# New Track and Facilities Transit Project Assessment Process

## Final Environmental Project Report – Chapter 5

05-Mar-2021

Prepared by:



Excellence Delivered As Promised

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This submission was completed and reviewed in accordance with the Quality Assurance Process for this project.

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APPENDIX O - Environmental Site Assessment Summary
APPENDIX P - Consultation Record

## 5 Impact Assessment

Based on the conceptual engineering design developed for the Project, potential effects were assessed, and mitigation measures developed based on the following four step approach:

**Step 1** – Identify potential effects (positive and negative) resulting from the construction and/or operation of the Project infrastructure;

**Step 2** – Establish avoidance/mitigation/compensation measures to eliminate or minimize potential negative effects (as required);

**Step 3** – Carry out consultation with stakeholders/regulatory authorities; update impact assessment results and/or proposed avoidance/mitigation/compensation mitigation measures as appropriate; and

Step 4 - Document impact assessment results.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

Footprint Impacts	<ul> <li>Potential displacement or loss of existing/planned features within the Study Area due to implementation of the physical project components (e.g., new tracks, new layover/storage facilities, etc.).</li> </ul>
Construction Impacts	<ul> <li>Potential short-term effects (e.g., disruption/disturbance) on existing features due to construction activities associated with the Project (e.g., construction of new tracks, layover facilities, electrification infrastructure, bridge modifications, etc.).</li> </ul>
Operations and Maintenance Impacts	<ul> <li>Potential displacement, permanent effects or loss of existing features due to implementation/long term operation of the physical project components (e.g., operation of new layover facilities).</li> <li>Potential long-term effects on existing study area features due to maintenance activities associated with the Project.</li> </ul>

TABLE 5-1 TYPES OF POTENTIAL EFFECTS

### 5.1 Refined Study Area

A preliminary conservative Study Area was previously established for purpose of baseline conditions data as part of the TPAP. Based on the conceptual design information available, the Study Area for the impact assessment phase was refined as follows for purposes of assessing potential impacts:

- Areas where property is required associated with new/upgraded/reconfigured track infrastructure;
- Physical footprint areas associated with new layover facilities:
  - o Proposed Walkers Line Layover Facility, including ancillary works;
  - o Proposed Unionville Storage Yard Facility, including ancillary works; and
  - o Proposed Don Valley Layover Facility, including ancillary works.
- Physical footprint areas associated with New GO Station Platforms as follows:
  - Unionville GO Station;
  - Mount Joy GO Station; and
  - o Oshawa GO Station.

**Gannett Fleming** 

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- Physical footprint area associated with Thickson Road Bridge Expansion; and
- Richmond Hill Rail Corridor along the Bala Subdivision (up to approximately Mile 4.4, Pottery Road) plus a 7 m OCS/Vegetation Clearing Zone on each side of the rail right-of-way (ROW) including bridges/rail overpasses along the corridor.



FIGURE 5-1 NEW TRACK & FACILITIES TPAP STUDY AREA

#### 5.1.1 Study Area Segments

For the purposes of documenting potential effects, the Study Area has been further organized into corridor segments (by rail corridor) as outlined in Table 5-2.

It should be noted that the starting point of each corridor map originates at Union Station Rail Corridor and continues out to the furthest point of the corridor, with the exception of the Don Branch Subdivision along the Richmond Hill Corridor, the Uxbridge Subdivision along the Stouffville Corridor, and the Kingston Subdivision along the Lakeshore East Corridor.

## TABLE 5-2 NEW TRACK AND FACILITY TPAP STUDY AREA SEGMENTS AND FIGURE REFERENCES

New Track & Facilities TPAP Study Area Segments (and Figure Reference)		Proposed Infrastructure	Appendix Reference			
Lakeshore West	Lakeshore West Corridor (LSW)					
Figure LSW-1	Mile 8.10 to Mile 8.60	Track upgrade Mile 2.45 to 2.60 (Canpa subdivision)	Appendix A1			
Figure LSW-2	Mile 20.20 to Mile 20.70	Track upgrade from Mile 20.44 to 20.80 Track upgrade from Mile 20.58 to 20.88				
Figure LSW-3	Mile 20.70 to Mile 21.20	Track upgrade from Mile 20.44 to 20.80 Track upgrade from Mile 20.58 to 20.88				
Figure LSW-4	Mile 28.50 to Mile 29.00	New Walkers Line Layover from Mile 28.65 to 29.48	Appendix A2			
Figure LSW-5	Mile 29.00 to Mile 29.50	New Walkers Line Layover from Mile 28.65 to 29.48				
Kitchener Corrid	or (KT)		•			
Figure KT-1	Mile 12.90 to Mile 13.40	Track upgrade from Mile 13.19 to Mile 13.69 Track upgrade from Mile 13.19 to Mile 13.64 Track upgrade from Mile 13.35 to Mile 13.70	Appendix A1			
Figure KT-2	Mile 13.40 to Mile 13.90	Track upgrade from Mile 13.19 to Mile 13.69 Track upgrade from Mile 13.19 to Mile 13.64 Track upgrade from Mile 13.35 to Mile 13.70				
Figure KT-3	Mile 16.10 to Mile 16.60 (Weston/Halton Subdivision)	Track upgrade from Mile 16.20 to Mile 16.39 Track upgrade from Mile 11.54 to Mile 16.46 Track upgrade from Mile 16.52 to Mile 11.56 New track from Mile 16.50 to 11.11				
Figure KT-4	Mile 16.60 to Mile 11.20 - (Weston/Halton Subdivision)	Track upgrade from Mile 11.54 to Mile 16.46 Track upgrade from Mile 16.52 to Mile 11.56 New track northside of Mile 16.50to Mile 11.11				
Figure KT-5	Mile 11.20 to Mile 11.80	New track from Mile 11.39 to Mile 11.75				
Barrie Corridor (	BR)					
Figure BR-1	Mile 12.10 to Mile 12.60	New track from Mile 12.19 to 12.53.	Appendix A1			
Figure BR-2	Mile 29.50 to Mile 30.00	Track upgrade from Mile 29.50 to 29.60 New track from Mile 29.54 to 34.62 Track upgrade from Mile 29.96 to 30.29				
Figure BR-3	Mile 30.00 to Mile 30.50	New track from Mile 29.54 to 34.62 Track upgrade from Mile 29.96 to 30.29				
Figure BR-4	Mile 30.50 to Mile 31.00.	New track from Mile 29.54 to 34.62				

New Track & Facilities TPAP Study Area Segments (and Figure Reference)		Proposed Infrastructure	Appendix Reference
Figure BR-5	Mile 31.00 to Mile 31.50.	New track from Mile 29.54 to 34.62	
Figure BR-6	Mile 31.50 to Mile 32.00.	New track from Mile 29.54 to 34.62	
Figure BR-7	Mile 31.90 to Mile 32.50.	New track from Mile 29.54 to 34.62	
Figure BR-8	Mile 32.50 to Mile 32.90	New track from Mile 29.54 to 34.62	
Figure BR-9	Mile 32.90 to Mile 33.50	New track from Mile 29.54 to 34.62	
Figure BR-10	Mile 33.40 to Mile 34.00	New track from Mile 29.54 to 34.62	
Figure BR-11	Mile 33.90 to Mile 34.50	New track from Mile 29.54 to 34.62	
Figure BR-12	Mile 34.40 to Mile 34.90	New track from Mile 29.54 to 34.62	
Figure BR-13	Mile 61.30 to Mile 61.80	New track from Mile 61.40 to 63.40	
Figure BR-14	Mile 61.80 to Mile 62.30	New track from Mile 61.40 to 63.40	
Figure BR-15	Mile 62.30 to Mile 62.80	New track from Mile 61.40 to 63.40	
Figure BR-16	Mile 62.80 to Mile 63.40	New track from Mile 61.40 to 63.40	
Stouffville Corrido	or (ST)		•
Figure ST-1	Mile 51.00 to Mile 50.60	Unionville storage yard from Mile 50.61 to 50.31	Appendix A1
		New Platform at Unionville GO Station	
		New track eastside of new platform from Mile 51.00 to 50.73	
		Track upgrade from Mile 52.00 to 51.01	
Figure ST-2	Mile 50.60 to Mile 50.00	Unionville storage yard from Mile 50.61 to 50.31	Appendix A2
Figure ST-3	Mile 46.30 to Mile 45.80	New Platform at Mount Joy GO Station	Appendix A1
		New passing track for new platform from Mile 46.35 to 45.42	
Figure ST-4	Mile 45.80 to Mile 45.30	New Platform at Mount Joy GO Station	
		New passing track for new platform from Mile 46.35 to 45.42	
Lakeshore East Co	orridor <mark>(LSE)</mark>		
Figure LSE-1	Mile 323.90 to Mile 323.40	New storage/reversal pocket track northside of Mile 323.36 to Mile 323.76	Appendix A1
	(Kingston Subdivision)		
Figure LSE-2	Mile 10.10 to Mile 10.70	New third track from Mile 10.44 to Mile 11.76	
		10.67	
		Retaining Wall at Thickson Road	
Figure LSE-3	Mile 10.70 to Mile 11.20	New track northside of new platform from Mile	
		New third track from Mile 10.44 to Mile 11.76	
		Retaining Wall at Oshawa GO	
Figure LSE-4	Mile 11.20 to Mile 11.70	New Platform at Oshawa GO Station	
		Retaining Wall at Oshawa GO	
		New track northside of new platform from Mile 11.56 to Mile 11.74	

New Track & Facilities TPAP Study Area Segments (and Figure Reference)		Proposed Infrastructure	Appendix Reference
		New third track from Mile 10.44 to Mile 11.76	
Richmond Hill Corridor (RH)			
Figure RH-1	Mile 1.60 to Mile 2.15	Electrification of the rail corridor (Bala Subdivision) Track upgrade from Mile 1.90 to 2.86	Appendix A1
Figure RH-2	Mile 2.15 to Mile 2.50	Electrification of the rail corridor (Bala Subdivision) Track upgrade from Mile 1.90 to 2.86 Track upgrade from Mile 2.37 to 2.86	
Figure RH-3	Mile 2.50 to Mile 3.10	Electrification of the rail corridor (Bala Subdivision) Track upgrade from Mile 1.90 to 2.86 Track upgrade from Mile 2.37 to 2.86 Track upgrade to Don Valley Layover from Mile 208.60 to Mile 209.50 (along Don Branch) Don Valley Layover from Mile 209.00 to 207.93 (along Don Branch) Retaining Wall at Don Valley Layover	Appendix A2
Figure RH-4	Mile 3.10 to Mile 3.60	Electrification of the rail corridor (Bala Subdivision) Don Valley Layover from Mile 209.00 to 207.93 (along Don Branch) Retaining Walls at Don Valley Layover	Appendix A1
Figure RH-5	Mile 3.60 to Mile 4.10	Electrification of the rail corridor (Bala Subdivision) Don Valley Layover from Mile 209.00 to 207.93 (along Don Branch) Retaining Wall at Don Valley Layover	
Figure RH-6	Mile 4.10 to Mile 4.65	Electrification of the rail corridor (Bala Subdivision)	

It should be noted that any proposed track infrastructure located within existing Metrolinx rail corridor ROW is not anticipated to result in any environmental impacts, with the exception of potential construction phase effects. Therefore, the focus of the impact assessment documented within this EPR is primarily focussed on proposed track infrastructure situated outside of MX owned ROW and/or that may require property acquisition/easement.

Additionally, since the proposed new switches are located within already disturbed Metrolinx existing rail corridor ROW, there are no anticipated environmental impacts associated with new switches and therefore discussion of these components has generally been omitted from this section of the report<sup>1</sup>. For a summary of operational effects related to noise, vibration and air quality please refer to EPR Chapter 6.

### 5.2 Natural Environment Methodology

The following Natural Environment criteria was established for purposes of evaluating potential effects associated with the Project. Refer to **Appendix B2** for a more detailed description of the methodology utilized for this assessment.

<sup>&</sup>lt;sup>1</sup> The Noise and Vibration Impact Assessment Report contained in **Appendix M1** takes new switches into consideration.

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- Potential effects on vegetation communities;
- Potential effects on wildlife and wildlife habitat;
- Potential effects on Species at Risk (SAR) and their habitat;
- Potential effects on wetlands;
- Potential effects on fish and fish habitat; and
- Other relevant matters of provincial interest relating to the natural environment (e.g. Areas of Natural and Scientific Interest (ANSI), core woodlands of the Oak Ridges Moraine (ORM).

Following identification of potential effects, mitigation/compensation/enhancement measures were identified based on a combination of best management practices and development of project-specific mitigation measures to address project-specific impacts.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

### 5.3 Hydrogeological Methodology

As noted in Chapter 4, general assumptions were made for each type of proposed infrastructure to determine the information required for impact assessment. Refer to **Appendix C2** for a more detailed description of the methodology utilized for this assessment.

These assumptions were as follows:

- **Track and/or Switch Upgrade** If the proposed infrastructure is a track and/or switch upgrade, then minimal intrusive work will be required (i.e., less than 0.3 m depth) as existing ballasts would be used as part of the track upgrade. As a result, there will be no water mitigation measures required (such as dewatering or water management) as part of the proposed infrastructure improvements. Surface water management (such as runoff) may be required if watercourses exist within or near the construction area.
- New Track and Equipment Storage Yard If the proposed infrastructure is new track or equipment storage yard, then shallow intrusive work will be required (less than 1 m depth) to construct the appropriate base for the track. Infrastructure for an equipment storage yard consists of a 1-track layover area with no service/maintenance bays or other deeper intrusive work being required (no greater than 1 m depth). As a result, there will be no water mitigation measures required (such as dewatering or water management) as part of the proposed infrastructure improvements. Surface water management (such as runoff) may be required if watercourses exist within or near the construction area.
- **Buildings Associated with Layover Facilities** At some new layover facilities, in addition to the proposed layover infrastructure, there may be small buildings constructed. It has been assumed that these buildings will be constructed as slab-on-grade and therefore shallow intrusive work will be required (less than 1 m depth) to construct the appropriate footings.
- Access Roads and Parking Lots There is associated access roads and parking lots being constructed at layover and storage facilities. It has been assumed that the construction activities associated with access roads and parking lots will include shallow excavation and grading (less than 1 m depth) and placement of fill. As a result of these shallow works, no water mitigation measures would be required (such as dewatering or water management).

- New GO Station Platform(s) New platforms were not considered as part of the original baseline conditions assessment but have been included as part of this impact assessment. The proposed infrastructure is primarily surficial structures and shallow foundations but may also include construction of tunnels, ramps, elevators and stairs for pedestrian access to the platforms. Intrusive works will be required for foundations, footings, and other underground elements which could be greater than 2 m in depth. As a result, water mitigation measures may be required during construction and potentially long-term.
- **New Layover/Storage Facilities** If the proposed infrastructure includes construction of new layover areas, intrusive works will be required for foundations, footings, service bays, utilities and other elements which are greater than 2 m in depth. As a result, water mitigation measures may be required during construction.
- **Electrification of the Rail Corridor** Beginning at Mile 4.4, the Richmond Hill Corridor will undergo electrification which will include the following components:
  - Overhead Contact System foundations may be installed at an estimated depth of 5 m or greater depending on the type of overhead contact system structure.
  - Grounding and Bonding underground infrastructure may be required.
  - Bridge Widenings/Modifications bridge modifications may occur above or below ground.

Based on the assumptions above, greater hydrogeological effects may be experienced at proposed new platform areas, layover/storage site areas and where electrification is occurring, as this is where underground infrastructure may be constructed. This was the focus of the hydrogeological impact assessment, which was subsequently competed using the following criteria that was established for purposes of evaluating potential effects associated with hydrogeological components of the Project:

- Potential effects on the hydrogeological conditions within the study area;
- Potential effects on the hydrogeological conditions immediately adjacent to the study area (such as to private and communal/municipal water supply wells);
- Potential hydrogeological effects on surface water features such as lakes, rivers, creeks and wetlands;
- Assess the effects that the local groundwater conditions that may affect the project (e.g. high water table in surficial sandy soils that may require dewatering for construction or long-term operation);
- Potential effects to sensitive biota reliant on local groundwater conditions; and,
- Matters of provincial interest relating to the hydrogeological environment (e.g. contributions to sensitive hydrologic features of the Oak Ridges Moraine (ORM)).

Following identification of potential effects, mitigation/compensation/enhancement measures were identified based on a combination of best management practices and development of project-specific mitigation measures, as appropriate, to address project-specific impacts.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

### 5.4 Land Use/Socio-Economic Methodology

The following Land Use and Socio-Economic criteria was established for purposes of evaluating potential effects associated with the Project. Refer to **Appendix D2** for a more detailed description of the methodology utilized for this assessment.

#### Land Use Criteria

- Potential effects on existing land uses; and
- Potential effects on approved future/planned land uses.

Where infrastructure is proposed within the existing Metrolinx railroad ROW, no land use impacts have been identified as the use of the corridor is for transportation and utility.

#### Socio-Economic Criteria

- Potential effects on sensitive facilities (i.e., hospitals, schools, community landmarks, child-care centres, and long-term care centres);
- Potential effects on active transportation routes;
- Potential effects on pedestrian trails; and
- Potential effects on parks/open spaces/natural areas.

In order to address the potential effects associated with the Project, mitigation/compensation /enhancement measures were developed based on a combination of best management practices and project-specific mitigation measures, as appropriate.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

### 5.5 Visual Methodology

The following Visual Impact Assessment criteria were established for purposes of evaluating potential effects associated with the Project. Refer to **Appendix E2** for a more detailed description of the methodology utilized for this assessment.

- Potential visual effects on Residential, Commercial and Institutional uses;
- Potential visual effects on Recreational Uses, Active Transportation, Trails and Parks, and Open Spaces; and,
- Potential visual effects on approved land uses and/or proposed developments.

Following identification of potential effects, mitigation/compensation/enhancement measures were identified based on a combination of best management practices and development of project-specific mitigation measures categorized as follows:

**Negligible Impact Areas** which are considered not visually sensitive (where no mitigation is warranted), such as:

- Proposed layover facility /storage yard infrastructure is located within or in the vicinity of industrial/employment/commercial areas;
- Areas where there are no residential areas or no areas where people congregate in proximity to the rail corridors where OCS infrastructure is proposed (relevant to the Richmond Hill corridor only for purposes of this report); and



• Proposed track infrastructure is within the existing rail ROW.

Low Impact Areas which have minimal visual sensitivity and where there are minor impacts which may warrant some mitigation, such as:

- Proposed layover facility /storage yard infrastructure located in residential areas where homes are more than 20 metres away from the proposed infrastructure (20 metres was chosen because rear yards that are longer than approximately 20 metres typically contain vegetation that helps to screen views of the rail corridor and new OCS infrastructure placed within the corridor);
- Visual impacts due to OCS installation on the corridors where views to the corridor are not considered of scenic value or have already been degraded by other infrastructure intruding into views; and
- Proposed infrastructure is located in the vicinity of Mixed-Use areas.

**Moderate Impact Areas** where sensitive views are compromised and impacts should be minimized/mitigated where feasible, such as:

- Areas and overpasses where there are scenic views or scenic and natural areas that will be altered by the introduction of OCS structures;
- Areas where high-rise buildings in a natural setting are closer than 30 metres to the proposed infrastructure (30 metres was chosen as the distance where views from low storeys, but not necessarily the lowest storey, of buildings would be significantly altered from view of natural vegetation to views of OCS infrastructure);
- Residential areas where homes are between 8 and 20 metres away from the proposed infrastructure (20 metres was chosen because rear yards that are longer than approximately 20 metres typically contain vegetation that helps to screen views of the corridor and new OCS infrastructure placed within the corridor); and
- Rural farmland.

**High Impact Areas** where views are considerably compromised and should be minimized/mitigated to the extent possible, such as:

- Residential areas where homes are within 8 metres away from the proposed infrastructure (8 metres was selected as the distance where the rear of homes were so close to the rail corridor that privacy could be compromised due to the removal of vegetation for OCS infrastructure);
- Scenic, cultural or historic features/environments directly adjacent to the proposed infrastructure; and
- Environmental protected and natural areas directly adjacent to the proposed infrastructure.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

### 5.6 Cultural Heritage Methodology

The following section provides an overview of the criteria applied to assess potential Cultural Heritage impacts within the Study Area. Refer to **Appendix F2** for a more detailed description of the methodology utilized for this assessment.

5.6.1 Approach to Screening for Built Heritage Resources (BHRs) and Cultural Heritage Landscapes (CHLs)

The Cultural Heritage Assessment Report contained in **Appendix F2** addresses above-ground BHRs and CHLs over 40 years old. Use of a 40-year-old threshold is a guiding principle when conducting a preliminary identification of BHRs and CHLs (MHSTCI 2016). While identification of a resource that is 40 years old or older does not confer outright heritage significance, this threshold provides a means to collect information about resources that may retain heritage value. Similarly, if a resource is slightly less than 40 years old, this does not preclude the resource from retaining heritage value.

In the course of the cultural heritage report, all potentially affected BHRs and CHLs are subject to inventory. Short form names are usually applied to each resource type. Examples include, but are not limited to: barn, residence, bridge, culvert, and neighbourhood cultural heritage landscape. It should be noted that only bridges and culverts in the rail right-of-way with potential impacts from the Project were subject to cultural heritage assessment.

Background historical research, which includes consultation of primary and secondary source material and historic mapping, was undertaken to identify early settlement patterns and broad agents or themes of change in the study area. This stage in the data collection process enables the researcher to determine the presence of sensitive heritage areas that correspond to nineteenth- and twentieth-century settlement and development patterns. For the purposes of this study, the following sources were consulted: nineteenth-century mapping; nineteenth-century local historical accounts (Boulton 1805; Robinson 1885; Smith 1846; etc.); twentieth-century mapping; and railroad-specific sources.

Historical background and historic map reviews of the Lakeshore West, Lakeshore East, Kitchener, Barrie, Stouffville and USRC rail corridors is not presented in this CHR. This information was presented in the GO Rail Network Electrification TPAP CHSR (ASI 2017a) and it was determined for the purposes of this assessment, that heritage studies prepared as part of this 2017 TPAP were recent enough, sufficient, relevant and could be relied upon for the purposes of informing baseline data collection for the present undertaking. Historical background and historic map reviews for the Richmond Hill rail corridor has not previously been presented in a Metrolinx TPAP and is therefore included in this CHR.

To augment data collected during this stage of the research process, federal, provincial, and municipal databases and/or agencies were consulted to obtain information about specific properties that have been previously identified and/or designated as retaining cultural heritage value. Typically, resources identified during this stage of the research process are reflective of particular architectural styles, associated with an important person, place, or event, and contribute to the contextual facets of a particular place, neighbourhood, or intersection.

Finally, site visits were conducted to confirm the location and integrity of previously identified BHRs and CHLs, and to identify potential BHRs and CHLs not previously recognized.

Several investigative criteria were utilized during the data gathering phase to appropriately identify BHRs and CHLs. These investigative criteria were derived from provincial guidelines (including the *Ontario Regulation 9/06* and *Ontario Regulation 10/06* of the OHA), definitions, and past experience.

#### 5.6.2 Approach to Screening Bridges and Overhead Structures

The bridges identified in the Cultural Heritage Assessment Report contained in **Appendix F2** were subject to assessment for potential or known cultural heritage value. To complete this assessment, each bridge was visited to conduct photographic documentation from public rights-of-way and the following archival and background documents were consulted:

- Municipal heritage register/mapping or heritage planner file holdings;
- System-wide Bridge Inventory (Metrolinx 2019a);



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- System-wide Culvert Inventory (Metrolinx 2019b);
- Ontario Heritage Bridge List;
- Archives of Ontario;
- Relevant websites: <u>http://www.railmuseums.com/namerica/ONTARIO/; http://www.thbrailway.ca/;</u> <u>http://historicbridges.org/; and</u>
- Lines of Country: An atlas of railway and waterway history in Canada (Andreae 1997)

From the above information, the following data was acquired (where available) to assist in determining which bridges had potential for cultural heritage value:

- Maintenance Responsibility/Ownership;
- Original Construction Date;
- Significant Dates (repairs, rehabilitation work);
- Builder & Engineer;
- Bridge Type;
- Materials;
- Number of Spans;
- Bridge Width; and
- Markings/Distinguishing Features.

In addition, structural condition or maintenance inspection reports were requested (Request for Bridge Inspection Reports were made to Gannett Fleming by email, 18 September 2019).

Based on best practices and the Heritage Bridge Checklist (Municipal Engineers Association 2014), any bridges constructed after 1956 and which were identified as a typical bridge type (rigid frame, precast with concrete deck, culvert or simple span, steel beam with concrete deck), were not identified as a potential BHR.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

Following identification of potential effects, mitigation/compensation/enhancement measures were identified based on a combination of best management practices and development of project-specific mitigation measures, as appropriate, to address project-specific impacts.

### 5.7 Archaeological Methodology

The following Stage 1 Archaeology criteria was established for purposes of evaluating potential effects associated with the Project. Refer to **Appendix G2** for a more detailed description of the methodology utilized for this assessment.

- Archaeological resources;
- Recreational Uses, Active Transportation, Trails and Parks, and Open Spaces;
- Property and access;
- Approved land use and/or proposed developments;

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- Other knows projects/studies;
- Impact zone along the rail corridors based on the proposed siting of infrastructure;
- Bridges/structures requiring modifications;
- Proposed road closures; and
- Potential property requirements.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

Following identification of potential effects, mitigation/compensation/enhancement measures were identified based on a combination of best management practices and development of project-specific mitigation measures, as appropriate, to address project-specific impacts.

### 5.8 Stormwater Management Assessment Methodology

The following section provides an overview of the assessment criteria applied to assess potential Stormwater Management Assessment impacts within the Project Study Area. Refer to **Appendix H2** for a more detailed description of the methodology utilized for this assessment.

5.8.1 Establish Impact Assessment Criteria

The following assessment criteria was established for purposes of evaluating potential effects associated with the Project:

- Potential effects on existing drainage;
- Potential effects on existing outlet points (i.e. watercourses, stormwater management ponds, etc.);
- Potential effects on environmentally sensitive areas; and
- Potential effects due to footprint impacts, operations and maintenance impacts, and construction impacts.

Please note that this hydrologic analysis is based on conceptual design. Routing calculation for sizing basins are not addressed, and will therefore need to be evaluated and addressees during detailed design.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

Following identification of potential effects, mitigation/compensation/enhancement measures were identified based on a combination of best management practices and development of project-specific mitigation measures, as appropriate, to address project-specific impacts.

### 5.9 Traffic Impact Assessment Methodology

Refer to EPR Chapter 6, Section 6.3 for a description of the Traffic Impact Assessment methodology that was followed. Additional details can be found in **Appendix I.** 

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### 5.10 Utilities Methodology

The following section provides an overview of the criterial applied to assess potential impacts on Utilities / Utility conflicts within the Study Area. Refer to **Appendix J** for a more detailed description of the methodology utilized for this assessment.

5.10.1 Establish Impact Assessment Criteria

The following assessment criteria was established for purposes of evaluating potential effects associated with the Project:

- Potential effects due to track improvements and upgrades;
- Potential effects on railway assets;
- Potential effects on underground crossing assets;
- Potential effects on underground parallel assets;
- Potential effects due to layover facility structures;
- Potential effects due to installation of OCS infrastructure;
- Potential effects on overhead crossings assets;
- Potential effects on overhead parallel assets; and
- Potential effects due to OCS pole foundation locations and the utility crossing location.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

Following identification of potential effects, mitigation/compensation/enhancement measures were identified based on a combination of best management practices and development of project-specific mitigation measures, as appropriate, to address project-specific impacts.

### 5.11 Noise & Vibration Methodology

Refer to EPR Chapter 6.

### 5.12 Air Quality Methodology

Refer to EPR Chapter 6.

### 5.13 Climate Change Methodology

Refer to EPR Chapter 6.

### 5.14 EMI/EMF Methodology

The following section provides an overview of the methodology followed to assess potential EMI/EMF impacts within the Study Area. Refer to **Appendix N** for a more detailed description of the methodology utilized for this assessment. This methodology is applicable to the Richmond Hill corridor portion of the study area only.

5.14.1 Establish Impact Assessment Criteria

As established and explained in previous EMI/EMF Baseline Assessment Reports:

The International Committee for Non-Ionizing Radiation Protection (ICNIRP) places the levels of ELF EMF warranting mitigation and/or concern at 2,000 milligauss (mG) for the general public exposure and 10,000 mG for occupational exposure. As a conservative level, indicating the presence of man-made ELF EMF, this report selected 10 mG. At this level of ELF EMF it would be recommended that a location be returned to, and measured post-electrification. As well, such locations should be measured for EMI both during Impact Assessment, both prior to and post electrification.

This established the criteria for when a site must be resurveyed during Impact Assessment and/or when that site should be included in any post-electrification measurements.

The primary effects assessed with regard to electromagnetic compatibility (EMC) relate to human exposure, i.e., Extremely Low Frequency (ELF) Electromagnetic Fields (EMF). With regard to Electromagnetic Interference (EMI), the primary concern is adverse effects on electronics. The impact assessment presented in this report addresses each of these effects. The following additional considerations were also used in developing criteria for evaluating potential effects associated with the Project:

- Potential effects on Residential, Commercial and Institutional uses;
- Potential effects on Recreational Uses, Active Transportation, Trails and Parks, and Open Spaces;
- Potential effects on property and access;
- Potential effects on approved land use and/or proposed developments; and
- Potential effects on sensitive EMI receptors, such as airports and hospitals, and other locations where radar or x-ray devices might be used.

For the purposes of differentiating the various types of potential environmental effects related to the Project, effects were characterized and grouped as outlined in Table 5-1.

Following identification of potential effects, mitigation/compensation/enhancement measures were identified based on a combination of best management practices and development of project-specific mitigation measures, as appropriate, to address project-specific impact

### 5.15 Footprint Impacts - Lakeshore West Corridor

#### 5.15.1 Natural Environment

A Natural Environment Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-101. Additional details can be found in **Appendix B2**.

#### 5.15.1.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

The Walkers Line Layover occurs within the urbanized setting of the City of Burlington within Ecoregion 7E-4. Surrounding land use consists primarily of residential, commercial and institutional uses. The features discussed below are provided on Figures LSW-4 and LSW-5 in **Appendix B2**.

#### Terrestrial Environment

Vegetation communities occurring beyond the Shoreacres Creek valley are dominated by Cultural Thicket (CUT) to the west of Shoreacres Creek and Cultural Meadow (CUM) to the east. The majority of the existing CUM and CUT communities will be removed to accommodate the proposed layover facility. Staghorn Sumac (Rhus typhina), Buckthorn (Rhamnus cathartica), Manitoba Maple (Acer negundo), and smaller shrubs (Raspberry (Rubus idaeus) comprise the majority of trees to be removed within the CUT community. The approximate area of vegetation loss is 3.2 hectares (ha) consisting of predominately of approximately 2.9 ha of CUM and CUT communities.

The Shoreacres Creek valley is comprised of woodland best characterized as a Fresh Moist Deciduous Lowland Willow Forest community (FOD7-3). Encroachment into the Shoreacres Creek valley to accommodate the proposed culvert extension to the north will result in approximately 0.11 ha of permanent vegetation removal along this valley corridor including the removal of several mature willow trees. The vegetation in this location is comprised of a mix of Crack Willow and willow species (Salix fragilis), American Elm (Ulmus americana), Manitoba Maple with understory shrubs of Gray Dogwood (Cornus racemose) in association with invasive Honeysuckle (Loniceria sp.) and Buckthorn. Herbaceous vegetation was dominated by invasive Garlic Mustard (Alliaria petiolata) and Dames Rocket (Hesberis matronalis) with evidence of native grasses along the banks and open canopy pockets.

The Shoreacres Creek valley provides a local corridor and linkages (movement) for urban tolerant wildlife. Species observed using this corridor included Racoon (Procyon lotor) and a Coyote (Canis latrans) and an Eastern Wood-Peewee (Contopus virens) was heard within the creek corridor in proximity (50 m) to the existing creek crossing in June 2020 by SLR Ecologists. Wildlife passage under the existing rail corridor appears to be possible based on the relatively large dimensions of the existing triple chamber culvert and 2020 field observations indicating that at least one of the chambers was dry during normal discharge events.

Potential footprint impacts include removal of nesting, foraging and general use habitats for urban tolerant wildlife and permanent displacement of vegetation. The proposed habitat removal and displacement are anticipated to be moderate given the disturbances observed on site including the abundance of non-native and invasive vegetation species and the fragmentation of the terrestrial environment due to presence of arterial roads and extensive industrial and commercial land use surrounding the Walkers Line Layover site. Due to the relatively large dimensions of the existing triple chamber culvert, the proposed extension is not anticipated to create a barrier to wildlife passage and therefore the linkage function should remain intact.

Restoration of the proposed encroachment into the FOD7-3 woodland will require special attention to ensure a robust vegetation restoration plan is provided to reintroduce instream shade with a goal to improve wildlife habitat opportunities within the creek corridor following construction. Using this approach, the encroachment into the FOD7-3 community is not anticipated to create long term residual



impacts to the Shoreacres Creek valley since vegetation loss will be replaced and a native and wildlife friendly plant community will be purposefully reintroduced into the valley lands adjacent to the existing culvert crossing.

With the use of the recommended mitigation and adherence to Metrolinx's Vegetation Removal and Compensation Guideline, there are no residual adverse effects to vegetation or wildlife habitat anticipated from the removal of the CUM and CUT communities due to the relatively low-quality habitat present and the position of the property within a long established industrial and commercial land use setting.

Mitigation for these removals include, but are not limited to:

- Ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal and wildlife outlined in Table 5-101 and adherence to Metrolinx's Vegetation Management Guidelines and Tree Removal Strategy;
- Special attention will be required to ensure a robust vegetation restoration plan is provided in accordance with Metrolinx's Vegetation Management Guidelines to reintroduce instream shade wildlife habitat opportunities within the creek corridor following construction; and
- Where lighting is required for safety and security of the proposed layover facility, the design and intensity should consider Wildlife Friendly Lighting to reduce possible harmful adverse effects.

#### Aquatic Environment

The Project study area segments that constitute the Walkers Line Layover (LSW-4 and LSW-5) are positioned on the divide between the subwatersheds of Tuck Creek and Shoreacres Creek. The main branch of Shoreacres Creek traverses through the eastern portion of the proposed Layover and passes under the existing tracks through a triple chamber concrete structure. This valley and floodplain area of Shoreacres Creek is located within the Conservation Halton jurisdiction and is regulated under *Ontario Regulation 162/06*.

The proposed extension of the existing large triple box culvert will also displace approximately 30 linear metres (or approximately 120 m<sup>2</sup>) of active creek and fish habitat. It should be noted that this conclusion was based on a conceptual level of design and infield creek dimension observed during the 2020 site investigation. The area of aquatic impact should be reassessed during future project phases, once a more mature design is available. This structural expansion will result in removal of boulders/cobbles and other instream cover for fish within the existing channel upstream of the central culvert chamber. Unique or sensitive instream habitat features were not observed in the footprint of the proposed culvert extension. While this removal of fish habitat is considered permanent, habitat improvements will be employed within the remainder of the channel through the reach to address and compensate for the potential harmful alteration, disruption or destruction (HADD) of fish habitat. A Request for Project Review should be submitted to DFO during future design phases to ensure compliance with the Fisheries Act. Similarly, Conservation Halton should be consulted to ensure required review and permitting requirements are achieved for works within a regulated area (*O. Reg.162/06*).As part of the avoidance and restoration plan for the protection of fish habitat:

- Instream construction activities will be subject to warmwater timing window of July 1<sup>st</sup> to March 31<sup>st</sup>; and
- General mitigation measures for fish and fish habitat and wetlands and waterbodies outlined in Table 5-101 will be followed.

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#### Species at Risk

Potential habitat for the following SAR occurs within the proposed Walkers Line Layover footprint, including the Lowland Willow Forest community (FOD 7-3) along Shoreacres Creek: Eastern Wood-Pewee (confirmed within the Project study area and on adjacent lands), Red-headed Woodpecker, Barn Swallow and SAR insects including Monarch Butterfly. The Shoreacres Creek corridor may also provide movement linkages for SAR Turtles and potential habitat for SAR bats.

The large triple chamber watercourse crossing structure provides potential habitat for Barn Shallow however none were observed onsite during the 2020 site visits. Eastern Wood-Peewee (Special Concern) was heard within the creek corridor in proximity (50 m) to the existing creek crossing during both spring visits in June 2020 by SLR Ecologists and is considered a probable breeder within the woodland valley.

Main portions of the existing CUM and CUT communities will require removal to accommodate the layover facility while encroachment into the Lowland Willow Forest community (FOD 7-3) will also be required. The removal of cultural vegetation and in particular, Milkweed (Asclepias syriaca) within the cultural meadow community, will potentially create a temporary displacement of habitat for Monarch Butterfly. Attractive habitat (Milkweed) for Monarch Butterfly can be incorporated into the vegetation restoration plan for the proposed layover area to off-set any temporary habitat removal.

While the encroachment of the Lowland Willow Forest community (FOD 7-3) is considered a permanent removal of potential habitat for both Eastern Wood-Pewee and Red-headed Woodpecker and SAR bats, habitat within the proposed culvert extension footprint is similar to the riparian vegetation along much of the remaining portion of the upstream valley corridor and does not represent unique habitat for these species. For these reasons, none of these potential reductions in vegetation is considered a significant disruption or loss of SAR habitat. Further consultation with MECP is recommended during subsequent design phases to ensure compliance with ESA, 2007.

Mitigation for these removals include, but are not limited to:

- Ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal and wildlife outlined in Table 5-101 and adherence to Metrolinx's Vegetation Management Guidelines and Tree Removal Strategy;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- Where lighting is required for safety and security of the proposed layover facility, the design and intensity should consider Wildlife Friendly Lighting to reduce possible harmful adverse effects.

