communities (excluding wetlands)	Forb cultural meadow; deciduous hedgerow at the southeast corner along Upper James St.; cattails surrounding drainage feature at north end of site.	Sparse mixed cultural meadow; small common reed wetland in the northwest corner.	Forb cultural meadow; old homestead with scattered trees; cattail marsh along watercourse at south end; online pond upstream from site.	Mostly forb cultural meadow with a small area of gray dogwood thicket. Reed canary grass marsh in center of site. Riparian vegetation surrounding watercourse south of site limited to narrow-leaved cattails near Dartnall Road.	Forb cultural meadow.
Impacts to Wetlands/PSW	Potential Impact on Provincially Significant Wetlands, locally significant wetlands and unevaluated wetlands.	The Upper Twenty Mile Creek PSW Complex is located on the northeast corner of Dickenson and Upper James Street, outside of the 120-metre area. Two small cattail marsh communities are present on or near the Option.	The Upper Twenty Mile Creek PSW Complex is located on the northeast corner of Dickenson and Upper James Street, outside of the 120-metre area.	The Upper Twenty Mile Creek PSW Complex is present on the western edge of the site.	There are no Provincially Significant Wetlands present on or adjacent to the site. A Reed Canary Grass Meadow Marsh (MAM2-2) was present adjacent to Dartnall Road in the northern section of the area.	There are no Provincially Significant Wetlands present on or adjacent to the site.
Features designated in City of Hamilton OP	Potential impact on Core Areas and Linkages	There are Key Hydrological Features (streams) which are regulated by the Conservation Authority. Areas identified as Significant Woodlands in the Urban Hamilton OP are no longer present on the site; confirmed during field investigation.	There are Key Hydrological Features (streams) which are regulated by the Conservation Authority.	There are Key Hydrological Features (streams) in the southwest corner of the site which are regulated by the Conservation Authority. Significant woodlands are identified west of the site.	There are Key Hydrological Features (streams) which are regulated by the Conservation Authority. Linkages are identified along the stream corridor.	No Core Areas, Linkages or Key Hydrological Features are present.

Table 2: Ecological Characteristics of the 5 Short-listed Sites

Natural heritage feature	Assessment criteria	Airport 1	Airport 2	Upper James/Twenty Rd.	Hannon 1	Hannon 2
Wildlife and Wildlife Habitat	Potential impact on Significant Wildlife Habitat, including Species of Conservation Concern	CUM1 meadow may provide nesting habitat for Common Nighthawk. Potential SWH for amphibian breeding (wetlands) and Terrestrial Crayfish associated with the MAS2-1 wetlands.	CUM1 meadow may provide nesting habitat for Common Nighthawk. No potential SWH was observed.	A small building on the site may provide nesting habitat for Barn Swallow and potential roosting habitat for SAR bats. CUM1 meadow may provide nesting habitat for Common Nighthawk and Eastern Meadowlark. Potential Milksnake habitat associated with the combination of meadow, water feature and potential hibernaculum in the small building. Potential Terrestrial Crayfish and amphibian breeding (woodlands) in the MAS2-1 wetland. Potential SWH for turtle overwintering areas and amphibian breeding (woodlands) in the online pond upstream of the Site.	CUM1 meadow may provide nesting habitat for Common Nighthawk and Eastern Meadowlark. Potential SWH for amphibian breeding (wetlands) and Terrestrial Crayfish habitat may occur in the MAS2-1 wetland.	CUM1 meadow may provide nesting habitat for Common Nighthawk and Eastern Meadowlark.
Species at risk	Potential impact on Species at Risk (habitat and species)	No recent NHIC records. The Ontario Amphibian and Reptile Atlas identified recent records of Jefferson Salamander. This site is unlikely to provide habitat for Eastern Meadowlark and Bobolink due to recent disturbance, low density and lack of grasses.	No recent NHIC records. This site is unlikely to provide habitat for Eastern Meadowlark and Bobolink due to its small size and low density.	No recent NHIC records. Barn Swallow records from E-bird. A building on the old homestead may provide nesting habitat for Barn Swallow. This site does not provide suitable habitat for Bobolink due to the lack of an abundance of grasses that this species prefers; however, the site may provide suitable habitat for Eastern Meadowlark.	No recent NHIC records. No recent E-bird records for bird SAR. This site does not provide suitable habitat for Bobolink due to the lack of an abundance of grasses that this species prefers; however, the site may provide suitable habitat for Eastern Meadowlark.	No recent NHIC records. No recent E-bird records for bird SAR. This site does not provide suitable habitat for Bobolink due to the lack of an abundance of grasses that this species prefers; however, the site may provide suitable habitat for Eastern Meadowlark.

Table 2: Ecological Characteristics of the 5 Short-listed Sites

Natural heritage feature	Assessment criteria	Airport 1	Airport 2	Upper James/Twenty Rd.	Hannon 1	Hannon 2
Watercourses/ fisheries/ aquatic impacts	Potential impact on existing watercourses Potential impact on fish/fish habitat	Watercourse supporting Special Concern species (Grass Pickerel) along the north edge of the site.	Watercourse supporting Special Concern species (Grass Pickerel) crosses northwest corner of site.	Watercourse supporting Special Concern species (Grass Pickerel) in south west corner of site.	Warmwater watercourse crosses middle of property. Fish presence is compromised by a number of barriers downstream of Rymal Road, short duration of flow and general lack of persistent pools.	No apparent watercourse. Fish habitat not present.

Table 3: Short List Natural Environment Evaluation Criteria

Criteria	Description	Scoring		
		5 Positive	**3 Neutral**	**0 Negative**
Vegetation	Potential impact on woodlands and other areas of natural vegetation communities (excluding wetlands)	Positive – little-no impact. Limited areas of natural vegetation communities.	Neutral – limited areas of natural vegetation, impacts can be mitigated through site design and other best practices.	Negative – significant loss of wooded area/vegetation communities.
Wetlands/PSW	Potential Impact on Provincially Significant Wetlands, locally significant wetlands and unevaluated wetlands.	Positive – no wetlands in proximity to the site.	Neutral – wetlands present within the project area, potential for impacts can be mitigated through site design and other best practices.	Negative – loss of wetland areas.
Features designated in City of Hamilton OP	Potential impact on Core Areas and Linkages	Positive – no Core Areas/Linkages located in proximity to the site.	Neutral – Core Areas/Linkages located in proximity to the site. Potential impacts can be mitigated through site design and other best practices.	Negative – loss of Core Areas/Linkages.
Wildlife and Wildlife Habitat	Potential impact on Significant Wildlife Habitat (SWH), including Species of Conservation Concern (SOCC)	Positive – low-no potential for SWH.	Neutral – potential for SWH. Potential impact can be mitigated through species-specific measures (timing windows, etc.)	Negative – permanent loss of SWH.
Species at risk	Potential impact on Species at Risk (SAR) (habitat and species)	Positive – low-no potential for SAR.	Neutral – potential impacts to SAR habitat. Impacts can be mitigated through species-specific measures.	Negative – permanent loss of SAR habitat.
Watercourses, fisheries, and aquatic impacts	Potential impact on existing watercourses Potential impact on fish/fish habitat	Positive – no watercourses/aquatic features present.	Neutral – aquatic resources present, impacts can be mitigated through site design/best management practices, and/or opportunities for enhancement.	Negative – permanent loss of fish habitat.

Table 4: Evaluation of Natural Environment features for all Options

Natural Heritage Feature	Airport 1	Airport 2	Upper James/Twenty Rd.	Hannon 1	Hannon 2
Vegetation	• Little-no impact	• Little-no impact	• Moderate impact to cultural savannah • Impacts to riparian habitat can be mitigated through site design/BMPs	•Moderate impact to vegetation and marsh habitat	• Little-no impact. • Impacts to riparian habitat can be mitigated through side design/BMPs
Score	**5**	**5**	**3**	**3**	**5**
Wetlands/PSW	• PSW on the northeast corner of Dickenson and Upper James Street, outside of the 120-metre area • A cattail marsh is present in the northwest portion of the site • Little-to-no potential for impact • Impacts can be mitigated through site design/best practices	• The Upper Twenty Mile Creek PSW Complex is located on the northeast corner of Dickenson and Upper James Street, outside of the 120-metre area	• PSW present on the western edge of the site • Little-to-no potential for impact • Impacts can be mitigated through site design/best practices	• A Reed Canary Grass Meadow Marsh (MAM2-2) present • Little-to-no potential for impact • Impacts can be mitigated through site design/best practices	• No wetlands located in proximity to the site • No impact
Score	**3**	**5**	**3**	**3**	**5**
Features designated in City of Hamilton OP	• Little-no impact, can be mitigated through site design/best practices	• Little-no impact, can be mitigated through site design/best practices	• Little-no impact, can be mitigated through site design/best practices	• Little-no impact, can be mitigated through site design/best practices	• Little-no impact, can be mitigated through site design/best practices
Score	**3**	**3**	**3**	**3**	**3**
Wildlife and Wildlife Habitat	• Low-moderate impact • Can be mitigated	• Low-moderate impact • Can be mitigated	• Low-moderate impact • Can be mitigated	• Low-moderate impact • Can be mitigated	• Low-moderate impact • Can be mitigated
Score	**3**	**3**	**3**	**3**	**3**
Species at risk	• Little-no impact	• Little-no impact	• Potential Barn Swallow and Eastern Meadowlark habitat. • Impacts can be mitigated	• Potential Eastern Meadowlark habitat • Impacts can be mitigated	• Potential Eastern Meadowlark habitat • Impacts can be mitigated
Score	**5**	**5**	**3**	**3**	**3**

Table 4: Evaluation of Natural Environment features for all Options

Natural Heritage Feature	Airport 1	Airport 2	Upper James/Twenty Rd.	Hannon 1	Hannon 2
Watercourses/ fisheries/ aquatic impacts	• Watercourse supporting habitat for Special Concern species (Grass Pickerel) along the north edge of the site • Potential for impacts can be mitigated	• Watercourse supporting habitat for Special Concern species (Grass Pickerel) crosses northwest corner of site • Potential for impacts can be mitigated	• Watercourse supporting habitat for Special Concern species (Grass Pickerel) in south west corner of site • Potential for impacts can be mitigated	• Warmwater watercourse crosses middle of property • Less ability to mitigate impacts due to location of watercourse, however watercourse is a candidate for rehabilitation which includes realignment (Aecom, 2017). Moving the watercourse presents an opportunity to implement the rehabilitation goal and create better habitat.	• No watercourse is present
Score	**3**	**3**	**3**	**3**	**5**
TOTAL SCORE	**22/30**	**24/30**	**18/30**	**18/30**	**24/30**
Rank	**2**	**1**	**3**	**3**	**1**

NEXT STEPS

Detail design of the preferred site option will require the preparation of an EIS to identify key natural heritage features, assign appropriate setbacks and provide mitigation recommendations to reduce the risk of impact of the site development. The EIS will include targeted field investigations to assess the presence of SAR, SOCC and SWH, assess aquatic habitat in greater detail and delineate the boundaries of the natural heritage features.

Future Mitigation Considerations

At the detail design stage of the project, mitigation measures can be built into the design of the preferred site to reduce the risk of impacts to terrestrial and aquatic habitats. Activities related to construction including grading, cut-and-fill, and presence of heavy machinery can cause soil erosion and compaction, and mobilize silt and sediment into adjacent watercourses. Potential for machinery to destroy over-hanging vegetation may occur while working in natural areas. Encroachment into the natural areas can also occur by machinery, foot traffic, and discarding or storage of construction materials outside the construction envelope if not properly mitigated. The following strategies are recommended to mitigate impacts to aquatic and terrestrial habitats that will be retained through the site design:

- Clearly delineate/demarcate work areas to avoid encroachment and incidental damage to native trees and areas of natural vegetation
- Educate workers on the requirements for and importance of avoiding entrance to the demarcated area
- Inspectors should commit to maintaining construction vehicles and personnel to stay within the construction envelope, thereby limiting the disturbance of natural vegetation
- All maintenance activities, vehicle refueling or washing, as well as the storage of chemical and construction equipment should be located >30 m from wetlands and floodplains, and >10m from Significant Woodland and other natural areas where possible
- In the event of an accidental spill, the MOE Spills Action Centre should be contacted and emergency spill procedures implemented immediately
- Accidental damage to trees, or unexpected vegetation removal, should be replaced/ restored with native species

Erosion and Sediment Control

- Minimize the access and temporary work space to the extent possible to limit destabilization of soils near the work area.
- Timing of the work to minimize impacts to downstream fish habitat in the Hannon Creek system using the warm water timing windows that allow work to occur from July 1 to March 31 (no work from April 1 to June 30) of any given year.
- Silt fencing and/or barriers could be used along all work zones where there is potential for sedimentation of watercourses or wetlands, or inadvertent encroachment of construction vehicles into trees or natural areas.
- Dust could be controlled by using water and not chemical suppressants in dust-sensitive areas such as the mapped natural heritage features.
- No equipment should be permitted to enter any natural areas beyond the barrier fencing.
- All exposed soil areas should be stabilized (native seed mixes; sourced locally if possible) and re-vegetated, through the placement of seed and mulching or seed and an erosion control blanket, promptly upon completion of construction activities.
- Equipment should be re-fueled 30 m away from sensitive natural features (e.g. watercourses) to avoid potential impacts if an accidental spill occurs.
- In addition to any specified requirements, additional silt fence and/or silt logs should be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency.
- Sediment and erosion controls should be monitored regularly and properly maintained as required. Controls are to be removed only after the soils of the construction area have been stabilized and adequately protected or until cover is re-established.
- The limits of construction adjacent to natural features to be retained will be fenced prior to construction and monitored during construction (along with sediment and erosion control measures) to make sure that the limits are maintained with respect to vehicular traffic and soil or equipment stockpiling.
- The Contractor is required to restore any disturbed natural areas to pre-construction conditions.

MIGRATORY BIRD CONVENTION ACT

Vegetation removal is recommended to occur outside of the core breeding bird season (i.e., April 15-August 9), which would avoid incidental take of any migratory bird nests, and thus be in compliance with the Migratory Bird Convention Act.

Nest sweeps are a secondary tool to avoid incidental take, but only if timing windows described above cannot be met and in simple habitats where vegetation is easy to search.

ENDANGERED SPECIES ACT, 2007

Potential habitat for SAR including bats, Eastern Meadowlark and Barn Swallow have potential to occur on the Options. Targeted SAR surveys are recommended to determine if these species are present. If the species are present, rules outlined in the Endangered Species Act, 2007 must be followed.

STANTEC CONSULTING LTD.