#### Significant Wildlife Habitat

Candidate SWH may be present due to the presence of Shoreacres Creek and its riparian habitat within the proposed layover Project study area. Candidate SWH, in addition to bat roosts, may include: Amphibian Breeding Habitat and Special Concern and Rare Wildlife Species.

While the encroachment of Lowland Willow Forest community (FOD 7-3) is considered a permanent removal of potential habitat for both Eastern Wood-Pewee and Red-headed Woodpecker, and SAR bats, habitat within the proposed culvert extension footprint is similar to the riparian vegetation along much of the remaining portion of the upstream valley corridor and does not represent unique habitat for these species. For similar reasons provided above for SAR habitat, none of the potential reductions in vegetation is considered a significant disruption or loss of candidate SWH habitat.

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#### **Designated Areas**

No provincially designated features are present within this segment of the Project study area. The Shoreacres Creek valley forms part of the Burlington Natural Heritage System. The proposed encroachment within the Shoreacres Creek valley will reduce the area of the NHS by approximately 370 m<sup>2</sup>. This reduction is unavoidable due to the linear design requirement of the layover facility. Due to the relatively large dimensions of the existing triple chamber culvert passing under the existing GO Rail ROW, the proposed culvert extension is not anticipated to create a barrier to wildlife passage and therefore the linkage function of the NHS should remain intact.

5.15.1.2 Potential Effects & Mitigation Measures: Segment: LSW-1 – Mile 8.10 to Mile 8.60

The proposed track infrastructure in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.15.1.3 Potential Effects & Mitigation Measures: Segment LSW-2 – Mile 20.20 to Mile 20.70

The proposed track infrastructure in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.15.1.4 Potential Effects & Mitigation Measures: Segment LSW-3 – Mile 20.70 to Mile 21.20

The proposed track infrastructure in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.15.1.5 Potential Effects & Mitigation Measures: Segment LSW-4 – Mile 28.50 to Mile 29.00

Refer to Section 5.15.1.1 above, which describes natural environment impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-4.

5.15.1.6 Potential Effects & Mitigation Measures: Segment LSW-5 – Mile 29.00 to Mile 29.50

Refer to Section 5.15.1.1 above, which describes natural environment impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-5.

#### 5.15.2 Hydrogeological

A Hydrogeology Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-102. Additional details can be found in **Appendix C2**.

5.15.2.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

The infrastructure for this Study Area Segment consists of a new layover facility. The surrounding area within 500 m is highly developed with commercial/industrial operations in the immediate area, and residential development further to the east.

The regional physiography in this area is defined as Iroquois Plain with the surficial geology described as being predominantly classified as Paleozoic bedrock (Blue Mountain Dolostone or Shale) near surface. Initial review of MECP well records for the area indicate little to no overburden soils in the vicinity of the Study Area (Gannett Fleming, 2020).

There are three domestic supply wells noted in the MECP Well Record Database (IDs 2800260, 2800261 and 5719966) within 500 m of the proposed Layover facility<sup>2</sup>. The remaining records are for

<sup>&</sup>lt;sup>2</sup> One record (Well ID 5719966) has been mistakenly mapped (within the MECP database) near the Study Area segment



wells used for observation/monitoring/test holes (77 wells), abandoned (3 wells) or of unknown use (11 wells). The area is serviced with municipal water supply, and based on the availability of municipal services, it is likely that the domestic wells are no longer in use for water supply purposes. Use of these wells should be confirmed by the contractor prior to construction activities.

There are 2 waterbodies located within 500 m of the Study Area Segment: Shoreacres Creek and Tuck Creek. Both creeks flow in a southerly direction under the current rail line ROW towards Lake Ontario. However, only Shoreacres Creek is located within the footprint of the proposed layover facility, passing under the existing tracks through a triple chamber concrete structure. Preliminary design plans include extension of the culvert for the Creek by approximately 32m.

Shoreacres Creek is a permanent warmwater watercourse with a hardbottom shale bed with very little silt/sand and no organics. The creek appears to be predominantly runoff fed, with little groundwater baseflow, although this should be confirmed during detailed design. The infrastructure is not expected to have an impact on groundwater baseflow into the Creeks due to the limited extant of the proposed new culvert (in comparison to the overall length of the creek) and the low anticipated groundwater contribution to streamflow under existing conditions.

The recharge of groundwater from infiltrating precipitation has potential to be reduced due to the increased impermeable surfaces from paving of road and parking areas. However, as the area is already highly developed, and the general low permeable of near surface soils across the general area, it is anticipated that infiltration is limited under current conditions.

Based on the above information, there it is not anticipated that there will be any adverse impacts due to the footprint of the infrastructure to the groundwater supply wells or Shoreacres Creek and Tuck Creek. Therefore, no mitigation measures are recommended.

5.15.2.2 Potential Effects & Mitigation Measures: Segment: LSW-1 – Mile 8.10 to Mile 8.60

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.15.2.3 Potential Effects & Mitigation Measures: Segment LSW-2 – Mile 20.20 to Mile 20.70

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.15.2.4 Potential Effects & Mitigation Measures: Segment LSW-3 – Mile 20.70 to Mile 21.20

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.15.2.5 Potential Effects & Mitigation Measures: Segment LSW-4 – Mile 28.50 to Mile 29.00

Refer to Section 5.15.2.1 above, which describes hydrogeological impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-4.

5.15.2.6 Potential Effects & Mitigation Measures: Segment LSW-5 – Mile 29.00 to Mile 29.50

Refer to Section 5.15.2.1 above, which describes hydrogeological impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-5.

#### 5.15.3 Land Use/Socio-Economic

A Land Use and Socio-Economic Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-103. Additional details can be found in **Appendix D2**.



#### 5.15.3.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

#### Land Use

The site of the proposed Walkers Line Layover is currently located in the City of Burlington in an area largely designated as employment/industrial and mixed-use, and is surrounded by Halton Honda, Sector Technology, JP Motors, and a small strip mall. There will be a footprint impact on employment/industrial land uses (i.e., the adjacent Attridge Transportation Inc. lands) due to the placement of layover facility components, such as staff parking, access road and facility structures (see Figure 5-2).

Under the City of Burlington Zoning By-law 2020, the rail corridor is zoned as Utility Services.

The proposed Walkers Lines Layover site, however, is zoned *General Employment (GE2-220)*, which permits various types of manufacturing uses, including public transportation; *General Employment (GE1)*, which permits transportation, communication and utilities, transportation equipment industries, waste transfer station, office uses, construction and trade contractors, and machinery and equipment storage; and *Utility Services (S)*, which permits any transportation, communication or utility use.

Based on this understanding, the proposed track infrastructure is not expected to conflict with the current zoning given existing land uses in the vicinity of the site.

#### Socio-Economic

There are no sensitive features within 100 metres of the proposed layover facility; therefore, there are no anticipated footprint impacts to sensitive features.

A pedestrian walkway traverses under the rail corridor at Walkers Line and along Harvester Road; however, this feature will not be impacted by the proposed works and there are no anticipated footprint impacts to recreational amenities as a result of the project.

Currently, the proposed Walkers Line Layover site is partially within the Metrolinx ROW and partially located on adjacent lands. Attridge Transportation Inc. operates an existing school bus depot on the proposed Walkers Line Layover site. There are anticipated footprint impacts to this business and the proposed works may result in a reduction in bus storage capacity. However, there is an opportunity for Metrolinx to work with the business owner to minimize impacts to the extent feasible.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality, please refer to the respective reports contained in the New Track & Facilities EPR and the GO Rail Network Electrification EPR Addendum.

There are no anticipated adverse effects on recreational amenities resulting from the implementation of layover infrastructure that were identified on the basis of the available conceptual design. Notwithstanding this, potential conflicts with recreational amenities and businesses will be re-examined during the detailed design phase, and if required the City of Burlington will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities and/or businesses.

#### Mitigation Measures

The Walkers Line Layover is proposed in an area that is compatible with existing uses in and adjacent to the site and therefore no impacts to land use are expected.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.



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FIGURE 5-2 EXCERPT OF APPENDIX D2, SEGMENT LSW-5 MAP

It is assumed that following municipal discussions and a review of the detailed design, it will be deemed consistent with adjacent uses due to the proximity to the rail corridor and the proposed location in a highly developed area characterized by industrial/utility uses. Additionally, Metrolinx will continue to work with the business owner of the adjacent Attridge Transportation Inc. lands to find integrated solutions to accommodate both the proposed development and existing uses of the site.

If an agreement cannot be met, Metrolinx will further work with the business owner to identify compensation and ensure that successful relocation can be achieved, if required. Property acquisition required for this Project will be undertaken by Metrolinx, with the objective being to provide fair market value compensation to affected property owners in accordance with applicable laws.

5.15.3.2 Potential Effects & Mitigation Measures: Segment LSW-1 – Mile 8.10 to Mile 8.60

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment, although there is the potential for property acquisition to accommodate the upgraded track alignment. As a result of this activity, there is a footprint impact on the adjacent employment/industrial land uses.

#### Socio-Economic

There are no sensitive facilities within 100 metres of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

Two parks are located in close proximity to the rail corridor; however, there are no expected footprint impacts on these parks as a result of this activity.

#### Mitigation Measures

The proposed track infrastructure is compatible with existing land uses and zoning.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.15.3.3 Potential Effects & Mitigation Measures: Segment LSW-2 – Mile 20.20 to Mile 20.70

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work, however a cycling route traverses the rail corridor at the Chartwell Road rail crossing. There are no anticipated footprint impacts to sensitive facilities or recreational amenities.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

#### Mitigation Measures

Mitigation recommendations outlined in their respective reports listed above for the Lakeshore West Corridor will be adhered to and implemented during detailed design and construction.

It is acknowledged that this segment is partially within Conservation Halton's regulated area, and traverse tributaries of the Lower Morrison Creek. As a result, there is the potential for flooding and erosion hazards. If there are any proposed modifications to the existing culverts or an expansion of development (i.e., structures, fill, grading, etc.) beyond the existing developed track area, further details will be provided to Conservation Halton staff to advise of any typical requirements under *Ontario Regulation 162/06*.

5.15.3.4 Potential Effects & Mitigation Measures: Segment LSW-3 – Mile 20.70 to Mile 21.20

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work. Cornwall Road Sports Park is in close proximity to the rail corridor, however there are no anticipated footprint impacts to sensitive facilities or recreational amenities.

#### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

It is acknowledged that this segment is partially within Conservation Halton's regulated area, and traverse tributaries of the Lower Morrison Creek. As a result, there is the potential for flooding and erosion hazards. If there are any proposed modifications to the existing culverts or an expansion of development (i.e., structures, fill, grading, etc.) beyond the existing developed track area, further details will be provided to Conservation Halton staff to advise of any typical requirements under Ontario Regulation 162/06.

5.15.3.5 Potential Effects & Mitigation Measures: Segment LSW-4 – Mile 28.50 to Mile 29.00

Refer to Section 5.15.3.1 above, which describes land sue and socio-economic impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-4.

5.15.3.6 Potential Effects & Mitigation Measures: Segment LSW-5 – Mile 29.00 to Mile 29.50

Refer to Section 5.15.3.1 above, which describes land use and socio-economic impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-5.

#### 5.15.4 Visual/Aesthetics

A Visual/Aesthetics Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-104. Additional details can be found in **Appendix E2**.

5.15.4.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

The Walkers Line Layover site is proposed east of Appleby GO Station, near Walkers Line and Harvester Road in the City of Burlington. The surrounding properties are primarily commercial and employment lands, with the exception of Shoreacres Creek, a natural area that is regulated by Conservation Halton. The proposed use of this layover facility is to reduce congestion on the rail corridor, minimize non-revenue travel by being near major GO Stations (including Appleby GO and Burlington GO Stations), and service the Lakeshore West corridor by utilizing this facility to park trains during off-peak hours.

The Walkers Line Layover Facility is anticipated to consist of storage for nine (9) trains within the existing rail ROW, which is to be electrified. The facility components (staff building, parking, access road, sanitary storage, lighting) are proposed on adjacent lands, which are currently being used as a school bus depot. The visual impact due to the proposed facility on commercial/employment lands is considered Negligible as the proposed storage tracks are contained within Metrolinx's existing ROW and industrial buildings are likely to block views from surrounding roadways. Therefore, views of the Walkers Line Layover Facility are largely limited to parking lots located behind commercial buildings (see Figure 5-3).

There is, however, anticipated impacts due to the construction of the Walkers Line Layover facility (i.e., facility will impact the composition and character of current views experienced by visual receptors along Shoreacres Creek resulting in High visual impacts). It is anticipated that views will be highly altered due to the proposed facility, specifically, due to stored trains obstructing views to and from the creek below.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18. Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the Walkers Line Layover are further described in Table 5-104.

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FIGURE 5-3 PROPOSED WALKERS LINE LAYOVER FACILITY – BIRD'S EYE VIEW

#### 5.15.4.2 Potential Effects & Mitigation Measures: Segment LSW-1 – Mile 8.10 to Mile 8.60

Segment LSW-1 consists mostly of employment/industrial land uses along the railroad.; these areas have been classified as a *Negligible* visual impact. Two large parks and a residential neighbourhood are adjacent to the railroad to the south, but since the proposed track is within the existing rail ROW, these areas have also been classified as a *Negligible* visual impact.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.15.4.3 Potential Effects & Mitigation Measures: Segment LSW-2 – Mile 20.20 to Mile 20.70

Segment LSW-2 consists mostly of commercial and employment/industrial land uses along the rail tracks. These areas are classified as having *Negligible* visual impacts and require no mitigation, since the proposed track is within the existing rail ROW.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.15.4.4 Potential Effects & Mitigation Measures: Segment LSW-3 – Mile 20.70 to Mile 21.20

Segment LSW-3 consists mostly of commercial and employment/industrial land uses along the rail track. These areas are classified as having *Negligible* visual impacts and require no mitigation. The Cornell Road Sports Park is adjacent to the tracks on the south, but since the proposed track is within the existing rail ROW, this area has also been classified as a *Negligible* visual impact.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.15.4.5 Potential Effects & Mitigation Measures: Segment LSW-4 – Mile 28.50 to Mile 29.00

Refer to Section 5.15.4.1 above, which describes visual impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-4.

5.15.4.6 Potential Effects & Mitigation Measures: Segment LSW-5 – Mile 29.00 to Mile 29.50

Refer to Section 5.15.4.1 above, which describes visual impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-5.

#### 5.15.5 Cultural Heritage

A Cultural Heritage Report: Impact Assessment was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-105. Additional details can be found in **Appendix F2**.

5.15.5.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

As no BHRs and CHLs were identified at in this segment, there will be no potential effects to BHRs and CHLs and associated mitigation measures are not required.

5.15.5.2 Potential Effects & Mitigation Measures: Segment LSW-1 – Mile 8.10 to Mile 8.60

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.15.5.3 Potential Effects & Mitigation Measures: Segment LSW-2 – Mile 20.20 to Mile 20.70

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.


5.15.5.4 Potential Effects & Mitigation Measures: Segment LSW-3 – Mile 20.70 to Mile 21.20

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.15.5.5 Potential Effects & Mitigation Measures: Segment LSW-4 – Mile 28.50 to Mile 29.00

Refer to Section 5.15.5.1 above, which describes cultural heritage impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-4.

5.15.5.6 Potential Effects & Mitigation Measures: Segment LSW-5 – Mile 29.00 to Mile 29.50

Refer to Section 5.15.5.1 above, which describes cultural heritage impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-5.

## 5.15.6 Archaeology

A Stage 1 Archaeological Assessment was undertaken for the New Track & Facilities TPAP. A summary of the findings and recommendations for the Lakeshore West Corridor can be found in the sections below. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-106. Additional details can be found in **Appendix G2**.

## 5.15.6.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

The Walkers Line Layover Location study area is located in Borden block *AiGw*. According to the OASD (MHSTCI 2020) eight previously registered archaeological sites are located within 1 km of the study area, none of which are located within 50m. Site details are presented below in Table 5-3.

### TABLE 5-3 WALKERS LINE LAYOVER LOCATION – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AiGw-82	George Alton	Archaic	Unknown	Arthur Roberts 1976
AiGw-83	Ross Segsworth	Pre-Contact Indigenous	Findspot	Arthur Roberts 1976
AiGw-87	George Richardson	Archaic	Unknown	Arthur Roberts 1976
AiGw-88	Appleby Line	Paleo-Indian; Archaic; Woodland		Arthur Roberts 1976
AiGw-90	Baseball Diamond	Archaic	Unknown	Arthur Roberts 1976
AiGw-91	Misfit Creek ∀alley	Archaic	Camp/campsite	Arthur Roberts 1976
AiGw-92	Misfit Creek ∀alley 2	Archaic	Unknown	Arthur Roberts 1976
AiGw-93	West Misfit Bank	Archaic	Unknown	Arthur Roberts 1976

There is potential for the disturbance of unassessed or documented archaeological resources within the Walkers Line Layover site (see **Appendix G2** for more information). For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, a Stage 2 Archaeological Assessment conducted by test pit survey at five metre intervals will be conducted by a professionally licensed archaeologist prior to disturbance.

According to the S & G Section 2.1.2, test pit survey is required on terrain where ploughing is not viable, such as wooded areas, properties where existing landscaping or infrastructure would be damaged, overgrown farmland with heavy brush or rocky pasture, and narrow linear corridors up to 10 metres wide.

No archaeological resources were encountered during the course of the Stage 2 Archaeological Assessment for the New Track and Facilities TPAP Walkers Line Layover, therefore no further archaeological assessment is required.

5.15.6.2 Potential Effects & Mitigation Measures: Segment: LSW-1 – Mile 8.10 to Mile 8.60

The Stage 1 Archaeological Assessment confirmed that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required.

5.15.6.3 Potential Effects & Mitigation Measures: Segment LSW-2 – Mile 20.20 to Mile 20.70

According to the OASD, no previously registered archaeological sites are located within one kilometre of the study area. Background research confirmed two previous reports, which detail fieldwork within 50 metres of the Segment LSW-2 study area. The Stage 1 Archaeological Assessment confirmed that there are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.15.6.4 Potential Effects & Mitigation Measures: Segment LSW-3 – Mile 20.70 to Mile 21.20

According to the OASD, no previously registered archaeological sites are located within one kilometer of the study area. Therefore, there are no anticipated impacts of the proposed tracks in this segment and no mitigation measures are required.

5.15.6.5 Potential Effects & Mitigation Measures: Segment LSW-4 – Mile 28.50 to Mile 29.00

Refer to Section 5.15.6.1 above, which describes archaeological impacts for the Walkers Line Layover and comprises Segment LSW-4.

5.15.6.6 Potential Effects & Mitigation Measures: Segment LSW-5 – Mile 29.00 to Mile 29.50

Refer to Section 5.15.6.1 above, which describes archaeological impacts for the Walkers Line Layover and comprises Segment LSW-5.

5.15.7 Stormwater Management

A Stormwater Management Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments for the Walkers Line Layover Facility are outlined in Table 5-107. Additional details can be found in **Appendix H**.

5.15.7.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

#### Hydrologic Analysis

## Drainage Areas

The proposed Walkers Line Layover site development will include a staff and storage building, parking lot, electrical substation and four (4) railroad car storage tracks enclosed by a chain link fence. The site will drain through two (2) distinct catchments with a mix of industrial impervious surfaces, track and ballast areas and open space. The drainage areas and runoff coefficients for the d two catchments are shown in Table 5-4. Runoff coefficients for track and ballast areas were taken from the Colorado DOT report titled, "Modeling Ballasted Tracks for Runoff Coefficient C" (August 2012). It should be noted that the existing and proposed catchment areas are based on preliminary assumptions and need to be reconfirmed during detailed design.

The proposed development areas and their locations are based on conceptual design and may be refined as the design progresses. Therefore, reassessment of the drainage areas will be required at subsequent design stages, as necessary.



The existing and the proposed drainage areas and runoff coefficients are summarized below in Table 5-4. Runoff coefficient for open space will be verified after soil type is determined during detailed design investigation.

TABLE 5-4 WALKERS	LINE LAYOVER	- EXISTING AND	PROPOSED	DRAINAGE	ARFAS
TABLE 5-4 WALKEND				DIVANAOL	

Existing Condition - Catchment 1			Proposed Condition - Catchment 1			
Area Type	Drainage Area (ha)	Runoff Coefficient	Area Type	Drainage Area (ha)	Runoff Coefficient	
Industrial Impervious	3.40	0.85	Industrial Impervious	3.40	0.85	
Track/Ballast	0.84	0.84	Track and Ballast	3.08	0.84	
Open Space	4.10	0.30	Open Space	1.86	0.30	
Total/Composite	8.34	0.58 (0.50)		8.34	0.72	
Existing Condition -	Catchment 2		Proposed Condition - Catchment 2			
Area Type	Drainage Area (ha)	Runoff Coefficient	Area Type	Drainage Area (ha)	Runoff Coefficient	
Industrial	0.00	0.85	Industrial	0.00	085	
Impervious			Impervious			
Track/Ballast	0.94	0.84	Impervious Track and Ballast	2.60	0.84	
Track/Ballast Open Space	0.94	0.84	Impervious Track and Ballast Open Space	2.60 0.65	0.84	

## Flow Analysis

A preliminary analysis of runoff from the site area was completed to assess the requirement of proposed measures and to mitigate the impact of the development on stormwater drainage. The Rational Formula was used to determine flows for the existing and the proposed development conditions. Two (2) catchment areas were used for the analysis to highlight the differences between existing and proposed conditions.

As discussed, the new development will increase the impervious area and, therefore, the stormwater runoff. Flows were computed for the 2-year to 100-year storm events using City of Burlington IDF curves (S-IDF, June 1998). The runoff for the 25mm storm was computed using equation 4.8 and 4.9 presented in the Stormwater Management Planning and Design Manual by MOE (March 2003) to assess the requirements for the runoff quality control. An estimated time of concentration (Tc) of 10 minutes was used in the flow computations.

Runoff computations are presented in **Appendix C**. Parameters used for the computations were determined from the City of Burlington IDF curves (S-IDF, June 1988). Results are summarized below in Table 5-5. A factor of 25% is applied to the post-development flows as per the Metrolinx Climate Change Initiative.

## TABLE 5-5 WALKERS LINE LAYOVER - EXISTING AND PROPOSED DEVELOPMENT FLOWS

#### Catchment 1

	Exist Flow	Post Dev.	Flow	Metrolinx C	limate Change Initia	ative (+25%)
Storm Event	EXIST	Flow	Increase	Post Dev. Flow	Flow Increase	9/ 1000000
	m³/s	m³/s	m³/s	m³/s	m³/s	% increase
25mm	0.317	0.621	0.304	0.776	0.459	144.62%
2yr	0.790	1.143	0.353	1.429	0.639	80.92%
5yr	1.021	1.477	0.456	1.847	0.826	80.92%
10yr	1.172	1.696	0.524	2.120	0.948	80.92%
25yr	1.364	1.974	0.610	2.468	1.104	80.92%
50yr	1.504	2.177	0.673	2.721	1.217	80.92%
100yr	1.644	2.380	0.736	2.974	1.330	80.92%

## Catchment 2

	Exist Flow Post Dev.		Flow	Metrolinx Climate Change Initiative (+25%)		
Storm Event	m Event	Flow Increase		Post Dev. Flow	Flow Increase	0/ 1
	m³/s	m³/s	m³/s	m³/s	m³/s	% increase
25mm	0.105	0.247	0.142	0.309	0.204	194.43%
2yr	0.281	0.451	0.170	0.564	0.283	100.73%
5yr	0.363	0.583	0.220	0.728	0.365	100.73%
10yr	0.417	0.669	0.252	0.836	0.420	100.73%
25yr	0.485	0.779	0.294	0.973	0.488	100.73%
50yr	0.535	0.859	0.324	1.073	0.539	100.73%
100yr	0.584	0.938	0.354	1.173	0.589	100.73%

## Development Impact on Drainage & Proposed Measures (Footprint Impacts)

The proposed Walkers Line Layover development will increase the track impervious area of the site by 3.90ha resulting in increased discharges of approximately 81% and 101% for Catchments 1 and 2 respectively for the 2yr to 100yr storm events. From Table 5-5, the theoretical increase in flows resulting from the Walkers Line Layover development is significant when considering the climate change initiative, therefore, measures for the quantity, quality and water balance will be required. Additionally, given the potential extension or replacement of existing 3-cell precast concrete box culvert and realignment of Shoreacres Creek, 2-D HEC-RAS modelling, cut-and-fill analysis for flood control, Geotechnical investigation for toe erosion allowance and stable slope allowance, and Fluvial Geomorphology investigation will be required for this site. Further investigation and analysis will be required to verify and mitigate these post-development conditions during detailed design.

Catchment 1 runoff from the layover facility infrastructure (including parking lot, access roads, and building area) will be collected in a series of catch basins and routed to a rip-rap spillway, ultimately discharging to the east into Shoreacres Creek. Refer to **Appendix H** for additional details.

The existing swale north of the tracks will be replaced by the proposed tracks (i.e. rail corridor widening to the north). Runoff from the layover tracks within Catchments 1 and 2 will drain through a series of catch basins and routed through an oil-grit separator (OGS) to the proposed drainage culvert, ultimately discharging to the east into Shoreacres Creek. The proposed drainage culvert will be sized to convey the layover track and facility runoff as well as any external drainage from adjacent properties to the existing outlet at Shoreacres Creek.

A separate drainage system is required for the track runoff. In accordance with Metrolinx standards, storm sewer system for all new facilities shall include provisions for spill capture and containment. Automated oil shutoff valves and oil/water separators from all drainage lines from all drip trays will be installed prior to drainage entering the existing storm system, for all new facilities. Drip trays and track drainage layouts will be confirmed and evaluated during detailed design.

Surface runoff for facilities and impervious surfaces shall be conveyed in a treatment train system (e.g. bio-swales, oil-grit separators, enhanced treatment swales, etc.) prior to discharging into the municipal storm sewer system(s) and conservation authority lands. Should poor infiltration rate (as determined through future hydrogeological investigations) be identified, innovative LID measures, which are not dependent on infiltration should be further investigated. Further analysis is needed at the detailed design stage to develop a treatment train, review downstream municipal infrastructure capacity and develop detailed solutions.

A potential impact of the proposed Walkers Line Layover development on existing drainage is to the existing 3-cell precast concrete box culvert carrying existing tracks at the Shoreacres Creek crossing. The addition of four (4) additional layover tracks and associated paved access road will result in widening, rehabilitation, and extension or replacement of the culvert. Depending on the type of works required, realignment of Shoreacres Creek will need to be reviewed. Any disturbances or modifications to the existing creek will be developed and reviewed during detailed design in consultation with Conservation Halton.

Safe access for operations and maintenance will be reviewed following this investigation and to be confirmed by the Constructor during detailed design.

A detailed analysis for the quantity, quality, erosion control and water balance will be required at the detailed design stage. The analysis shall include details for a treatment train approach which prioritizes minimizing footprint impacts while satisfying quantity and quality criteria.

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FIGURE 5-4 WALKERS LINE LAYOVER - HRCA REGULATION MAPPING<sup>3</sup>

<sup>3</sup> This mapping has been developed through publicly available information for the purposes of this Report.

## **Recommendations**

From the hydrological analysis and the subsequent discussion presented in this section of the report, it is concluded that the construction of the Walkers Line Layover will result in an increase to the runoff rate and quantity compared to existing conditions. A treatment train system is recommended consisting of oil-grit separators, swales, and low impact development features providing quality control. Extensive analysis during detailed design stage will need to be completed to determine the capacity of the existing municipal infrastructure.

Erosion control and water balance targets will be achieved by infiltrating 5 mm of runoff.

The flow contribution to existing swales, culverts and storm sewers and their capacities are not known at this stage. A firm design must be presented at detailed design stage, utilizing information from the survey and the municipal data to determine the capacity of the existing structures and the site runoff outfalls.

Some other considerations include the following:

- To avoid/minimize excavation and dewatering requirement, shallow foundations are recommended;
- Analyze and recommend Low Impact Development (LID) measures to effectively address Water Quantity and Erosion, while taking flooding risks and space constraints into account. Specifically, consider usage of large undeveloped areas (i.e. "Open Space") located at the east and west limits of the site for treating run-off through bio-retention or infiltration;
- Should poor infiltration rate (as determined through future hydrogeological investigations) be identified, innovative LID measures which do not depend on infiltration should be further investigated. It is especially critical at this location for LID design to address both the ultimate condition and the interim (during construction);
- The stormwater servicing of the site to align with the recommendations of the Area Specific Servicing Plans prepared for Burlington Mobility Hub and the Downtown Lands;
- In accordance with Metrolinx standards, storm sewer system for all new facilities shall include provisions for spill capture and containment. Automated oil shutoff valves and oil/water separators from all drainage lines from all drip trays will be installed prior to drainage entering the existing storm system. Additionally, a very robust and fail-proof treatment system will be required that removes oil contamination from the runoff of the layover tracks in accordance with City of Burlington's storm sewer discharge by-law;
- Safe access and egress to the site to be provided considerate of the Regulatory Storm's floodplain and/or associated spills;
- The City of Burlington has developed new Stormwater Management Design Guidelines (2020) at the time of finalising this report. Recalculation of run-off flows is required at subsequent design stages to confirm the findings of this report;
- For establishing quantity controls, Conservation Halton noted preference for using the City of Burlington's proposed SWM criteria for re-development sites, which applies a maximum runoff coefficient C of 0.50 (i.e. 36% imperviousness) for establishing pre-development conditions;
- A computer-based model will be developed to assess the site's hydrology and hydraulics; and
- In order to meet Provincial Water Quality Objective (PWQO) and the Canadian Water Quality Guidelines for the Protection of Aquatic Life, mitigation measures to enhance water quality will be considered.

## 5.15.8 Traffic

A Traffic Impact Assessment Report was completed for the New Track & Facilities TPAP. Additional details can be found in **Appendix I**.

5.15.8.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

Refer to EPR Chapter 6 for a summary of potential effects and mitigation.

## 5.15.9 Utilities

A Utilities Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-110. Additional details can be found in **Appendix J**.

5.15.9.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

The following potential conflicts have been identified in Table 5-6. All conflicts identified below are to be confirmed pending further investigations. All assets within the Metrolinx layover site development area may need to be protected in place, removed, relocated and/or locally lowered with a casing pipe across all tracks. Reservicing of the site will be required.

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Telus	UG - Parallel	Communication Cable	144F	Fiber	Lower Jarvis St to Waterdown Rd
Bell	UG - Parallel	Communication Cable	Unknown	Plastic	Lyons Lane to Waterdown Rd
City of Burlington	UG - Parallel	Storm Sewer	450mm	Concrete	Fairview St
City of Burlington	UG - Parallel	Storm Sewer	600mm	Concrete	Fairview St
City of Burlington	UG - Parallel	Storm Sewer	900mm	Concrete	Fairview St
City of Burlington	UG - Parallel	Storm Sewer	825mm	Concrete	Fairview St
Cogeco Connexion	UG - Crossing	Communication Cable	12F	Fiber	Appleby Line
Halton Region	UG - Crossing	Sanitary Sewer	1370mm casing, 825mm pipe	Concrete in Steel Casing	Walkers Line
City of Burlington	UG - Crossing	Culvert	1200x3200mm	Concrete	Griffith Ct

TABLE 5-6 SEGMENT LSW-4 AND LSW-5 POTENTIALLY IMPACTED UTILITIES

5.15.9.2 Potential Effects & Mitigation Measures: Segment LSW-1 - Mile 8.10 to Mile 8.60

There are no anticipated utility impacts in Segment LSW-1. Track upgrades in Segment LSW-1 are occurring within the same footprint of the existing tracks. Excavations required for track upgrades do not typically exceed 0.4m and therefore there are no anticipated utility impacts in Segment LSW-1.

5.15.9.3 Potential Effects & Mitigation Measures: Segment LSW-2 – Mile 20.20 to Mile 20.70

There are no anticipated utility impacts in Segment LSW-2 Track upgrades in Segment LSW-2 are occurring within the same footprint of the existing tracks. Excavations required for track upgrades do not typically exceed 0.4m and therefore there are no anticipated utility impacts in Segment LSW-2.

## 5.15.9.4 Potential Effects & Mitigation Measures: Segment LSW-3 – Mile 20.70 to Mile 21.20

There are no anticipated utility impacts in Segment LSW-3. Track upgrades in Segment LSW-3 are occurring within the same footprint of the existing tracks. Excavations required for track upgrades do not typically exceed 0.4m and therefore there are no anticipated utility impacts in Segment LSW-3.

5.15.9.5 Potential Effects & Mitigation Measures: Segment LSW-4 – Mile 28.50 to Mile 29.00

Refer to Section 5.15.9.1 above, which describes utilities impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-4.

5.15.9.6 Potential Effects & Mitigation Measures: Segment LSW-5 – Mile 29.00 to Mile 29.50

Refer to Section 5.15.9.1 above, which describes utilities impacts and mitigation measures for the Walkers Line Layover and comprises Segment LSW-5.

### 5.15.10 Phase I ESA

A Phase I Environment Site Assessment (ESA) was completed for the proposed Walkers Line Layover. The purpose of the Phase I ESA was to identify potential or actual environmental contamination as a result of current or past activities at the proposed site, or in the immediate vicinity. The Phase I ESA was generally completed based on the requirements of the Canadian Standards Association (CSA) Phase I ESA document, Z768-01 (R2016), November 2001, reaffirmed in 2016 (CSA Standard).

5.15.10.1 Potential Effects & Mitigation Measures: Walkers Line Layover Facility

The proposed Walkers Line Layover is bounded by Harvester Road to the north, Appleby Line to the east, a segment of rail corridor to the south, as part of Canadian National Railway (CNR) – Oakville Subdivision (current Metrolinx GO Transit – Lakeshore West corridor), and Walkers Line to the west in Burlington, Ontario.

A 100 m study area was applied from the boundary of the layover site for the purposes of determining whether Potentially Contaminating Activities (PCAs) or Areas of Potential Environmental Concern (APEC) could lead to significant environmental contaminant impacts at the layover. The following Table presents a general description of PCAs identified through the Phase I ESA and presents recommendations from this study.

Site	General PCA Descriptions within the 100m Study Area	Media Potentially Impacted	Recommendations
Walkers Line Layover	<ul> <li>Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems</li> </ul>	Soil and groundwater	<ul> <li>Prior to construction, a Phase II ESA (a preliminary sampling plan) is</li> </ul>
	<ul> <li>Gasoline and associated products storage in fixed tanks</li> </ul>		recommended at the proposed Walkers Line
	<ul> <li>Importation of fill material of unknown quality</li> </ul>		quality of the soils and
	<ul> <li>Pulp, paper and paperboard manufacturing and processing</li> </ul>		groundwater in accordance with the current applicable
	<ul> <li>Plastics (including fiberglass) manufacturing and processing</li> </ul>		<ul><li>MECP Standards.</li><li>If contamination is</li></ul>
	Salvage yard, including automobile wrecking		confirmed from previous
	<ul> <li>Registrable waste generation associated with current land use, including light fuel</li> </ul>		subsurface investigation (i.e. delineation – a detailed

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TABLE 5-7 GENERAL PCAS AND RECOMMENDATIONS FOR THE PROPOSED WALKERS LINE LAYOVER FACILITY



Site	Genera Area	I PCA Descriptions within the 100m Study	Media Potentially Impacted	Recommendations
	•	Industrial manufacturing activities since at least mid-1980s; Registrable waste generation associated with industrial manufacturing activities, including halogenated solvents		sampling plan) will be conducted to determine the extent of contamination and develop a remedial action
	•	Textile manufacturing and Processing		plan (i.e. remediation
	Glass	Glass manufacturing		program).
	•	Metal treatment, coating, plating and finishing		
	•	Presence of rail yards, tracks and spurs		
	•	Registrable waste generation associated with industrial manufacturing activities, including halogenated solvents		
	•	Industrial land use historically and/or current; presence of storage tanks		

## **Conclusions**

It is recommended that a Phase II Environmental Site Assessment (ESA) be completed on the Walkers Line Layover to assess soil and groundwater quality in accordance with the current applicable MECP Standards.

Refer to Table 5-112 for a summary of mitigation and monitoring measures related to excavated materials, contaminated soil, groundwater management.

## 5.16 Footprint Impacts - Kitchener Corridor

## 5.16.1 Natural Environment

A Natural Environment Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-101. Additional details can be found in **Appendix B2**.

## 5.16.1.1 Potential Effects & Mitigation Measures: Segment KT-1 – Mile 12.90 to Mile 13.40

The track infrastructure is proposed within an actively used and managed portion of the existing Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.16.1.2 Potential Effects & Mitigation Measures: Segment KT-2 – Mile 13.40 to Mile 13.90

The track infrastructure is proposed within an actively used and managed portion of the existing Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

## 5.16.1.3 Potential Effects & Mitigation Measures: Segment KT-3 – Mile 16.10 to Mile 16.60

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW. While a portion of this Project study area segment is positioned in a TRCA regulated area (floodplain / hazard lands) no impacts to the Mimico Creek tributary or its habitat are anticipated provided standard sediment and erosion control measures are used during construction. There are no ecological impacts anticipated and therefore no additional mitigation measures are proposed.

5.16.1.4 Potential Effects & Mitigation Measures: Segment KT-4 – Mile 16.60 to Mile 11.20

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW. A Meadow Marsh (MAM) community occurs along the northwest border of this segment within the broad corridor of a small Mimico Creek tributary. A short section of this watercourse meanders into the Metrolinx rail corridor property within this Project study area segment. Proposed works include track upgrades and installing new track on existing ballast. Provided standard sediment and erosion control measures are used during construction, no impacts to the Mimico Creek tributary or its habitat are anticipated. There are no ecological impacts anticipated and therefore no additional mitigation measures are proposed.