Debbie Giesbrecht, M.Sc.
Aquatic Ecologist

Phone: (905) 381-3214
Debbie.giesbrecht@stantec.com

Sean Geddes, B.Sc. (Hons.)
Senior Aquatic Biologist

Phone: (519) 780-8116
Sean.geddes@stantec.com

Attachment: Attachment A - Figures
Attachment B – SAR/SOCC Assessment Table, SWH Assessment Table

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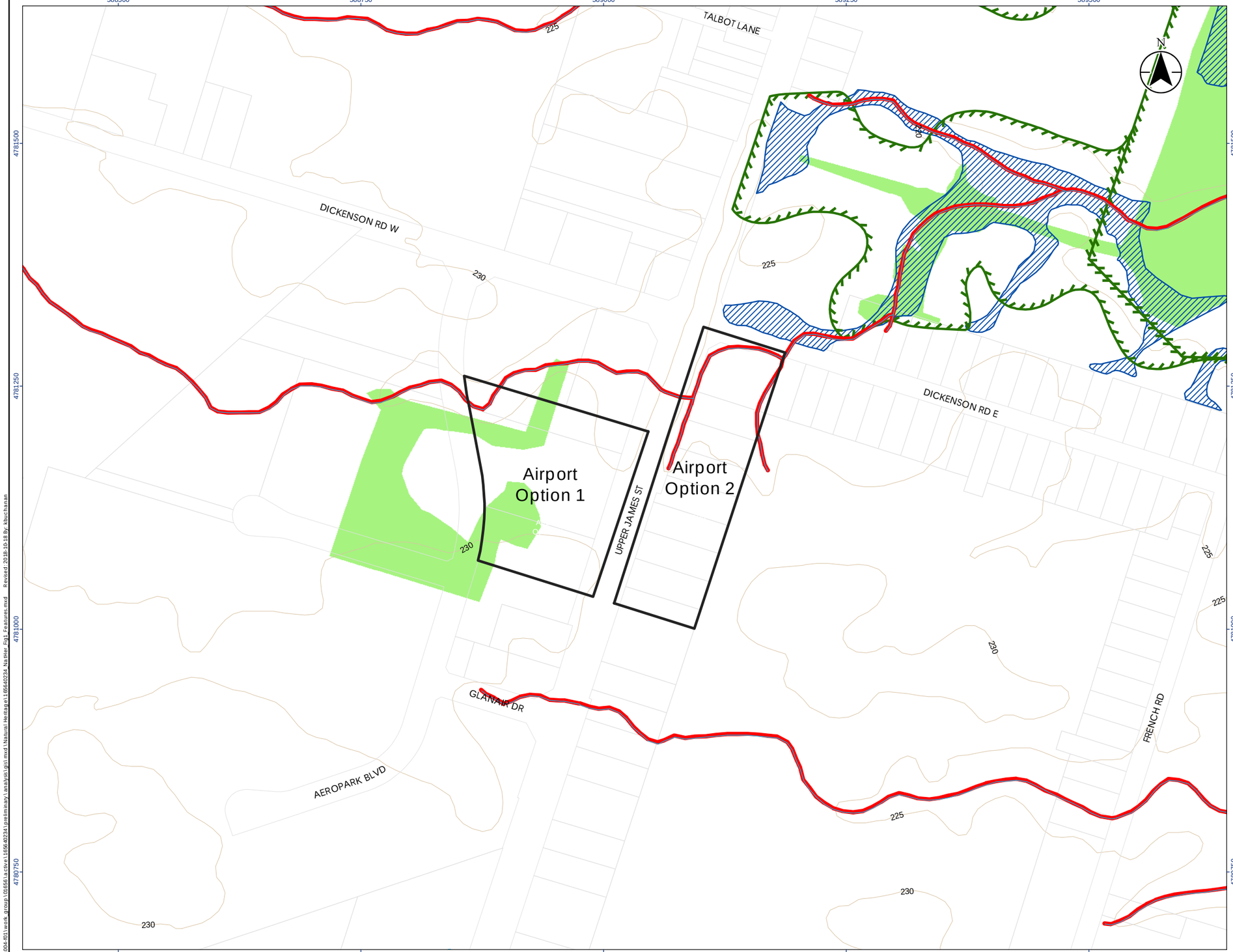
ATTACHMENT A:
Figures



Stantec

Legend

- Study Area
- Elevation Contour (5 m)
- Watercourse
- Aquatic Species at Risk Distribution
- Waterbody
- Wetland (Provincially Significant)
- Wooded Area
- Greenbelt Natural Heritage System

0 50 100 m

1:4,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Client/Project
CITY OF HAMILTON
NEW WASTE HAULAGE RECEIVING STATION
MUNICIPAL CLASS EA AND CONCEPTUAL DESIGN

Figure No.
1-1

Title
Designated Natural Features
Airport Options 1 and 2

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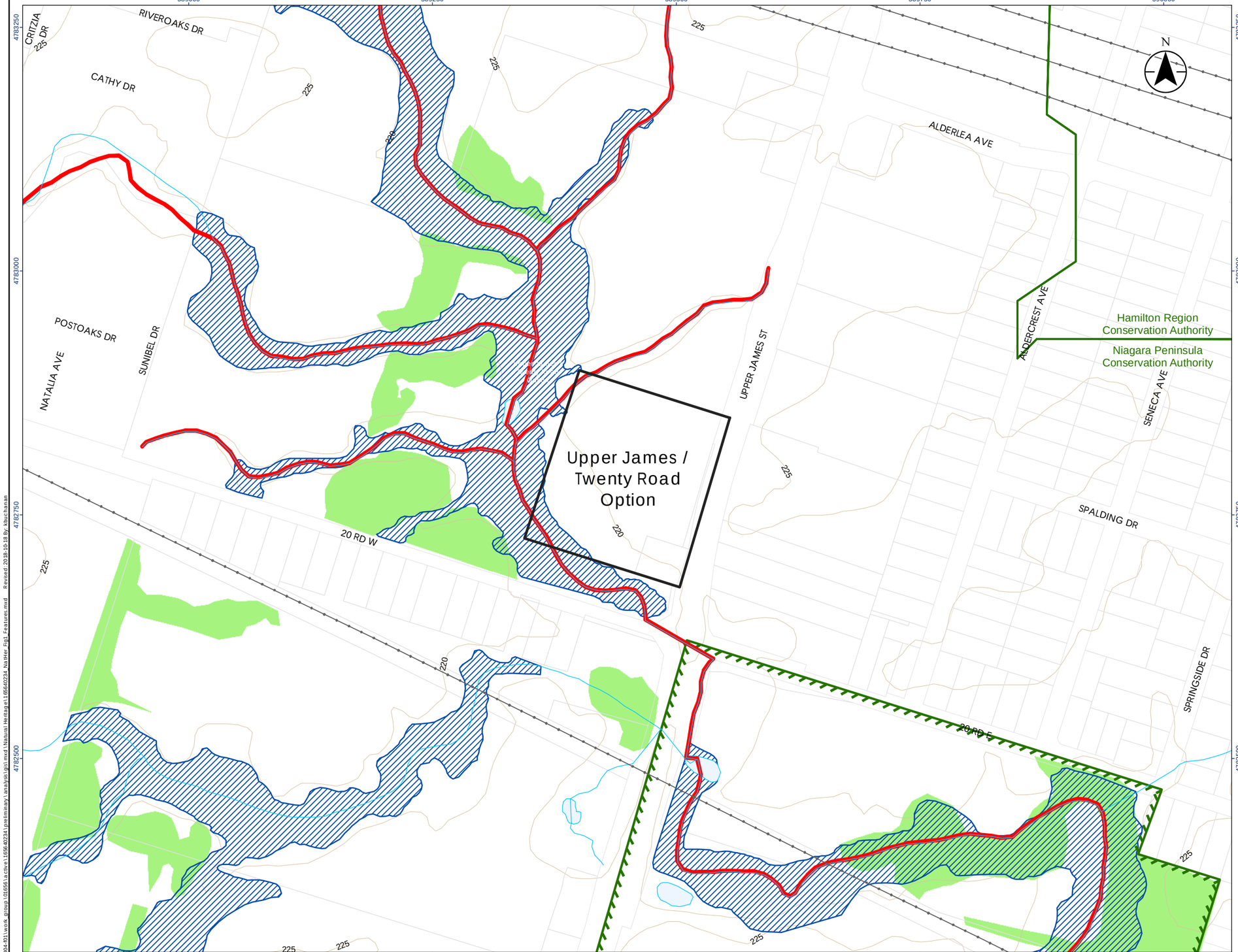

Stantec

Legend

- Study Area
- Elevation Contour (5 m)
- Hydro Line
- Watercourse
- Aquatic Species at Risk Distribution
- Waterbody
- Wetland (Provincially Significant)
- Wooded Area
- Greenbelt Natural Heritage System

0 50 100 m

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Notes

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NEW WASTE HAULAGE RECEIVING STATION
MUNICIPAL CLASS EA AND CONCEPTUAL DESIGN

Figure No.
1-2

Title
Designated Natural Features
Upper James / Twenty Road Option

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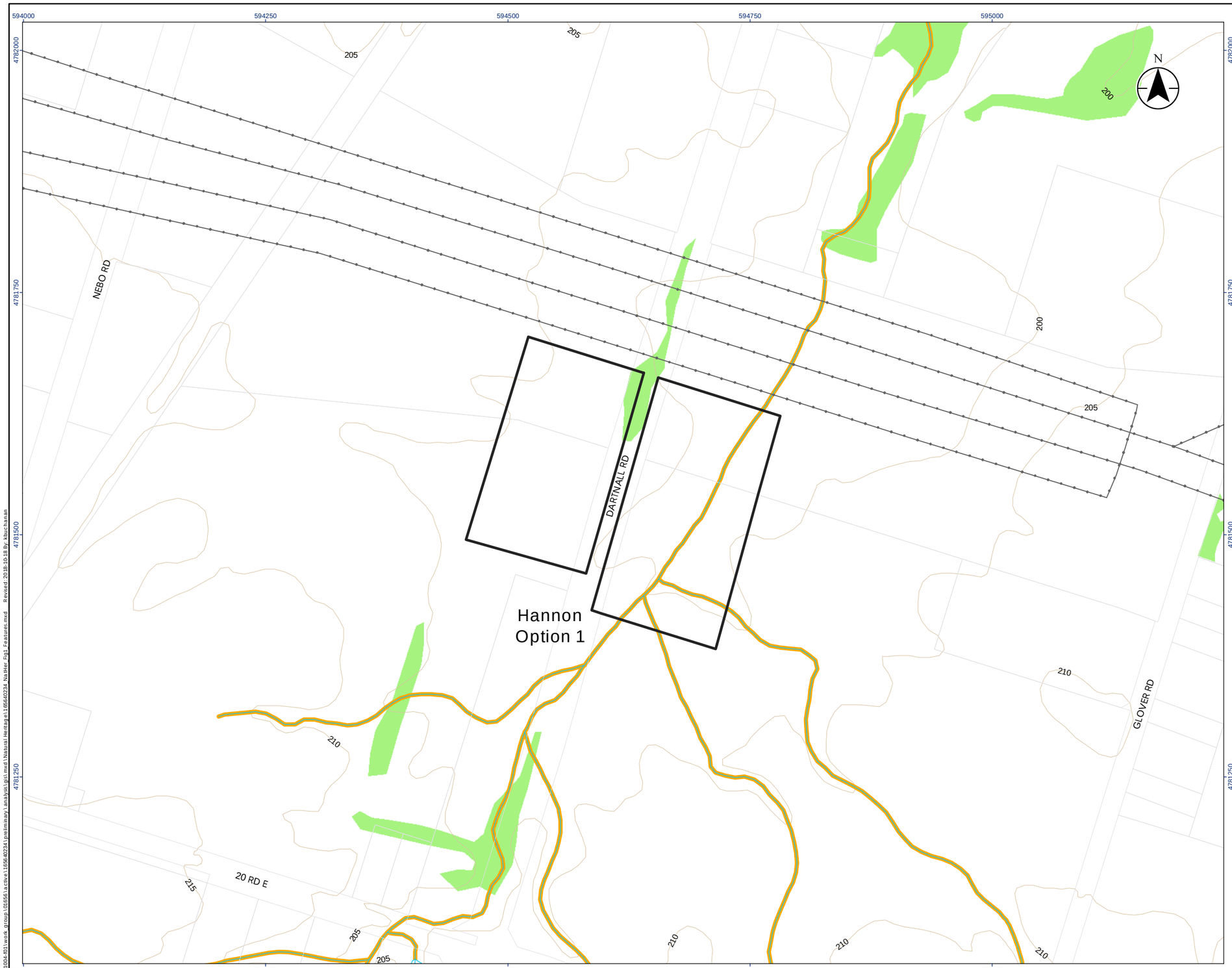

Stantec

Legend

- Study Area
- Elevation Contour (5 m)
- Hydro Line
- Watercourse
- Warm Thermal Regime
- Waterbody
- Wooded Area

0 50 100 m

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Notes

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NEW WASTE HAULAGE RECEIVING STATION
MUNICIPAL CLASS EA AND CONCEPTUAL DESIGN