5.16.1.5 Potential Effects & Mitigation Measures: Segment KT-5 – Mile 11.20 to Mile 11.80

No potential impacts to the natural environment are anticipated as a result of the proposed track upgrade and new island platform at the Bramalea GO Station. The proposed footprint for these improvements is primarily contained within the existing active rail corridor while the proposed property boundary expansion to the south contemplates works on an existing loading access road utilized by transport trucks. A short section of this watercourse meanders into the Metrolinx rail corridor property within this Project study area segment. Proposed works include track upgrades and installing new track and an island platform. Provided standard sediment and erosion control measures are used during construction, no impacts to the Mimico Creek tributary or its habitat are anticipated. There are no ecological impacts anticipated and therefore no additional mitigation measures are proposed.

## 5.16.2 Hydrogeological

A Hydrogeology Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-102. Additional details can be found in **Appendix C2**.

## 5.16.2.1 Potential Effects & Mitigation Measures: Segment KT-1 – Mile 12.90 to Mile 13.40

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.2.2 Potential Effects & Mitigation Measures: Segment KT-2 – Mile 13.40 to Mile 13.90

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.2.3 Potential Effects & Mitigation Measures: Segment KT-3 – Mile 16.10 to Mile 16.60

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.2.4 Potential Effects & Mitigation Measures: Segment KT-4 – Mile 16.60 to Mile 11.20

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.2.5 Potential Effects & Mitigation Measures: Segment KT-5 – Mile 11.20 to Mile 11.80

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

### 5.16.3 Land Use/Socio-Economic

A Land Use and Socio-Economic Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-103. Additional details can be found in **Appendix D2**.

5.16.3.1 Potential Effects & Mitigation Measures: Segment KT-1 – Mile 12.90 to Mile 13.40

## Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities or recreational amenities within 100 meters of the proposed track work and therefore, there will be no footprint impacts.

#### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.3.2 Potential Effects & Mitigation Measures: Segment KT-2 – Mile 13.40 to Mile 13.90

## Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

## Socio-Economic

There are no sensitive facilities or recreational amenities within 100 meters of the proposed track work and therefore, there will be no footprint impacts.

## **Mitigation Measures**

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.3.3 Potential Effects & Mitigation Measures: Segment KT-3 – Mile 16.10 to Mile 16.60

## Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

### Socio-Economic

There are no sensitive facilities or recreational amenities within 100 meters of the proposed track work and therefore, there will be no footprint impacts.

### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.3.4 Potential Effects & Mitigation Measures: Segment KT-4 – Mile 16.60 to Mile 11.20

### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

### Socio-Economic

No effects to sensitive facilities and recreational amenities along KT-4 are anticipated.

#### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.3.5 Potential Effects & Mitigation Measures: Segment KT-5 – Mile 11.20 to Mile 11.80

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment, although there is the potential for property acquisition to accommodate the proposed new track. As a result of this activity, there is a footprint impact on the adjacent employment/industrial land uses (see Figure 5-5).



## FIGURE 5-5 EXCERPT OF APPENDIX D2, SEGMENT KT-5 MAP

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work and therefore, there will be no footprint impacts to sensitive facilities.

One park is located in close proximity to the south of the rail corridor; however, there are no expected footprint impacts on these parks as a result of this activity. The pedestrian and cyclist pathway north of Steeles Avenue within this segment should be maintained during construction to the extent feasible and, that if impacts to this feature are required, they will be implemented in such a way as to not jeopardize pedestrian safety.

#### Mitigation Measures

The proposed track infrastructure is compatible with existing land uses and zoning.

Although Metrolinx is not subject to municipal permits and approvals, Metrolinx's policy is to adhere to the intent of the relevant permits/approvals requirements to the extent possible. Additional coordination with the City of Brampton will be undertaken during detailed design to finalize design details and minimize conflicts on adjacent uses where possible.

#### 5.16.4 Visual/Aesthetics

A Visual Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-104. Additional details can be found in **Appendix E2**.

5.16.4.1 Potential Effects & Mitigation Measures: Segment KT-1 – Mile 12.90 to Mile 13.40

Segment KT-1 is comprised of employment/industrial uses; therefore, this segment is classified as having *Negligible* visual impacts. Additionally, the proposed track upgrades are to occur within the existing Metrolinx rail ROW, therefore, there are no anticipated impacts of the proposed tracks in and no mitigation measures have been proposed.

## 5.16.4.2 Potential Effects & Mitigation Measures: Segment KT-2 – Mile 13.40 to Mile 13.90

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no visible impacts anticipated. The surrounding area is classified as a *Negligible* visual impact, requiring no mitigation measures.

5.16.4.3 Potential Effects & Mitigation Measures: Segment KT-3 – Mile 16.10 to Mile 16.60

Segment KT-3 is comprised primarily of employment/industrial uses; therefore, according to the visual impact criteria, this section is classified as having *Negligible* visual impacts. There are no anticipated impacts of the proposed tracks; therefore, no mitigation measures have been proposed.

5.16.4.4 Potential Effects & Mitigation Measures: Segment KT-4 – Mile 16.60 to Mile 11.20

In Segment KT-4, the surrounding area is classified as a *Negligible* visual impact as the proposed track upgrades are to occur within the existing Metrolinx rail ROW. There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.16.4.5 Potential Effects & Mitigation Measures: Segment KT-5 – Mile 11.20 to Mile 11.80

Segment KT-5 comprises the Bramalea GO Station and is entirely designated as an employment/industrial area. Bramalea GO Station passengers are not expected to experience visual impacts, as the station is within an industrial area where track infrastructure exists as part of the general visual environment. Therefore, this section is classified as having *Negligible* visual impacts due to existing industrial uses surrounding the area. There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

## 5.16.5 Cultural Heritage

A Cultural Heritage Report: Impact Assessment was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-105. Additional details can be found in **Appendix F2**.

5.16.5.1 Potential Effects & Mitigation Measures: Segment KT-1 – Mile 12.90 to Mile 13.40

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.5.2 Potential Effects & Mitigation Measures: Segment KT-2 – Mile 13.40 to Mile 13.90

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.5.3 Potential Effects & Mitigation Measures: Segment KT-3 – Mile 16.10 to Mile 16.60

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.5.4 Potential Effects & Mitigation Measures: Segment KT-4 – Mile 16.60 to Mile 11.20

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.16.5.5 Potential Effects & Mitigation Measures: Segment KT-5 – Mile 11.20 to Mile 11.80

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

## 5.16.6 Archaeology

A Stage 1 Archaeological Assessment was undertaken for the New Track & Facilities TPAP. A summary of the findings and recommendations for the Kitchener Corridor can be found in the sections below. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-106. Additional details can be found in **Appendix G2**.

5.16.6.1 Potential Effects & Mitigation Measures: Segment KT-1 – Mile 12.90 to Mile 13.40

According to the OASD, one previously registered archaeological site is located within one kilometre of the study area, which is not located within 50 metres. Site details are presented below in Table 5-8.

TABLE 5-8 SEGMENT KT 1 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGv-345	N/A	Pre-Contact Indigenous	Unknown	ASI 2017

Background research confirmed five previous reports, which detail fieldwork within 50 metres of the Segment KT-1 study area. The Stage 1 Archaeological Assessment confirmed that there are no anticipated impacts of the proposed tracks (see Figure 5-6), therefore no mitigation measures have been proposed.



FIGURE 5-6 AREA DISTURBED ALONG KITCHENER CORRIDOR, NO POTENTIAL FOR ARCHAEOLOGICAL IMPACTS



5.16.6.2 Potential Effects & Mitigation Measures: Segment KT-2 – Mile 13.40 to Mile 13.90

According to the OASD, one previously registered archaeological site is located within one kilometre of the study area, which is not located within 50 metres. Site details are presented below in Table 5-9.

TABLE 5-9 SEGMENT KT 2 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGv-345	N/A	Pre-Contact Indigenous	Unknown	ASI 2017

Additional background research of seven previous reports detail fieldwork completed within 50 metres of the study area. There are no anticipated impacts of the proposed tracks, therefore no mitigation measures have been proposed.

5.16.6.3 Potential Effects & Mitigation Measures: Segment KT-3 – Mile 16.10 to Mile 16.60

According to the OASD two previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-10.

TABLE 5-10 SEGMENT KT 3 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGw-7	Leonard Thompson	Euro-Canadian	Homestead	MPP 1986
AkGw-8	N/A	Archaic, Late	Unknown	MPP 1986
AkGw-476	Soper Site	Euro-Canadian	Homestead	DRPA 2014; TMHC 2015; Stantec 2016

The Stage 1 Archaeological Assessment confirmed that the proposed track footprint includes an active railway line on disturbed lands. Archaeological potential has therefore been removed, as such no further Archaeological Assessment is recommended. However, it should be noted that although it is beyond the project limits, there are two previously registered sites with archaeological potential.

5.16.6.4 Potential Effects & Mitigation Measures: Segment KT-4 – Mile 16.60 to Mile 11.20

According to the OASD, four previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-11.

TABLE 5-11 SEGMENT KT 4 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGw-7	Leonard Thompson	Euro-Canadian	Homestead	MPP 1986
AkGw-8	N/A	Archaic, Late	Unknown	MPP 1986
AkGw-84	N/A	Archaic, Late	Findspot	CRMG 1994
AkGw-476	Soper Site	Euro-Canadian	Homestead	DRPA 2014; TMHC 2015; Stantec 2016

Background research confirmed two previous reports, which detail fieldwork within 50 metres of the Segment KT-4 study area. The Stage 1 Archaeological Assessment confirmed that there are no anticipated impacts of the proposed tracks, therefore no mitigation measures have been proposed.

5.16.6.5 Potential Effects & Mitigation Measures: Segment KT-5 – Mile 11.20 to Mile 11.80

According to the OASD, five previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-12.

TABLE 5-12 SEGMENT KT 5 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGw-6	Davis	Euro-Canadian	Homestead	ASI 1981
AkGw-7	Leonard Thompson	Euro-Canadian	Homestead	MPP 1986
AkGw-8	N/A	Archaic, Late	Unknown	MPP 1986
AkGw-84	N/A	Archaic, Late	Findspot	CRMG 1994
AkGw-476	Soper Site	Euro-Canadian	Homestead	DRPA 2014; TMHC 2015; Stantec 2016

Background research confirmed two previous reports, which detail fieldwork within 50 metres of the Segment KT-5 study area. The Stage 1 Archaeological Assessment confirmed that the proposed track footprint does not have the potential to disturb unassessed or documented archaeological resources due to deep soil disturbance events, and according to the S & G Section 1.3.2, do not retain archaeological potential. No further archaeological assessment is required.

#### 5.16.7 Utilities

A Utilities Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-110. Additional details can be found in Appendix J.

5.16.7.1 Potential Effects & Mitigation Measures: Segment KT-1 - Mile 12.90 to Mile 13.40

The following potential conflicts have been identified in Table 5-13. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

Owner	Utility Class	Description	Size	Material	ſ	
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TABLE 5-13 SEGMENT KT-1 – POTENTIALLY IMPACTED UTILITIES

Owner	Utility Class	Description	Size	Material	Nearest Street
Unknown	UG - Parallel	Culvert	Unknown	Unknown	Carlingview Dr
Unknown	UG - Crossing	Culvert	Unknown	Unknown	Carlingview Dr
Unknown	UG - Parallel	Culvert	Unknown	Unknown	Carlingview Dr

5.16.7.2 Potential Effects & Mitigation Measures: Segment KT-2 – Mile 13.40 to Mile 13.90

There are no anticipated utility impacts in Segment KT-2. Track upgrades in Segment KT-2 are occurring within the same footprint of the existing tracks. Excavations required for track upgrades do not typically exceed 0.4m and therefore there are no anticipated utility impacts in Segment KT-2.

5.16.7.3 Potential Effects & Mitigation Measures: Segment KT-3 – Mile 16.10 to Mile 16.60

The following utility has been identified in Table 5-14 to be potentially impacted. This conflict is spatial in nature. The conflict will be mitigated by the removal, reconfigurations or relocation of utilities.

## TABLE 5-14 SEGMENT KT-3 – POTENTIALLY IMPACTED UTILITIES

Owner	Utility Class	Description	Size	Material	Nearest Street
Enbridge Gas	UG - Crossing	Gas	36"	Metallic	Hwy 407

5.16.7.4 Potential Effects & Mitigation Measures: Segment KT-4 – Mile 16.60 to Mile 11.20

The following potential conflicts have been identified in Table 5-15. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-15 SEGMENT KT-4 – POTENTIALLY IMPACTED UTILITIES

Owner	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communication Conduit	36F	Fiber	Airport Rd to Steeles Ave E
Rogers	UG - Parallel	Communication Conduit	Unknown	Unknown	Hwy 407
Zayo	UG - Parallel	Communication Conduit	Unknown	Fiber	Hwy 427 to Steeles Ave W

5.16.7.5 Potential Effects & Mitigation Measures: Segment KT-5 – Mile 11.20 to Mile 11.80

The following potential conflicts have been identified in Table 5-16. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

## TABLE 5-16 SEGMENT KT-5 – POTENTIALLY IMPACTED UTILITIES

Owner	Utility Class	Description	Size	Material	Nearest Street
Peel Region	UG - Crossing	Sanitary Sewer	375mm pipe, 900mm casing	PVC in Steel Casing	Hwy 407
Rogers	UG - Parallel	Communication Conduit	36F	Fiber	Airport Rd to Steeles Ave E
Rogers	UG - Parallel	Communication Conduit	Unknown	Unknown	Hwy 407

## 5.17 Footprint Impacts - Barrie Corridor

## 5.17.1 Natural Environment

A Natural Environment Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-101. Additional details can be found in **Appendix B2**.

5.17.1.1 Potential Effects & Mitigation Measures: Segment BR-1 – Mile 12.10 to Mile 12.60

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.2 Potential Effects & Mitigation Measures: Segment BR-2 – Mile 29.50 to Mile 30.00

The proposed track infrastructure beyond the Aurora GO station in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.3 Potential Effects & Mitigation Measures: Segment BR-3 – Mile 30.00 to Mile 30.50

The proposed track infrastructure beyond the Aurora GO station in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.4 Potential Effects & Mitigation Measures: Segment BR-4 – Mile 30.50 to Mile 31.00

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.5 Potential Effects & Mitigation Measures: Segment BR-5 – Mile 31.00 to Mile 31.50

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.6 Potential Effects & Mitigation Measures: Segment BR-6 – Mile 31.50 to Mile 32.00

The track infrastructure in this segment is proposed within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.7 Potential Effects & Mitigation Measures: Segment BR-7 – Mile 31.90 to Mile 32.50

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.



## 5.17.1.8 Potential Effects & Mitigation Measures: Segment BR-8 – Mile 32.50 to Mile 32.90

The track infrastructure in this segment is proposed within an actively used and managed portion of the exiting Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.9 Potential Effects & Mitigation Measures: Segment BR-9 – Mile 32.90 to Mile 33.50

The track infrastructure in this segment is proposed within an actively used and managed portion of the exiting Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.10 Potential Effects & Mitigation Measures: Segment BR-10 – Mile 33.40 to Mile 34.00

The track infrastructure in this segment is proposed within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.11 Potential Effects & Mitigation Measures: Segment BR-11 – Mile 33.90 to Mile 34.50

The track infrastructure in this segment is proposed within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.12 Potential Effects & Mitigation Measures: Segment BR-12 – Mile 34.40 to Mile 34.90

The track infrastructure in this segment is proposed within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.13 Potential Effects & Mitigation Measures: Segment BR-13 – Mile 61.30 to Mile 61.80

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW and was previously approved as part of the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

5.17.1.14 Potential Effects & Mitigation Measures: Segment BR-14 – Mile 61.80 to Mile 62.30

This segment of the Project study area occurs within the urbanized setting of the City of Barrie. Surrounding land use is comprised primarily of low rise residential, CVC, treed agriculture and some CVI.

Proposed works include the addition of a section of new track to enhance the operational performance of the existing layover facility. Small portions of land adjacent to the existing rail corridor have been identified for acquisition to accommodate the additional track.

## **Terrestrial Environment**

The existing rail corridor through this segment is subject to a 7 m wide vegetation removal zone within CVI lands as approved previously through the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). As part of these approved works, clearance zones will entail vegetation removals/clearing mainly within the existing Metrolinx owned rail corridor.



The rail corridor vegetation community is dominated by non-native grasses and common urban tolerant herbaceous plants. The lands identified for property acquisition in the southeastern quadrant of the subject work area segments consist of a narrow portion of CUW containing deciduous dominated trees and shrubs. Similarly, a narrow row of deciduous dominated trees and shrubs occupies the central portion of CVC lands identified for property acquisition.

Potential footprint impacts include encroachment and removal of a narrow portion of trees and shrubs in from the CUW and the CVC lands. Approximately 0.085 ha of CUW will be displaced. These removals are considered minor due to the relatively small portion of woody vegetation that will be displaced from the edge of the 1.5 ha woodland and the position of these trees along the existing rail corridor and within CVC lands.

Mitigation for these removals includes, but is not limited to:

• Ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined in Chapter 9 and adherence to Metrolinx's Vegetation Management Guidelines.

While the deciduous trees and shrubs adjacent to the existing rail corridor together with the cultural vegetation communities provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the minor encroachments are considered to be a low impact from an ecological perspective given the position of position of these trees along the exiting rail corridor and within CVC lands and the availability of higher quality habitat in the contiguous mixed forest unit.

## Aquatic Environment

There are no aquatic features within this segment of the Project study area.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within this segment of the Project study area. SAR generalists with habitats that may occur anywhere, including three (3) species of bats, Butternut, and Monarch Butterfly all may occur within this Project study area segment.

SAR bats (Tri-colored Bat, Little Brown Myotis and Northern Myotis) may use any tree (typically greater than 10 cm DBH) along the rail corridor as a bat day roost or possibly bat maternity roost. Butternut may occur within open edges, hedgerows and fence lines due to dispersal by wildlife, such as squirrels. Monarch Butterfly can often be found wherever the host plant (Milkweed) occurs. This is often disturbed areas immediately adjacent to the tracks regardless of whether the habitat is landscaped or naturalized.

Other potential SAR species include habitat for Eastern Wood-peewee and Red-headed Woodpecker within the mixed forest unit. While encroachment may occur along the edge of this woodland unit providing potential habitat for Eastern Wood-peewee and Red-headed Woodpecker, the majority (>93%) of the woodland unit will remain unaffected. The majority of the land identified for acquisition consists of sparsely treed open canopy amongst actively disturbed lands (commercial back yards).

Mitigation includes:

- Screening for Butternut trees in advance of clearing and addressing any required removals through the provincial registration process;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

There are no adverse effects on SAR or their habitat anticipated due to the low potential for generalist SAR to occur, the maintenance of suitable habitat for Eastern Wood-peewee and Red-headed Woodpecker and the application of appropriate mitigation.

#### **Designated Areas**

No designated features occur within this segment of the Project study area.

5.17.1.15 Potential Effects & Mitigation Measures: Segment BR-15 – Mile 62.30 to Mile 62.80

This segment of the Project study area occurs within the urbanized setting of the City of Barrie. Surrounding land use is comprised primarily of residential and CVI lands with some CVC and shallow marsh.

Proposed works include the addition of a section of new track to enhance the operational performance of the existing layover facility. Small portions of land adjacent to the existing rail corridor have been identified for acquisition to accommodate the additional track.

### Terrestrial Environment

The existing rail corridor through this segment is subject to a 7 m wide vegetation removal zone within CVI lands as approved previously through the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). As part of these approved works, clearance zones will entail vegetation removals/clearing mainly within the existing Metrolinx owned rail corridor.

The rail corridor vegetation community is dominated by non-native grasses and common urban tolerant herbaceous plants. The land identified for property acquisition in the southeastern quadrant of this segment consist of lands identified as commercial and institutional containing a narrow row of deciduous dominated trees and shrubs.

Potential footprint impacts include encroachment and removal of a narrow portion of trees and shrubs within the CVC lands. These removals are considered minor due to the small quality of woody vegetation that will be displaced and the position of these trees along the existing rail corridor and within CVC lands.

Mitigation for these removals includes, but is not limited to:

• Ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined in Chapter 9 and adherence to Metrolinx's Vegetation Management Guidelines.

While the deciduous trees and shrubs adjacent to the existing rail corridor together with the cultural vegetation communities provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the minor encroachment is considered to be a low impact from an ecological perspective given the position of these trees along the exiting rail corridor and within CVC lands and the availability of higher quality habitat in the contiguous mixed forest unit.

#### Aquatic Environment

There are no aquatic features within this segment of the Project study area.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within this segment of the Project study area. SAR generalists with habitats that may occur anywhere, including three (3) species of bats, Butternut, and Monarch Butterfly all may occur within this Project study area segment.

SAR bats (Tri-colored Bat, Little Brown Myotis and Northern Myotis) may use any tree (typically greater than 10 cm DBH) along the rail corridor as a bat day roost or possibly bat maternity roost. Butternut may occur within open edges, hedgerows and fence lines due to dispersal by wildlife, such as squirrels.



Monarch Butterfly can often be found wherever the host plant (Milkweed) occurs. This is often disturbed areas immediately adjacent to the tracks regardless of whether the habitat is landscaped or naturalized.

Other potential SAR species include habitat for Eastern Wood-peewee and Red-headed Woodpecker within the adjacent mixed forest unit. No encroachment into this unit is anticipated and therefore these habitats should be not be impacted.

Mitigation includes:

- Screening for Butternut trees in advance of clearing and addressing any required removals through the provincial registration process;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

There are no adverse effects on SAR or their habitat anticipated due to the low potential for generalist SAR to occur, the maintenance of suitable habitat for Eastern Wood-peewee and Red-headed Woodpecker and the application of appropriate mitigation.

#### **Designated Areas**

No designated features occur within this segment of the Project study area.

5.17.1.16 Potential Effects & Mitigation Measures: Segment BR-16 – Mile 62.80 to Mile 63.40

This segment of the Project study area occurs within the urbanized setting of the City of Barrie. Surrounding land use is comprised of residential areas, CVI and CVC lands.

Proposed works include the addition of a second track parallel to the existing track within the existing ROW. The majority of the existing rail corridor through this segment consists of Transportation and Utility (CVI) lands and subject to the approved GO Rail Network Electrification TPAP. As part of these approved works, clearance zones will entail vegetation removals/clearing mainly within the existing Metrolinx owned rail corridor. Potential impacts related to the portion of proposed new track north of the Allandale Waterfront GO station are addressed below.

## Terrestrial Environment

Potential footprint impacts include encroachment into the deciduous linear hedgerow positioned along the north side of the rail corridor. The removals are considered minor due to the position of these vegetation units within actively developed CVC lands.

Mitigation for these removals will include, but is not limited to:

- Candidate SWH occurring in the hedgerow community includes bat roosts. With the application of recommended mitigation, including adherence to timing windows for vegetation clearing, provided in Metrolinx Vegetation Management Guidelines, there are no adverse effects anticipated to wildlife habitat, including bats due to the relatively minor extent of proposed tree removal, the position of these trees within actively developed CVC lands.
- The potential encroachments into this hedgerow may reduce some foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals however such removal is considered to be a low impact from an ecological perspective given the relatively minor extent of proposed tree removal and the position of these trees within actively developed CVC lands.

 Mitigation for these removals will include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined in Chapter 9 and adherence to Metrolinx's Vegetation Management Guidelines.

## Aquatic Environment

No aquatic features are present in or adjacent to the works proposed through this Project Area segment.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within the subject segments of the Project study area. Butternut trees and three species of bats, considered SAR generalists with habitats that may occur in deciduous trees, may occur within the subject segment.

SAR bats (Tri-colored Bat, Little Brown Myotis and Northern Myotis) may use any tree (typically greater than 10 cm DBH) along the rail corridor as a bat day roost or possibly bat maternity roost. Butternut may occur within open edges, hedgerows and fence lines due to dispersal by wildlife, such as squirrels.

Mitigation includes:

- Screening for Butternut trees in advance of clearing and addressing any required removals through the provincial registration process;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

## Designated Areas

No designated features occur within this segment of the Project study area.

## 5.17.2 Hydrogeological

A Hydrogeology Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-102. Additional details can be found in **Appendix C2**.

5.17.2.1 Potential Effects & Mitigation Measures: Segment BR-1 – Mile 12.10 to Mile 12.60

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.2 Potential Effects & Mitigation Measures: Segment BR-2 – Mile 29.50 to Mile 30.00

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.3 Potential Effects & Mitigation Measures: Segment BR-3 – Mile 30.00 to Mile 30.50

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.4 Potential Effects & Mitigation Measures: Segment BR-4 – Mile 30.50 to Mile 31.00

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.5 Potential Effects & Mitigation Measures: Segment BR-5 – Mile 31.00 to Mile 31.50

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.6 Potential Effects & Mitigation Measures: Segment BR-6 – Mile 31.50 to Mile 32.00

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.7 Potential Effects & Mitigation Measures: Segment BR-7 – Mile 31.90 to Mile 32.50

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.8 Potential Effects & Mitigation Measures: Segment BR-8 – Mile 32.50 to Mile 32.90

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.9 Potential Effects & Mitigation Measures: Segment BR-9 – Mile 32.90 to Mile 33.50

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.10 Potential Effects & Mitigation Measures: Segment BR-10 - Mile 33.40 to Mile 34.00

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.11 Potential Effects & Mitigation Measures: Segment BR-11 - Mile 33.90 to Mile 34.50

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.12 Potential Effects & Mitigation Measures: Segment BR-12 - Mile 34.40 to Mile 34.90

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.13 Potential Effects & Mitigation Measures: Segment BR-13 – Mile 61.30 to Mile 61.80

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.14 Potential Effects & Mitigation Measures: Segment BR-14 - Mile 61.80 to Mile 62.30

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.15 Potential Effects & Mitigation Measures: Segment BR-15 - Mile 62.30 to Mile 62.80

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.2.16 Potential Effects & Mitigation Measures: Segment BR-16 - Mile 62.80 to Mile 63.40

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

## 5.17.3 Land Use/Socio-Economic

A Land Use and Socio-Economic Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-103. Additional details can be found in **Appendix D2**.

5.17.3.1 Potential Effects & Mitigation Measures: Segment BR-1 – Mile 12.10 to Mile 12.60

#### Land Use

The track infrastructure is proposed within the rail ROW along this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities or recreational amenities within 100 meters of the proposed track work and therefore, there are no anticipated footprint impacts.

#### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.3.2 Potential Effects & Mitigation Measures: Segment BR-2 – Mile 29.50 to Mile 30.00

### Land Use

Under the Town of Aurora Zoning By-law 6000-17, the rail corridor is zoned for *Employment*. The proposed track infrastructure will be located within the rail ROW along this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities within 100 metres of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

There is a cycling route along Industrial Parkway South, extending to Sheppard's Bush Conservation Area. However, there are no expected impacts on surrounding recreational amenities as a result of this activity.

#### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.3.3 Potential Effects & Mitigation Measures: Segment BR-3 – Mile 30.00 to Mile 30.50

## Land Use

Under the Town of Aurora Zoning By-law 6000-17, the rail corridor is zoned for *Employment, Commercial and Promenade*. Based on available information, it is acknowledged that an Official Plan Amendment and Zoning By-law Amendment applications for properties along Berczy Street have been submitted to the Town of Aurora (and circulated to the Region of York). The applicant is proposing to construct an 8-storey mixed use building, containing 184 residential units, and office and retail uses on the first two floors. Since the proposed track infrastructure will be located within the rail ROW along this segment, there are no anticipated adverse effects on land use due to the new tracks.

## Socio-Economic

There are two sensitive facilities (child care centre and school) located within the vicinity of BR-3, as shown in Table 5-17. The Aurora Early Learning Centre is located within 30 metres of the rail corridor



and École élémentaire catholique is located within 100 metres of the rail corridor; however, considering the proposed track infrastructure is within the existing rail ROW, there is no anticipated footprint impact to this sensitive facility.

## TABLE 5-17 SENSITIVE FACILITY WITHIN THE VICINITY OF BR-3

Segment/Figure	Туре	Name	Address	Approximate Distance from ROW
BR-3	Child Care Centre	Aurora Early Learning Centre	138 Centre Street	29 metres
BR-3	School	École élémentaire catholique Saint-Jean	90 Walton Drive	75 metres

A cycling route and pedestrian trail traverse the rail corridor at Wellington Street East and Centre Street rail crossings. However, there are no anticipated impacts to recreational amenities as a result of this activity.

The potential effects on the socio-economic environment associated with the Barrie Corridor have been assessed through the Air Quality, Noise & Vibration and Visual Impact Assessment Reports.

#### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.3.4 Potential Effects & Mitigation Measures: Segment BR-4 – Mile 30.50 to Mile 31.00

#### Land Use

Under the Town of Aurora Zoning By-law 6000-17, the rail corridor is zoned for *Employment*. The proposed track infrastructure will be located within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

Valhalla Park is located adjacent to the rail corridor, however there are no expected footprint impacts on surrounding parks as a result of this activity.

#### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.3.5 Potential Effects & Mitigation Measures: Segment BR-5 – Mile 30.50 to Mile 31.50

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There is one sensitive facility within the vicinity of BR-5, as shown in Table 5-18. The school is located within 30 meters of the rail corridor; however, considering that the proposed track infrastructure is to remain within the existing rail ROW, there will be no footprint impact on the sensitive facility.



### TABLE 5-18 SENSITIVE FACILITY WITHIN THE VICINITY OF BR-5

Segment	Туре	Name	Address	Approximate Distance from ROW
BR-5	School	Aurora Montessori School	330 Industrial Parkway North	0 meters

A cycling route and pedestrian trail extends along St. John's Side Road, which traverses the rail corridor, however, there are no anticipated footprint impacts to recreational amenities.

The potential effects on the socio-economic environment associated with the Barrie Corridor have been assessed through the Air Quality, Noise & Vibration and Visual Impact Assessment Reports.

#### Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.6 Potential Effects & Mitigation Measures: Segment BR-6 – Mile 31.50 to Mile 32.00

#### Land Use

Under the Town of Newmarket Zoning By-law 2010-40, the rail corridor is zoned for *Open Space and Mature Neighbourhoods*, however the existing use is transportation. The proposed track infrastructure will be located within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities located within 100 meters of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

The Foxtail Ridge, Bailey Ecological Park, trails, cycling routes and St. Andrew's Valley Golf Club are located around rail corridor. However, considering that the track infrastructure is proposed within the existing rail ROW, there are no anticipated footprint impacts to recreational amenities.

The potential effects on the socio-economic environment associated with the Barrie Corridor have been assessed through the Air Quality, Noise & Vibration and Visual Impact Assessment Reports.

#### Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.7 Potential Effects & Mitigation Measures: Segment BR-7 – Mile 31.90 to Mile 32.50

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work, however Bailey Ecological Park and associated trails extend into this segment of the rail corridor.

There are no anticipated footprint impacts on sensitive facilities or to recreational amenities as a result of this activity.



The potential effects on the socio-economic environment associated with the Barrie Corridor have been assessed through the Air Quality, Noise & Vibration and Visual Impact Assessment Reports.

#### Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.8 Potential Effects & Mitigation Measures: Segment BR-8 – Mile 32.50 to Mile 32.90

### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work in this segment. Bailey Ecological Park Natural Area, Fairy Lake Park and associated cycling routes/trails extend along the rail corridor. A cycling route also traverses the rail corridor at Mulock Drive.

There are no anticipated footprint impacts on sensitive facilities or to recreational amenities as a result of this activity.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

### Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.9 Potential Effects & Mitigation Measures: Segment BR-9 – Mile 32.90 to Mile 33.50

## Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

Within this segment, there are no sensitive facilities within 100 meters of the proposed track work. Fairy Lake Park and associated trails and cycling routes extend along the rail corridor.

There are no anticipated footprint impacts on sensitive facilities or to recreational amenities as a result of this activity.

The potential effects on the socio-economic environment associated with the Barrie Corridor have been assessed through the Air Quality, Noise & Vibration and Visual Impact Assessment Reports.

#### Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.10 Potential Effects & Mitigation Measures: Segment BR-10 – Mile 33.40 to Mile 34.00

## Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.



### Socio-Economic

There is one sensitive facility within the vicinity of BR-10, as shown in Table 5-19. The Newmarket Community Centre and Lions Halls is located adjacent to the rail corridor.

## TABLE 5-19 SENSITIVE FACILITY WITHIN THE VICINTIY OF BR-10

Segment	Туре	Name	Address	Approximate Distance from ROW
BR-10	Community Landmark	Newmarket Community Centre and Lions Hall	200 Doug Duncan Drive	0 meters

Additionally, a cycling route and pedestrian trail traverse the rail corridor at Timothy Street rail crossing. The Town of Newmarket has a planned cycling route along Water Street, which also traverses the rail corridor.

There are no anticipated footprint impacts on sensitive facilities or to existing or future recreational amenities as a result of this activity.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

#### Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.11 Potential Effects & Mitigation Measures: Segment BR-11 – Mile 33.90 to Mile 34.50

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are two sensitive facilities within the vicinity of BR-11, as shown in Table 5-20. The Newmarket Recreation Youth Centre & Sk8 Park is located more than 30 meters away from the rail corridor, while the Church on the Go is located directly adjacent to the rail corridor. Since the proposed infrastructure in this segment is within the rail ROW, there will be no footprint impact to the sensitive facilities.

#### TABLE 5-20 SENSITIVE FACILITIES WITHIN THE VINICTY OF BR-12

Segment	Туре	Name	Address	Distance from ROW (m)
BR-11	Community Landmark	Newmarket Recreation Youth Centre & Sk8 Park	56 Charles Street	50 meters
BR-11	Community Landmark	Church on the Go	465 Davis Drive	0 meters

Additionally, a cycling route traverses the rail corridor at Davis Drive rail crossing and throughout surrounding parks/conservation areas. The Town of Newmarket has a planned cycling route along Queen Street, which also traverses the rail corridor. However, there are no anticipated footprint impacts to recreational amenities as a result of this activity.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

## Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.12 Potential Effects & Mitigation Measures: Segment BR-12 - Mile 34.40 to Mile 34.90

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work and therefore, there will be no footprint impacts to sensitive facilities.

This segment of the Barrie Corridor is surrounded by large parks/open areas and meandering trails throughout the neighbourhood. However, there are no anticipated footprint impacts to the recreational amenities as a result of the proposed track infrastructure, as the track will remain within the existing rail ROW.

The potential effects on the socio-economic environment associated with the Barrie Corridor have been assessed through the Air Quality, Noise & Vibration and Visual Impact Assessment Reports.

#### Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.13 Potential Effects & Mitigation Measures: Segment BR-13 – Mile 61.30 to Mile 61.80

#### Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There is one sensitive facility within the vicinity of BR-13, as shown in Table 5-21. The Mill Creek Care Centre is located more than 30 meters from the rail corridor. Recognizing that the proposed track infrastructure is to remain within the existing rail ROW, there will be no impacts to the sensitive facility.

## TABLE 5-21 SENSITIVE FACILITY WITHIN THE VICINITY OF BR-13

Segment	Туре	Name	Address	Approximate Distance from ROW
BR-13	Long Term Care Centre	Mill Creek Care Centre	286 Hurst Drive	30 meters

In addition, two parks and associated trails are located in close proximity to the rail corridor. However, there are no anticipated impacts to recreational amenities as a result of this activity.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

## Mitigation Measures

The mitigation measures developed in their respective reports for the Barrie Corridor will be implemented during detailed design and construction.

5.17.3.14 Potential Effects & Mitigation Measures: Segment BR-14 - Mile 61.80 to Mile 62.30

#### Land Use

Although the track infrastructure is proposed within the rail ROW in this segment, however there is a potential property acquisition to the north of the rail corridor. As a result of this activity, there is a footprint impact on the adjacent residential and commercial land uses (see Figure 5-7).



## FIGURE 5-7 EXCERPT OF APPENDIX D2, SEGMENT BR-14 MAP

#### Socio-Economic

Within this segment, there are no sensitive facilities within 100 meters of the proposed track work. Three parks are located in close proximity to the south of the rail corridor: Wallwins Natural Area, Minet's Point Road Natural Area and Allandale Station Park. A trail traverses the rail corridor at Minet's Point Road rail crossing.

However, there are no anticipated footprint impacts on sensitive facility or to recreational amenities as the proposed track infrastructure will remain within the existing rail ROW.

The potential effects on the socio-economic environment associated with the Barrie Corridor have been assessed through the Air Quality, Noise & Vibration and Visual Impact Assessment Reports.

#### Mitigation Measures

The proposed track infrastructure may conflict with existing residential and commercial land uses and zoning policies.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal

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processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.17.3.15 Potential Effects & Mitigation Measures: Segment BR-15 – Mile 62.30 to Mile 62.80

## Land Use

Within Segment BR-15, the track infrastructure continues and is proposed within the rail ROW in this segment, however there is a potential property acquisition to the north of the rail corridor. As a result of this activity, there is a footprint impact on the adjacent residential and commercial land uses.

## Socio-Economic

There is one sensitive facility located within the vicinity of BR-44, as shown in Table 5-22. The South Shore Community Centre is located more than 30 meters from the rail corridor, and therefore there will result in no footprint impact to this sensitive facility.

## TABLE 5-22 SENSITIVE FACILITY WITHIN THE VICINITY OF BR-15

Segment	Туре	Name	Address	Approximate Distance from ROW
BR-15	Community Landmark	Southshore Community Centre	205 Lakeshore Drive	30 meters

Allandale Station Park and associated trails are also located in close proximity to the rail corridor; however, there are no expected footprint impacts on surrounding parks as a result of this activity.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

## Mitigation Measures

The proposed track infrastructure may conflict with existing land uses and zoning policies.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.17.3.16 Potential Effects & Mitigation Measures: Segment BR-16 – Mile 62.80 to Mile 63.40

## Land Use

The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

## Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

Allandale Station Park and associated trails are located in close proximity of the rail corridor; however, there are no expected footprint impacts as a result of this activity.