Figure No.
1-3

Title
Designated Natural Features
Hannon Option 1

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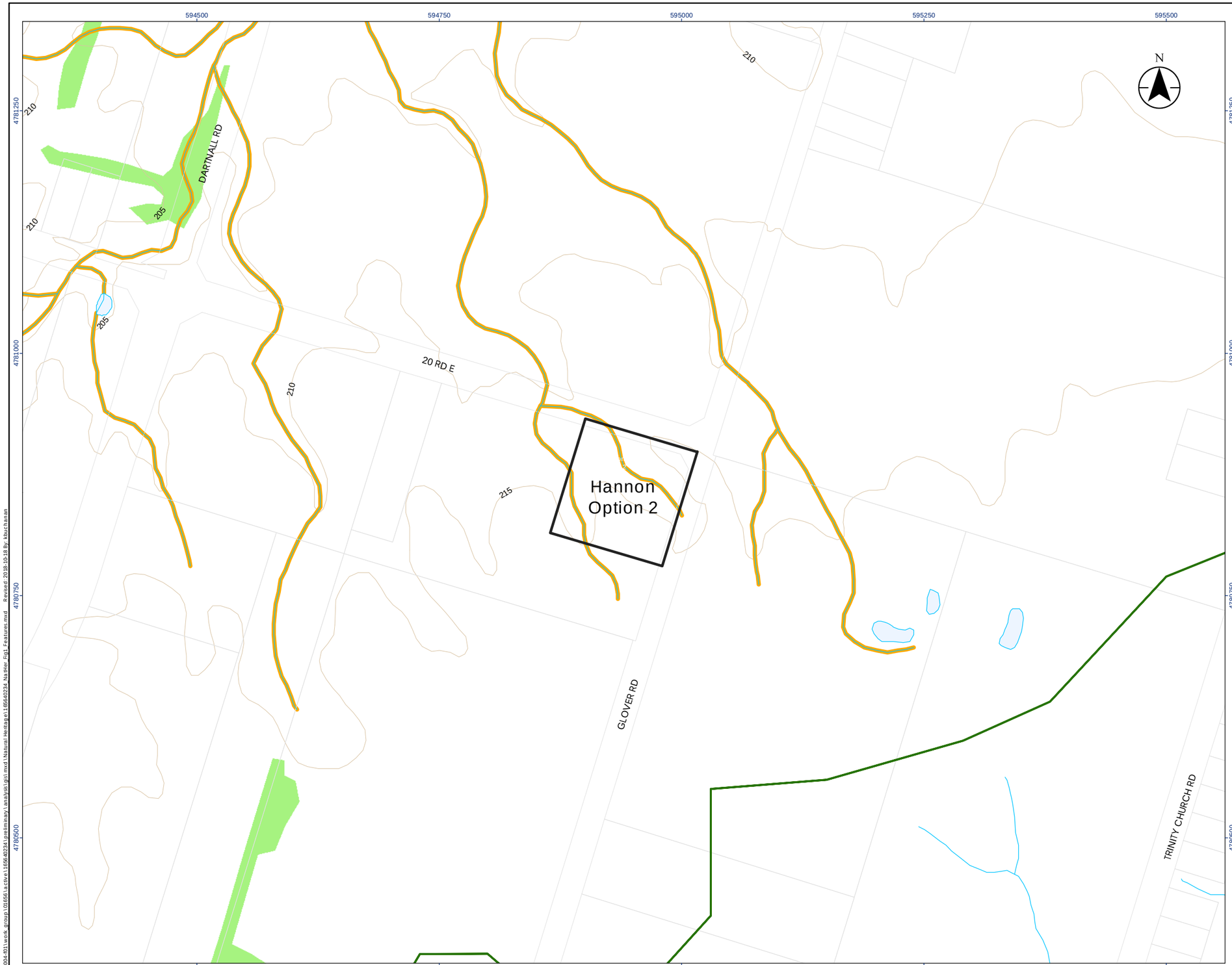

Stantec

Legend

- Study Area
- Elevation Contour (5 m)
- Watercourse
- Warm Thermal Regime
- Waterbody
- Wooded Area

0 50 100 m

1:4,000 (At original document size of 11x17)

Notes

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MUNICIPAL CLASS EA AND CONCEPTUAL DESIGN

Figure No.
1-4

Title
Designated Natural Features
Hannon Option 2

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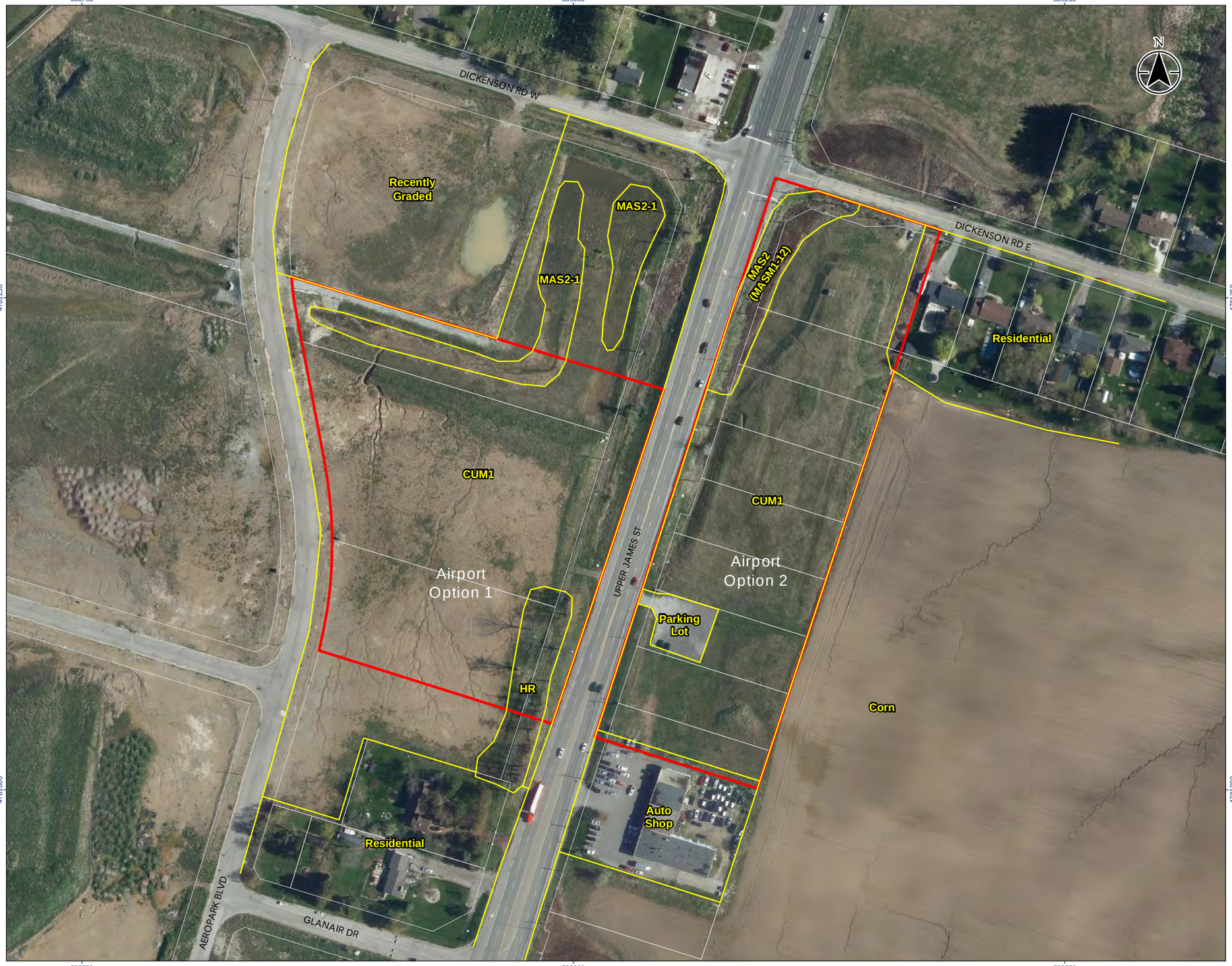

Stantec

Legend

- Study Area
- ELC Boundary

ELC Key

CUM1	Mineral Cultural Meadow
CUS1	Mineral Cultural Savannah
CUT1-4	Gray Dogwood Cultural Thicket
HR	Hedgerow
MAS2	Mineral Shallow Marsh
MAS2-1	Cattail Mineral Shallow Marsh
SA	Shallow Aquatic

0 50 100 m

1:2,000 (At original document size of 11x17)

Notes

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NEW WASTE HAULAGE RECEIVING STATION
MUNICIPAL CLASS EA AND CONCEPTUAL DESIGN

Figure No.
2-1

Title
Ecological Land Classification
Airport Options 1 and 2

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589250 589500

4783000 4783000

4782750 4782750

589250 589500

Stantec

Legend

- Study Area
- ELC Boundary

ELC Key

CUM1	Mineral Cultural Meadow
CUS1	Mineral Cultural Savannah
CUT1-4	Gray Dogwood Cultural Thicket
HR	Hedgerow
MAS2	Mineral Shallow Marsh
MAS2-1	Cattail Mineral Shallow Marsh
SA	Shallow Aquatic

0 50 100 m

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Notes

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Client/Project
CITY OF HAMILTON
NEW WASTE HAULAGE RECEIVING STATION
MUNICIPAL CLASS EA AND CONCEPTUAL DESIGN

Figure No.
2-2

Title
Ecological Land Classification
Upper James / Twenty Road Option

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Project Location

Client/Project

Figure No.