## Mitigation Measures

The proposed track infrastructure will be located within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks in this segment.

## 5.17.4 Visual/Aesthetics

A Visual Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-104. Additional details can be found in **Appendix E2**.

5.17.4.1 Potential Effects & Mitigation Measures: Segment BR-1 – Mile 12.10 to Mile 12.60

Segment BR-1 includes the York University GO Station and is entirely designated as an employment/industrial area. Therefore, this section is classified as having *Negligible* visual impacts due to the existing industrial uses in the surrounding area. Passengers at York University GO Station are not expected to experience visual impacts, as the proposed track is anticipated to have a minimal vertical profile (i.e., not impeding views at eye-level) within the existing Metrolinx rail ROW, resulting in *Negligible* visual impacts.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.2 Potential Effects & Mitigation Measures: Segment BR-2 – Mile 29.50 to Mile 30.00

Segment BR-2 include Aurora GO Station and consists mostly of mixed use, residential and park/open space land uses along the corridor. The Sheppard's Bush Conservation Area and residential homes are in close proximity to the railroad. However, passengers at Aurora GO Station are not expected to experience visual impacts, as the proposed track is anticipated to have a minimal vertical profile (i.e., not impeding views at eye-level) within the existing Metrolinx rail ROW, resulting in *Negligible* visual impacts.

It is noted the Aurora GO Station structure is considered to be of cultural heritage significance. Views to and from the structure are not anticipated to impacted due to the proposed track infrastructure within the Metrolinx rail ROW. Refer to the Cultural Heritage Assessment Report in **Appendix F2** for further details.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.3 Potential Effects & Mitigation Measures: Segment BR-3 – Mile 30.00 to Mile 30.50

Refer to Section 5.17.4.2 of this Report for a detailed description of potential effects and mitigation measures for the proposed infrastructure at Aurora GO Station.

5.17.4.4 Potential Effects & Mitigation Measures: Segment BR-4 – Mile 30.50 to Mile 31.00

Segment BR-4 traverses various land uses, including residential, employment/industrial, parks/open space and institutional. These areas are categorized as having a *Negligible* visual impact since this is an urbanized area where rail infrastructure already exists as part of their views. Changes to the existing views of the corridor will be *Negligible* because the new track is within the existing railroad ROW.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.5 Potential Effects & Mitigation Measures: Segment BR-5 – Mile 30.50 to Mile 31.50

Segment BR-5 extends into the Town of Aurora. The corridor passes through areas of residential development on the west side of the corridor. Houses in these areas are classified as having potential *Negligible* visual impact due to the proposed track being within the existing Metrolinx rail ROW. Employment/industrial, natural area and parks/open space properties also surround the corridor;

however, since the track infrastructure already exists as part of their views, these areas are also classified as *Negligible* visual impact and require no mitigation.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.6 Potential Effects & Mitigation Measures: Segment BR-6 – Mile 31.50 to Mile 32.00

Segment BR-6 extends north beyond the Aurora GO Station into the Town of Newmarket. The corridor passes through a residential development and two large parks, the Foxtail Ridge Rear Park and Bailey Ecological Park on the west side of the corridor, while a golf course is located on the east side. These areas surrounding the corridor are classified as *Negligible* visual impacts and require no mitigation, as the track infrastructure is proposed within the rail ROW.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.7 Potential Effects & Mitigation Measures: Segment BR-7 – Mile 31.90 to Mile 32.50

Within Segment BR-7, the corridor continues through Bailey Ecological Park. The surrounding area is classified as a *Negligible* visual impact and requires no mitigation. The track infrastructure already exists as part of the general visual environment, therefore, changes to the existing views of the corridor will be *Negligible* because the proposed track is within the existing rail ROW.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.8 Potential Effects & Mitigation Measures: Segment BR-8 – Mile 32.50 to Mile 32.90

Within segment BR-8, the corridor passes through an employment/industrial area and two large parks, the Fairy Lake Park and Bailey Ecological Park. These areas surrounding the corridor are classified as *Negligible* visual impacts due to the track infrastructure already existing as part of the general view. Changes to the existing views of the corridor will be *Negligible* because the proposed track is within the existing railroad ROW.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.9 Potential Effects & Mitigation Measures: Segment BR-9 – Mile 32.90 to Mile 33.50

Segment BR-9 extends north within the Town of Newmarket. The corridor passes through several land uses, including residential, employment/industrial and parks/open space areas. These areas are classified as having *Negligible* visual impact and require no mitigation. Fairy Lake Park is located east of the corridor, but since the proposed track is within the existing rail ROW, this area has also been classified as a *Negligible* visual impact.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.10 Potential Effects & Mitigation Measures: Segment BR-10 – Mile 33.40 to Mile 34.00

Segment BR-10 passes through a developed area primarily designated as residential and mixed use. Since the proposed track is within the existing rail ROW, and the corridor already exists as part of the general view, this area has been classified as a *Negligible* visual impact.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.


5.17.4.11 Potential Effects & Mitigation Measures: Segment BR-11 – Mile 33.90 to Mile 34.50

Segment BR-11 is comprised primarily of mixed uses. Since the track infrastructure is proposed within the rail ROW, this segment is classified as having *Negligible* visual impacts.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.12 Potential Effects & Mitigation Measures: Segment BR-12 – Mile 34.40 to Mile 34.90

Within Segment BR-12, the corridor passes through a variety of land uses, including residential, natural area and parks/open space. These areas are classified as having a *Negligible* visual impact and require no mitigation due to the corridor existing as part of the current view. Bayview Park is adjacent to the corridor, but since the proposed track is within the existing railroad ROW, this area has also been classified as a *Negligible* visual impact.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.13 Potential Effects & Mitigation Measures: Segment BR-13 – Mile 61.30 to Mile 61.80

Segment BR-13 extends into the City of Barrie and the Allandale GO Station. The surrounding area is comprised primarily of residential land uses, including several single-family homes to the north and south of the corridor. Gables Park is also located south of the rail corridor. These areas are classified as a *Negligible* visual impact, since the proposed track is within the existing Metrolinx rail ROW.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.14 Potential Effects & Mitigation Measures: Segment BR-14 - Mile 61.80 to Mile 62.30

Within Segment BR-14, the corridor passes through several land uses, including residential, natural area, commercial and parks/open space. These areas are classified as having a *Negligible* visual impact and require no mitigation due to the corridor existing as part of the current view and the track being proposed within the existing railroad ROW.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.15 Potential Effects & Mitigation Measures: Segment BR-15 – Mile 62.30 to Mile 62.80

Segment BR-15 consists of commercial, parks/open space and residential land uses along the corridor. Allandale Station Park is located adjacent to the corridor, but since the proposed track is within the existing rail ROW, this area has been classified as a *Negligible* visual impact and requires no mitigation.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

5.17.4.16 Potential Effects & Mitigation Measures: Segment BR-16 – Mile 62.80 to Mile 63.40

Segment BR-16 includes the Allandale GO Station and is comprises primarily residential and mixed land uses. Since the proposed track is within the existing Metrolinx rail ROW, this segment is classified as having *Negligible* visual impacts. Allandale GO Station passengers are not expected to experience major visual impacts, since track infrastructure already exists as part of their general view. Additionally, the proposed track will have a minimal vertical profile (i.e., not impeding eye-level views), resulting in *Negligible* visual impacts.

There are no anticipated impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.



#### 5.17.5 Cultural Heritage

A Cultural Heritage Report: Impact Assessment was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-105. Additional details can be found in **Appendix F2**. There are 16 known and potential CHRs identified in the Barrie corridor.

5.17.5.1 Potential Effects & Mitigation Measures: Segment BR-1 – Mile 12.10 to Mile 12.60

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.2 Potential Effects & Mitigation Measures: Segment BR-2 – Mile 29.50 to Mile 30.00

One BHR (BR-01) was identified in this segment. However, there are no anticipated footprint impacts resulting in direct or indirect impacts to the BHR and therefore no mitigation measures are required.

5.17.5.3 Potential Effects & Mitigation Measures: Segment BR-3 – Mile 30.00 to Mile 30.50

Four BHRs (BR-01, BR-02, BR-03, BR-04) were identified in this segment. However, there are no anticipated footprint impacts resulting in direct or indirect impacts to the BHRs and therefore no mitigation measures are required.

5.17.5.4 Potential Effects & Mitigation Measures: Segment BR-4 – Mile 30.50 to Mile 31.00

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.5 Potential Effects & Mitigation Measures: Segment BR-5 – Mile 31.00 to Mile 31.50

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.6 Potential Effects & Mitigation Measures: Segment BR-6 – Mile 31.50 to Mile 32.00

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.7 Potential Effects & Mitigation Measures: Segment BR-7 – Mile 31.90 to Mile 32.50

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.8 Potential Effects & Mitigation Measures: Segment BR-8 – Mile 32.50 to Mile 32.90

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.9 Potential Effects & Mitigation Measures: Segment BR-9 – Mile 32.90 to Mile 33.50

Five BHRs (BR-05, BR-06, BR-07, BR-08, BR-09) were identified in this segment. However, there are no anticipated footprint impacts resulting in direct or indirect impacts to the BHRs and therefore no mitigation measures are required.

5.17.5.10 Potential Effects & Mitigation Measures: Segment BR-10 – Mile 33.40 to Mile 34.00

Three BHRs (BR-10, BR-11, BR-12) were identified in this segment. However, there are no anticipated footprint impacts resulting in direct or indirect impacts to the BHRs and therefore no mitigation measures are required.

5.17.5.11 Potential Effects & Mitigation Measures: Segment BR-11 – Mile 33.90 to Mile 34.50

Four BHRs (BR-13, BR-14, BR-15, BR-16) were identified in this segment. However, there are no anticipated footprint impacts resulting in direct or indirect impacts to the BHRs and therefore no mitigation measures are required.

5.17.5.12 Potential Effects & Mitigation Measures: Segment BR-12 - Mile 34.40 to Mile 34.90

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.13 Potential Effects & Mitigation Measures: Segment BR-13 - Mile 61.30 to Mile 61.80

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.14 Potential Effects & Mitigation Measures: Segment BR-14 - Mile 61.80 to Mile 62.30

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.15 Potential Effects & Mitigation Measures: Segment BR-15 - Mile 62.30 to Mile 62.80

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.17.5.16 Potential Effects & Mitigation Measures: Segment BR-16 - Mile 62.80 to Mile 63.40

Eight BHRs (BR-17, BR-18, BR-19, BR-20, BR-21, BR-22, BR-23 and BR-24) were identified in this segment. However, there are no anticipated footprint impacts resulting in direct or indirect impacts to the BHRs and therefore no mitigation measures are required.

#### 5.17.6 Archaeology

A Stage 1 Archaeological Assessment was undertaken for the New Track & Facilities TPAP. A summary of the findings and recommendations for the Barrie Corridor can be found in the sections below. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-106. Additional details can be found in **Appendix G2**.

5.17.6.1 Potential Effects & Mitigation Measures: Segment BR-1 – Mile 12.10 to Mile 12.60

According to the OASD, one previously registered archaeological site is located within one kilometre of the study area, which is not located within 50 metres. Site details are presented below in Table 5-23.

TABLE 5-23 SEGMENT BR-1 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGu-85	Elia United Cemetery/Gram's Appointment	Euro-Canadian	Burial	ASI 2012

Background research confirmed three previous reports, which detail fieldwork within 50 metres of the Segment BR-1 study area. The Stage 1 Archaeological Assessment confirmed that there are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

#### 5.17.6.2 Potential Effects & Mitigation Measures: Segment BR-2 – Mile 29.50 to Mile 30.00

Within Segment BR-2, the OASD three previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-24.

TABLE 5-24 SEGMENT BR-2 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGu-512	Location 1	Euro-Canadian	Residential	Stantec 2017
BaGu-136	N/A	Euro-Canadian	Homestead	TAI 2006
BaGu-194	Knowles/Readman Site	Euro-Canadian	Unknown	WSP Canada 2017

Background research confirmed seven previous reports, which detail fieldwork within 50 metres of the Segment BR-2 study area. The Stage 1 Archaeological Assessment confirmed that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required.

5.17.6.3 Potential Effects & Mitigation Measures: Segment BR-3 – Mile 30.00 to Mile 30.50

The Stage 1 Archeological Assessment confirmed two previously registered archaeological sites located within one kilometre of the study area (not located within 50 metres) according to the OASD. Site details are presented below in Table 5-25.

TABLE 5-25 SEGMENT BR-3 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITE WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BaGu-136	N/A	Euro-Canadian	Homestead	TAI 2006
BaGu-194	Knowles/Readman Site	Euro-Canadian	Unknown	WSP Canada 2017

Additional background research of seven previous reports detail fieldwork completed within 50 metres of the study area. There are no anticipated impacts of the proposed tracks and platforms in this segment therefore no mitigation measures have been proposed.

5.17.6.4 Potential Effects & Mitigation Measures: Segment BR-4 – Mile 30.50 to Mile 31.00

The Stage 1 Archeological Assessment confirmed six previously registered archaeological sites are located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-26. Additional background research of three previous reports detail fieldwork completed within 50 metres of the BR-4 study area.

TABLE 5-26 SEGMENT BR-4 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AIGt-618	Angus Farm Site	Euro-Canadian	Farmstead, Agricultural	TLA 2015
BaGu-60	Mary Burkett	Euro-Canadian	Homestead	ASI 1992
BaGu-136	n/a	Euro-Canadian	Homestead	TAI 2006

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BaGu-187	Pearson North	Euro-Canadian	Homestead	TLA 2015, 2016, 2017
BaGu-188	Pearson South	Euro-Canadian	Secondary deposit	TLA 2015, 2016, 2017
BaGu-194	Knowles/Readman Site	Euro-Canadian	Unknown	WSP Canada 2017

Background research confirmed seven previous reports, which detail fieldwork within 50 metres of the Segment BR-4 study area. There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.6.5 Potential Effects & Mitigation Measures: Segment BR-5 - Mile 31.00 to Mile 31.50

According to the OASD six previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-27.

TABLE 5-27 SEGMENT BR-5 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-618	Angus Farm Site	Euro-Canadian	Farmstead, Agricultural	TLA 2015
BaGu-34	Cottontail	Woodland, Early	Findspot	ASI 1990
BaGu-59	Andrew Clubine	Euro-Canadian	Homestead	ASI 1992
BaGu-60	Mary Burkett	Euro-Canadian	Homestead	ASI 1992
BaGu-187	Pearson North	Euro-Canadian	Homestead	TLA 2015, 2016, 2017
BaGu-188	Pearson South	Euro-Canadian	Secondary deposit	TLA 2015, 2016, 2017

According to the background research, seven previous ASI reports detail fieldwork within 50 metres of the Segment BR-5 study area. The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.6.6 Potential Effects & Mitigation Measures: Segment BR-6 – Mile 31.50 to Mile 32.00

According to the OASD eight previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-28.

TABLE 5-28 SEGMENT BR-6 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-618	Angus Farm Site	Euro-Canadian	Farmstead, Agricultural	TLA 2015
BaGu-34	Cottontail	Woodland, Early	Findspot	ASI 1990
BaGu-59	Andrew Clubine	Euro-Canadian	Homestead	ASI 1992
BaGu-60	Mary Burkett	Euro-Canadian	Homestead	ASI 1992
BaGu-61	George Bodfish	Euro-Canadian	Homestead	ASI 1992



Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BaGu-69	Stanjon	Pre-contact Indigenous	Findspot	ASI 1993
BaGu-187	Pearson North	Euro-Canadian	Homestead	TLA 2015, 2016, 2017
BaGu-188	Pearson South	Euro-Canadian	Secondary deposit	TLA 2015, 2016, 2017

According to the background research, seven previous ASI reports detail fieldwork within 50 metres of the Segment BR-6 study area. The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.6.7 Potential Effects & Mitigation Measures: Segment BR-7 – Mile 31.90 to Mile 32.50

According to the OASD, four previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-29.

TABLE 5-29 SEGMENT BR-7 – PREVIOUSLY REISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BaGu-34	Cottontail	Woodland, Early	Findspot	ASI 1990
BaGu-59	Andrew Clubine	Euro-Canadian	Homestead	ASI 1992
BaGu-60	Mary Burkett	Euro-Canadian	Homestead	ASI 1992
BaGu-61	George Bodfish	Euro-Canadian	Homestead	ASI 1992

Background research confirmed seven previous reports, which detail fieldwork within 50 metres of the Segment BR-7 study area. The Stage 1 Archaeological Assessment confirmed that there are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.6.8 Potential Effects & Mitigation Measures: Segment BR-8 – Mile 32.50 to Mile 32.90

The Stage 1 Archeological Assessment confirmed one previously registered archaeological site is located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-30. Additional background research of seven previous reports detail fieldwork completed within 50 metres of the study area.

TABLE 5-30 SEGMENT BR-8 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BaGu-34	Cottontail	Woodland, Early	Findspot	ASI 1990

Background research confirmed seven previous reports, which detail fieldwork within 50 metres of the Segment BR-8 study area. There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.6.9 Potential Effects & Mitigation Measures: Segment BR-9 – Mile 32.90 to Mile 33.50

The Stage 1 Archeological Assessment confirmed no previously registered archaeological sites is located within one kilometre of the study area according to the OASD, therefore there are no anticipated impacts and mitigation measures proposed.

5.17.6.10 Potential Effects & Mitigation Measures: Segment BR-10 – Mile 33.40 to Mile 34.00

The Stage 1 Archeological Assessment confirmed one previously registered archaeological site is located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-31.

TABLE 5-31 SEGMENT BR-10 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BaGu-191	Mordecai Sawmill Site	Euro-Canadian	Sawmill	EAS 2016; ASI 2017

Background research confirmed seven previous reports, which detail fieldwork within 50 metres of the Segment BR-10 study area. There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.6.11 Potential Effects & Mitigation Measures: Segment BR-11 – Mile 33.90 to Mile 34.50

The Stage 1 Archeological Assessment confirmed one previously registered archaeological site is located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-32.

TABLE 5-32 SEGMENT BR-11 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BaGu-191	Mordecai Sawmill Site	Euro-Canadian	Sawmill	EAS 2016; ASI 2017

Background research confirmed seven previous reports, which detail fieldwork within 50 metres of the Segment BR-11 study area. There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.6.12 Potential Effects & Mitigation Measures: Segment BR-12 - Mile 34.40 to Mile 34.90

The Stage 1 Archeological Assessment confirmed one previously registered archaeological site is located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-33.

TABLE 5-33 SEGMENT BR-12 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BaGu-191	Mordecai Sawmill Site	Euro-Canadian	Sawmill	EAS 2016; ASI 2017

Background research confirmed seven previous reports, which detail fieldwork within 50 metres of the Segment BR-12 study area. There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.



5.17.6.13 Potential Effects & Mitigation Measures: Segment BR-13 – Mile 61.30 to Mile 61.80

The Stage 1 Archeological Assessment confirmed one previously registered archaeological site is located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-34.

TABLE 5-34 SEGMENT BR-13 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BcGv-9	Tollendale Creek	Paleo-Indian; Archaic, Late;	Camp/campsite	Hunter 1977; Henry 1986;
		Woodland, Early, Late		Knight 1986; Warrick 1986; AMICK 1997

Background research confirmed four previous reports, which detail fieldwork within 50 metres of the Segment BR-13 study area. There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.17.6.14 Potential Effects & Mitigation Measures: Segment BR-14 – Mile 61.80 to Mile 62.30

The Stage 1 Archeological Assessment confirmed one previously registered archaeological site is located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-35.

TABLE 5-35 SEGMENT BR-14 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BcGv-9	Tollendale Creek	Paleo;	Camp/campsite	Hunter 1977;
		Archaic, Late;		Henry 1986;
		Woodland, Early, Late		Knight 1986; Warrick 1986; AMICK 1997

There is the potential for the disturbance of unassessed or documented archaeological resources within the Segment BR-14. A Stage 2 Archaeological Assessment is recommended for areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities. Test pit surveys at five metre intervals, expect where ploughing is not viable, will be conducted by a professionally licensed archaeologist prior to disturbance.

No archaeological resources were encountered during the course of the Stage 2 Archaeological Assessment for the New Track and Facilities TPAP in this segment, therefore no further archaeological assessment is required.

5.17.6.15 Potential Effects & Mitigation Measures: Segment BR-15 - Mile 62.30 to Mile 62.80

The Stage 1 Archeological Assessment confirmed one previously registered archaeological site is located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-36.

# TABLE 5-36 SEGMENT BR-15 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BcGw-69	Allandale Station Lands	Ancestral Huron-Wendat	Village	AFBY 2000, 2001;
			Ossuary	AMICK 2010, 2011, 2013;

The Allandale site is located within the Historic Allandale Station complex. The site has been identified as an ancestral Huron-Wendat settlement and ossuary, and CHVI has been established. There is potential for the disturbance of unassessed or documented deeply buried archaeological resources in this segment. A Stage 2 Archaeological Assessment is recommended for areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities. Test pit surveys at five metre intervals.

Accordingly, depending on the results of the Stage 2 assessment, there is a possibility that further Stage 3 archaeological assessment (preferably with the engagement of interested Indigenous communities) and, ultimately, Stage 4 mitigation—protection/ avoidance of the Allandale site will be recommended. As with all such significant archaeological sites, it is preferable that impacts to the site are mitigated through the development of a Stage 4 protection and avoidance strategy. If the site cannot be fully protected and avoided, then some archaeological mitigation through salvage excavation, with Indigenous engagement, may also be required. Finally, due to the previously documented evidence on the historic Allandale Station site, archaeological monitoring of any proposed impacts to the historic station property is recommended within the area between Essa Road and Milburn Street.

5.17.6.16 Potential Effects & Mitigation Measures: Segment BR-16 – Mile 62.80 to Mile 63.40

The Stage 1 Archeological Assessment confirmed one previously registered archaeological site is located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-37.

### TABLE 5-37 SEGMENT BR-16 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BcGw-69	Allandale Station Lands	Ancestral Huron-Wendat	Village	AFBY 2000, 2001;
			Ossuary	AMICK 2010, 2011, 2013;

The Allandale site is located within the Historic Allandale Station complex. The site has been identified as an ancestral Huron-Wendat settlement and ossuary, and CHVI has been established. There is potential for the disturbance of unassessed or documented deeply buried archaeological resources in this segment. A Stage 2 Archaeological Assessment is recommended for areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities. Test pit surveys at five metre intervals.

Accordingly, depending on the results of the Stage 2 assessment, there is a possibility that further Stage 3 archaeological assessment (preferably with the engagement of interested Indigenous communities) and, ultimately, Stage 4 mitigation—protection/ avoidance of the Allandale site will be recommended. As with all such significant archaeological sites, it is preferable that impacts to the site are mitigated through the development of a Stage 4 protection and avoidance strategy. If the site cannot be fully protected and avoided, then some archaeological mitigation through salvage excavation, with Indigenous engagement, may also be required. Finally, due to the previously documented evidence on the historic Allandale

Station site, archaeological monitoring of any proposed impacts to the historic station property is recommended within the area between Essa Road and Milburn Street.

#### 5.17.7 Utilities

A Utilities Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-110. Additional details can be found in **Appendix J**.

5.17.7.1 Potential Effects & Mitigation Measures: Segment BR-1 - Mile 12.10 to Mile 12.60

There are no anticipated utility impacts in Segment BR-1 due to no utilities being identified in the location of new track.

5.17.7.2 Potential Effects & Mitigation Measures: Segment BR-2 – Mile 29.50 to Mile 30.00

The following potential conflicts have been identified in Table 5-38. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

Owner	Utility Class	Description	Size	Material	Nearest Street
Town of Aurora	UG - Crossing	Water	200mm	Unknown	Wellington St E
Bell	UG - Crossing	Communication Duct Bank	1 duct	Plastic	Wellington St E
York Region	UG - Crossing	Water	900mm pipe, 1500mm casing	Concrete in Steel Casing	Wellington St E
York Telecom Network	UG - Crossing	Communication Conduit	96 CT, 100mm casing	Fiber in Steel Casing	Wellington St E
Bell	UG - Crossing	Cable	Unknown	Plastic	Wellington St E
Bell	UG - Crossing	Communication Duct Bank	1 duct	Plastic	Wellington St E
Enbridge Gas	UG - Crossing	Gas	6"	Steel Coated	Wellington St E

#### TABLE 5-38 SEGMENT BR-2 - POTENTIALLY IMPACTED UTILITIES

5.17.7.3 Potential Effects & Mitigation Measures: Segment BR-3 – Mile 30.00 to Mile 30.50

The following potential conflicts have been identified in Table 5-39. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

#### TABLE 5-39 SEGMENT BR-3 – POTENTIALLY IMPACTED UTILITIES

Owner	Utility Class	Description	Size	Material	Nearest Street
Bell	UG - Crossing	Communication Duct Bank	1 duct	Plastic	Wellington St E
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	Centre St
Bell	UG - Crossing	Communication Duct Bank	9 - 10 ducts	Concrete	Centre St
Town of Aurora	UG - Crossing	Water	200mm pipe, 400mm casing	Unknown in Steel Casing	Centre St



#### 5.17.7.4 Potential Effects & Mitigation Measures: Segment BR-4 – Mile 30.50 to Mile 31.00

The following potential conflicts have been identified in Table 5-40. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

#### TABLE 5-40 SEGMENT BR-4 - POTENTIALLY IMPACTED UTILITIES

Owner	Utility Class	Description	Size	Material	Nearest Street
Alectra (Powerstream)	UG - Crossing	Electrical Conduit	Unknown	Unknown	St John's Sideroad E
Town of Aurora	UG - Crossing	Water	300mm pipe, 600mm casing	Ductile Iron in Steel Casing	St John's Sideroad E

5.17.7.5 Potential Effects & Mitigation Measures: Segment BR-5 – Mile 31.00 to Mile 31.50

The following potential conflicts have been identified in Table 5-41. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

Owner	Utility Class	Description	Size	Material	Nearest Street
Enbridge Gas	UG - Crossing	Gas	12" pipe, 16" casing	Steel Coated in Unknown Casing	St John's Sideroad E
Hydro One	OH - Parallel	Conductor	44k∨	Metallic	St. John's sideroad to Mulock dr.
Town of Newmarket	UG - Crossing	Culvert	Unknown	Unknown	St Jonh's Sideroad E
Town of Newmarket	UG - Crossing	Sewer	750mm	Concrete in Concrete Casing	St Jonh's Sideroad E
York Region	UG - Crossing	Sewer	1200mm	Unknown	Bosworth Court
Town of Newmarket	UG - Crossing	Sewer	450mm pipe, 900mm casing	Concrete in Steel Casing	Jelley Ave
Bell	UG - Crossing	Cable	Unknown	Plastic	St Jonh's Sideroad E
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	St Jonh's Sideroad E
Bell	UG - Crossing	Communication Duct Bank	5 ducts	Concrete	St Jonh's Sideroad E
York Region	UG - Crossing	Sewer	1050mm	Concrete	St Jonh's Sideroad E
Town of Aurora	UG - Crossing	Water	500mm pipe, 1050mm liner	Ductile Iron in Steel Casing	St Jonh's Sideroad E

#### 5.17.7.6 Potential Effects & Mitigation Measures: Segment BR-6 – Mile 31.50 to Mile 32.00

The following potential conflicts have been identified in Table 5-42. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

Owner	Utility Class	Description	Size	Material	Nearest Street
Hydro One	OH - Parallel	Conductor	44k∨	Metallic	St. John's Sideroad E to Mulock Dr
Town of Newmarket	UG - Crossing	Culvert	Unknown	Unknown	St John's Sideroad E
Town of Newmarket	UG - Crossing	Sewer	750mm	Concrete in Concrete Casing	St John's Sideroad E
York Region	UG - Crossing	Sewer	1200mm	Unknown	Bosworth Court
Town of Newmarket	UG - Crossing	Sewer	450mm pipe, 900mm casing	Concrete in Steel Casing	Jelley Ave

TABLE 5-42 SEGMENT BR-6 – POTENTIALLY IMPACTED UTILITIES

5.17.7.7 Potential Effects & Mitigation Measures: Segment BR-7 – Mile 31.90 to Mile 32.50

The following potential conflict has been identified in Table 5-43. This conflict is spatial in nature. The conflict identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

#### TABLE 5-43 SEGMENT BR-7 - POTENTIALLY IMPACTED UTILITY

Owner	Utility Class	Description	Size	Material	Nearest Street
York Region	UG - Crossing	Sewer	900 mm	Concrete	Sydor Court

5.17.7.8 Potential Effects & Mitigation Measures: Segment BR-8 – Mile 32.50 to Mile 32.90

The following potential conflicts have been identified in Table 5-44. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

Owner	Utility Class	Description	Size	Material	Nearest Street
Bell	UG - Crossing	Communication Duct Bank	4 ducts	Concrete	Mulock Dr
Enbridge Gas	UG - Crossing	Gas	8"	Steel Coated	Mulock Dr
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	Mulock Dr
Bell	UG - Crossing	Cable	Unknown	Plastic	Mulock Dr
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	Mulock Dr
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	Mulock Dr
York Telecom Network	UG - Crossing	Communication Conduit	2x59mm conduits, 168.3mm casing	Plastic in Steel Casing	Mulock Dr



Owner	Utility Class	Description	Size	Material	Nearest Street
Town of Newmarket	UG - Crossing	Sewer	10" pipe, 27" casing	Vitrified Clay in Metallic Casing	Mulock Dr
Town of Newmarket	UG - Crossing	Storm	42"	Concrete	Mulock Dr

5.17.7.9 Potential Effects & Mitigation Measures: Segment BR-9 – Mile 32.90 to Mile 33.50

The following potential conflicts have been identified in Table 5-45. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-45 SEGMENT BR-9 – POTENTIALLY IMPACTED UTILITIES

Owner	Utility Class	Description	Size	Material	Nearest Street
Town of Newmarket	UG - Crossing	Sewer	300mm	Unknown	Mulock Dr
Town of Newmarket	UG - Crossing	Culvert	Unknown	Unknown	Mulock Dr
Town of Newmarket	UG - Crossing	Culvert	750 mm	Unknown	Oak St
York Region	UG - Crossing	Sewer	450mm pipe, 900mm casing	PVC in Steel Casing	Water Street
Bell	UG - Crossing	Communication Duct Bank	1 duct	Plastic	Water Street
Town of Newmarket	UG - Crossing	Culvert	1025mm	Concrete	Water Street

5.17.7.10 Potential Effects & Mitigation Measures: Segment BR-10 – Mile 33.40 to Mile 34.00

The following potential conflicts have been identified in Table 5-46. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-46 SEGMENT BR-10 - POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Bell	UG - Crossing	Communication Duct Bank	1 duct	Plastic	Water Street
Town of Newmarket	UG - Crossing	Culvert	1025mm	Concrete	Water Street
Town of Newmarket	UG - Crossing	Storm	Unknown	Unknown	Water Street
Bell	UG - Crossing	Communication Duct Bank	6 - 24 ducts	Concrete	Water Street
Enbridge Gas	UG - Crossing	Gas	8"	Steel Coated	Water Street
Town of Newmarket	UG - Crossing	Storm	300mm	PVC	Water Street
York Telecom Network	UG - Crossing	Communication Conduit	48F, 50 mm conduit	Fiber in Plastic Casing	Water Street



Owner Name	Utility Class	Description	Size	Material	Nearest Street
York Region	UG - Crossing	Sewer	900mm pipe, 1500mm tunnel	Concrete in Unknown Casing	Water Street
Town of Newmarket	UG - Crossing	Water	150mm	Unknown	Timothy St
Town of Newmarket	UG - Crossing	Sewer	14" pipe, 30" liner	Asbestos Cement in Steel Casing	Timothy St
Rogers	UG - Crossing	Cable	Unknown	Unknown	Timothy St
York Telecom Network	UG - Crossing	Communication Conduit	48 Fibre	Fiber	Timothy St
Bell	UG - Crossing	Communication Duct Bank	20 ducts	Concrete	Queen St
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	Queen St
Town of Newmarket	UG - Crossing	Sewer	8" pipe, 18" liner	Unknown in Steel Casing	Queen St

#### 5.17.7.11 Potential Effects & Mitigation Measures: Segment BR-11 - Mile 33.90 to Mile 34.50

The following potential conflicts have been identified in Table 5-47. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

#### TABLE 5-47 SEGMENT BR-11 – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Bell	UG - Crossing	Communication Duct Bank	20 ducts	Concrete	Queen St
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	Queen St
Town of Newmarket	UG - Crossing	Sewer	8" pipe, 18" liner	Unknown in Steel Casing	Queen St
Town of Newmarket	UG - Crossing	Storm	450mm	Unknown	Ontario St
Bell	UG - Crossing	Communication Duct Bank	8 FRE in 610 mm steel casing	Steel Casing	Davis Dr
Rogers	UG - Crossing	Communication Conduit	4 FRE in 610 mm steel casing	Steel Casing	Davis Dr
York Telecom Network	UG - Crossing	Communication Conduit	2 FRE in 610 mm steel casing	Fiber in Steel Casing	Davis Dr
Enbridge Gas	UG - Crossing	Gas	6"	Steel Coated	Davis Dr
York Telecom Network	UG - Crossing	Communication Conduit	1 FRE	Fiber	Davis Dr
Bell	UG - Crossing	Communication Duct Bank	4 Ducts	Steel	Davis Dr
Town of Newmarket	UG - Crossing	Sewer	750mm	Concrete	Davis Dr

5.17.7.12 Potential Effects & Mitigation Measures: Segment BR-12 – Mile 34.40 to Mile 34.90

The following potential conflicts have been identified in Table 5-48. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

The York Region 850mm sanitary sewer will be reviewed for potential conflicts when additional information on the asset is received.

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Town of Newmarket	UG - Crossing	Sewer	250mm pipe, 600mm casing	PVC in Steel Casing	Main St North By- Pass
Town of Newmarket	UG - Crossing	Storm	24" pipe, 42" casing	Asbestos Cement in Steel Casing	Main St
Town of Newmarket	UG - Crossing	Sewer	72" pipe, 58" x 91" casing	Concrete in Concrete Casing	Main St
Unknown	UG - Crossing	Culvert	1050mm	Concrete	Davis Dr
Unknown	UG - Crossing	Culvert	1050mm	Concrete	Davis Dr
Unknown	UG - Crossing	Culvert	750mm	Unknown	Davis Dr

#### TABLE 5-48 SEGMENT BR-12 – POTENTIALLY IMPACTED UTILITIES

5.17.7.13 Potential Effects & Mitigation Measures: Segment BR-13 – Mile 61.30 to Mile 61.80

The following potential conflicts have been identified in Table 5-49. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

#### TABLE 5-49 SEGMENT BR-13 – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Bell	UG - Crossing	Cable	Unknown	Unknown	Foster Dr
City of Barrie	UG - Parallel	Storm	Unknown	Plastic	Little Ave to Brennan Ave

5.17.7.14 Potential Effects & Mitigation Measures: Segment BR-14 - Mile 61.80 to Mile 62.30

The following potential conflicts have been identified in Table 5-50. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-50 SEGMENT BR-14 – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
City of Barrie	UG - Crossing	Sewer	675mm	Concrete	Minet's Point Rd
Enbridge Gas	UG - Crossing	Gas	4" pipe, 6" casing	Plastic in Steel Casing	Minet's Point Rd
Bell	UG - Crossing	Communication Duct Bank	7 ducts	Concrete	Minet's Point Rd
City of Barrie	UG - Crossing	Culvert	1500mm	Concrete	Minet's Point Rd

Owner Name	Utility Class	Description	Size	Material	Nearest Street
City of Barrie	UG - Crossing	Storm	300mm	Unknown	Minet's Point Rd
City of Barrie	UG - Crossing	Water	300mm pipe, 600mm casing	Steel Casing	Minet's Point Rd
Rogers	UG - Crossing	Cable	144F in 4" pipe in 8.25" sleeve	Plastic in Steel Casing	Minet's Point Rd
Enbridge Gas	UG - Crossing	Gas	2"	Steel Coated	Minet's Point Rd
City of Barrie	UG - Crossing	Water	600mm	Unknown	Minet's Point Rd
City of Barrie	UG - Crossing	Sewer	Unknown	Unknown	Minet's Point Rd

#### 5.17.7.15 Potential Effects & Mitigation Measures: Segment BR-15 - Mile 62.30 to Mile 62.80

The following potential conflicts have been identified in Table 5-51. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

#### TABLE 5-51 SEGMENT BR-15 – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
City of Barrie	UG - Parallel	Storm	1050mm	Concrete	Barrie Layover Yard
City of Barrie	UG - Crossing	Storm	1050mm	Unknown	Barrie Layover Yard

#### 5.17.7.16 Potential Effects & Mitigation Measures: Segment BR-16 - Mile 62.80 to Mile 63.40

The following potential conflicts have been identified in Table 5-52. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

#### TABLE 5-52 SEGMENT BR-16 – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	Essa Rd
City of Barrie	UG - Crossing	Storm	24" 300mm pipe, 600mm casing	Concrete	Essa Rd
City of Barrie	UG - Crossing	Water	600mm	Plastic in unknown casing	Essa Rd
City of Barrie	UG - Crossing	Sewer	500mm	Concrete	Essa Rd
Enbridge Gas	UG - Crossing	Gas	8"	Steel	Essa Rd
City of Barrie	UG - Parallel	Storm	300mm	Concrete	Gowan St
Bell	UG - Crossing	Communication Conduit	Unknown	Plastic	Essa Rd

### 5.18 Footprint Impacts - Stouffville Corridor

#### 5.18.1 Natural Environment

A Natural Environment Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-101. Additional details can be found in **Appendix B2**.