Title

ATTACHMENT B:

SAR/SOCC Assessment Table, SWH Assessment Table

Appendix B: 165640234 Species at Risk Habitat Assessment

Scientific Name	Common Name	S-Rank	SARO	SARA	Source	Species habitat requirements	Potential habitat present at the short-listed options?
Birds							
Bank Swallow	*Riparia riparia*	S4B	THR	THR	OBBA	Excavates nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits	No – there were no exposed banks on any of the options.
Barn Swallow	*Hirundo rustica*	S4B	THR	THR	OBBA	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water	**Yes – Potential habitat for nesting Barn Swallows associated with a small building on the Upper James St./Twenty Rrd option.**
Barn Owl	*Tyto alba*	S1	END	END	OBBA	Favours pastures, hayfields, marshes and other grassy habitats that support mice and vole populations. It has nested in barns, church steeples, silos, cavities in large trees and artificial nest boxes (Cadman et al., 2007).	No – Barn Owls are very rare and not likely to occur in the Study Area. Only one potential nesting site was located among the short-listed options; a small building on the Upper James St./Twenty Rd option.
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR	OBBA	large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50 ha, but can use >10ha	No – there were no large, dense grasslands or hayfields on any of the options.
Chimney Swift	*Chaetura pelagica*	S4B, S4N	THR	THR	OBBA	Commonly found in urban areas near buildings; nests almost exclusively in chimneys or other man-made structures; highly gregarious; feeds over open water.	No –there were no chimneys were present on any of the options.
Common Nighthawk	*Chordeiles minor*	S4B	SC	THR	OBBA	Nests on the ground in open habitats preferably with rocky or graveled substrate.	**Yes – potential habitat in open meadows on each of the options, especially Airport 1 and 2 options due to their sparse ground cover.**
Eastern	*Sturnella magna*	S4B	THR	THR	OBBA	Open, grassy meadows, farmland, pastures, hayfields	**Yes – Potential habitat in**

Appendix B: 165640234 Species at Risk Habitat Assessment

Scientific Name	Common Name	S-Rank	SARO	SARA	Source	Species habitat requirements	Potential habitat present at the short-listed options?
Meadowlark						or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	**open meadow habitat on Hannon 1 and 2, and Upper James St. options. Ground cover on Airport 1 and 2 is relatively sparse, and likely not suitable.**
Eastern Wood Pewee	*Contopus virens*	S5B	SC	SC	OBBA	Open, deciduous, mixed or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots, parks.	No – there were no woodlands on any of the options. Potential suitable habitat may be present in the woodland directly adjacent to the Upper James St. option.
Golden-winged Warbler	*Vermivora chrysoptera*	S4B	SC	THR	OBBA	Breeding occurs in successional scrub habitats bordered by forests and nests are constructed on the ground (Cadman et al, 2007). Preference is shown towards early successional scrub (10-30 years into succession).	No – there was no successional scrub present on any of the options and this species is very rare in the region.
Louisiana Waterthrush	*Parkesia motacilla*	S3B	SC	SC	OBBA	Prefers deciduous and mixed forests with a strong Eastern Hemlock component, in deeply incised ravines (Cadman et al. 2007). It will also inhabit large flooded tracts of mature deciduous swamp forest.	No – there were no deeply incised ravines or flooded swamps present on any of the options.
Peregrine Falcon	*Falco perigrinus*	S3B	SC	SC	OBBA	Traditionally prefers suitable rock cliffs, particularly those adjacent to water. More recently the species has been released in various urban centers in Ontario where it successfully nests on tall buildings.	No – there were no cliffs or tall buildings on any of the options.
Wood Thrush	*Hylocichla mustelina*	S4B	THR	THR	OBBA	deciduous and mixed forests in southern Ontario, ranging from small and isolated to large and contiguous woodlots; presence of tall trees and a thick understory are preferred	No – there were no woodlands on any of the options. Potential suitable habitat may exist in the woodland directly adjacent to the Upper James St. option.
Yellow-breasted	*Icteria virens*	S2B	END	END	OBBA	Prefers scrubby, early successional habitat; dense	No – there was no dense,

Appendix B: 165640234 Species at Risk Habitat Assessment

Scientific Name	Common Name	S-Rank	SARO	SARA	Source	Species habitat requirements	Potential habitat present at the short-listed options?
Chat						tangles of grape vine and raspberry are features of most breeding sites.	early successional habitat present on any of the options.
Amphibians							
Jefferson Salamander	*Ambystoma jeffersonianum*	S2	END	END	ORAA	Terrestrial during the adult stage and inhabits upland deciduous forests with suitable breeding areas including limestone sinkhole ponds, kettle ponds, vernal pools and other natural basins. Breeding areas are often ephemeral and are fed by spring runoff, groundwater, or springs.	No – there were no vernal pools suitable for breeding salamanders on any of the options. There was no deciduous woodland habitat for the terrestrial stage of this species at any of the options.
Reptiles							
Milksnake	*Lampropeltis triangulum*	S3	NAR	SC	ORAA	Frequently reported in and around buildings, especially old structures. However, it is found in a variety of habitats, including prairies, pastures, hayfields, rocky hillsides and a wide variety of forest types. Two important features of ideal habitat are proximity to water, and suitable locations for basking and egg-laying.	**Yes – habitat for this species may be present on the Upper James St. option; there is a small building present and an adjacent water feature.**
Snapping turtle	*Chelydra serpentina*	S3	SC	SC	ORAA	Inhabits permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites.	No – there was no habitat with permanent or semi-permanent water on any of the options. There was potential suitable habitat adjacent to the Upper James St. option in a small online pond.
Mammals							
Eastern Small-footed Myotis	*Myotis leibii*	S2S3	END		OMA	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests	**Yes – there is potential roost habitat in the small building on the Upper James St. option.**

Appendix B: 165640234 Species at Risk Habitat Assessment

Scientific Name	Common Name	S-Rank	SARO	SARA	Source	Species habitat requirements	Potential habitat present at the short-listed options?
Little Brown Myotis	*Myotis lucifuga*	S4	END	END	OMA	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 – there is potential roost habitat in the small building on the Upper James St. option.**
Northern Myotis	*Myotis septentrionalis*	S3?	END	END	OMA	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, human-made structures but prefers hollow trees or under loose bark; hunts within forests, below canopy	No – there was no woodland habitat present on any of the options. There was potential habitat in the woodland adjacent to the Upper James St. option.
Tri-colored Bat	*Perimyotis subflavus*	S3?	END	END	OMA	Roosts in colonies in tree cavities in a wide variety of deciduous and coniferous forest stands. Little is known about the effect of stand composition on maternity roost selection for this species, but it is strongly associated with forest watercourses and streamside vegetation.	No – there was no woodland habitat present on any of the options. There was potential habitat in the woodland adjacent to the Upper James St. option.
Woodland Vole	*Microtus pinetorum*	S3?	SC	SC	OMA	Inhabits deciduous forests with a dense layer of leaf litter, woodland or orchard grassy patches, and areas of dense brush. Primarily subterranean, spending the majority of their time underground in burrows that are made in shallow soil or under leaf litter (Reid, 2006).	No – there was no woodland habitat present on any of the options. There was potential habitat in the woodland adjacent to the Upper James St. option.
Insects							
Monarch Butterfly	*Danaus plexippus*	S4B, S2N	SC	SC		Larvae occur only where milkweed exists; adults are more generalized, feeding on a variety of wildflower nectar (OMNR, 2014).	Yes – meadow habitat on each of the options provides foraging habitat for this species; however, there were no areas with an abundance of milkweed required for larvae.
Mottled Dusky Wing	*Erynnis martialis*	S2	END	END		Associated with the larval food plants, which in Ontario are Prairie Root and New Jersey Tea. These plant species generally grow in dry, sandy soils within	No –there were no dry, sandy woodland communities present on