#### 5.18.1.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

The Unionville Storage Yard Project area segments occur within the urbanized setting of the City of Markham. Surrounding land use is comprised of a woodland, CUM and (fields) lands undergoing preparation for intensive urbanization and a high school. The study area segments are bounded to the south by Enterprise Drive and to the north by the Rouge River Valley.

Proposed works include track upgrades and the addition of an access road and a six stall parking lot for servicing the new proposed layover operations at this location. Small portions of land adjacent to the existing rail corridor have been identified for acquisition to accommodate the access road and six stall parking lot.

#### Terrestrial Environment

The existing rail corridor through these segments is subject to a 7 m wide vegetation removal zone within CVI lands as approved previously through the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). As part of these approved works, clearance zones will entail vegetation removals/clearing mainly within the existing Metrolinx owned rail corridor.

The lands identified for property acquisition and construction of an access road along the west side of the rail corridor are comprised of CUM vegetation dominated by non-native grasses and common urban tolerant herbaceous plants and CUT within the Rouge River corridor.

Potential footprint impacts include encroachment and removal of a contiguous linear portion of approximately 0.53 ha of CUM habitat and 0.31 ha CUT adjacent to the rail corridor. Encroachment into the deciduous woodland positioned on each side of the rail corridor will be avoided. The removals are considered minor due to the position of these vegetation units along the existing rail corridor and the common occurrence of these habitat units within urban and rural landscapes, including within the adjacent protected Rouge Valley corridor.

Mitigation for these removals will include, but is not limited to:

- Mitigation for these removals will include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined in Chapter 9 and adherence to Metrolinx's Vegetation Management Guidelines;
- Candidate SWH occurs in the adjacent woodland communities along the Rouge River corridor to the west of the work area. Candidate SWH includes bat roosts, raptor nesting and habitat for Special Concern, and Rare Wildlife Species; and
- While the CUM and CUT communities provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the proposed minor encroachments are considered to be a low impact from an ecological perspective given the position of these communities along the existing rail corridor and the availability of similar and higher quality habitat in the adjacent protected Rouge Valley corridor. No potential impacts are anticipated to the adjacent SWH in the woodland communities due to the separation distance (50 m or more) of these communities from the proposed work area.

#### Aquatic Environment

The Middle Rouge River flows west to east under the rail corridor in this segment of the Project study area. The Rouge valley in this location is well defined and extensively vegetated with a variety of community types including mixed woodlands, CUT and CUM. As no bridge modifications are included in the proposed works, no direct or long-term impacts are anticipated to the Rouge River aquatic environment.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within the subject segments of the Project study area. SAR generalists with habitats that may occur anywhere, including three species of bats, Butternut, and Monarch Butterfly may occur within the subject segments. Recent correspondence from TRCA suggests that the reach was recently designated by MECP as regulated Redside Dace habitat. Confirmation from MECP should be obtained during future design phases of the project as this designation may influence the selection and use of sediment and erosion control measures on the adjacent table lands.

SAR bats (Tri-colored Bat, Little Brown Myotis and Northern Myotis) may use any tree (typically greater than 10 cm DBH) along the rail corridor as a bat day roost or possibly bat maternity roost. Butternut may occur within open edges, hedgerows and fence lines due to dispersal by wildlife, such as squirrels. Monarch Butterfly can often be found wherever the host plant (Milkweed) occurs.

While habitat for other potential SAR species including Eastern Wood-pewee and Red-headed Woodpecker occur within the Rouge Valley corridor in proximity to the project area, no suitable habitat occurs in the proposed footprint area of the access road or parking lot. For this reason, the vegetation encroachment and removal of the CUM and CUT communities is not anticipated to impact the potential habitat for these avian species. The riparian wetland habitats and the Rouge River corridor occurring in proximity to these segments of the Project study area provide habitat for Snapping Turtles whereby they could utilize the south slope embankments and / or gravel surfaces of the tracks abutting these features for nesting. While such use of the rail corridor by Snapping Turtles may occur, the constructed, maintained and utilized corridor does not require habitat protection. Rather, only protection of the individual(s) of the species is required under this scenario.

Mitigation includes:

- Screening for Butternut trees in advance of clearing and addressing any required removals through the provincial registration process;
- Ensuring a wildlife awareness and management program is employed during construction to identify and avoid harmful encounters to SAR turtles or their eggs;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

With the application of recommended mitigation, the encroachment into CUM and CUT communities adjacent to the Rouge River valley corridor is not anticipated to result in adverse effects on SAR or their habitat given the position of these communities along the exiting rail corridor and the availability of similar and higher quality habitat in the adjacent protected Rouge Valley corridor.

#### **Designated Areas**

The Rouge River valley corridor is designated municipally in the City of Markham Official Plan as part of the City's Greenway System and as included as an Urban River Valley of the provincial Greenbelt Plan (2017). As no bridge modifications are included in the proposed works and proposed vegetation encroachment is confined to the edges of cultural vegetation communities, no direct or long-term impacts are anticipated to the Rouge River Urban River Valley corridor or the City's Greenway.

5.18.1.2 Potential Effects & Mitigation Measures: Segment ST-1 – Mile 51.00 to Mile 50.60

Refer to Section 5.18.1.1 above, which describes natural environment impacts and mitigation measures for the Unionville Storage Yard and comprises Segment ST-1.

This segment of the Project study area occurs within the urbanized setting of the City of Markham. Surrounding land use is comprised of the Unionville GO station, the Highway 407 corridor and CUM habitats (fields) lands undergoing preparation for intensive urbanization.

Proposed works include two new island platforms, track upgrades and the addition of a section of new track to facilitate the new island platforms. Small portions of land adjacent to the existing Unionville GO station rail corridor have been identified for acquisition to accommodate the additional track and platforms.

#### Terrestrial Environment

The existing rail corridor through these segments is subject to a 7 m wide vegetation removal zone within CVI lands as approved previously through the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). As part of these approved works, clearance zones will entail vegetation removals/clearing mainly within the existing Metrolinx owned rail corridor.

The lands identified for property acquisition along the west side of the rail corridor are comprised of CUM vegetation dominated by non-native grasses and common urban tolerant herbaceous plants. Property acquisition along the east side primarily consist of existing parking lot (CVI) with a small portion of CUM.

Potential footprint impacts include encroachment and removal of narrow portions CUM. These removals are considered minor due to the position of these vegetation units along the exiting rail corridor, and the common occurrence of these habitat units and the small portion of habitat removed.

Mitigation for these removals will include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal in Table 5-97 and adherence to Metrolinx's Vegetation Management Guidelines.

While the CUM communities provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the minor encroachments are considered to be a low impact from an ecological perspective given the position of position of these trees along the exiting rail corridor and the availability of higher quality habitat in the Rouge Valley corridor located approximately 350 m north of the subject work area.

#### Aquatic Environment

There are no aquatic features within the subject segment of the Project study area.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within the subject segments of the Project study area. SAR generalists with habitats that may occur anywhere including Nine-spotted lady Beetle and Monarch Butterfly and its host plant (Milkweed) may occur in the meadow habitats. While the potential for Butternut may occur within open edges, hedgerows and fence lines due to dispersal by wildlife, such as squirrels, no trees were observed in the study area.



Mitigation includes:

- Screening for Butternut trees in advance of clearing and addressing any required removals through the provincial registration process;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

There are no anticipated adverse effects on Species at Risk or their habitat due to the low potential for generalist species at risks to occur and the application of appropriate mitigation.

#### **Designated Areas**

No designated features occur within the subject segment of the Project study area.

5.18.1.3 Potential Effects & Mitigation Measures: Segment ST-2 – Mile 50.60 to Mile 50.00

Refer to Section 5.18.1.1 above, which describes natural environment impacts and mitigation measures for the Unionville Storage Yard and comprises Segment ST-2.

5.18.1.4 Potential Effects & Mitigation Measures: Segment ST-3 – Mile 46.30 to Mile 45.80

These segments of the Project study area occur within the urbanized setting of the City of Markham. In addition to the Mount Joy GO station, surrounding land use consists of residential, recreational, commercial and institutional uses, including two constructed stormwater management (SWM) facilities associated with the Mount Joy subwatershed.

Proposed works include the addition of a new passing track and a new platform. Small portions of land adjacent to the existing rail corridor have been identified for acquisition to accommodate theses proposed works. It is anticipated that a 7 m wide vegetation removal zone will be required to accommodate the electrification of the new passing track.

#### Terrestrial Environment

The existing rail corridor through these segments is subject to a 7 m wide vegetation removal zone within the Transportation and Utility (CVI) lands as approved previously through the GO Rail Network Electrification TPAP. As part of these approved works, clearance zones will entail vegetation removals/clearing mainly within the existing Metrolinx owned rail corridor.

The lands identified for property acquisition and construction of the new passing track and a new island platform along the east side of the rail corridor are comprised of a treed hedgerow, and CUM vegetation dominated by non-native plant species including grasses and common urban tolerant herbaceous plants. A European Common Reed (*Phragmites* sp.) MAM dominated community borders this meadow community and will remain intact.

Potential footprint impacts include encroachment and removal of a contiguous linear portion of 0.17 ha of treed hedgerow and 0.14 ha of CUM habitat adjacent to the rail corridor. The removals are considered minor due to the position of these vegetation units along the existing rail corridor, the common occurrence of these habitat units within urban and rural landscapes and the disturbed condition of this community as evidenced by the abundance of non-native vegetation.

Mitigation includes:

• Ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined in Chapter 9 and adherence to Metrolinx's Vegetation Management Guidelines.

While the cultural meadow community may provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the proposed encroachments are considered to be a low impact from an ecological perspective given the position of these communities along the existing rail corridor and the disturbed condition and low quality habitat offered by this vegetation unit.

#### Aquatic Environment

These segments of the Project study area occur within the Mount Joy Creek sub-watershed, the main channel of which flows adjacent and at times parallel to the rail corridor within these segments. The channel reach directly adjacent to the existing track is characterized and functions as an urban ditch, providing very low quality potential aquatic habitat. There is one existing culvert crossing within the Project study area near the corridor crossing with Bur Oak Avenue. As no culvert modifications are included in the proposed works, no direct or long-term impacts are anticipated to the Mount Joy Creek aquatic environment.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within the subject segments of the Project study area. Given the dominance of non-native vegetation in the cultural meadow, potential habitat for SAR "generalists" is not anticipated to occur within the project footprint of the subject Project study area segments.

The riparian meadow marsh wetland habitats and the naturalized adjacent SWM facilities occurring in proximity to the proposed work area may provide habitat for Snapping Turtles whereby they could utilize the gravel surfaces of the tracks for nesting. While such use of the rail corridor by snapping turtles may occur, the constructed, maintained and utilized corridor does not require habitat protection. Rather, only protection of the individual(s) of the species is required under this scenario.

Mitigation includes:

- Ensuring a wildlife awareness and management program is employed during construction to identify and avoid harmful encounters to SAR turtles or their eggs; and
- General mitigation measures outlined in Table 5-101.

There are no anticipated adverse effects on SAR or their habitat due to the low potential for generalist SAR to occur and the application of appropriate mitigation.

#### **Designated Areas**

The Mount Joy Creek corridor is designated municipally in the City of Markham Official Plan as part of the City's Greenway System and as included as an Urban River Valley of the provincial Greenbelt Plan (2017). As no culvert modifications are included in the proposed works and proposed vegetation encroachment is confined to the edges of cultural vegetation communities, no direct or long-term impacts are anticipated to the Mount Joy Creek Urban River Valley corridor or the City's Greenway.

5.18.1.5 Potential Effects & Mitigation Measures: Segment ST-4 – Mile 45.80 to Mile 45.30

This segment of the Project study area occurs within the urbanized setting of the City of Markham. In addition to the Mount Joy GO station, surrounding land use consists of residential, recreational, commercial and institutional uses, including two constructed stormwater management (SWM) facilities associated with the Mount Joy subwatershed.

Proposed works include the addition of a new passing track and a new island platform. Small portions of land adjacent to the existing rail corridor have been identified for acquisition to accommodate these proposed works. It is anticipated that a 7 m wide vegetation removal zone will be required to accommodate the electrification of the new passing track.

#### **Terrestrial Environment**

The existing rail corridor through these segments is subject to a 7 m wide vegetation removal zone within CVI lands as approved previously through the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). As part of these approved works, clearance zones will entail vegetation removals/clearing mainly within the existing Metrolinx owned rail corridor.

The lands identified for property acquisition and construction of the new passing track and a new island platform along the east side of the rail corridor are comprised of CUM vegetation dominated by nonnative plant species including grasses and common urban tolerant herbaceous plants. A European Common Reed MAM dominated community boards this meadow community and will remain intact.

Potential footprint impacts include encroachment and removal of a contiguous linear portion of 0.18 ha of CUM habitat adjacent to the rail corridor. The removals are considered minor due to the position of these vegetation units along the existing rail corridor, the common occurrence of these habitat units within urban and rural landscapes and the disturbed condition of this community as evidenced by the abundance of non-native vegetation.

Mitigation includes:

• Ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined in Chapter 9 and adherence to Metrolinx's Vegetation Management Guidelines.

While the CUM community may provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the proposed encroachments are considered to be a low impact from an ecological perspective given the position of these communities along the exiting rail corridor and the disturbed condition and low quality habitat offered by this vegetation unit.

#### Aquatic Environment

This segment of the Project study area occurs within the Mount Joy Creek sub-watershed, the main channel of which flows adjacent and at times parallel to the rail corridor within these segments. The channel reach directly adjacent to the existing track is characterized and functions as an urban ditch, providing very low quality potential aquatic habitat. There is one existing culvert crossing within the Project study area near the corridor crossing with Bur Oak Avenue. Given the low quality aquatic habitat potential in the existing channel and that no culvert modifications are included in the proposed works, no direct or long-term impacts are anticipated to the Mount Joy Creek aquatic environment.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within this segment of the Project study area. Given the dominance of non-native vegetation in the CUM, potential habitat for SAR generalists is not anticipated to occur within the project footprint subject Project study area segments.

The riparian MAM wetland habitats and the naturalized adjacent SWM facilities occurring in proximity to the proposed work area may provide habitat for Snapping Turtles whereby they could utilize the gravel surfaces of the tracks for nesting. While such use of the rail corridor by Snapping Turtles may occur, the constructed, maintained and utilized corridor does not require habitat protection. Rather, only protection of the individual(s) of the species is required under this scenario.

Mitigation includes:

- Ensuring a wildlife awareness and management program is employed during construction to identify and avoid harmful encounters to SAR turtles or their eggs; and
- General mitigation measures outlined in Table 5-101.

There are no anticipated adverse effects on SAR or their habitat due to the low potential for generalist SAR to occur and the application of appropriate mitigation.

#### **Designated Areas**

The Mount Joy Creek corridor is designated municipally in the City of Markham Official Plan as part of the City's Greenway System and as included as an Urban River Valley of the provincial Greenbelt Plan (2017). As no culvert modifications are included in the proposed works and proposed vegetation encroachment is confined to the edges of cultural vegetation communities, no direct or long-term impacts are anticipated to the Mount Joy Creek Urban River Valley corridor or the City's Greenway.

#### 5.18.2 Hydrogeological

A Hydrogeology Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-102. Additional details can be found in **Appendix C2**.

5.18.2.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

Infrastructure for an equipment storage yard consists of a 1-track layover area with no service/maintenance bays or other deeper intrusive work being required (no greater than 1 m depth). As a result, there will be no water mitigation measures required (such as dewatering or water management) as part of the proposed infrastructure improvements.

There are therefore no anticipated footprint impacts of the proposed Unionville Storage Yard in this segment therefore no mitigation measures have been proposed.

5.18.2.2 Potential Effects & Mitigation Measures: Segment ST-1 – Mile 51.00 to Mile 50.60

The infrastructure for this Study Area segment consists of an equipment storage yard, new platform at the Unionville GO Station, new track and track upgrades. The surrounding area within 500 m is urbanized with greenspace and the Rouge River located approximately 400 m northwest of the track. However, this water feature is of sufficient distance from the proposed infrastructure and is not expected to be impacted by the footprint.

The track upgrade and new track infrastructure footprint is expected to be less than 1 m in depth and therefore is not expected to cause any adverse groundwater impacts. The infrastructure may include excavations up to 5 to 10 m in depth for pedestrian tunnels and/or elevators. Detailed designs were not available for review for the platform; however, should pedestrian tunnels and/or elevators be included, additional evaluation will be required to assess the need for continued groundwater elevation management to keep tunnels and elevator shafts dry.

The regional physiography in this area is defined as Peel Plain with the surficial geology at ST-1 described as being predominantly composed of stone-poor, low permeability silty to sandy till. Near Enterprise Boulevard, soils change to foreshore-basinal deposits over the till with alluvial deposits furthest north. ST-1 is not located within a WHPA or IPZ.

It is noted that review of well logs for the area indicate variable static water levels generally between 1.5 and 14 m below grade at the time of drilling, with surficial soils generally described as being clay and silty clay tills of low permeability. Therefore, groundwater elevations may represent perched conditions, and the need for dewatering may be limited.

There are 11 domestic supply wells, two commercial supply wells, and one dewatering well within 500 m of ST-1. As dewatering is expected to be limited and the availability of municipal water, there is not expected to be any adverse groundwater impacts to local well users. The presence of these wells should be confirmed further prior to construction as some may no longer be in existence.

5.18.2.3 Potential Effects & Mitigation Measures: Segment ST-2 – Mile 50.60 to Mile 50.00

See details in Section 5.18.3.2 above. There are no anticipated footprint impacts of the proposed infrastructure in this segment therefore no mitigation measures have been proposed.

5.18.2.4 Potential Effects & Mitigation Measures: Segment ST-3 – Mile 46.30 to Mile 45.80

The infrastructure for this Study Area segment consists of a new platform at the Mount Joy GO Station and new passing track. The surrounding area within 500 m is urbanized with two City of Markham managed Storm Water Management (SWM) Ponds (Mount Joy Lake) located immediately adjacent (east) of the rail line ROW. The Mount Joy Creek is located along the eastern edge of the ROW. Detailed design of the platforms was not available for review; however, it is expected that the new infrastructure footprints will be outside of the creek and SWM ponds boundaries. Surficial soils in the area are generally composed of low permeable clay and silty clay tills based on review of well records and suggest that the creek and SWM ponds are not likely hydraulically connected to the groundwater system.

The new track infrastructure footprint is expected to be less than 1 m in depth and therefore is not expected to cause any adverse groundwater impacts. The infrastructure may include excavations up to 5 to 10 m in depth for pedestrian tunnels and/or elevators. Detailed designs were not available for review for the platform, however, should pedestrian tunnels and/or elevators be included, additional evaluation will be required to assess the need for continued groundwater elevation management to keep tunnels and elevator shafts dry.

The regional physiography in this area is defined as Peel Plain with the surficial geology at ST-3 described as being predominantly comprised of stone-poor, silty to sandy till which are overlain by foreshore-basinal deposits further to the north. ST-5 is not located within a WHPA or IPZ.

Static water elves are reported in the MECP well logs as being near surface (within 3 to 4 m below grade). Surficial soils in the area are generally composed of low permeable clay and silty clay tills based on review of well records. Some locations report more permeable sandy soils overlying the clay. It is likely that water levels represent perched conditions, and the need for dewatering may be limited.

There are four domestic supply wells, two commercial supply wells, four industrial supply wells and one irrigation well within 500 m of ST-3. The domestic wells are reported to extend to depths greater than 30 m (100 ft), and therefore would not be impacted by the excavations associated with the infrastructure footprint. Due to the availability of municipal water, there is not expected to be any impacts to groundwater quantity for local well users should these wells still be in use.

5.18.2.5 Potential Effects & Mitigation Measures: Segment ST-4 – Mile 45.80 to Mile 45.30

This Study Area segment is adjacent to ST-3, with similar proposed infrastructure and existing conditions. Refer to Section 5.18.2.4above for further details.

There are three domestic supply wells and one industrial supply well within 500 m of ST-4 recorded in the MECP database. The domestic wells are reported to extend to depths greater than 30 m (100 ft), with reported static water levels at 1 to 3 m below surface. Due to the availability of municipal water, there is not expected to be any impacts to groundwater quantity for local well users should these wells still be in use.

#### 5.18.3 Land Use/Socio-Economic

A Land Use and Socio-Economic Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-103. Additional details can be found in **Appendix D2**.

5.18.3.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

#### Land Use

This segment of the rail corridor is zoned Transportation and Utilities within the City of Markham. While a majority of the proposed Unionville Storage Yard is located within the existing rail ROW, the access road, parking and fencing components of the storage yard may extend beyond the existing rail ROW, resulting in potential property requirements (see Figure 5-8). It should be noted that the proposed storage track is within the existing rail ROW. As a result of this activity, there is a footprint impact on the adjacent mixed-use area, which is designated for future development.

Based on this understanding, the proposed infrastructure is not expected to conflict with existing policies outlined in the Markham Centre Secondary Site Specific Policy Area.

It is noted that the City of Markham has a nearby development, better known as Downtown Markham Master Plan. It is understood that the proposed urban centre is currently being developed to offer a mix of retail, commercial and residential uses, while being integrated within the Rouge Valley Park. This growing community has been selected as a provincial mobility hub, seeking to seamlessly integrate this urban centre by regional rail which includes the Unionville GO Station.

Currently, there is no known approved site plan for the area directly west of the proposed Unionville Storage Yard (i.e., potential property impact area). It is noted that a Zoning by-law Amendment and Official Plan Amendment applications are underway (i.e., currently in pre-consultation phase) for mid-rise and high-rise residential units off of Enterprise Boulevard. There may be the potential for footprint impacts on the proposed development. However, since development/construction has not begun at this location, there is an opportunity for Metrolinx to work with the developer to minimize impacts as much as possible.



#### FIGURE 5-8 EXCERPT OF APPENDIX D2, SEGMENT ST-2 MAP

Lands within this segment are subject to the Markham Centre Secondary Site Specific Policy Area, which is widely considered the City's Downtown. The policies encourage vibrant urban growth that is characterized by a diversity of residential, retail, office and public uses that are accessible by public transit and support the ingratiation of regional rapid transit. It is noted that the City of Markham is currently preparing an updated secondary plan for the area known as Markham Centre. Based on information available to date, the City of Markham is exploring opportunities to enhance the integration of this civic centre with future developments.

Recognizing that the existing use of the site (i.e., nearby Unionville GO Station) is already established and designated as mixed use, the presence of the storage yard is not anticipated to impact planned land uses for the area. Instead, the proposed infrastructure seeks to facilitate public transit ridership. Additionally, the rail corridor is zoned *Transportation and Utilities* within the City of Markham.

#### Socio-Economic

There are two sensitive facilities within the vicinity of ST-2, as shown in Table 5-53. Bill Crothers Secondary School and Unionville Home Society are located directly adjacent to the rail corridor.

Recognizing their location to the proposed storage yard, there is no anticipated footprint impacts to the sensitive facilities.

#### TABLE 5-53 SENSITIVE FACILITIES WTIHIN THE VICINITY OF THE UNIONVILLE STORAGE YARD

Segment	Туре	Name	Address	Approximate Distance from ROW
ST-2	School	Bill Crothers Secondary School	44 Main Street	0 meters
ST-2	Long Term Care Centre	Unionville Home Society	4300 Highway 7	0 meters

A cycling route traverses under the rail corridor at the Enterprise Boulevard crossing. However, there are no anticipated footprint impacts to this recreational amenity as a result of this activity. It is noted that the City of Markham is proposing an Active Transportation Master Plan to improve walking, cycling and other modes of active transportation for the community. This long-term strategic plan contains policies to promote a more pedestrian-friendly environment that safely connects people through an innovative pedestrian network. Additionally, the City of Markham has an ongoing environmental assessment, know as Markham Centre Trails EA. Currently, the Warden Avenue to Main Street Unionville (Area 3) has undergone detailed design and the trail network is anticipated to begin being constructed in 2020.

Lastly, Rouge Park extends into this segment of the rail corridor. However, portions of Rouge Park are designated under the Downtown Markham Master Plan for future commercial and residential development. As a result, there are no anticipated footprint impacts to park spaces and/or proposed trails due to the proposed Unionville Storage Yard.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter and the GO Rail Network Electrification EPR Addendum.

#### Mitigation Measures

The proposed Unionville Storage Yard may conflict with existing land use and zoning policies.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

#### 5.18.3.2 Potential Effects & Mitigation Measures: Segment ST-1 – Mile 51.00 to Mile 50.60

Refer to Section 5.18.3.1 above, which describes land use and socio-economic impacts and mitigation measures for the Unionville Storage Yard and comprises Segment ST-1.

#### Land Use

The proposed track, platform, and storage yard is anticipated to extend beyond the existing rail ROW along this segment; therefore, there are potential property requirements associated with the construction of this infrastructure. As a result, there is a footprint impact on the adjacent mixed use area and Parkway Belt Plan area land designations (see Figure 5-9).



#### FIGURE 5-9 EXCERPT OF APPENDIX D2 SEGMENT ST-1 MAP

Lands within this segment are also subject to the Markham Centre Secondary Plan area, which is widely considered the City's Downtown, as described in Section 5.18.3.1.

Based on this understanding, the proposed track and platform at Unionville GO Station is not expected to conflict with existing policies outlined in the Markham Centre Secondary Plan.

#### Socio-Economic

There are no sensitive facilities within 100 metres of the proposed track work and platform and therefore, there are no anticipated footprint impacts to sensitive facilities.

Further north, Rouge Park is located directly adjacent to the rail corridor. There is no anticipated footprint impact to the park as a result of the proposed track and platform at Unionville GO Station.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

There are no anticipated adverse effects on recreational amenities resulting from the implementation of track and platform infrastructure identified as part of the conceptual design. Notwithstanding this, potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the City of Markham will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities.

#### Mitigation Measures

The proposed track and platform may conflict with existing land use and zoning policies.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to

incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.18.3.3 Potential Effects & Mitigation Measures: Segment ST-2 - Mile 50.60 to Mile 50.00

Refer to Section 5.18.3.1 above, which describes land use and socio-economic impacts and mitigation measures for the Unionville Storage Yard and comprises Segment ST-2.

5.18.3.4 Potential Effects & Mitigation Measures: Segment ST-3 – Mile 46.30 to Mile 45.80

#### Land Use

Although the track infrastructure is proposed within the rail ROW along this segment, there is a property requirement to accommodate a proposed island platform east of the rail corridor. As a result of this activity, there is a footprint impact on the adjacent low density residential and natural area land uses (see Figure 5-10).



#### FIGURE 5-10 EXCERPT OF APPENDIX D2, SEGMENT ST-3 MAP

This segment of the rail corridor falls within the Berczy Village/Wismer Commons/Greensborough/Swan Lake Site specific policy area. Within this policy area, the rail corridor is designated as Local Corridor – Markham Road Corridor – Mount Joy. This designation promotes mixed use areas that seek to integrate housing and employment through expanded transit services. The proposed track and platform at Mount Joy GO will enable the station to accommodate more passengers, resulting in increased service capacity. As a result, the track and platform will not conflict with existing policies in the Berczy Village/Wismer Commons/Greensborough/Swan Lake Site specific policy area.

Additionally, the City of Markham is currently preparing the Mount Joy Secondary Plan for a mixed-use corridor that integrates a range of housing, employment, shopping and recreation opportunities, at transit supportive densities adjacent to the Mount Joy GO station.

#### Socio-Economic

Three sensitive facilities are located in the vicinity of ST-3, as shown in Table 5-54. Mount Joy Community Centre's property is located directly adjacent to the rail corridor. As the track and platform is proposed on the east side of the rail corridor, there is an anticipated footprint impact to this sensitive facility resulting from potential property requirements. The other facilities listed are not anticipated to be affected.

#### TABLE 5-54 SENSITIVE FACILITIES WITHIN THE VICINITY OF ST-3

Segment	Туре	Name	Address	Approximate Distance from ROW
ST-3	Child Care Centre	Markham Montessori	6007 16th Avenue	65 meters
ST-3	Child Care Centre	Little Readers Academy	9275 Markham Road	0 meters
ST-3	Community Landmark	Mount Joy Community Centre	6140 16th Avenue	0 meters

A cycling route traverses the rail corridor at the 16<sup>th</sup> Avenue rail crossing. However, there are no anticipated footprint impacts to the cycling route as a result of this activity.

The Mount Joy Park and Exhibition Creek natural areas are located directly adjacent to the rail corridor. There is an anticipated footprint impact to these natural areas as a result of the proposed track and platform infrastructure.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

#### Mitigation Measures

The proposed track and platform may conflict with existing land use and zoning policies.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.18.3.5 Potential Effects & Mitigation Measures: Segment ST-4 – Mile 45.80 to Mile 45.30

#### Land Use

Continuing on from Segment ST-4, the track infrastructure is proposed within the rail ROW in this segment. There is a requirement to accommodate a proposed island platform to the east of the rail corridor. As a result, there is a footprint impact on the adjacent low density residential and natural area land uses (see Figure 5-11).

This section of the rail corridor is zoned Transportation and Utilities within the City of Markham. Although the proposed track infrastructure will be located within the rail ROW in this segment, there is a requirement to accommodate a proposed island platform to the east of the rail corridor. As a result, there is a footprint impact on the adjacent low density residential and natural area land uses (see Figure 5-11).

Refer to Segment ST-3 for more detail concerning surrounding land uses and zoning.



#### FIGURE 5-11 EXCERPT OF APPENDIX D2, SEGMENT ST-4 MAP

#### Socio-Economic

One sensitive facility is located within the vicinity of ST-4, as shown in Table 5-55. The Olive Branch Community Church is located directly adjacent to the rail corridor. Recognizing that the proposed track infrastructure is already located within the existing rail ROW, there is no anticipated footprint impact to this sensitive facility.

#### TABLE 5-55 SENSITIVE FACILITY WITHIN THE VICINITY OF ST-4

Segment	Туре	Name	Address	Approximate Distance from ROW
ST-4	Community Landmark	Olive Branch Community Church	6007 16 <sup>th</sup> Avenue	0 meters

The Exhibition Creek natural area is located directly adjacent to the rail corridor. There is an anticipated footprint impact to the park as a result of the proposed infrastructure.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

#### Mitigation Measures

The proposed track and platform may conflict with existing land use and zoning policies.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

#### 5.18.4 Visual/Aesthetics

A Visual Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-104. Additional details can be found in **Appendix E2**.

5.18.4.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

The proposed Unionville Storage Yard is located north of the Unionville GO Station between Enterprise Road and Highway 7 in the City of Markham. Land uses abutting the rail corridor are mainly mixed use, employment and natural area. The Unionville Storage Yard site is a single-track electrified facility (located within the rail ROW), proposed to store trains during the day and at night, reduce congestion on the rail corridor and minimize non-revenue travel by operating in close proximity to major GO stations, including the Unionville GO Station (see Figure 5-12).

Bill Crothers Secondary School is located on the east side of corridor, with a parking lot facing the corridor and the proposed storage yard site. Views of the proposed Unionville Storage Yard site from the second storey of the school building are anticipated to be impacted, as classrooms windows have a clear view of the corridor. Since the school building is at a considerable distance (approximately 100 metres away), views will be *Moderately* impacted.

Currently, the proposed Unionville Storage Yard will be visible from Enterprise Boulevard, as cars approach from both the east and west. Additionally, the proposed access road to the site extends off of Enterprise Boulevard. Considering the storage yard will be built within the existing ROW, the impact to existing visual conditions are considered to be *Moderate*.

It is noted that the City of Markham has a nearby development, better known as Downtown Markham Master Plan. It is understood that the proposed urban centre is currently being developed to offer a mix of retail, commercial and residential uses, while being integrated with the Rouge Valley Park. This growing community has been selected as a provincial mobility hub, seeking to seamlessly integrate this urban centre by regional rail which includes the Unionville GO Station.

Currently, there is no known approved site plan for the area directly west of the proposed Unionville Storage Yard. There may be the potential for visual impacts on the proposed development. However, since development/construction has not begun at this location, there is an opportunity for Metrolinx to work with the developer to minimize visual impacts as much as possible.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), vegetative buffers, and careful placement of structures where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the Unionville Storage Yard are further described in Table 5-104.

### METROLINX



FIGURE 5-12 PROPOSED UNIONVILLE STORAGE YARD - BIRD'S EYE VIEW

#### 5.18.4.2 Potential Effects & Mitigation Measures: Segment ST-1 – Mile 51.00 to Mile 50.60

Refer to Section 5.18.4.1 of this Report for a detailed description of potential effects and mitigation measures for the Unionville Storage Yard.

This segment extends from Enterprise Drive to the south of the Highway 407 Express Toll Road, passing by the Unionville GO Station. A new track and platforms have been proposed along the Unionville GO Station. While majority of the proposed infrastructure is to occur within the existing ROW, a portion of the infrastructure may impact the existing GO Station parking lot. South of the Unionville GO Station, track upgrades are proposed to occur within the existing ROW. The surrounding area is comprised primarily of employment/industrial uses. The proposed track and platform infrastructure suggests are anticipated to impact the views of the Unionville GO Station, thus visual impacts are classified as *Low* and *Moderate*.

With regards to the proposed platform, although the height of sheltering structures on the platform may alter the view, the area is primarily mixed-use with existing transportation facilities. The new platform will alter the views of GO Train passengers; however, the impact is considered *Negligible* because the platform is located near and adjacent to the existing Unionville GO Station.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the proposed platform and track infrastructure are further described in Table 5-104.

5.18.4.3 Potential Effects & Mitigation Measures: Segment ST-2 – Mile 50.60 to Mile 50.00

Refer to Section 5.18.4.1 of this Report for a detailed description of potential effects and mitigation measures for the Unionville Storage Yard.

5.18.4.4 Potential Effects & Mitigation Measures: Segment ST-3 – Mile 46.30 to Mile 45.80

This area includes industrial development, recreational/natural spaces as well as residential development. The proposed side platform and track upgrades are to occur within the existing ROW. The new platform will be located on the east side, next to the Mount Joy Lake Park and recreational fields which is adjacent to a short stretch of single-family homes. The side platform will replicate the existing platform on the opposite side of the ROW. The existing station, parking lot and station platform already determine the character of this segment of the rail corridor and views of potential nearby visual receptors have already been altered. However, as the new platform is close to receptors such as recreational and residential uses, this area is categorized as having a *Moderate* visual impact.

With regards to the proposed platform, although the height of sheltering structures on the platform may alter the view, the area is residential/park space with existing transportation facilities. The new platform will alter the views of GO Train passengers; however, the impact is considered *Negligible* because the platform is located near and adjacent to the existing Mount Joy GO Station.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be

accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the proposed platform and track infrastructure are further described in Table 5-104.

5.18.4.5 Potential Effects & Mitigation Measures: Segment ST-4 – Mile 45.80 to Mile 45.30

Potential visual impacts surrounding Mount GO Joy Station extend within this segment. See Section 5.18.4.4 above for a detailed description of potential effects and mitigation measures.

5.18.5 Cultural Heritage

A Cultural Heritage Report: Impact Assessment was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-105. Additional details can be found in **Appendix F2**.

5.18.5.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

As no BHRs or CHLs were identified at this location, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.18.5.2 Potential Effects & Mitigation Measures: Segment ST-1 – Mile 51.00 to Mile 50.60

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.18.5.3 Potential Effects & Mitigation Measures: Segment ST-2 – Mile 50.60 to Mile 50.00

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.18.5.4 Potential Effects & Mitigation Measures: Segment ST-3 – Mile 46.30 to Mile 45.80

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.18.5.5 Potential Effects & Mitigation Measures: Segment ST-4 – Mile 45.80 to Mile 45.30

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.18.6 Archaeology

A Stage 1 Archaeological Assessment was undertaken for the New Track & Facilities TPAP. A summary of the findings and recommendations for the Stouffville Corridor can be found in the sections below. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-106. Additional details can be found in **Appendix G2**.

5.18.6.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

According to the OASD eight previously registered archaeological sites are located within one kilometre of the Unionville Storage Yard (study area), none of which are located within 50 metres. Site details are presented below in Table 5-56.



### TABLE 5-56 UNIONVILLE STORAGE YARD - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-211	CNR Uxbridge 2	Euro-Canadian	Midden	CRMG 1995
AIGt-235	CNR Uxbridge 3	Euro-Canadian	Homestead	CRMG 1995
AIGt-262	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AIGt-263	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-264	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-265	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-266	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AIGt-267	H1	Euro-Canadian	Homestead,	ASI 2000

Background research of nine previous reports confirmed that there is no archaeological potential within the vicinity of the Unionville Storage Yard. Therefore, the Stage 1 Archaeological Assessment confirmed that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential (see Figure 5-13). No further archaeological assessment is required.



FIGURE 5-13 AREA DISTURBED ALONG STOUFFVILLE CORRIDOR, NO POTENTIAL FOR ARCHAEOLOGICAL IMPACTS

5.18.6.2 Potential Effects & Mitigation Measures: Segment ST-1 - Mile 51.00 to Mile 50.60

Refer to Section 5.18.6.1 above, which describes archaeological impacts for the Unionville Storage Yard and comprises Segment ST-1.

According to the OASD eight previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-57.
## TABLE 5-57 SEGMENT ST-1 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-211	CNR Uxbridge 2	Euro-Canadian	Midden	CRMG 1995
AlGt-235	CNR Uxbridge 3	Euro-Canadian	Homestead	CRMG 1995
AlGt-262	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-263	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-264	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-265	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-266	N/A	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-267	H1	Euro-Canadian	Homestead,	ASI 2000

Background research of six previous reports confirmed that there is no archaeological potential within the vicinity of the Unionville GO Station and/or Unionville Storage Yard (associated features). Therefore, the Stage 1 Archaeological Assessment confirmed that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required.