Appendix B: 165640234 Species at Risk Habitat Assessment

Scientific Name	Common Name	S-Rank	SARO	SARA	Source	Species habitat requirements	Potential habitat present at the short-listed options?
						oak or pine woodlands, along roadsides, hydro corridors, riverbanks, oak savannas, shady hillside, tallgrass prairies and alvars (Linton, 2015).	any of the options.
West Virginia White	*Pieris virginiensis*	S3	SC	NAR		Occurs near its only known food plant, toothwort. Toothworts, generally occupy moister areas of good quality, mesic, sugar maple-dominated deciduous woodlands.	No – there were no woodland communities with potential to provide habitat for toothwort present on any of the options.
Plants							
Butternut	*Juglans cinerea*	S3?	END	END	Farrar 1995	Commonly found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows ideal habitat includes rich, moist, and well-drained soils often found along streams, but may also be found on well-drained gravel sites, particularly those made of limestone (COSEWIC, 2003).	Unlikely – there were no butternuts observed during the roadside survey.

Appendix B: 165640234 Significant Wildlife Habitat Assessment

Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Seasonal Concentration Areas		
Waterfowl Stopover and Staging Area (Terrestrial)	• Fields with sheet water or utilized by tundra swans during spring (mid-March to May), or annual spring melt water flooding found in any of the following Community Types: Meadow (CUM1), Thicket (CUT1). • Agricultural fields with waste grains are commonly used by waterfowl, and these are not considered SWH unless used by Tundra swans in the Long Point, Rondeau, Lake St. Clair, Grand Bend and Point Pelee Areas.	• The Airport 1 and 2 options were too sloped/well-drained to retain sheet water during the annual spring melt. Sites are too small to support large numbers of staging waterfowl. • No candidate habitat for waterfowl stopover and staging (terrestrial) was present on the options.
Waterfowl Stopover and Staging Area (Aquatic)	• The following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD). • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. • The combined area of the ELC ecosites and a 100 m radius area is the SWH. • 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.	• Due to their small size, wetlands are not likely to support an abundance of waterfowl during migration. • No candidate habitat for waterfowl stopover and staging areas (aquatic) was observed on any of the options.

Appendix B: 165640234 Significant Wildlife Habitat Assessment

Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Shorebird Migratory Stopover Area	• 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 amour 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 significant wildlife habitat. • The following community types: Meadow Marsh (MAM), Beach/Bar (BB), or Sand Dune (SD)	• Wetlands do not provide suitable exposed, muddy habitat for shorebirds. • No candidate habitat for shorebird migratory stopover areas was observed on any of the options.
Raptor Wintering Area	• At least one of the following Forest Community Types: Deciduous Forest (FOD), Mixed Forest (FOM) or Coniferous Forest (FOC), in combination with one of the following Upland Community Types: Meadow (CUM), Thicket (CUT), Savannah (CUS), Woodland (CUW) (<60% cover) that are >20 ha and provide roosting, foraging and resting habitats for wintering raptors. • Upland habitat (CUM, CUT, CUS, CUW), must represent at least 15 ha of the 20 ha minimum size.	• There are no cultural meadow, thicket or woodland communities >15ha associated with woodland communities on any of the options. • No candidate habitat for raptor wintering areas was observed on any of the options.
Bat Hibernacula	• Hibernacula may be found in caves, mine shafts, underground foundations and karsts. • May be found in these Community Types: Crevice (CCR), Cave (CCA).	• No crevices, caves or abandoned mines were observed to accommodate hibernating bats. • No candidate habitat for bat hibernacula was observed on any of the options.

Appendix B: 165640234 Significant Wildlife Habitat Assessment

Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Bat Maternity Colonies	• Maternity colonies considered significant wildlife habitat are found in forested ecosites. • Either of the following Community Types: Deciduous Forest (FOD) or Mixed Forest (FOM), that have>10/ha wildlife trees >25cm diameter at breast height (dbh). • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees • 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.	• There were no forest or swamp communities identified on any of the options. • No candidate habitat for bat maternity colonies was observed on any of the options.

Appendix B: 165640234 Significant Wildlife Habitat Assessment

Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Turtle Wintering Areas	• Snapping and Midland Painted turtles utilize ELC community classes: Swamp (SW), Marsh (MA) and Open Water (OA). Shallow water (SA), Open Fen (FEO) and Open Bog (BOO). • Northern Map turtle- open water areas such as deeper rivers or streams and lakes can also be used as over-wintering habitat. • Water has to be deep enough not to freeze and have soft mud substrate. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.	• No ponds with enough water not to freeze were observed. • No candidate habitat for turtle wintering areas was observed on any of the options.
Snake Hibernacula	• Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock and other natural features. 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 outcroppings. • Any ecosite in southern Ontario other than very wet ones may provide habitat. The following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1).	• No natural rock features were observed on any of the options. • No candidate habitat for snake hibernacula was observed on any of the options.