5.18.6.3 Potential Effects & Mitigation Measures: Segment ST-2 – Mile 50.60 to Mile 50.00

Refer to Section 5.18.6.1 above, which describes archaeological impacts for the Unionville Storage Yard and comprises Segment ST-2.

5.18.6.4 Potential Effects & Mitigation Measures: Segment ST-3 – Mile 46.30 to Mile 45.80

According to the OASD thirteen previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-58.

TABLE 5-58 SEGMENT ST-3 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-163	Strickler	Euro-Canadian	Homestead	HH 1987
			Farmstead	
			Privy	
AIGt-209	James Hawkins	Euro-Canadian	Homestead	MTO 1992
AlGt-210	Swan Lake	Archaic, Early	Findspot	ASI 1994
AlGt-231	Wismer Commons 7	Pre-Contact Indigenous	Findspot	Robert Pearce 1996
AIGt-232	Wismer Commons 8	Euro-Canadian	Unknown	Robert Pearce 1996
AlGt-254	Clendenen	Euro-Canadian	Homestead	ASI 1999
AIGt-256	n/a	Archaic, Middle	Findspot	ASI 1999
AIGt-257	n/a	Pre-Contact Indigenous	Findspot	ASI 1999
AlGt-258	n/a	Pre-Contact Indigenous	Findspot	ASI 1999



Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AIGt-259	n/a	Pre-Contact Indigenous	Findspot	ASI 2000b
AIGt-538	Markham Pottery Site	Euro-Canadian	Manufacturing	ASI 1880, 2009, 2012, 2013
			Midden	
			Workshop	
AIGt-604	Farley	Euro-Canadian	Homestead	ASI 2012
AIGt-630	Clarry West Site	Euro-Canadian	Farmstead	TLAI 2017

Background research of four previous reports confirmed that there is no archaeological potential within the vicinity of Segment ST-3. Therefore, the Stage 1 Archaeological Assessment confirmed that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required.

5.18.6.5 Potential Effects & Mitigation Measures: Segment ST-4 – Mile 45.80 to Mile 45.30

The Stage 1 Archaeological Assessment confirmed twelve previously registered archaeological sites are located within one kilometre of the study area, one of which is located within 50 metres, according to the OASD. Site details are presented below in Table 5-59.

TABLE 5-59 SEGMENT ST-4 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-163	Strickler	Euro-Canadian	Homestead Farmstead Privy	HH 1987
AIGt-209	James Hawkins	Euro-Canadian	Homestead	MTO 1992
AIGt-210	Swan Lake	Archaic, Early	Findspot	ASI 1994
AlGt-231	Wismer Commons 7	Pre-Contact Indigenous	Findspot	Robert Pearce 1996
AIGt-254	Clendenen	Euro-Canadian	Homestead	ASI 1999
AIGt-256	N/A	Archaic, Middle	Findspot	ASI 1999
AIGt-257	N/A	Pre-Contact Indigenous	Findspot	ASI 1999
AIGt-258	N/A	Pre-Contact Indigenous	Findspot	ASI 1999
AIGt-259	N/A	Pre-Contact Indigenous	Findspot	ASI 2000b
AlGt-538	Markham Pottery Site	Euro-Canadian	Manufacturing Midden Workshop	ASI 1880, 2009, 2012, 2013
AIGt-604	Farley	Euro-Canadian	Homestead	ASI 2012
AIGt-630	Clarry West Site	Euro-Canadian	Farmstead	TLAI 2017

Site AIGt-259 was an isolated findspot identified as a celt blank. Its location is simply at 16<sup>th</sup> Avenue and 9<sup>h</sup> Line. Background research confirmed four previous reports within 50 metres of the Segment ST-4 study area.

🖣 Gannett Fleming

The Stage 1 Archaeological Assessment confirmed that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required, and therefore, no mitigation/compensation measures are recommended.

#### 5.18.7 Stormwater Management

A Stormwater Management Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments for the Unionville Storage Yard Facility are outlined in Table 5-103. Additional details can be found in **Appendix H**.

5.18.7.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

#### Hydrologic Analysis

#### **Drainage Areas**

For the existing condition, based on the split land use of industrial and open space (including the existing berm), the runoff coefficient, 'C' is estimated at 0.35. Runoff coefficients for industrial and open space were taken from the City of Markham, Engineering Department, Design Criteria Document, Section E (June 2016). See Table 5-60 for characteristics of the existing drainage areas.

Runoff from the proposed site along the railway tracks will be collected in a proposed ditch/swale that will run parallel to the west. Ditch drainage will discharge into a proposed ditch inlet and connect into the existing storm sewer system on Enterprise Boulevard. Further investigations are required to determine the existing storm sewer system capacity and detail the proposed storm sewer connections. It should be noted that the existing and proposed catchment areas are preliminary and need to be reconfirmed during detailed design.

As a result of the proposed site footprint, regrading of the existing berm may be required for the proposed ditch/swale. Further investigations are required to determine the existing berm soil composition and propose solutions to prevent flows entering the site from the west.

The proposed Unionville Storage Yard site development will include a track storage yard, access road and limited parking enclosed by a chain link fence. The site will have a mix of industrial impervious surfaces, track and ballast areas and open space. The industrial impervious, track and ballast and open space areas are 0.8, 0.4 and 0.8 ha respectively. The proposed Storage Yard improvements are shown in **Appendix H**. The drainage areas and runoff coefficients for the different area types are shown in Table 5-60. The composite runoff coefficient for the entire site area of 2.0 ha, after development, will be approximately 0.58. Runoff coefficients for industrial and open space were taken from the City of Markham, Engineering Department, Design Criteria Document, Section E (June 2016). Runoff coefficients for track and ballast areas were taken from the Colorado DOT report titled, "Modeling Ballasted Tracks for Runoff Coefficient C" (August 2012). See Table 5-60 for characteristics of the proposed drainage areas. Runoff coefficient for open space will be verified after soil type is determined during detailed design investigation.

The proposed development areas and their locations are based on conceptual design and may be refined as the design progresses. Therefore, reassessment of the drainage areas will be required at subsequent design stages, as necessary.

The existing and the proposed drainage areas and runoff coefficients are summarized below in Table 5-60.

Existing Condition - Catchment 1			Proposed Condition - Catchment 1		
Area Type	Drainage Area (ha)	Runoff Coefficient	Area Type	Drainage Area (ha)	Runoff Coefficient
Industrial Impervious	0.27	0.90	Industrial Impervious	0.50	0.90
Track and Ballast	-	-	Track and Ballast	0.43	0.84
Open Space	1.48	0.25	Open Space	0.83	0.25
Total/Composite	1.75	0.35		1.75	0.58

#### TABLE 5-60 UNIONVILLE STORAGE YARD - EXISTING AND PROPOSED DRAINAGE AREAS

#### Flow Analysis

A preliminary analysis of runoff from the site area was completed to assess the requirement of proposed measures and to mitigate the impact of the development on stormwater drainage. The Rational Formula was used to determine flows for the existing and the proposed development conditions. One catchment area was used in this analysis.

As discussed, the new development will increase the impervious area and, therefore, the stormwater runoff. Flows were computed for the 2-year to 100-year storm events using the City of Markham IDF data set (June 2016). The runoff for the 25mm storm was computed using equation 4.8 and 4.9 presented in the Stormwater Management Planning and Design manual by MOE (March 2003) to assess the requirements for the runoff quality control. An estimated time of concentration (Tc) of 10 minutes was used in the flow computations.

Parameters used for the computations were determined from the City of Markham IDF data set (June 2016). Under Section E of the City of Markham's Engineering Design Criteria, a Return Period Factor is applied to flow calculations for each storm events. Results are summarized below in Table 5-61. A factor of 25% is applied to the post-development flows as per the Metrolinx Climate Change Initiative.

	Exist Flow Post Day Flow Flow Increase		Elow Inorocoo	Metrolinx Clim	ate Change Initiat	ive (+25%)
Storm Event	EXIST. FIOW	Post Dev. Flow	Flow increase	Post Dev. Flow	Flow Increase	% Incroses
	m³/s	m³/s	m³/s	m³/s	m³/s	/o increase
25mm	0.102	0.151	0.049	0.189	0.087	85.3
2yr	0.137	0.228	0.091	0.285	0.148	108.0
5yr	0.190	0.316	0.126	0.395	0.205	107.9
10yr	0.230	0.384	0.154	0.480	0.250	108.7
25yr	0.302	0.505	0.203	0.631	0.329	108.9
50yr	0.362	0.604	0.242	0.755	0.393	108.6
100yr	0.425	0.710	0.285	0.888	0.463	108.9

#### TABLE 5-61 UNIONVILLE STORAGE YARD - EXISTING AND PROPOSED DEVELOPMENT FLOWS

#### Development Impact on Drainage & Proposed Measures

The proposed Unionville Storage Yard development will increase the industrial use of the site resulting in increased discharges. From Table 5-61, the theoretical increase in flows resulting from the Unionville Storage Yard development is significant when considering the climate change initiatives, therefore,

measures for the quantity, quality or water balance will be required to verify these post-development conditions during detailed design.

Catchment 1 runoff from the storage yard facility infrastructure (including parking lot and access road) will be collected by the two ditches/swales, one existing parallel to Enterprise Boulevard and one proposed along the west of the access road. Those ditches/swales can be converted to bio-swales in order to mitigate the increased runoff impact, provide quality control, and promote onsite infiltration for water balance/erosion control. Note onsite infiltration is dependent on the confirmation of infiltration rate and soil type during detailed design. The bio-swales are to be used within a treatment train for quality and quantity control. These bio-swales will eventually discharge to the existing sewer system along Enterprise Boulevard.

A separate drainage system is required for the track runoff. In accordance with Metrolinx standards, storm sewer system for all new facilities shall include provisions for spill capture and containment. Automated oil shutoff valves and oil/water separators from all drainage lines from all drip trays will be installed prior to drainage entering the existing storm system, for all new facilities. Drip trays and track drainage layouts will be confirmed and evaluated during detailed design.

Excavations for the Unionville Storage Yard are expected to be shallow for construction. The Rouge River and an associated wetland is located adjacent to the proposed Storage Yard. Suitable sedimentation controls should be in place to help control and reduce the turbidity of run-off water which may flow towards the River. The detailed design should aim to replicate existing drainage pattern and minimize grading impacts.

Further analysis is needed at the detailed design stage to develop a treatment train, review downstream municipal infrastructure capacity and develop detailed solutions.

A potential impact of the proposed development on existing drainage features is at the north limit of the proposed storage yard, where the proposed access road is partially encroaching on the existing south bank of the Rouge River. A Geotechnical Study is required to address the overall setback distance (Erosion Hazard Limit) as described in "TRCA Geotechnical Engineering Design and Submission Requirements", with three components:



FIGURE 5-14 UNIONVILLE STORAGE YARD - TRCA REGULATION MAPPING<sup>4</sup>

<sup>4</sup> This mapping has been developed through publicly available information for the purposes of this Report.

- Toe Erosion Allowance;
- Geotechnical Stable Slope Allowance; and
- Erosion Access Allowance.

Safe access will be reviewed following this investigation and to be confirmed by Project Co. during detailed design.

A detailed analysis for the quantity, quality, erosion control and water balance will be required at detailed design stage. The analysis shall include details for a treatment train approach which prioritizes minimizing footprint impacts while satisfying quantity and quality criteria.

#### **Recommendations**

From the hydrological analysis and the subsequent discussion presented in this section of the report, it is concluded that the construction of the Unionville Storage Yard will result in an increase to the runoff rate and quantity compared to existing conditions. A treatment train system consisting of oil-grit separators, swales, and low impact development features providing quality control. Extensive analysis during detailed design stage will need to be completed to determine the capacity of the existing municipal infrastructure.

Erosion control and water balance targets will be achieved by infiltrating 5 mm of runoff.

The flow contribution to existing swales and storm sewers and their capacities are not known at this stage. A firm design will be presented at the detailed design stage, utilizing information from topographic survey and the municipal data to determine the capacity of the existing structures and the site runoff outfalls.

#### 5.18.8 Traffic

A Traffic Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Additional details can be found in **Appendix I**.

5.18.8.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

Refer to EPR Chapter 6 for a summary of potential effects and mitigation.

#### 5.18.9 Utilities

A Utilities Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-110. Additional details can be found in **Appendix J**.

5.18.9.1 Potential Effects & Mitigation Measures: Unionville Storage Yard Facility

At this time, the assets identified in the Unionville Storage Yard site development area are not anticipated to be impacted, however reservicing of the site will be required.

5.18.9.2 Potential Effects & Mitigation Measures: Segment ST-1 – Mile 51.00 to Mile 50.60

There are no anticipated utility impacts in Segment ST-1 due to no utilities being identified in the location of new track or platform.

Refer to Section 5.18.8.1 above, which describes utilities impacts and mitigation measures for the Unionville Storage Yard and comprises Segment ST-1.

5.18.9.3 Potential Effects & Mitigation Measures: Segment ST-2 – Mile 50.60 to Mile 50.00

Refer to Section 5.18.8.1 above, which describes utilities impacts and mitigation measures for the Unionville Storage Yard and comprises Segment ST-2.



#### 5.18.9.4 Potential Effects & Mitigation Measures: Segment ST-3 – Mile 46.30 to Mile 45.80

The following potential conflicts have been identified in Table 5-62. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-62 SEGMENT	ST-3 – POTENTIALLY	IMPACTED UTILITIES	DUF TO TRACK	

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Unknown	UG - Crossing	Culvert	700mm	Concrete	North of 16th Ave
Unknown	UG - Crossing	Culvert	1100mm	Concrete	North of 16th Ave
Bell Mobility	Hardware	Signal Broadcast Tower	Unknown	Metallic	North of 16th Ave
City of Markham	UG - Crossing	Storm	1800mm	Concrete	North of 16th Ave
Unknown	UG - Crossing	Culvert	450mm	Steel	Markham Rd
Unknown	UG - Crossing	Culvert	900mm	CSP	Mt Joy GO Station

5.18.9.5 Potential Effects & Mitigation Measures: Segment ST-3 – Mile 45.80 to Mile 45.30

The following potential conflicts have been identified in Table 5-63. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-63 SEGMENT ST-3 – POTENTIALLY IMPACTED UTILITIES DUE TO TRACK UPGRADES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Unknown	UG - Crossing	Culvert	900mm	CSP	Mt Joy GO Station
City of Markham	UG - Crossing	Culvert	2.4 x 1.2 m 1.8 x 1.2 m 2.4 x 1.5 m	Concrete	Bur Oak Ave
Bell	UG - Crossing	Communication Duct Bank	7 ducts	Concrete	Bur Oak Ave
City of Markham	UG - Crossing	Water	900mm	Ductile Iron in Steel Casing	Bur Oak Ave
Alectra (Powerstream)	UG - Crossing	Electrical Conduit	27.6k∨	Unknown	Bur Oak Ave
Rogers	UG - Crossing	Communication Conduit	610mm	Steel Casing	Bur Oak Ave
Unknown	UG - Crossing	Culvert	900mm	Metallic	Bur Oak Ave
Unknown	UG - Crossing	Culvert	900mm	Metallic	North of Bur Oak Ave
Unknown	UG - Crossing	Culvert	600mm	Steel	North of Bur Oak Ave

5.18.10 Phase I ESA

A Phase I Environment Site Assessment (ESA) was completed for the proposed Unionville Storage Facility site. The purpose of the Phase I ESA was to identify potential or actual environmental contamination as a result of current or past activities. The Phase I ESA was generally completed based on the requirements of the Canadian Standards Association (CSA) Phase I ESA document, Z768-01 (R2016), November 2001, reaffirmed in 2016 (CSA Standard).

5.18.10.1 Potential Effects & Mitigation Measures: Unionville Storage Facility

The proposed Unionville Storage Yard site is located approximately 600 m west of Kennedy Road, running approximately north-south from Highway 7 towards the Canadian National Railway (CNR) – York Division in Markham, Ontario.

A 100m study area was applied from the boundary of the storage yard site for the purposes of determining whether PCAs or APEC could lead to significant environmental contaminant impacts at the storage yard. The following Table presents a general description of PCAs identified through the Phase I ESA and presents recommendations from this study.

TABLE 5-64 GENERAL PCAS AND RECOMMENDATIONS FOR PROPOSED THE UNIONVILLE STORAGE YARD FACILITY

Site	General PCA Descriptions within the 100m Study Area	Media Potentially Impacted	Recommendations
Unionville Storage Yard	<ul> <li>Presence of rail yards, tracks and spurs</li> <li>On-going constructions for additional rail tracks and track-side platform</li> <li>Registerable waste generation and historical spills</li> <li>Possible application of pesticide associated with previous golf course</li> <li>Potential presence of de-icing material</li> <li>Registerable waste generation associated with Unionville GO Station and on-going construction</li> </ul>	Soil and groundwater	<ul> <li>It is recommended that, prior to the transfer of temporary easement sites to Metrolinx, Metrolinx complete a baseline condition sampling for soil and groundwater (pre- construction assessment) to the extent of the construction boundaries and depth at the Unionville Storage Yard to determine the quality of soils for reuse and categorize the excess soils for proper off-site disposal, if applicable.</li> </ul>

#### **Conclusions**

Based on information gathered to date and observations made, the Phase I ESA has revealed that the likelihood of current significant adverse environmental contaminant impact to the proposed Unionville Storage Yard site appears low. Therefore, there are no recommendations made for a Phase II ESA at the proposed Unionville Storage Yard site at this time.

Refer to Table 5-112 for a summary of mitigation and monitoring measures related to excavated materials, contaminated soil, groundwater management.

### 5.19 Footprint Impacts - Lakeshore East Corridor

#### 5.19.1 Natural Environment

A Natural Environment Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-101. Additional details can be found in **Appendix B2**.

#### 5.19.1.1 Potential Effects & Mitigation Measures: Segment LSE-1 – Mile 323.90 to Mile 323.40

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed.

#### 5.19.1.2 Potential Effects & Mitigation Measures: Thickson Road Bridge Expansion

This Project study area segment containing the Thickson Road Railway Bridge Expansion occurs within the urbanized setting of the Town of Whitby. Surrounding land use consists primarily of commercial and industrial uses. Positioned in the Corbett Creek watershed, the west branch of Corbett Creek crosses under the rail corridor near the western terminus of the proposed works.

Proposed works include the addition of a new track and the widening of the Thickson Road Railway Bridge. Small portions of land adjacent to the existing rail corridor have been identified for acquisition to accommodate these proposed works, including the footprint of a retaining wall. The potential impacts related to the construction of the retaining wall are addressed in Chapter 7 of the NTF EPR.

#### **Terrestrial Environment**

The lands identified for property acquisition and construction and addition of a new track on an existing elevated platform and the widening of the Thickson Road Railway Bridge along the north side of the rail corridor are comprised of MAM and CUM vegetation and sporadically occurring trees.

As a result of the elevated bridge works, approximately 0.07 ha of CUM and 0.32 ha of MAM will be temporarily displaced to accommodate the retaining wall. Restoration of the MAM community in accordance with Metrolinx's Vegetation Management Guidelines. Potential long-term footprint impacts to the existing vegetation or terrestrial habitat opportunities are not anticipated due to the resilience of cattail dominated MAM communities. Any localized tree removal or permanent removal of CUM vegetation is considered minor in extent and significance from an ecological perspective.

Mitigation includes:

- Ensuring a wildlife awareness and management program is employed during construction to identify and avoid harmful encounters to SAR turtles or their eggs; and
- General mitigation measures outlined in Table 5-101.

While the CUM community may provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the proposed widening of the Thickson Road Railway Bridge is not anticipated to interfere with existing wildlife habitat opportunities with the application of recommended mitigation.

SWH habitat within the subject Project study area segments is extremely limited. In addition to potential bat roost habitat in the few sporadic trees occurring adjacent to the proposed bridge expansion works, candidate SWH may include an amphibian movement corridor along Corbett Creek between wetland habitats north of the Project study area and natural features to the south associated with the Corbet Creek Coastal Wetland Complex. As no culvert modifications or encroachments into the Corbett Creek



corridor are included in the proposed works, no direct or long-term impacts are anticipated to the potential amphibian movement corridor function of Corbett Creek.

Mitigation includes:

- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

#### Aquatic Environment

The west branch of the Corbett Creek sub-watershed flows north to south under the rail corridor within these segments of the Project study area. As no culvert modifications are included in the proposed works, no direct or long-term impacts are anticipated to the Corbett Creek aquatic environment.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within this segment of the Project study area. SAR generalists with habitats that may occur anywhere, including three species of bats, Butternut, and Monarch Butterfly may occur within the subject segment although likelihood habitat opportunities being present for the of these SAR species is very low.

SAR bats (Tri-colored Bat, Little Brown Myotis and Northern Myotis) may use the sporadically occurring trees (typically greater than 10 cm DBH) along the rail corridor as a bat day roost or possibly bat maternity roost. Butternut may occur within open edges, hedgerows and fence lines due to dispersal by wildlife, such as squirrels. Monarch Butterfly can often be found wherever the host plant (Milkweed) occurs.

Barn Swallow may nest on the under surface of the existing Thickson Road bridge although no nesting evidence or presence of this species in the vicinity of the bridge was observed in 2019. In addition, SAR generalists with habitats that may occur anywhere, including three species of bats, Butternut, and Monarch Butterfly may occur within the subject segments although habitat opportunities for these species is very limited due to the relatively small area of culturally influenced vegetation within CVC lands.

Mitigation includes:

- Screening for Butternut trees in advance of clearing and addressing any required removals through the provincial registration process;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

With the application of recommended mitigation, the proposed bridge expansion is not anticipated to result in adverse effects on SAR or their habitat.

#### **Designated Areas**

No provincially designated features are present within this segment of the Project study area. The west branch of Corbett Creek is municipally designated as part of the Town of Whitby's Natural Heritage System. As no culvert modifications or encroachments into the Corbett Creek corridor are included in the proposed works, no direct or long-term impacts are anticipated to the Town's Natural Heritage System.



5.19.1.3 Potential Effects & Mitigation Measures: Segment LSE-2 – Mile 10.10 to Mile 10.70 & Retaining Wall

The existing rail corridor through these segments is subject to a 7 m wide vegetation removal zone within CVI lands as approved previously through the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). The new track will be constructed alongside the existing tracks within the Metrolinx rail corridor. To minimize the Project footprint, a retaining wall will be constructed along the north boundary of the existing railbed though a portion of this Project segment. Since sections of the new track will be constructed on the new Thickson Road bridge expansion there are no ecological impacts anticipated and therefore no mitigation measures are proposed. The potential impacts related to the construction of the retaining wall are addressed in Chapter 7 of the NTF EPR.

5.19.1.4 Potential Effects & Mitigation Measures: Segment LSE-3 – Mile 10.70 to Mile 11.20 & Retaining Wall

The existing rail corridor through this segment is subject to a 7 m wide vegetation removal zone within CVI lands as approved previously through the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). The new track will be constructed alongside the existing tracks within the Metrolinx rail corridor. To minimize the project footprint, a retaining wall will be constructed along the north boundary of the existing railbed though a portion of this Project Segment. Since sections of the new track will be constructed on the new Thickson Road bridge expansion there are no ecological impacts anticipated and therefore no mitigation measures are proposed. The potential impacts related to the construction of the retaining wall are addressed in Chapter 7 of the EPR.

5.19.1.5 Potential Effects & Mitigation Measures: Segment LSE-4 – Mile 11.20 to Mile 11.70 & Retaining Wall

The Project study area segment occurs within the urbanized setting of the Town of Whitby. In addition to the Oshawa GO station, surrounding land use consists primarily of commercial and industrial uses. Positioned in the Corbett Creek watershed, the east branch of Corbett Creek crosses under the rail corridor near the western terminus of the proposed works.

Proposed works include the addition of a new track and a new platform at the Oshawa GO station. A retaining wall is also proposed to reduce the footprint of the additional track and platform. Small portions of land along the north side of the existing rail corridor have been identified for acquisition to accommodate theses proposed works.

#### **Terrestrial Environment**

The existing rail corridor through these segments is subject to a 7 m wide vegetation removal zone within CVI lands as approved previously through the GO Rail Network Electrification TPAP (Gannett Fleming and Morrison Hershfield, 2017). As part of these approved works, clearance zones will entail vegetation removals/clearing mainly within the existing Metrolinx owned rail corridor.

The lands identified for property acquisition and construction new track and a new island platform consist of CUM vegetation and sporadically occurring shrubs along the rail corridor embankment. The removal of approximately 0.28 ha of CUM vegetation is considered minor in extent and significance from an ecological perspective due the common occurrence of these habitat units within urban areas and the extent of similar vegetation communities occurring in the Corbett Creek corridor.

Mitigation for any required vegetation removals will include the general mitigation measures for vegetation removal outlined in Table 5-97 and adherence to Metrolinx's Vegetation Management Guidelines.

While the CUM community may provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the proposed edge encroachment is not anticipated to interfere with



existing wildlife habitat opportunities provided by the remaining portions of this vegetation community in the Corbett Creek corridor.

SWH habitat within the subject Project study area segments is extremely limited. Candidate SWH may include an amphibian movement corridor along Corbett Creek between wetland habitats north of the Project study area and natural features to the south associated with the Corbet Creek Coastal Wetland Complex. As no culvert modifications or encroachments into the Corbett Creek corridor are included in the proposed works, no direct or long-term impacts are anticipated to the potential amphibian movement corridor function of Corbett Creek.

Mitigation includes, but is not limited to:

- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

#### Aquatic Environment

The east branch of the Corbett Creek sub-watershed flows north to south under the rail corridor within these segments of the Project study area. As no culvert modifications are included in the proposed works, no direct or long-term impacts are anticipated to the Corbett Creek aquatic environment.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within the subject segments of the Project study area. SAR "generalists" with habitats that may occur anywhere, including Butternut, Nine-spotted Lady Beetle and Monarch Butterfly may occur within the subject segments.

Butternut may occur within open edges, hedgerows and fence lines due to dispersal by wildlife, such as squirrels. Monarch Butterfly can often be found wherever the host plant (milkweed) occurs.

#### Mitigation includes:

- Screening for Butternut trees in advance of clearing and addressing any required removals through the provincial registration process;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

With the application of recommended mitigation, the proposed works are not anticipated to result in adverse effects on SAR or their habitat.

#### Designated Areas

No provincially designated features are present within these segments of the Project study area. The east branch of Corbett Creek is municipally designated as part of the Town of Whitby's Natural Heritage System. As no culvert modifications or encroachments into the Corbett Creek corridor are included in the proposed works, no direct or long-term impacts are anticipated to the Town's Natural Heritage System.

#### 5.19.2 Hydrogeological

A Hydrogeology Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-102. Additional details can be found in **Appendix C2**.

5.19.2.1 Potential Effects & Mitigation Measures: Segment LSE-1 – Mile 323.90 to Mile 323.40

There are no anticipated footprint impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.19.2.2 Potential Effects & Mitigation Measures: Thickson Road Bridge Expansion

The infrastructure for this Study Area segment consists of the Thickson Road Bridge expansion. The surrounding area within 500 m is industrial/commercial. The Tributary of Corbett Creek is located north and south of the ROW with the tributary crossing beneath the tracks. However, railway infrastructure already exists and crosses this tributary and therefore the additional footprint infrastructure is not expected to impact the tributary.

The regional physiography in this area is defined as Iroquois Plain with the surficial geology at LSE-1 described as having soils that are stone-poor, silty to sandy tills of low permeability and fine-grained soils overlying the till which are massive and well laminated (Gannett Fleming, 2019). LSE-1 is not located within a WHPA or IPZ.

There are two domestic supply wells (Well ID 4603067 and 4603073) located about 300 m south (downgradient) and 500 m north (upgradient), respectively, of LSE-9. The well record for 4603067 indicates a 6 m deep (20 ft) dug well completed in 1954 extending through primarily sand soils. A second well record (Well ID 4603068) reports extension of the well in 1957 to a depth of 32 m (106 ft) through clay. Well record 4603073 indicates a 7.3 m deep dug well completed in 1961 into clayey soils. The area is now fully developed with industrial uses that have municipal water servicing, and therefore it is expected that the well is no longer in use for water supply, however no decommissioning records were found. As the area is supplied with municipal water, and no permanent dewatering required for the infrastructure footprint, no adverse impacts are anticipated.

The infrastructure may include deeper excavations for bridge footings but is not expected to cause any adverse groundwater impacts as no dewatering will be required due to the infrastructure footprint.

Based on the above information, there is no anticipated adverse impacts due to the footprint of the infrastructure to the supply wells, groundwater or the Tributary of Corbett Creek. Therefore, no mitigation measures are recommended. It should be noted that footprint impacts related to bridge expansion will be further reviewed during the detailed design phase.

5.19.2.3 Potential Effects & Mitigation Measures: Segment LSE-2 – Mile 10.10 to Mile 10.70 & Retaining Wall

This Study Area Segment is adjacent to LSE-2, with similar proposed infrastructure and existing conditions. Refer to Section 5.19.2.2.

5.19.2.4 Potential Effects & Mitigation Measures: Segment LSE-3 – Mile 10.70 to Mile 11.20 & Retaining Wall

This Study Area Segment is adjacent to LSE-3, with similar proposed infrastructure and existing conditions. Refer to Section 5.19.2.2.

Corbett Creek Eastern Branch crosses beneath the existing rail ROW just at the east end of the Study Segment. As railway infrastructure already exists and crosses this tributary, the additional footprint infrastructure is not expected to result in additional footprint impacts.

## 5.19.2.5 Potential Effects & Mitigation Measures: Segment LSE-4 – Mile 11.20 to Mile 11.70 & Retaining Wall

The infrastructure for this Study Area Segment consists of the new platform at the Oshawa GO Station, retaining wall and new track. The surrounding area within 500 m is industrial/commercial. The East branch of Corbett Creek is located along the western boundary of the study segment, crossing beneath the tracks. However, railway infrastructure already exists and crosses this creek and therefore the additional footprint infrastructure is not expected to impact the tributary.

The infrastructure may include excavations up to 5 to 10 m in depth with the excavation of pedestrian tunnels or elevator shafts. Detailed designs were not available for review at the time of this report for the platform, however, should pedestrian tunnels and/or elevators be included, additional evaluation will be required to assess the need for continued groundwater elevation management to keep tunnels and elevator shafts dry.

The regional physiography in this area is defined as Iroquois Plain with the surficial geology at LSE-4 described as being massive-well laminated fine textured glaciolacustrine deposits containing silt and clay with minor sand and gravel. LSE-4 is not located within a WHPA or IPZ, but is located within an HVA.

There are no records listed in the MECP database indicating the presence of water supply wells located within 500m of ST-4.

#### 5.19.3 Land Use/Socio-Economic

A Land Use and Socio-Economic Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-103. Additional details can be found in **Appendix D2**.

5.19.3.1 Potential Effects & Mitigation Measures: Segment LSE-1 – Mile 323.90 to Mile 323.40

#### Land Use

Under the City of Toronto Zoning By-law 569-2013, the rail corridor is zoned for *Utility and Transportation.* The track infrastructure is proposed within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work and therefore, there will be no footprint impacts.

McCowan District Park is located in close proximity to the rail corridor, however there are no expected footprint impacts as a result of this activity.

#### Mitigation Measures

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.19.3.2 Potential Effects & Mitigation Measures: Thickson Road Bridge Expansion

#### Land Use

The proposed expansion of the Thickson Road Bridge is required to accommodate a new third track. As a result, there is a footprint impact on the adjacent natural area, employment/industrial and commercial land uses (see Figure 5-15).

Under the Town of Whitby Zoning By-law 1784, the rail corridor has no zoning designation, and the potentially effected lands are zoned *Prestige Industrial (M1A)*, which permit industrial uses such as

warehouses for the storage of goods and retail outlets, *Special Purpose Commercial – Retail Warehouse* (C2-S-RW-5), which permit a variety of retail, restaurants and financial institutions, and *Greenbelt* (G), which permit conservation efforts and farming.

As a result, the proposed retaining wall and bridge expansion are not expected to conflict with zoning policies given the land uses that already exist close to the site.

Additionally, Metrolinx as a Crown Agency is not subject to municipal zoning by-laws, as outlined under Section 4 (c) of the Town of Whitby Zoning By-law 1784:

"This By-law shall not be effective to reduce or mitigate any restrictions lawfully imposed by a governmental authority having jurisdiction to make such restrictions."

#### Socio-Economic

There are no sensitive facilities within 100 metres of the proposed track work and bridge expansion and therefore, there are no anticipated footprint impacts to sensitive facilities.

The Town of Whitby has a planned cycling route which is to pass under the rail corridor at the Thickson Road crossing. This cycling route is to extend along the south side of Victoria Street to Oshawa GO Station according to Durham's Transportation Master Plan. There are no anticipated footprint impacts to recreational amenities as a result of this activity.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

There are no anticipated adverse effects on recreational amenities resulting from the implementation of the proposed bridge expansion infrastructure identified as part of the conceptual design. Notwithstanding this, potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the Town of Whitby will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities.

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FIGURE 5-15 EXCERPT OF APPENDIX D2, SEGMENT LSE-2 MAP

#### Mitigation Measures

The proposed new third track, retaining wall and bridge expansion may conflict with existing land use and zoning policies.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.19.3.3 Potential Effects & Mitigation Measures: Segment LSE-2 – Mile 10.10 to Mile 10.70 & Retaining Wall

Refer to Section 5.19.3.2 of this Report for a detailed description of potential effects and mitigation measures for the Thickson Road Bridge Expansion.

#### Land Use

The proposed track infrastructure will be located within the rail ROW, there is a potential property acquisition to the north of the rail corridor to accommodate the proposed retaining wall. As a result of this activity, there is a footprint impact on the adjacent natural area land uses.

Under the Town of Whitby Zoning By-law 1784, the rail corridor has no zoning designation, and the potentially effected lands are zoned *Greenbelt (G)*, which permit conservation efforts and farming.

As a result, the proposed retaining wall are not expected to greatly conflict with zoning policies given the land uses that already exist close to the site.



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Additionally, Metrolinx as a Crown Agency is not subject to municipal zoning by-laws, as outlined under Section 4 (c) of the Town of Whitby Zoning By-law 1784:

"This By-law shall not be effective to reduce or mitigate any restrictions lawfully imposed by a governmental authority having jurisdiction to make such restrictions."

#### Socio-Economic

There are no sensitive facilities within 100 metres of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

The Town of Whitby has a planned cycling route which is to pass under the rail corridor at the Thickson Road crossing. This cycling route is to extend along the south side of Victoria Street to Oshawa GO Station according to Durham's Transportation Master Plan. There are no anticipated footprint impacts to recreational amenities as a result of this activity.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

There are no anticipated adverse effects on recreational amenities resulting from the implementation of the bridge expansion infrastructure identified as part of the conceptual design. Notwithstanding this, potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the Town of Whitby will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities.

#### Mitigation Measures

The proposed track and retaining wall are located in an area that may conflict with existing land use and zoning.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.19.3.4 Potential Effects & Mitigation Measures: Segment LSE-3 – Mile 10.70 to Mile 11.20 & Retaining Wall

Refer to Section 5.19.3.2 of this Report for a detailed description of potential effects and mitigation measures for the Thickson Road Bridge Expansion.

#### Land Use

The proposed track infrastructure will be located within the rail ROW, there is a potential property acquisition to the north of the rail corridor to accommodate the proposed retaining wall. As a result of this activity, there is a footprint impacts on the adjacent commercial land uses.

Under the Town of Whitby Zoning By-law 1784, the rail corridor has no zoning designation, and the potentially effected lands are zoned *Special Purpose Commercial – Retail Warehouse (C2-S-RW-5)*, which permit a variety of retail, restaurants and financial institutions.

As a result, the proposed retaining wall are not expected to greatly conflict with zoning policies given the land uses that already exist close to the site.



Additionally, Metrolinx as a Crown Agency is not subject to municipal zoning by-laws, as outlined under Section 4 (c) of the Town of Whitby Zoning By-law 1784:

"This By-law shall not be effective to reduce or mitigate any restrictions lawfully imposed by a governmental authority having jurisdiction to make such restrictions."

#### Socio-Economic

There are no sensitive facilities within 100 metres of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

#### Mitigation Measures

The proposed track and retaining wall are located in an area that may conflict with existing land use and zoning.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.19.3.5 Potential Effects & Mitigation Measures: Segment LSE-4 – Mile 11.20 to Mile 11.70 & Retaining Wall

#### Land Use

Segment LSE-4 extends into the City of Oshawa, where the Lakeshore West Corridor terminates at Oshawa GO Station/Oshawa Via Rail Train Station. The proposed track, platform, and retaining wall are anticipated to extend beyond the existing rail ROW in this segment; therefore, a property acquisition may be required to accommodate this infrastructure. As a result of this activity, there is a footprint impact on the adjacent employment/industrial land uses. However, most the footprint impacts fall within Metrolinx owned property surrounding Oshawa GO Station.

Under the Town of Whitby Zoning By-law 1784 and the City of Oshawa Zoning By-law 60-94, the rail corridor does not have any zoning designation. The potentially affected lands are zoned *Select Industrial (SI-C/EU)*, which permits a variety of uses such as an assembly hall, a sales outlet, an electrical supply building, outdoor storage, and an automobile body shop (see Figure 5-16).

Based on this understanding, the proposed infrastructure is not expected to conflict with current zoning given the suitability of existing land uses on site (i.e., Oshawa GO Station).



#### FIGURE 5-16 EXCERPT OF APPENDIX D2, SEGMENT LSE-4 MAP

#### Socio-Economic

There are no sensitive facilities or recreational amenities within 100 meters of the proposed track work and therefore, there will be no footprint impacts.