Appendix B: 165640234 Significant Wildlife Habitat Assessment

Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	• Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following Community Types: Meadow (CUM), Thicket (CUT), Bluff (BL), Cliff (CL). • 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.	• No exposed banks, bridges or tall structures were observed on any of the options. • No bank and cliff colonial-nesting bird breeding habitat was observed on any of the options.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	• Identification of stick nests in any of the following Community Types: Mixed Swamp (SWM), Deciduous Swamp (SWD), Treed Fen (FET). • The edge of the colony and a minimum 300 m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH. • Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.	• No tree/shrub colonial-nesting bird breeding habitat was observed on any of the options.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Colonial-Nesting Bird Breeding Habitat (Ground)	• Any rocky island or peninsula within a lake or large river. • For Brewer's Blackbird close proximity to watercourses in open fields or pastures with scattered trees or shrubs found in any of the following Community Types: Meadow Marsh (MAM1-6), Shallow Marsh (MAS1-3), Meadow (CUM), Thicket (CUT), Savannah (CUS).	• No ground colonial-nesting bird breeding habitat was identified on any of the options.
Migratory Butterfly Stopover Areas	• Located within 5 km of Lake Ontario • A combination of ELC communities, one from each land class is required: Field (CUM, CUT, CUS) and Forest (FOC, FOM, FOD, CUP) • Minimum of 10 ha in size with a combination of field and forest habitat present	• None of the options are located within 5 km of Lake Ontario. • No habitat for migratory butterfly stopover areas occurs on any of the options.
Landbird Migratory Stopover Areas	• The following community types: Forest (FOD, FOM, FOC) or Swamp (SWC, SWM, SWD) • Woodlots must be >10 ha in size and within 5 km of Lake Ontario – woodlands within 2 km of Lake Ontario are more significant	• None of the Sites are located within 5 km of Lake Ontario. • No habitat for landbird migratory stopover areas occurs on any of the options.
Deer Winter Congregation Areas	• Woodlots typically > 100 ha in size unless determined by the MNR as significant. (If large woodlots are rare in a planning area >50ha) • All forested ecosites within Community Series: FOC, FOM, FOD, SWC, SWM, SWD • Conifer plantations much smaller than 50 ha may also be used	• There are no woodlands >100 ha on any of the options that provide habitat for deer winter congregation areas.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Rare Vegetation Communities		
Cliffs and Talus Slopes	• A Cliff is vertical to near vertical bedrock >3 m in height. • A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris • Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT • Most cliff and talus slopes occur along the Niagara Escarpment	• No cliffs or talus slopes were identified on any of the options.
Sand Barrens	• Sand barrens typically are exposed sand, generally sparsely vegetated and cause by lack of moisture, periodic fires and erosion. • Vegetation can vary from patchy and barren to tree covered but less than 60%. • Any of the following Community Types: SBO1 (Open Sand Barren Ecosite), SBS1 (Shrub Sand Barren Ecosite), SBT1 (Treed Sand Barren Ecosite).	• No sand barrens were identified on any of the options.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Alvars	• 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. • 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 zoogeographically diverse, supporting many uncommon or are relict plant and animal species. • Vegetation cover varies from patchy to barren with a less than 60% tree cover. • Any of the following Community Types: ALO1(Open Alvar Rock Barren Ecosite), ALS1 (Alvar Shrub Rock Barren Ecosite), ALT1 (Treed Alvar Rock Barren Ecosite), FOC1 (Dry-Fresh Pine Coniferous Forest), FOC2 (Dry-Fresh Cedar Coniferous Forest), CUM2 (Bedrock Cultural Meadow), CUS2 (Bedrock Cultural Savannah), CUT2-1 (Common Juniper Cultural Alvar Thicket), or CUW2 (Bedrock Cultural Woodland) • An Alvar site > 0.5 ha in size	• No alvars were identified on any of the options.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Old-growth Forest	• Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species. • No minimum size criteria t in any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest) • Forests greater than 120 years old and with no historical forestry management was the main criteria when surveying for old-growth forests.	• No old growth forests were identified on any of the options.
Savannahs	• A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. • In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). • Any of the following Community Types: TPS1 (Dry-Fresh Tallgrass Mixed Savannah Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savannah Ecosite), TPW1 (Dry-Fresh Black Oak Tallgrass Deciduous Woodland Ecosite), TPW2 (Fresh-Moist Tallgrass Deciduous Woodland Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite).	• No savannahs were identified on any of the options.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Tall-grass Prairies	• A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. • In Ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). • Any of the following Community Types: TPO1 (Dry Tallgrass Prairie Ecosite), TPO2 (Fresh-Moist Tallgrass Prairie Ecosite).	• No tall grass prairies were identified on any of the Sites.
Other Rare Vegetation Communities	• Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG	• No rare vegetation communities were identified on any of the options.
Specialized Habitat for Wildlife		
Waterfowl Nesting Area	• 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	• Wetlands are too small to attract populations of breeding waterfowl. • No candidate habitat for waterfowl nesting areas was identified on any of the options.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). • ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• There was no candidate habitat for Bald Eagles or Osprey identified on any of the options.
Woodland Raptor Nesting Habitat	• All natural or conifer plantation woodland/forest stands combined >30 ha and with >4 ha of interior habitat. Interior habitat determined with a 200 m buffer. • 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 Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • May be found in all forested ELC Ecosites. • May also be found in SWC, SWM, SWD and CUP3	• There were no woodlands on any of the options to provide candidate woodland raptor nesting habitat.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Turtle Nesting Areas	• Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1 • Best nesting habitat for turtles is close to water, 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.	• No natural areas of exposed mineral soil for turtle nesting areas was observed on any of the options.
Seeps and Springs	• 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	• There was no candidate habitat for this seeps and springs identified on any of the options.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Amphibian Breeding Habitat (Woodland)	• All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD • Presence of a wetland, lake, or pond within or adjacent (within 120 m) to a woodland (no minimum size). 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	• **Potential candidate amphibian breeding habitat (woodlands) may occur on the Upper James St. option in the MAS2-1 wetland.**
Amphibian Breeding Habitat (Wetland)	• ELC Community Classes SW, MA, FE, BO, OA and SA. • Wetland areas >120 m from woodland habitats. • Wetlands and pools (including vernal pools) >500 m2 (about 25 m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats. • 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.	• **Potential candidate amphibian breeding habitat (wetlands) may occur on the Hannon 1 and Airport 1 options in the MAS2-1 wetlands.**
Species of Conservation Concern		

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Marsh Bird Breeding Habitat	• All wetland habitats with shallow water and emergent aquatic vegetation. • May include any of the following Community Types: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: Swamp (SW), Marsh (MA) and Meadow (CUM) Community Types.	• Due to their small size, wetlands are not likely to support an abundance of marsh breeding birds. • No candidate habitat for waterfowl stopover and staging areas (aquatic) was observed on any of the options.
Woodland Area-sensitive Bird Breeding Habitat	• Habitats >30ha where interior forest is present (at least 200 m from the forest edge); typically, >60 years old. • These include any of the following Community Types: Forest (FO), Treed Swamp (SW)	• There are no woodlands on any of the options that provide candidate woodland area-sensitive bird breeding habitat.
Open Country Bird Breeding Habitat	• Grassland areas > 30 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or hay or livestock pasturing in the last 5 years, in the following Community Type: Meadow (CUM).	• There are no grasslands > 30 ha on any of the options that provide candidate open country bird breeding habitat.
Habitat for Other Species of Conservation Concern (Includes species listed in **Appendix A** as either confirmed in the Study Area during field investigations, or identified as having a medium potential of occurring in the Study Area; Excludes species listed as endangered or threatened)	• Habitats used by Species of Conservation Concern for all or part of their lifecycle.	• Potential habitat for Eastern Milksnake occurred on the Upper James St. option with the combination of meadow habitat, a water feature and potential hibernaculum associated with the small building.

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Candidate Wildlife Habitat	Criteria (based on MNRF Criteria Schedules for Ecoregion 7E, 2015)	Habitat Assessment of Features Based on EIS data (refer to ELC mapping)
Shrub/Early Successional Bird Breeding Habitat	• Oldfield areas succeeding to shrub and thicket habitats >10 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Types: Thickets (CUT), Savannahs (CUS), or Woodlands (CUW).	• There are no successional habitats >10ha on any of the options that provide shrub/early successional bird breeding habitat.
Terrestrial Crayfish	• Meadow marshes and edges of shallow marshes (no minimum size). Vegetation communities include MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3. • Construct burrows in marshes, mudflats, meadows • Can be found far from water	• No terrestrial crayfish burrows were identified on any of the options; however, the field site visit was conducted from the roadside only. • **Potential candidate significant wildlife habitat for Terrestrial Crayfish may occur adjacent to the MAS2-1 wetlands on the Hannon 1, Upper James St. and Airport 1 options.**
Animal Movement Corridors		
Amphibian Movement Corridor	• Corridors may be found in all ecosites associated with water. • Determined based on identifying significant amphibian breeding habitat (wetland).	• Potential candidate significant amphibian breeding habitat (wetlands) was observed on Hannon Option 1. • Potential candidate habitat for amphibian movement corridors may occur on Hannon Option 1.