#### Mitigation Measures

The proposed track, retaining wall and platform is compatible with existing employment/industrial and utilities/transportation uses in and adjacent to the site.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

#### 5.19.4 Visual/Aesthetics

A Visual Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-104. Additional details can be found in **Appendix E2**.

#### 5.19.4.1 Potential Effects & Mitigation Measures: Segment LSE-1 – Mile 323.90 to Mile 323.40

Segment LSE-1 is an urbanized area where track infrastructure already exists as part of the general visual environment. While parts of the corridor are surrounded by employment/industrial uses, resulting in minimal visual impacts, there are also single-family homes and high-rise residential buildings that are less than 20 metres away from the existing rail ROW.

The proposed infrastructure within this segment include a storage and passing track. This may result in trains being parked at this location for an extended period of time, potentially impacting views surrounding the corridor. Due to the close proximity of the residences to the proposed infrastructure, this segment is categorized as having a *Moderate* visual impact.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the proposed track infrastructure are further described in Table 5-104.

5.19.4.2 Potential Effects & Mitigation Measures: Thickson Road Bridge Expansion

Thickson Road Bridge will be expanded to the north to accommodate a third track. Given that the area consists of commercial and industrial lands, with no visual receptors identified, the visual impact of the Thickson Road bridge expansion is categorized as *Negligible*. Passengers travelling along Thickson Road may experience alternating views due to the expansion, however, since the bridge is part of the existing environment, visual impacts have also been deemed *Negligible*.

There are no anticipated impacts of the bridge expansion in this segment; therefore, no mitigation measures have been proposed.

Mitigation measures related to the construction of the Thickson Road Bridge Expansion are further described in Table 5-104.

5.19.4.3 Potential Effects & Mitigation Measures: Segment LSE-2 – Mile 10.10 to Mile 10.70 & Retaining Wall

Refer to Section 5.19.4.2 of this Report for a detailed description of potential effects and mitigation measures for the Thickson Road Bridge Expansion.

Within Segment LSE-2, the corridor passes through a largely commercial area, containing big box retail stores and little to no visual receptors. This area is classified as having a *Negligible* visual impact due to the corridor existing as part of the current view and the proposed track being located within the existing rail ROW.

Additionally, the proposed retaining walls are not anticipated to impact surrounding visual receptors since the views are already disturbed by passing GO trains and screened by industrial buildings. Passengers travelling southbound along Thickson Road may experience a brief visual disturbance due to the proposed retaining walls, however, given that the roadway is at a much lower elevation, a passenger's sightline is not expected to be impacted. Therefore, visual impacts have been categorized as *Negligible*.

There are no anticipated impacts of the proposed tracks and retaining wall in this segment; therefore, no mitigation measures have been proposed.

5.19.4.4 Potential Effects & Mitigation Measures: Segment LSE-3 – Mile 10.70 to Mile 11.20 & Retaining Wall

Refer to Section 5.19.4.2 of this Report for a detailed description of potential effects and mitigation measures for the Thickson Road Bridge Expansion.

Potential visual impacts surrounding the proposed track and retaining wall extend within this segment. See Section 5.19.4.3 above for a detailed description of potential effects and mitigation measures.

5.19.4.5 Potential Effects & Mitigation Measures: Segment LSE-4 – Mile 11.20 to Mile 11.70 & Retaining Wall

Segment LSE-4 comprises the Oshawa GO Station, which contains a bus terminal and a large parking lot north of the rail corridor and a freight rail yard south of the rail corridor. *Negligible* impacts to the existing views are expected as the new track, platform and retaining wall are almost entirely within the



existing ROW. In addition, the surrounding area is largely industrial/employment lands containing storage units and a parking lot, where views are already disturbed due to the Oshawa GO Station and train storage area.

With regards to the proposed platform, although the height of sheltering structures on the platform may alter the view, the area is primarily industrial with existing transportation facilities. The new platform will alter the views of GO Train passengers; however, the impact is considered *Negligible* because the platform is located near and adjacent to the existing Oshawa GO Station.

There are no anticipated impacts in this segment; therefore, no mitigation measures have been proposed.

#### 5.19.5 Cultural Heritage

A Cultural Heritage Report: Impact Assessment was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-105. Additional details can be found in **Appendix F2**.

5.19.5.1 Potential Effects & Mitigation Measures: Segment LSE-1 – Mile 323.90 to Mile 323.40

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.19.5.2 Potential Effects & Mitigation Measures: Thickson Road Bridge Expansion

The Thickson Road Bridge was not identified as a potential or known BHR.

5.19.5.3 Potential Effects & Mitigation Measures: Segment LSE-2 – Mile 10.10 to Mile 10.70 & Retaining Wall

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.19.5.4 Potential Effects & Mitigation Measures: Segment LSE-3 – Mile 10.70 to Mile 11.20 & Retaining Wall

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

5.19.5.5 Potential Effects & Mitigation Measures: Segment LSE-4 – Mile 11.20 to Mile 11.70 & Retaining Wall

As no BHRs or CHLs were identified in this segment, there will be no potential effects to BHRs or CHLs and associated mitigation measures are not required.

#### 5.19.6 Archaeology

A Stage 1 Archaeological Assessment was undertaken for the New Track & Facilities TPAP. A summary of the findings and recommendations for the Lakeshore East Corridor can be found in the sections below. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-106. Additional details can be found in **Appendix G2**.

5.19.6.1 Potential Effects & Mitigation Measures: Segment LSE-1 – Mile 323.90 to Mile 323.40

The Stage 1 Archaeological Assessment confirmed that the proposed track footprint includes an active railway line on disturbed lands. However, it should be noted that although it is beyond the project limits, there is one previously registered site with archaeological potential. Site details are presented below in Table 5-65.



## TABLE 5-65 SEGMENT LSE-1 – PREVIOUSLY REGISTERED ARCHAEOLOGCIAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGt-15	Heinze	Pre-Contact Indigenous	Camp/campsite	Konrad 1950

The assessment determined that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required.

5.19.6.2 Potential Effects & Mitigation Measures: Thickson Road Bridge Expansion

According to the OASD four previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-66.

#### TABLE 5-66 THICKSON ROAD BRIDGE EXPANSION - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGr-6	Walter Huron 1	Paleo-Indian, Late	Unknown	Arthur Roberts 1977; Richard Sutton 1978
AlGr-7	Walter Huron 2	Archaic	Camp/campsite	Arthur Roberts 1977; MIA 1983
AlGr-13	Glenway 2	Pre-Contact Indigenous	Scatter	MIA 1984
AlGr-173	N/A	Pre-Contact Indigenous	Findspot	ASI 2005

According to the background research, one previous ASI report details fieldwork within 50 metres of the study area. No potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required.

No mitigation/compensation measures are required.

5.19.6.3 Potential Effects & Mitigation Measures: Segment LSE-2 – Mile 10.10 to Mile 10.70 & Retaining Wall

According to the OASD, three previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-67.

TABLE 5-67 SEGMENT LSE-2 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Sit e Name	Cultural Affiliation	Site Type	Researcher
AlGr-6	Walter Huron 1	Paleo-Indian, Late	Unknown	Arthur Roberts 1977;
				Richard Sutton 1978
AlGr-7	Walter Huron 2	Archaic	Camp/campsite	Arthur Roberts 1977; MIA 1983
AlGr-173	N/A	Pre-Contact Indigenous	Findspot	ASI 2005

Background research confirmed one previous report, which detail fieldwork within 50 metres of the Segment LSE-2 study area. The Stage 1 Archaeological Assessment confirmed that no potential for disturbance of unassessed or documented archaeological resources due to deep soil disturbance events are to occur. No further archaeological assessment is required.

5.19.6.4 Potential Effects & Mitigation Measures: Segment LSE-3 – Mile 10.70 to Mile 11.20 & Retaining Wall

According to the OASD, four previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in Table 5-68.

TABLE 5-68 SEGMENT LSE 3 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGr-6	Walter Huron 1	Paleo-Indian, Late	Unknown	Arthur Roberts 1977; Richard Sutton 1978
AlGr-7	Walter Huron 2	Archaic	Camp/campsite	Arthur Roberts 1977; MIA 1983
AlGr-13	Glenway 2	Pre-Contact Indigenous	Scatter	MIA 1984
AlGr-173	N/A	Pre-Contact Indigenous	Findspot	ASI 2005

Background research confirmed one previous report, which detail fieldwork within 50 metres of the Segment LSE-3 study area. The Stage 1 Archaeological Assessment confirmed that no potential for disturbance of unassessed or documented archaeological resources due to deep soil disturbance events are to occur (see Figure 5-17). No further archaeological assessment is required.



FIGURE 5-17 AREA DISTURBED ALONG THE LAKESHORE EAST CORRIDOR, NO POTENTIAL FOR ARCHAEOLOGICAL IMPACTS

5.19.6.5 Potential Effects & Mitigation Measures: Segment LSE-4 – Mile 11.20 to Mile 11.70 & Retaining Wall

The Stage 1 Archeological Assessment confirmed four previously registered archaeological sites are located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Additional background research of one previous report detail fieldwork completed within 50 metres of the LSE-4 study area. Site details are presented below in Table 5-69.

TABLE 5-69 SEGMENT LSE-4 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGr-6	Walter Huron 1	Paleo-Indian, Late	Unknown	Arthur Roberts 1977; Richard Sutton 1978
AlGr-7	Walter Huron 2	Archaic	Camp/campsite	Arthur Roberts 1977; MIA 1983
AlGr-13	Glenway 2	Pre-Contact Indigenous	Scatter	MIA 1984
AlGr-173	N/A	Pre-Contact Indigenous	Findspot	ASI 2005

There is the potential for the disturbance of unassessed or documented archaeological resources within LSE-4. A Stage 2 Archaeological Assessment is recommended for areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities. Test pit surveys at five metre intervals, expect where ploughing is not viable, will be conducted by a professionally licensed archaeologist prior to disturbance.



FIGURE 5-18 EXCERPT OF APPENDIX G2, SEGMENT LSE-4 MAP

#### 5.19.7 Utilities

A Utilities Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-110. Additional details can be found in **Appendix J**.

5.19.7.1 Potential Effects & Mitigation Measures: Segment LSE-1 – Mile 323.90 to Mile 323.40

The following potential conflicts have been identified in Table 5-70. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-70 SEGMENT LSE-1 – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Telus	UG - Parallel	Cable	3x144F/288F	Fiber	Greenwood Ave to Main St
Rogers	UG - Crossing	Communication Conduit	Unknown	Unknown	McCowan Rd
Enbridge Gas	UG - Crossing	Gas	6"	Plastic	McCowan Rd

5.19.7.2 Potential Effects & Mitigation Measures: Thickson Road Bridge Expansion

The following third-party utilities have been identified in the footprint related to Thickson Road Bridge Expansion. Impacts will be determined once the reference concept design for Thickson Road Bridge Expansion is made available.

TABLE 5-71 THICKSON ROAD BRIDGE EXPANSION – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Zayo	UG - Parallel	Cable	Unknown	Fiber	Lower Jarvis to Cherry Street
Bell	UG - Parallel	Cable	Unknown	Plastic	Lower Sherbourne Street to Lower Don River Trail
Enbridge Gas	UG - Crossing	Gas	8"	Steel	Thickson Rd S
Durham Region	UG - Crossing	Water	750mm	Concrete	Thickson Rd S
Bell	UG - Crossing	Communication Duct Bank	8 Ducts	Concrete	Thickson Rd S
Bell	UG - Crossing	Communication Conduit	1 duct	Plastic	Thickson Rd S
Elexicon (former Whitby Hydro)	OH - Crossing	Conductor	44k∨ + 13.8 k∨	Metallic	Thickson Rd S
Unknown	UG - Parallel	Culvert	600mm	CSP	Thickson Rd S
Unknown	UG - Parallel	Culvert	600mm	CSP	East of Thickson Rd S

5.19.7.3 Potential Effects & Mitigation Measures: Segment LSE-2 – Mile 10.10 to Mile 10.70 & Retaining Wall

The following potential conflicts have been identified in Table 5-72. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-72 SEGMENT LSE-2 – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Unknown	UG - Crossing	Culvert	200mm	CSP	East Rail MF

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Durham Region	UG - Crossing	Sewer	1375mm	Concrete	Thickson Rd S
Enbridge Gas	UG - Crossing	Gas	8"	Steel	Thickson Rd S
Durham Region	UG - Crossing	Water	750mm	Concrete	Thickson Rd S
Bell	UG - Crossing	Communication Duct Bank	8 Ducts	Concrete	Thickson Rd S
Bell	UG - Crossing	Communication Conduit	1 duct	Plastic	Thickson Rd S

## 5.19.7.4 Potential Effects & Mitigation Measures: Segment LSE-3 – Mile 10.70 to Mile 11.20 & Retaining Wall

The following potential conflicts have been identified in Table 5-73. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Bell	UG - Crossing	Cable	Unknown	Plastic	East of Thickson Rd S
Unknown	UG - Parallel	Culvert	600mm	CSP	Thickson Rd S
Unknown	UG - Parallel	Culvert	600mm	CSP	East of Thickson Rd S

TABLE 5-73 SEGMENT LSE-3 - POTENTIALLY IMPACTED UTILITIES

# 5.19.7.5 Potential Effects & Mitigation Measures: Segment LSE-4 – Mile 11.20 to Mile 11.70 & Retaining Wall

The following potential conflicts have been identified in Table 5-74. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

It should be noted that Durham Region advised of a 250mm sanitary sewer that runs parallel to the north side of the rail corridor from the Oshawa GO Station to Mile 11.25. Additional information on this asset is required to determine potential impacts due to the proposed new track and retaining wall.

#### TABLE 5-74 SEGMENT LSE-4 – POTENTIALLY IMPACTED UTILITIES

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Unknown	UG - Parallel	Culvert	Unknown	Unknown	Oshawa GO Station
Unknown	UG - Crossing	Culvert	200mm	CSP	East of Thickson Rd S
Durham Region	UG - Crossing	Sewer	2032mm	Concrete in Metallic Casing	East of Thickson Rd S

### 5.20 Footprint Impacts - Richmond Hill Corridor

#### 5.20.1 Natural Environment

A Natural Environment Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-101. Additional details can be found in **Appendix B2**.

#### 5.20.1.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

The Project study area segments are located in an urbanized setting of the City of Toronto within the Lower Don River Valley, where surrounding land use consists of densely treed, urban valley with open space to commercial properties. The main channel of the Lower Don River flows adjacent to the existing rail corridor and provides degraded and highly disturbed warmwater habitat conditions for a variety of fish species. Chester Springs Marsh, a significant restoration project of "Bring Back the Don" occurs west of the proposed Layover, south of the Bloor Street viaduct. This formerly constructed marsh has undergone natural succession and currently resembles wet meadow with sporadic occurrences of shrubs.

Pockets of CUM, CUW and cultural plantation (CUP) communities form the majority of the vegetation communities adjacent to the existing rail corridor proposed for the layover facility. This adjacent vegetation represents a broad mix of established native and landscaped (exotic) species (e.g., Russian Olive (*Elaeagnus angustifolia*), Manitoba Maple, Black Locust, Tree of Heaven (*Ailanthus altissima*) and Siberian Elm (*Ulmus pumila*)) typically found in urban landscapes. Herbaceous species are those often found in disturbed landscapes and are made up of mostly non-native and highly invasive species such as European Common Reed, Japanese Knot Weed and Dog-strangling Vine. Successional treed hedgerows consisting primarily of Willow, Black Locust, Tree of Heaven and Manitoba Maple occur along the existing rail corridor and often form the riparian cover of the Don River.

Proposed works include track upgrade along a dormant section of the rail corridor and upgrades to an existing access road. Additional proposed works include construction of retaining walls, a staff office building, a sanding facility, an electrical substation building and related ancillary facilities. Portions of land along the west side of the existing rail corridor have been identified for acquisition to accommodate the proposed building site and the improved access road.

#### Terrestrial Environment

The footprint of the proposed new Don Valley Layover Facility is confined almost entirely to existing linear infrastructure footprints and pre-disturbed areas. As a result, only minor permanent removal or disruption of natural features is anticipated. The proposed layover and access road improvements will occur on a pre-existing rail bed and an existing maintained access road. Similarly, it is anticipated that the existing rail bridge over the Don River will be used as part of the layover facility which eliminates potential impacts to the Don River and fish habitat. Potential impacts to the Chester Springs Marsh, positioned approximately 50 m west of the proposed layover, are not anticipated from the proposed layover alignment. For similar reasons, only minor edge encroachments will occur within cultural vegetation communities dominated by non-native and invasive vegetation to facilitate the layover facility and therefore significant changes in the natural environment are not anticipated. Approximately 0.38 ha of vegetation communities will be encroached upon to facilitate the proposed rail layover. This sum includes approximately 0.07 ha of Exotic Successional Savannah (CUS1-b), 0.06 ha of Locust Deciduous Plantation (CUP1-c) and 0.09 ha of Exotic Deciduous Thicket (CUT1-c).

The proposed location of the staff office building, an electrical substation building and related ancillary facilities have been positioned partially within an area previously used as a laydown for past construction

activities and devoid of vegetation. The remaining portion of the building footprint and access road along the rail bed occurs within a CUT community characterized as highly disturbed due to the dominance of non-native invasive vegetation including Japanese Knot Weed and Dog-strangling Vine within the lower canopy and groundcover. The proposed footprint will remove approximately 0.22 ha of CUT and CUT/CUM communities.

The encroachment and removal of portions of this cultural community are considered minor impacts due to the dominance of non-native plant species together with the common occurrence of these communities within urban and rural landscapes, including within the Don River corridor.

Potential effects on the valley's function as a wildlife movement corridor is anticipated to negligible due to the relatively broad width of the valley floor in this location and the presence of an existing access road, rail bridge over the Don River and fencing bordering the inactive rail corridor. The position of the proposed layover to one side of the valley along an existing rail bed and adjacent to the Don Valley Parkway means the core of the valley floor and its connection to the Don River will remain intact and available for wildlife movement.

Mitigation for these removals will include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined in Chapter 9 and adherence to Metrolinx's Vegetation Management Guidelines.

While the CUM community provides foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals, the quality of this unit (dominance of non-native invasive vegetation) diminishes its value as wildlife habitat. Proposed encroachment into this cultural community is considered to be a low impact from an ecological perspective given its position along the existing rail corridor and the availability of similar and higher quality habitat in the adjacent protected Don Valley corridor.

Candidate SWH was identified as potentially occurring within the woodland features and CUT through the subject Project study area. Candidate SWH in the vicinity of the proposed track upgrade or layover buildings and facilities includes potential for bat roosts and amphibian breeding habitat (wetlands); neither of which have been investigated. The determination of breeding habitat within the adjacent wetlands should be undertaken during detail design to inform stormwater management and mitigation during construction. Other candidate SWH identified in the subject Project study area segments would occur in vegetation comminutes such as FOD positioned beyond the influence of the proposed footprint. No potential impacts are anticipated to the adjacent SWH in the woodland communities with the adherence of mitigation measures outlined in Table 5-101 and the separation distance (50 m or more) of proposed layover facility from the FOD community.

Mitigation includes, but is not limited to:

- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

The proposed improvements to the access road should be designed and constructed to mitigate potential impacts to the adjacent wetland/shallow open water aquatic feature. Although this feature has not been identified as provincially significant, it may provide amphibian breeding habitat and should be retained if feasible in the layover design.

#### Aquatic Environment

The Lower Don Rover flows southward and crosses under the existing rail corridor near the southern terminus of the layover track. As no bridge modifications are included in the proposed works, no direct or long-term impacts are anticipated to the Don River aquatic environment.

To avoid potential impacts related to storm drainage discharge to the Don River, including water quality and erosion control, it is recommended that any required ditches be designed as a part of an integrated Low Impact Development (LID) stormwater management system during detailed design. This system may include bioswales/ditches, bio-retention in open areas, tree planters along sidewalks and parking lots, and permeable pavements in the parking lot and sidewalks.

#### Species at Risk

No SAR species or MNRF area sensitive species were identified within the subject segments of the Project study area. SAR "generalists" with habitats that may occur anywhere, including three species of Bats, Butternut, and Monarch Butterfly may occur within the subject segments.

SAR Bats - Tri-colored Bat, Little Brown Myotis and Northern Myotis – may use any tree (typically greater than 10 cm dimeter at breast height) along the rail corridor as a bat day roost or possibly bat maternity roost. Butternut may occur within open edges, hedgerows and fence lines due to dispersal by wildlife, such as squirrels. Monarch Butterfly can often be found wherever the host plant (milkweed) occurs.

While habitat for other potential SAR species including Barn Swallow, Eastern Wood-pewee, Wood Thrush, Red-headed Woodpecker and Snapping Turtle were identified as having potential to occur within the subject Project study area segments, based availability of suitable habitat.

No Barn Swallow nests were observed on any structure or bridge within the Project study area segment. Suitable habitat for Eastern Wood-pewee, Wood Thrush and Red-headed Woodpecker does not occur in the proposed project footprint. For this reason, the vegetation encroachment and removal of the cultural meadow and thicket communities is not anticipated to impact the potential habitat for these avian SAR species.

Snapping Turtles using the lower portion of the Don River could utilize the gravel surfaces of the tracks for nesting due to the proximity of the Don River to the proposed project footprint. While such use of the rail corridor by Snapping Turtles may occur, the constructed, maintained and utilized corridor does not require habitat protection. Rather, only protection of the individual(s) of the species is required under this scenario.

Mitigation includes:

- Screening for Butternut trees in advance of clearing and addressing any required removals through the provincial registration process;
- Ensuring a wildlife awareness and management program is employed during construction to identify and avoid harmful encounters to SAR turtles or their eggs;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- General mitigation measures outlined in Table 5-101.

With the application of recommended mitigation, the encroachment into CUM and CUT communities is not anticipated to result in adverse effects on SAR or their habitat due to the availability of similar and higher quality habitat in the adjacent Don River corridor and that most of the suitable vegetation communities such as FOD are positioned beyond the influence of the proposed footprint.

#### **Designated Areas**

While no provincially designated features are present within these segments of the Project study area, all six Richmond Hill rail corridor segments occur within the City of Toronto's Natural Heritage System (NHS). Project study area segments RH-3 and RH-4 also occur with a City of Toronto designated ESA.

As the majority of the proposed layover construction will occur within an existing rail bed, access road and former construction laydown footprint, potential vegetation removal is confined to the edges of cultural vegetation communities, most of which are dominated by non-native invasive plants. The proposed encroachments into these vegetation communities will result in the removal of approximately 0.38 ha the City's NHS. This reduction is unavoidable due to the linear design requirement of the layover facility.

Mitigation includes:

- Ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined in Table 5-97 and adherence to Metrolinx's Vegetation Management Guidelines which includes compensation planting ratios;
- Performing vegetation removal outside the typical breeding period for birds as well as the period of potential occupation of treed roosts (habitat) by bats and Milkweed by Monarch caterpillars (April 1<sup>st</sup> to September 30<sup>th</sup>); and
- Where lighting is required for safety and security of the proposed layover facility, the design and intensity should consider Wildlife Friendly Lighting to reduce possible harmful adverse effects.

Toronto's ravines, including the subject portion of the Don Valley, are protected through land use policies, regulations and management plans that focus on protecting the ravine landform from degradation including the removal of trees and changes in grade. In October 2017, the City of Toronto adopted Toronto's Ravine Strategy to "support a ravine system that is a natural, connected sanctuary essential for the health and well-being of the city, where use and enjoyment support protection, education and stewardship." Essentially, the Strategy is a framework for future management decisions based on a set of principles and priorities, including a common vision to guide policies, activities, investments and stewardship for ravines. Five guiding principles and twenty actions have been developed that represent core ideas which guide future decision-making. The principles aim to protect, invest, connect, partner and celebrate Toronto's ravine system for decades to come.

The Toronto Ravine Strategy is an essential piece in Toronto's ongoing management process to guide policies, activities, investments and stewardship for City ravines. While development is generally prohibited in valleys and ravines, exceptions include essential public works; provided that impacts are mitigated. The proposed improvements and re-use of the abandoned track and rail beds within the Don Valley to create the Don Valley Layover is a challenging proposal when viewed alongside the Toronto Ravine Strategy and the Toronto's Ravine and Natural Feature Protection bylaw. However, the impact assessment provided above determined that the potential impacts to the natural features of most significance in the vicinity of the proposed layover can be avoided provided that:

- Mitigation outlined in Table 5-101 and other best management practices are employed during construction;
- Design elements are incorporated into the form of the buildings and other features;

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- Operational elements including the selection/use of lighting are employed; and
- Metrolinx will engage with the City of Toronto to incorporate municipal requirements as a best practice, where practical, and may seek opportunities to participate in ravine stewardship as it relates to the Don Valley Layover.

A site specific natural heritage impact study should be completed during future design phases and each of these three themes should be examined and enhanced further to ensure that potential impacts are understood in more detail and that adequate mitigation and operational procedures are employed to protect adjacent natural features of significance.

5.20.1.2 Potential Effects & Mitigation Measures: Segment RH-1 – Mile 1.60 to Mile 2.15

The proposed track infrastructure in this segment is located within an actively used and managed portion of the existing Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed. The address of potential impacts from the electrification of this Project segment is provided in Chapter 6.

5.20.1.3 Potential Effects & Mitigation Measures: Segment RH-2 – Mile 2.15 to Mile 2.50

The proposed track infrastructure in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed. The address of potential impacts from the electrification of this Project segment is provided in Chapter 6.

5.20.1.4 Potential Effects & Mitigation Measures: Segment RH-3 – Mile 2.50 to Mile 3.10 & Retaining Wall

Refer to Section 5.20.1.1. above, which describes land use and socio-economic impacts and mitigation measures for the Don Valley Layover and comprises Segment RH-3.

The proposed track infrastructure in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed. The address of potential impacts from the electrification of this Project segment is provided in Chapter 6.

5.20.1.5 Potential Effects & Mitigation Measures: Segment RH-4 – Mile 3.10 to Mile 3.60

Refer to Section 5.20.1.1. above, which describes land use and socio-economic impacts and mitigation measures for the Don Valley Layover and comprises Segment RH-4.

The proposed track infrastructure in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed. The address of potential impacts from the electrification of this Project segment is provided in Chapter 6.

5.20.1.6 Potential Effects & Mitigation Measures: Segment RH-5 – Mile 3.60 to Mile 4.10 & Retaining Wall

Refer to Section 5.20.1.1. above, which describes land use and socio-economic impacts and mitigation measures for the Don Valley Layover and comprises Segment RH-5.

The proposed track infrastructure in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed. The address of potential impacts from the electrification of this Project segment is provided in Chapter 6.



#### 5.20.1.7 Potential Effects & Mitigation Measures: Segment RH-6 – Mile 4.10 to Mile 4.65

The proposed track infrastructure in this segment is located within an actively used and managed portion of the exiting Metrolinx rail corridor ROW. There are no ecological impacts anticipated and therefore no mitigation measures are proposed. The address of potential impacts from the electrification of this Project segment is provided in Chapter 6.

#### 5.20.2 Hydrogeological

A Hydrogeology Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-102. Additional details can be found in **Appendix C2**.

#### 5.20.2.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

The infrastructure for this Study Area segment consists of electrification of the rail corridor, track upgrade and the Don Valley Layover. The surrounding area within 500 m is highly urbanized. The Don River is located east of the proposed infrastructure as it runs parallel to the railway ROW. The Tributary of Don River crosses under the ROW north of the Study Area segment.

The subsurface footprint is expected to be greater than 2 m in depth but no more than 5 m depth. Review of well records for the area indicates near surface soils generally consist of modern alluvial deposits clay, silt and sand. Water levels reported in the MECP well logs suggest depth to water between 2 to 10 m. Any dewatering completed during construction will be short-term and not result in infrastructure footprint hydrogeological impacts.

The regional physiography in this area is defined as Iroquois Plain with the surficial geology at RH-3 comprised of permeable modern alluvial deposits that run north-to-south along the New Track & Facilities and Metrolinx GO Rail right-of-way. Massive, well laminated and foreshore-basinal deposits (poorly drained fine grained soils) exist to the west of the Study Area Segment while undifferentiated older till underlies stratified sediments and basinal deposits (poorly drained fine grain soils) east of the Study Area Segment (Gannett Fleming, 2020). RH-3 is located within IPZ-3, which represents an area where contaminants could reach the intake pipe during and after a large storm.

The recharge of groundwater from infiltrating precipitation has potential to be reduced due to the increased impermeable surfaces from paving of road and parking areas. However, review of preliminary designs for the layover facility suggest that the increase in impermeable surfaces will be minimal, and not likely to significantly influence overall infiltration and the water balance for the Site.

Within 500 m of the RH-3, RH-4 and RH-5 Study Area Segments, the MECP database indicates the presence of 3 dewatering wells (Well IDs 7050598, 7140186 and 7140191), with one of these (Well 7050598) being located across the Don River from the proposed layover facility. No information on the current status of these dewatering wells or associated PTTW record could be found for these wells. No other records for groundwater supply were listed in the MECP database for the area.

Based on the above information, it is not anticipated that there will be any adverse impacts due to the footprint of the infrastructure to the groundwater or groundwater dependent features, including the Don River and the Tributary of the Don River and IPZ-3. Therefore, no mitigation measures are recommended.

5.20.2.2 Potential Effects & Mitigation Measures: Segment RH-1 – Mile 1.60 to Mile 2.15

The infrastructure for this Study Area Segment consists of electrification of the rail corridor and track upgrade. The infrastructure related to electrification may include:

• Overhead Contact System – foundations may be installed at an estimated depth of 5 m or greater depending on the type of overhead contact system structure;



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- Grounding and Bonding underground infrastructure may be required; and
- Bridge Widenings/Modifications bridge modifications may occur above or below ground.

The surrounding area within 500 m is highly urbanized. The Don River is located east of the proposed infrastructure as it runs parallel to the railway ROW. Groundwater provides a baseflow to the river.

The regional physiography in this area is defined as Iroquois Plain with the surficial geology at RH-1 comprise primarily of undifferentiated older till/stratified sediments. Overlying foreshore-basinal deposits (silty fine sands with a high water table) exist in a band traversing the Study Area. However, permeable modern alluvial deposits run north-to-south along the New Track & Facilities and Metrolinx GO Rail ROW. As a result of its proximity to the Don River, there may be a higher water table. RH-1 is located within IPZ-3.

Railway infrastructure already exists within this Study Area segment and the incremental addition of infrastructure to the footprint is not expected to result in any additional impact to the Don River or IPZ-3.

Based on the above information, there is not anticipated to be any adverse impacts of the additional infrastructure footprint to the groundwater or groundwater dependent features, including the Don River. Therefore, no mitigation measures are recommended.

5.20.2.3 Potential Effects & Mitigation Measures: Segment RH-2 – Mile 2.15 to Mile 2.50

The proposed infrastructure for this Study Area Segment is similar to RH-1 above. Refer to Section 5.20.2.2.

5.20.2.4 Potential Effects & Mitigation Measures: Segment RH-3 – Mile 2.50 to Mile 3.10 & Retaining Wall

This segment corresponds to the location of the proposed Don Valley Layover. Refer to Section 5.20.2.1.

5.20.2.5 Potential Effects & Mitigation Measures: Segment RH-4 – Mile 3.10 to Mile 3.60

This segment corresponds to the location of the proposed Don Valley Layover. Refer to Section 5.20.2.1.

5.20.2.6 Potential Effects & Mitigation Measures: Segment RH-5 – Mile 3.60 to Mile 4.10 & Retaining Wall

This segment has similar proposed infrastructure and existing hydrogeological conditions as segment RH-1. Refer to Section 5.20.2.2.

5.20.2.7 Potential Effects & Mitigation Measures: Segment RH-6 – Mile 4.10 to Mile 4.65

This segment has similar proposed infrastructure and existing hydrogeological conditions as segment RH-1. Refer to Section 5.20.2.2.

5.20.3 Land Use/Socio-Economic

A Land Use and Socio-Economic Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-103. Additional details can be found in **Appendix D2**.

5.20.3.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

Land Use

Under the City of Toronto Zoning By-law 569-2013, the rail corridor is zoned for *Utility and Transportation (UT).* The proposed track infrastructure (as part of the Don Valley Layover) will be located within the rail

ROW; therefore, there are no anticipated adverse effects on land use due to the new storage tracks. Lands within the rail ROW are owned by Metrolinx.

The remainder of the proposed Don Valley Layover site is currently located in the City of Toronto in a park/open space/natural area, surrounded by the Lower Don Valley Parklands. There is a footprint impact on existing natural area land uses as a result of this activity (see Figure 5-19). It should be noted that the proposed access route to the facility currently exists and is being used to access a hydro substation.

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FIGURE 5-19 EXCERPT OF APPENDIX D2, SEGMENT RH-4 MAP
The potentially affected lands are zoned *Open Space Natural (ON)*, which permits emergency services, public utility and transportation uses. Current land uses within the site and surrounding area include public parks and trails. However, the proposed layover is not expected to conflict with current zoning policies given the permitted uses outlined in the City's Zoning By-law and current uses of the site. It is noted that there is a potential loss of park space.

The City of Toronto's Secondary Plan – Downtown Plan is in full force and effect, and as such, the Don Valley Layover Facility is partially located within the Core Circle (Parks and Public Realm) designation. The Core Circle area is to serve local residents and workers with a continuous pedestrian/cycling route, to provide users with an immersive natural experience. Considering that the proposed Don Valley Layover is proposed adjacent to the Don Valley Parkway and is in close proximity to the Richmond Hill Rail Corridor, the surrounding area is currently industrialized to some degree. The facility is not anticipated to reduce the key functions of park users; that is the Lower Don River Trail is to remain open to provide a continuous pedestrian/cycling network.

Lands within the Don River Valley are within the City of Toronto's Environmentally Significant Area (ESA). An ESA encourages protecting and enhancing the natural environment by carrying out good stewardship practices during and post development. Natural heritage features require special attention to preserve their environmentally significant qualities, provide ecosystem functions, promote biodiversity and increase resiliency. Any development should seek to minimize negative impacts and restore the ecological functions of the area, where possible. Metrolinx is aligned with the City of Toronto to develop a layover facility outside of the City's ESA limits as to preserve the natural function of the Don River Valley.

In October 2017, the City of Toronto adopted Toronto's Ravine Strategy to "*support a ravine system that is a natural, connected sanctuary essential for the health and well-being of the city, where use and enjoyment support protection, education and stewardship.*" Essentially, the Strategy is a framework for future management decisions based on a set of principles and priorities, including a common vision to guide policies, activities, investments and stewardship for ravines. Five guiding principles and twenty actions have been developed that represent core ideas which guide future decision-making. The principles aim to protect, invest, connect, partner and celebrate Toronto's ravine system for decades to come. Metrolinx will engage with the City of Toronto to incorporate municipal requirements as a best practice, where practical, and may seek opportunities to participate in ravine stewardship as it relates to the Don Valley Layover.

The proposed Don Valley Layover is designated as Natural Heritage in the City of Toronto's Official Plan. Development is not generally permitted in the natural heritage system, except where the underlying land use designation permits, as described above. If development does occur, efforts to mitigation and/or improve the natural heritage system shall be sought out. Section 3.4.7 of the Official Plan does permit transportation services in a floodplain if there is no reasonable alternative. It should be noted that the proposed parking/staff facilities are located outside of the 100-year floodplain to ensure resiliency in the event of a major storm.

Additionally, the majority of the proposed layover construction will occur within an existing rail bed, access road and former construction laydown footprint. Potential vegetation removal is confined to the edges of vegetation communities, most of which are dominated by non-native invasive plants. The proposed encroachments into these vegetation communities will reduce the area of the City's Natural Heritage System by approximately 0.38 ha. This reduction is unavoidable due to the linear design requirement of the layover facility.

It is acknowledged that the Lower Don River Valley is designated as an Urban River Valley in the 2017 Greenbelt Plan. The Urban River Valley designation seeks to protect natural and open space lands along river ways and assist in preserving the ecological connectivity to the Greenbelt Area. Policies seek to preserve natural settings of recreational lands, including parklands and trails.

As previously mentioned, the Don Valley Layover Facility is proposed on lands partially owned by Metrolinx, and lands not owned by Metrolinx are currently being used as an access road and parking area. In total, there is a potential loss of approximately 0.38 ha of 'parkland' area, which is mostly dominated by dirt and non-native invasive plant species. Based on this understanding, the proposed Don Valley Layover facility is not anticipated to disrupt the ecological connectivity to the Greenbelt Area and all surrounding parklands, and the Lower Don River Trail is to remain open to preserve its recreational use.

Additionally, policy 6.2.3 states "all existing, expanded or new infrastructure which is subject to and approved under the Environmental Assessment Act, or which receives a similar approval, is permitted provided it supports the needs of adjacent settlement areas or serves the significant growth and economic development expected in southern Ontario and supports the goals and objectives of the Greenbelt Plan."

The proposed Don Valley Layover is proposed in close proximity to Union Station (in the City of Toronto) to support increased train service levels across the Metrolinx network, as outlined in the GO Expansion Program initiatives. Therefore, this proposed layover facility is intended to support the growth and development of transportation infrastructure in Southern Ontario which will allow for more economic development opportunities, as access and connectivity across the Greater Golden Horseshoe Area (GGHA) becomes more efficient and frequent.

#### Socio-Economic

There are no sensitive facilities within 100 metres of the proposed layover facility and therefore, there are no anticipated footprint impacts to sensitive facilities.

Riverdale Park West, Toronto Necropolis, Wellesley Park, Rosedale Ravine Lands and the Lower Don Parklands surround the corridor, and the Lower Don River Trail meanders throughout the Lower Don Parklands within this segment. It is acknowledged that Evergreen Brickworks has an agreement with the City of Toronto to use portions of the Lower Don Parklands to support activities, such as public programming and temporary art installation.

As a result, there are anticipated footprint impacts to adjacent parks due to the proposed site of the layover. Users will be able to continue recreation and leisure activities; however, the setting/experience may change as a result due to potential odour, visual and noise impacts associated with the proposed works and increase in train service. It is anticipated that temporary art installation opportunities may be altered due to the proposed Don Valley Layover. For public safety reasons, the facility must be fenced, which may result in access limitations for art installation, depending on location of such activities.

To minimize adverse effects on recreational amenities resulting from the implementation of layover infrastructure identified as part of the conceptual design, the following recommendations are proposed:

- Buildings setbacks are to allow for recreational amenities to be maintained adjacent to site;
- Buildings/structures will achieve Ontario Building Code requirements;
- Structures will be oriented to maximize public access and views to the park, where feasible given various site constraints;
- Structures are to be designed, in keeping with the characteristics of the surrounding area and Metrolinx Design Excellence Standards;
- Ensure the safety and separation of the park/trail users from the facility; and
- Locate loading/servicing areas away from the Lower Don River Trail and park spaces, where feasible.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter and the GO Rail Network Electrification EPR Addendum.

Notwithstanding this, potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the City of Toronto will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities.

#### Mitigation Measures

The proposed Don Valley Layover may conflict with existing land use and zoning policies.

A range of municipal permits and approvals may be required for the project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

5.20.3.2 Potential Effects & Mitigation Measures: Segment RH-1 – Mile 1.60 to Mile 2.15

#### Land Use

Under the City of Toronto Zoning By-law 569-2013, the rail corridor is zoned for *Utility and Transportation* (UT). The proposed track infrastructure will be located within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

# ocs

Based on the current design, OCS infrastructure will be located within the rail ROW. Therefore, there are no anticipated adverse effects on land use due to the new OCS infrastructure in this segment. Potential impacts and easements will be further assessed during detailed design.

#### Bridges

All of the bridges within RH-1 are rail underpasses that do not have vertical clearance issues. The structures outlined in Table 5-75 below will require wire attachments; however, there are no land use effects associated with this modification.

Corridor Segment	Mile	Primary Name	Type of Structure	Vertical Clearance Issue?	Flash Plate to be Attached to Bridge?	Wires to be Attached to Bridge?	Bridge Protection Barrie to be Added or Modified?
RH-1	1.93	Eastern Avenue (#264)	Bridge (Road)	No	No	Yes	Yes
RH-1	1.95	Don Valley Parkway Ramp (#263)	Bridge (Road)	No	No	Yes	Yes
RH-1	1.98	Queen Street East (#245	Bridge (Road)	No	No	Yes	Yes

# TABLE 5-75 RH-1 SUMMARY OF BRIDGE MODIFICATIONS



#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

Corktown Common Park and the multi-use Lower Don River Trail is located near the Richmond Hill Corridor. There are no anticipated footprint impacts to these recreational amenities as a result of this activity.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

#### Mitigation Measures

The mitigation measures identified in the above referenced reports will be implemented during detailed design and construction.

5.20.3.3 Potential Effects & Mitigation Measures: Segment RH-2 – Mile 2.15 to Mile 2.50

#### Land Use

Under the City of Toronto Zoning By-law 569-2013, the rail corridor is zoned for *Utility and Transportation* (UT). The proposed track infrastructure will be located within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

#### ocs

Based on the current design, OCS infrastructure will be located within the rail ROW. Therefore, there are no anticipated adverse effects on land use due to the new OCS infrastructure in this segment. Potential impacts and easements will be further assessed during detailed design.

# Bridges

All of the bridges within RH-2 are rail underpasses that do not have vertical clearance issues. The structures outlined in Table 5-76 below will require wire attachments; however, there are no land use effects associated with this bridge modification.

Corridor Segment	Mile	Primary Name	Type of Structure	Vertical Clearance Issue?	Flash Plate to be Attached to Bridge?	Wires to be Attached to Bridge?	Bridge Protection Barrie to be Added or Modified?
RH-2	2.26	Dundas Street East (#042)	Bridge (Road)	No	No	Yes	Yes
RH-2	2.45	Gerrard Street East (#244)	Bridge (Road)	No	No	Yes	Yes

# TABLE 5-76 RH-2 SUMMARY OF BRIDGE MODIFICATIONS

# Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

There are no anticipated adverse effects to these recreational amenities as the proposed track and OCS infrastructure will be located within the rail ROW in this segment. Recreational amenities in the vicinity include Riverdale Park West, Corktown Common, and the Lower Don River Trail.



For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

# Mitigation Measures

The mitigation measures identified in the above referenced reports will be implemented during detailed design and construction.

5.20.3.4 Potential Effects & Mitigation Measures: Segment RH-3 – Mile 2.50 to Mile 3.10 & Retaining Wall

Refer to Section 5.20.3.1 above, which describes land use and socio-economic impacts and mitigation measures for the Don Valley Layover and comprises Segment RH-3.

# Land Use

Under the City of Toronto Zoning By-law 569-2013, the rail corridor is zoned for *Utility and Transportation* (UT). The proposed track infrastructure will be located within the rail ROW in this segment; therefore, there are no anticipated adverse effects on land use due to the new tracks.

# ocs

Based on the current design, OCS infrastructure will be located within the rail ROW. Therefore, there are no anticipated adverse effects on land use due to the new OCS infrastructure in this segment. Potential impacts and easements will be further assessed during detailed design.

# Bridges

All of the bridges within RH-3 are rail underpasses that do not have vertical clearance issues.

The structures outlined in Table 5-77 below will require wire attachments; however, there are no land use effects associated with this bridge modification.

Corridor Segment	Mile	Primary Name	Type of Structure	Vertical Clearance Issue?	Flash Plate to be Attached to Bridge?	Wires to be Attached to Bridge?	Bridge Protection Barrie to be Added or Modified?
RH-3	2.67	Riverdale Park Pedestrian Bridge (#041)	Bridge (Pedestrian)	No	No	Yes	Yes
RH-3	2.70	Don River	Bridge (Rail)	No	No	Yes	No

TABLE 5-77 RH-3 SUMMARY OF BRIDGE MODIFICATIONS

# Socio-Economic

There are no sensitive facilities within 100 meters of the corridor and therefore, there are no anticipated footprint impacts to sensitive facilities.

Since the OCS infrastructure is confined to the rail ROW, there are no anticipated impacts to surrounding recreational amenities.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

# Mitigation Measures

The mitigation measures identified in the above referenced reports will be implemented during detailed design and construction.

5.20.3.5 Potential Effects & Mitigation Measures: Segment RH-4 - Mile 3.10 to Mile 3.60

Refer to Section 5.20.3.1 above, which describes land use and socio-economic impacts and mitigation measures for the Don Valley Layover and comprises Segment RH-4.

#### Land Use

Under the City of Toronto Zoning By-law 569-2013, the rail corridor is zoned for *Utility and Transportation* (*UT*).

# ocs

Based on the current design, OCS infrastructure will be located within the rail ROW. Therefore, there are no anticipated adverse effects on land use due to the new OCS infrastructure in this segment. Potential impacts and easements will be further assessed during detailed design.

#### Bridges

The bridge within RH-4 is a rail underpass that does not have vertical clearance issues. The structure outlined in Table 5-78 below will not require wire attachments; therefore, there will be no impacts on adjacent land uses.

Corridor Segment	Mile	Primary Name	Type of Structure	Vertical Clearance Issue?	Flash Plate to be Attached to Bridge?	Wires to be Attached to Bridge?	Bridge Protection Barrie to be Added or Modified?
RH-4	3.31	Prince Edward Viaduct (Danforth Ave-Bloor St E)	Bridge (Road)	No	No	No	No

#### TABLE 5-78 RH-4 SUMMARY OF BRIDGE MODIFICATIONS

#### Socio-Economic

There is one sensitive facility (school) located within the vicinity of RH-4, as shown in Table 5-79. The City Adult Learning Centre is located to the east of the rail corridor, at a much higher elevation than the proposed layover facility. The City Adult Learning Centre is located more than 30 metres from the rail corridor, and therefore there will be no footprint impact to the sensitive facility.

# TABLE 5-79 SENSITIVE FACILITIES WITHIN THE VICINITY OF RH-4

Segment/Figure	Туре	Name	Address	Approximate Distance from ROW
RH-4	School	City Adult Learning Centre	1 Danforth Avenue	76 metres

The Lower Don Parklands and Trail extend into this segment. There are no anticipated footprint impacts to recreational amenities as a result of the proposed OCS infrastructure, however temporary/permanent easements may be required to construct and maintain the OCS infrastructure. Users will be able to continue recreation and leisure activities; however, the setting/experience may change as a result due to the visual and noise impacts associated with the proposed works and increase in train service.



For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

There are no anticipated adverse effects on recreational amenities resulting from the implementation of OCS infrastructure identified as part of the conceptual design. Notwithstanding this, potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the City of Toronto will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities.

#### Mitigation Measures

The mitigation measures identified in the above referenced reports will be implemented during detailed design and construction.

5.20.3.6 Potential Effects & Mitigation Measures: Segment RH-5 – Mile 3.60 to Mile 4.10 & Retaining Wall

Refer to Section 5.20.3.1 above, which describes land use and socio-economic impacts and mitigation measures for the Don Valley Layover and comprises Segment RH-5.

# Land Use

Under the City of Toronto Zoning By-law 569-2013, the rail corridor is zoned for *Utility and Transportation* (*UT*).

# ocs

Based on the current design, OCS infrastructure will be located within the rail ROW. Therefore, there are no anticipated adverse effects on land use due to the new OCS infrastructure in this segment. Potential impacts and easements will be further assessed during detailed design.

# Bridges

All of the bridges within RH-5 are rail underpasses that do not have vertical clearance issues.

One structure outlined in Table 5-80 below will require wire attachments; however, there are no land use effects associated with this modification.

Corridor Segment	Mile	Primary Name	Type of Structure	Vertical Clearance Issue?	Flash Plate to be Attached to Bridge?	Wires to be Attached to Bridge?	Bridge Protection Barrie to be Added or Modified?
RH-5	3.65	DVP to Bayview Extensions (#079)	Bridge (Road)	No	No	Yes	Yes
RH-5	4.03	CP Belleville Sub`	Bridge (Rail)	No	No	No	No

# TABLE 5-80 RH-5 SUMMARY OF BRIDGE MODIFICATIONS

# Socio-Economic

There is one sensitive facility located within the vicinity of RH-5, as shown in Table 5-81. Evergreen Brickworks is located within approximately 32 meters from the rail corridor; however, considering that the proposed OCS infrastructure is to remain within the existing rail ROW, there will be no footprint impact to the sensitive facility.



#### TABLE 5-81 SENSITIVE FACILITY WITHIN THE VICINITY OF RH-5

Segment	Туре	Name	Address	Approximate Distance from ROW
RH-5	Community Centre	Evergreen Brickworks	550 Bayview Avenue	32 meters

The Lower Don Parklands and Trail runs adjacent to the rail corridor, however, there are no anticipated footprint impacts to recreational amenities as a result of OCS infrastructure.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter

#### Mitigation Measures

The mitigation measures identified in the above referenced reports will be implemented during detailed design and construction.

5.20.3.7 Potential Effects & Mitigation Measures: Segment RH-6 – Mile 4.10 to Mile 4.65

#### Land Use

Under the City of Toronto Zoning By-law 569-2013, the rail corridor is zoned for *Utility and Transportation* (*UT*).

# ocs

Based on the current design, OCS infrastructure will be located within the rail ROW. Therefore, there are no anticipated adverse effects on land use due to the new OCS infrastructure in this segment. Potential impacts and easements will be further assessed during detailed design.

#### Bridges

There are no bridges within this segment of the Richmond Hill Corridor.

#### Socio-Economic

There are no sensitive facilities within 100 meters of the proposed track work and therefore, there are no anticipated footprint impacts to sensitive facilities.

This segment of the corridor is surrounded by the Lower Don Parklands; however, there are no expected footprint impacts on surrounding parks as a result of this activity as it is restricted to the rail ROW.

For further detail related to socio-economic effects such as visual/aesthetics, noise & vibration, electromagnetic interference/electromagnetic fields, and air quality refer to the respective sections in this Chapter.

#### Mitigation Measures

The mitigation measures identified in the above referenced reports will be implemented during detailed design and construction.

#### 5.20.4 Visual/Aesthetics

A Visual Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-104. Additional details can be found in **Appendix E2**.

# 5.20.4.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

The proposed Don Valley Layover site is located on the Lower Don Valley, running alongside the Don Valley Parkway to the east and the Lower Don Valley River trail to the west, as shown in Figure 5-20.

The proposed use of this layover facility is to reduce congestion on the rail corridor, minimize nonrevenue travel by being near major GO Stations, service the Barrie and Milton GO Rail corridors by utilizing this facility to park trains during off-peak hours, and alleviate congestion at Union Station.

The site is proposed to store three (3) L12L consists, each containing a locomotive, twelve (12) coaches, and another locomotive. Unlike the other layover facilities described above, the Don Valley Layover will not be electrified. No maintenance activities are proposed at this layover facility, although lighting and parking for staff and storage building will be required. The construction of the Don Valley Layover facility will impact the composition and character of current views experienced by visual receptors along the Lower Don Valley Trail and surrounding park space, resulting in High visual impacts. It should be noted that staff/storage facilities are located in a linear configuration adjacent to the storage track, which maximizes the distance between proposed structures and the Lower Don River Trail to minimize visual impacts.

It is anticipated that views of trail users will be highly altered due to the proposed facility. Specifically, retaining walls are anticipated to obstruct views of pedestrians in nearby parks. At this time, retaining wall dimensions are unknown and will be further explored during detailed design. It is acknowledged that Evergreen Brickworks has an agreement with the City of Toronto to use portions of the Lower Don Parklands to support activities, such as public programming and temporary art installation. It is anticipated that temporary art installation opportunities may be altered due to the proposed Don Valley Layover, specifically below the Prince Edwards Viaduct. In addition, the proposed facility may conflict with the Don River Valley Public Art Plan route, which is intended to integrate art with the natural environment. For public safety reasons, the facility must be fenced, which may result in access limitations for art installation, thereby altering the setting/experience of the park. Any initiatives related to public art will be the responsibility of the City of Toronto.

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FIGURE 5-20 PROPOSED DON VALLEY LAYOVER – BIRD'S EYE VIEW

Additionally, the Prince Edward Viaduct, designated under the *Ontario Heritage Act*, passes over the Richmond Hill corridor, just north of the proposed layover facility. The views to the bridge will most likely be altered to have *High* visual impacts due to the proposed structures/building as part of the layover facility. However, views from the top of the bridge, looking north and south are not likely to be altered as existing safety barriers currently impede existing views. The Cultural Heritage Evaluation Report contained in **Appendix F2** provides additional mitigation measures for the Don Valley Layover.

A Design Excellence process and urban design review will be completed during future project stages to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), vegetative buffers, and careful placement of structures where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.

Special consideration should be given to the aesthetic design of the Don Valley Layover as much as possible during detailed design, with consideration that the proposed facility is within the City of Toronto's natural heritage system and the Lower Don Valley is considered an ecological and cultural network in the community.

With respect to retaining walls, mitigation recommendations include the use of concrete patterning where walls are adjacent to sensitive receptors, and consideration for grading design to minimize wall heights and maximize planting of trees and shrubs, where applicable. Additionally, offsetting tree removals where feasible, as per Metrolinx's Vegetation Management Protocol (January 2020) in affected areas and parks may reduce visual impacts.

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the proposed Don Valley Layover are further described in Table 5-104.

5.20.4.2 Potential Effects & Mitigation Measures: Segment RH-1 – Mile 1.60 to Mile 2.15

Beginning in the downtown core of the City of Toronto, this section of the Richmond Corridor extends north along the Don River and Don Valley Parkway on the east side of the corridor. On the west side of the rail ROW, the corridor traverses commercial and industrial/employment areas with pockets of high-rise residential buildings with direct views of the Don Valley Park and the rail corridor. OCS infrastructure will alter the views of adjacent residences, as well as parts of the Lower Don River trail (part of the Don River Valley Park). Recognizing that both the residential buildings and trail are visual receptors, their visual impacts are classified as *High*.

The installation of OCS infrastructure will affect the viewshed along the rail corridor, particularly in areas of vegetation/tree clearing. Visual impact mitigation strategies for new infrastructure (i.e. OCS structure, etc.) will be identified and incorporated into the detailed design process, if feasible. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor.

Since the track infrastructure already exists as part of the general visual environment, impacts to the existing views of the corridor will be *Negligible* because the proposed track is within the existing ROW.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or

significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the proposed track and OCS infrastructure are further described in Table 5-104.

5.20.4.3 Potential Effects & Mitigation Measures: Segment RH-2 – Mile 2.15 to Mile 2.50

Potential visual impacts surrounding the proposed OCS and track infrastructure extend within this segment. See Section 5.20.4.2 above for a detailed description of potential effects and mitigation measures.

5.20.4.4 Potential Effects & Mitigation Measures: Segment RH-3 – Mile 2.50 to Mile 3.10 & Retaining Wall

Refer to Section 5.20.4.1 of this Report for a detailed description of potential effects and mitigation measures for the Don Valley Layover Facility.

This segment of the Richmond Corridor traverses open park spaces. OCS infrastructure will alter the views of park users, as well as people driving along Bayview Avenue and Roseland Valley Road. Recognizing that pedestrians within the park are visual receptors, the visual impacts are classified as *High*.

The installation of OCS infrastructure will affect the viewshed along the rail corridor, particularly in areas of vegetation/tree clearing. Visual impact mitigation strategies for new infrastructure (i.e. OCS structure, etc.) will be identified and incorporated into the detailed design process, if feasible. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor.

Since the track infrastructure already exists as part of the general visual environment, impacts to the existing views of the corridor will be *Negligible* because the proposed track is within the existing ROW.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the proposed track and OCS infrastructure are further described in Table 5-104.

5.20.4.5 Potential Effects & Mitigation Measures: Segment RH-4 – Mile 3.10 to Mile 3.60

Refer to Section 5.20.4.1 of this Report for a detailed description of potential effects and mitigation measures for the Don Valley Layover Facility.

This segment of the Richmond Corridor contains the Prince Edward Viaduct, as described above. The corridor traverses open park spaces. OCS infrastructure will alter the views of Lower Don Parkland users, as well as people driving along Bayview Avenue. Recognizing that pedestrians within the park are visual receptors, the visual impacts are classified as *High*.

The installation of OCS infrastructure will affect the viewshed along the rail corridor, particularly in areas of vegetation/tree clearing. Visual impact mitigation strategies for new infrastructure (i.e. OCS structure, etc.) will be identified and incorporated into the detailed design process, if feasible. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.

Mitigation measures related to the proposed OCS infrastructure are further described in Table 5-104.

5.20.4.6 Potential Effects & Mitigation Measures: Segment RH-5 – Mile 3.60 to Mile 4.10 & Retaining Wall

Refer to Section 5.20.4.1 of this Report for a detailed description of potential effects and mitigation measures for the Don Valley Layover Facility.

OCS infrastructure will be constructed along this segment of the Richmond Hill Corridor. The OCS infrastructure will alter the views of the Don River Valley Park and Lower Don River trail running through the park as well as other open natural spaces such as Riverdale Park and the Rosedale Ravine Lands. Other visual receptors include the Evergreen Brickworks natural and cultural center. As a result, the proposed infrastructure will result in *High* visual impacts on visual receptors such as Evergreen Brickworks, and pedestrians within the Lower Don Parklands and the Lower Don Valley Trail.

The OCS infrastructure will affect the viewshed along the rail corridor, particularly in areas of vegetation/tree clearing. Visual impact mitigation strategies for new infrastructure (i.e. OCS structure, layover facilities) will be identified and incorporated into the detailed design process. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporates industry best practices provided in ANSI/IES RP-8-18.

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables in Chapter 6.



# 

Mitigation measures related to the proposed OCS infrastructure are further described in Table 5-104.

5.20.4.7 Potential Effects & Mitigation Measures: Segment RH-6 – Mile 4.10 to Mile 4.65

Potential visual impacts surrounding the proposed OCS infrastructure extend within this segment. See Section 5.20.4.6 above for a detailed description of potential effects and mitigation measures.

# 5.20.5 Cultural Heritage

A Cultural Heritage Report: Impact Assessment was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-105. Additional details can be found in **Appendix F2**.

5.20.5.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

One CHL and one BHR (RH-05 and RH-06 respectively) have been identified adjacent to the Don Valley Layover Location.

There are no anticipated footprint impacts resulting in direct or indirect impacts to the CHL (RH-05) and therefore no mitigation measures are required.

The one BHR (RH-06; Prince Edward Viaduct bridge) adjacent to the layover facility is not expected to be subject to direct impacts in relation to significant views. The footprint of the proposed layover facility will not physically impact the bridge substructure or superstructure resulting in the demolition, removal or alteration. No views were identified as significant in the Designation By-law for the subject bridge; however, significant views are identified in the City of Toronto Official Plan (Schedule 4). Significant views are identified from the subject bridge to the downtown core of the City of Toronto (View 1g on Map 7a in the Official Plan). This view will not be impacted by the proposed layover facility.

Based on assessment findings conducted as part of this project, prominent views to this landmark structure are available from the following key vantage points: Riverdale Park to the southeast, the Russell Hill Lookout to the northeast, users of the Lower Don Valley Recreational Trail, and to motorists on the Don Valley Parkway. These views are not outlined in the Official Plan as significant:

- Views to the subject bridge from the Russell Hill Lookout and Riverdale Park are not anticipated to be permanently negatively impacted by the construction of the proposed Don Valley Layover Facility due to the scale of the anticipated structures and the obstruction of views of this area due to seasonal tree cover in the Don Valley. Accordingly, these impacts may be considered indirect in nature given their low magnitude and low frequency;
- Based on a review of the conceptual renderings provided, no significant impacts to views from motorists using the Don Valley Parkway are anticipated;
- Based on a review of the conceptual renderings provided, no significant obstructions to any full vistas of the subject bridge at large or individual components of the bridge are anticipated for users of the Lower Don River Recreational Trail; and
- The identified significant views from the subject bridge to the Don Valley or to the downtown core of the City of Toronto will not be obstructed or altered by the proposed construction of the layover facility.

Introduction of the proposed layover facility and its impacts on the setting and visual experience of the bridge are considered to be indirect based on the analysis presented above. The new facility will not significantly and permanently alter visual experiences of the bridge and its riverine setting within the Don River trail system. The scale of the facility in relation to the bridge will not physically overwhelm it and is not expected to significantly diminish the integrity of the property. The proposed facility is sited within a

location that has been already subject to recent alterations and land disturbances, presumably as part of construction staging activities associated with other infrastructure improvements. Additionally, impacts of the layover facility are considered reversible as the facility can be removed in the future.

As such, the proposed layover facility and its impacts on the Prince Edward Viaduct are considered to be of a low magnitude, severity, duration, and frequency. These indirect impacts can be mitigated through further design refinement with regard to scale, massing, height, and selection of exterior finishes, materials, and palettes. Post-construction landscaping plans may also mitigate visual impacts of the new facility on the setting of the bridge.

In order to reduce indirect impacts of the Don Valley Layover Facility and its related components on this bridge, a HIA should be conducted to help inform subsequent design stages. Such a study should consider and address the scale and massing of the ancillary buildings, as well as building finishes and palettes, grading plans, and post-construction landscaping plans. Consideration should be given to using materials, colours, and finishes that will make these structures physically and visually compatible with, subordinate to, and distinguishable from the surrounding landscape and the subject bridge.

5.20.5.2 Potential Effects & Mitigation Measures: Segment RH-1 – Mile 1.60 to Mile 2.15

One BHR (RH-01) was identified in this segment. However, there are no anticipated footprint impacts resulting in direct or indirect impacts to the BHR and therefore no mitigation measures are required.

5.20.5.3 Potential Effects & Mitigation Measures: Segment RH-2 – Mile 2.15 to Mile 2.50

Two BHRs (RH-02 and RH-03) were identified in this segment. However, there are no anticipated footprint impacts resulting in direct or indirect impacts to the BHRs and therefore no mitigation measures are required.

5.20.5.4 Potential Effects & Mitigation Measures: Segment RH-3 – Mile 2.50 to Mile 3.10 & Retaining Wall

One BHR (RH-06) was identified in this segment. However, there are no anticipated footprint impacts relating to track infrastructure resulting in direct or indirect impacts to the BHR and therefore no mitigation measures are required.

5.20.5.5 Potential Effects & Mitigation Measures: Segment RH-4 – Mile 3.10 to Mile 3.60

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.20.5.6 Potential Effects & Mitigation Measures: Segment RH-5 – Mile 3.60 to Mile 4.10 & Retaining Wall

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

5.20.5.7 Potential Effects & Mitigation Measures: Segment RH-6 – Mile 4.10 to Mile 4.65

There are no anticipated impacts of the proposed tracks in this segment therefore no mitigation measures have been proposed.

# 5.20.6 Archaeology

A Stage 1 Archaeological Assessment was undertaken for the New Track & Facilities TPAP. A summary of the findings and recommendations for the Richmond Hill Corridor can be found in the sections below. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-106. Additional details can be found in **Appendix G2**.



# 5.20.6.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

The Stage 1 Archeological Assessment confirmed seven previously registered archaeological sites are located within one kilometre of the study area (none of which are located within 50 metres) according to the OASD. Site details are presented below in Table 5-82. Additional background research of previous reports detail fieldwork completed within 50 metres of the Don Valley Layover study area was completed.

TABLE 5-82 DON VALLEY LAYOVER – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AjGu-58	Old Don Jail	Euro-Canadian	Jail	ASI 2007
AkGu-1	Withrow	Pre-Contact Indigenous	Village, ossuary	D. Boyle 1888,
				Konrad 1971
AkGu-5	Castle Frank	Pre-Contact Indigenous	Burial	Garrad 1972
AkGu-7	Don Valley Brick Works	Euro-Canadian	n/a	Royal Ontario Museum 1971
AkGu-40	Todmorden Mills	Euro-Canadian	Other	HHI 2015
AkGu-59	Don Valley Brick Works	Euro-Canadian	Manufacturing	ASI 2008
AkGu-74	House of Industry	Euro-Canadian	Manufacturing	ASI 2009; MTO 2009

There is the potential for the disturbance of unassessed or documented archaeological resources within the Don Valley Layover site, as shown in Figure 5-21. A Stage 2 Archaeological Assessment is recommended for areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities. Test pit surveys at five metre intervals, expect where ploughing is not viable, will be conducted by a professionally licensed archaeologist prior to disturbance.



FIGURE 5-21 EXCERPT OF APPENDIX G2, SEGMENT RH-4 MAP



No archaeological resources were encountered during the course of the Stage 2 Archaeological Assessment for the New Track and Facilities TPAP Don Valley Layover, therefore no further archaeological assessment is required.

5.20.6.2 Potential Effects & Mitigation Measures: Segment RH-1 – Mile 1.60 to Mile 2.15

Segment RH-1 contains ten previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres, according to the OSAD. Site details are presented below in Table 5-83.

TABLE 5-83 SEGMENT RH-1 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AjGu-16	Thornton Blackburn	Iroquoian; Afro-Canadian; Euro -Canadian	Camp/campsite; Homestead House; School	Karolyn Smardz 1984; ASI 2011
AjGu-35	J.G. Worts Residence	Euro-Canadian	Homestead	ASI 1996
AjGu-39	St. Paul's Catholic Cemetery	Archaic, Middle; Euro-Canadian	Unknown; Cemetery, school	HH 1998
AjGu-41	Parliament	Euro-Canadian	Administrative, other building	ASI 2000
AjGu-46	Gooderham and Worts Windmill	Euro-Canadian	Mill	ASI 2003
AjGu-61	Toronto Lime Kiln Works	Euro-Canadian	Homestead	Archeoworks 2008
AjGu-64	Lime Kiln Works Site	Euro-Canadian	Industrial Lime Kiln House	Archeoworks Inc. 2009
AjGu-65	Bright-Barber	Euro-Canadian	Residential	ASI 2010
AjGu-66	n/a	Euro-Canadian	Soap and candle factory	ASI 2010
AjGu-77	Alverthorpe	Euro-Canadian	House Inn	URS Canada 2011

The Stage 1 Archaeological Assessment reviewed seven previous reports with properties located within 50 metres of the Segment RH-1 study area, and confirmed that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required, and therefore, no mitigation/compensation measures are recommended.

5.20.6.3 Potential Effects & Mitigation Measures: Segment RH-2 - Mile 2.15 to Mile 2.50

Segment RH-2 contains thirteen previously registered archaeological sites are located within one kilometre of the RH-2 study area, none of which are located within 50 metres, according to the OSAD. Site details are presented below in Table 5-84.

# TABLE 5-84 SEGMENT RH-2 - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AjGu-58	Old Don Jail	Euro-Canadian	Jail	ASI 2007
AjGu-16	Thornton Blackburn	Iroquoian; Afro- Canadian; Euro - Canadian	Camp/campsite; Homestead; House; School	Karolyn Smardz 1984; ASI 2011
AjGu-35	J.G. Worts Residence	Euro-Canadian	Homestead	ASI 1996
AjGu-39	St. Paul's Catholic Cemetery	Archaic, Middle; Euro- Canadian	Unknown; Cemetery, school	HH 1998
AjGu-41	Parliament	Euro-Canadian	Administrative, other building	ASI 2000
AjGu-46	Gooderham and Worts Windmill	Euro-Canadian	Mill	ASI 2003
AjGu-61	Toronto Lime Kiln Works	Euro-Canadian	Homestead	Archeoworks 2008
AjGu-64	Lime Kiln Works Site	Euro-Canadian	Industrial Lime Kiln House	Archeoworks Inc. 2009
AjGu-65	Bright-Barber	Euro-Canadian	Residential	ASI 2010
AjGu-66	n/a	Euro-Canadian	Soap and candle factory	ASI 2010
AjGu-77	Alverthorpe	Euro-Canadian	House Inn	URS Canada 2011
AkGu-1	Withrow	Pre-Contact Indigenous	Village, ossuary	D. Boyle 1888, Konrad 1971
AkGu-74	House of Industry	Euro-Canadian	Manufacturing	ASI 2009; MTO 2009

The assessment determined that there is no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential. No further archaeological assessment is required.

5.20.6.4 Potential Effects & Mitigation Measures: Segment RH-3 – Mile 2.50 to Mile 3.10 & Retaining Wall

Refer to Section 5.20.6.1 which describes archaeological impacts for the Don Valley Layover which comprises Segment RH-3.

Segment RH-3 contains four previously registered archaeological sites are located within 1 km of the study area, none of which are located within 50 metres, according to the OASD. Site details are presented in Table 5-85.

TABLE 5-85 SEGMENT RH 3 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AjGu-58	Old Don Jail	Euro-Canadian	Jail	ASI 2007
AkGu-1	Withrow	Pre-Contact Indigenous	Village, ossuary	D. Boyle 1888,
				Konrad 1971
AkGu-5	Castle Frank	Pre-Contact Indigenous	Burial	Garrad 1972



# 

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGu-74	House of Industry	Euro-Canadian	Manufacturing	ASI 2009; MTO 2009

There is potential for the disturbance of unassessed or documented archaeological resources. For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, a Stage 2 Archaeological Assessment conducted by test pit survey at five metre intervals will be conducted by a professionally licensed archaeologist prior to disturbance.

No archaeological resources were encountered during the course of the Stage 2 Archaeological Assessment for the New Track and Facilities TPAP Don Valley Layover, therefore no further archaeological assessment is required.



FIGURE 5-22 AREA DISTURBED ALONG THE RICHMOND HILL CORRIDOR, NO POTENTIAL FOR ARCHAEOLOGICAL IMPACTS

5.20.6.5 Potential Effects & Mitigation Measures: Segment RH-4 – Mile 3.10 to Mile 3.60

Refer to Section 5.20.6.1 which describes archaeological impacts for the Don Valley Layover which comprises Segment RH-4.

Segment RH-4 contains seven previously registered archaeological sites are located within 1 km of the study area, none of which are located within 50 metres, according to the OASD. Site details are presented below in Table 5-86.

TABLE 5-86 SEGMENT RH-4 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AjGu-58	Old Don Jail	Euro-Canadian	Jail	ASI 2007
AkGu-1	Withrow	Pre-Contact Indigenous	Village, ossuary	D. Boyle 1888,
				Konrad 1971
AkGu-5	Castle Frank	Pre-Contact Indigenous	Burial	Garrad 1972

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGu-7	Don Valley Brick Works	Euro-Canadian	n/a	Royal Ontario Museum 1971
AkGu-40	Todmorden Mills	Euro-Canadian	Other	HHI 2015
AkGu-59	Don Valley Brick Works	Euro-Canadian	Manufacturing	ASI 2008
AkGu-74	House of Industry	Euro-Canadian	Manufacturing	ASI 2009; MTO 2009

There is potential for the disturbance of unassessed or documented archaeological resources. For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, a Stage 2 Archaeological Assessment conducted by test pit survey at five metre intervals will be conducted by a professionally licensed archaeologist prior to disturbance.

No archaeological resources were encountered during the course of the Stage 2 Archaeological Assessment for the New Track and Facilities TPAP Don Valley Layover, therefore no further archaeological assessment is required.

5.20.6.6 Potential Effects & Mitigation Measures: Segment RH-5 – Mile 3.60 to Mile 4.10 & Retaining Wall

Refer to Section 5.20.6.1 which describes archaeological impacts for the Don Valley Layover which comprises Segment RH-5.

Segment RH-5 contains four previously registered archaeological sites are located within 1 km of the study area, none of which are located within 50 m, according to the OASD. Site details are presented below in Table 5-87.

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGu-5	Castle Frank	Pre-Contact Indigenous	Burial	Garrad 1972
AkGu-7	Don Valley Brick Works	Euro-Canadian	n/a	Royal Ontario Museum 1971
AkGu-40	Todmorden Mills	Euro-Canadian	Other	HHI 2015
AkGu-59	Don Valley Brick Works	Euro-Canadian	Manufacturing	ASI 2008

TABLE 5-87 SEGMENT RH-5 – PREVIOUSLY REGISTERED SITES WITHIN ONE KILOMETRE

Additionally, The Stage 1 Archaeological Assessment determined that there is no potential for the disturbance of unassessed or documented archaeological resources within Segment RH-5 due to electrification infrastructure.

5.20.6.7 Potential Effects & Mitigation Measures: Segment RH-6 – Mile 4.10 to Mile 4.65

Segment RH-6 contains three previously registered archaeological sites are located within 1 km of the study area, according to the OASD. Site details are presented below in Table 5-88. Additional background research of seven previous reports detail fieldwork completed within 50 metres of the RH-6 study area.

# TABLE 5-88 SEGMENT RH-6 PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN ONE KILOMETRE

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGu-7	Don Valley Brick Works	Euro-Canadian	n/a	Royal Ontario Museum 1971
AkGu-40	Todmorden Mills	Euro-Canadian	Other	HHI 2015
AkGu-59	Don ∀alley Brick Works	Euro-Canadian	Manufacturing	ASI 2008

The assessment determined that there is no potential for the disturbance of unassessed or documented archaeological resources within Segment RH-6, therefore, no further archaeological assessment is required.

5.20.7 Stormwater Management

A Stormwater Management Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments for the Don Valley Layover Facility are outlined in Table 5-109. Additional details can be found in **Appendix H**.

5.20.7.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

#### Hydrologic Analysis

#### **Drainage Areas**

The proposed Don Valley Layover Facility site development will include access roads, site office buildings, sanitary waste disposal building, electrical/storage building and layover track enclosed by a chain link fence. The site will have a mix of industrial impervious surfaces, track and ballast areas and open space. The industrial impervious, track and ballast and open space areas are 0.98, 0.73 and 5.55 ha respectively. The drainage areas and runoff coefficients for the proposed catchment area analyzed are shown in Table 5-89. The composite runoff coefficients for this area is 0.46. Runoff coefficients for industrial and open space were taken from the Toronto Design Criteria for Sewers and Watermains (November 2009). Runoff coefficients for track and ballast areas were taken from the Colorado DOT report titled, "Modeling Ballasted Tracks for Runoff Coefficient C" (August 2012). See Table 5-89 for characteristics of the proposed drainage areas. It should be noted that the existing and proposed catchment areas are based on preliminary assumptions and need to be reconfirmed during detailed design.

Runoff from the western portion of the developed site will discharge over the natural grade into to the Don River, mimicking existing condition. At three (3) locations along the west side of the proposed access road, rip-rap is proposed at localized low points to control overland flow. Two (2) precast concrete culverts are proposed to carry flows (north-south) across a part of the proposed access road. Runoff from the eastern access road and site facilities will be collected in a series of catch basins, routed through an oil-grit separator for quality treatment, and discharged to an existing municipal storm sewer system at south end of the site. The use of ditches/swales are not recommended at this location since the site is partially within the existing floodplain. Metrolinx shall review and mitigate the potential for backwatering of the precast culverts due to flooding to be confirmed during detailed design stage. The proposed development areas and their locations are based on conceptual design and may be refined as the design progresses. Therefore, reassessment of the drainage areas will be required at subsequent design stages, as necessary. The existing and proposed drainage areas and runoff coefficients are summarized below in Table 5-89. Runoff coefficient for open space will be verified after soil type is determined during detailed design investigation.



# TABLE 5-89 DON VALLEY LAYOVER - EXISTING AND PROPOSED DRAINAGE AREAS

Existing Condition Catchment 1			Proposed Condition Catchment 1		
Area Type	Drainage Area (ha)	Runoff Coefficient	Area Type	Drainage Area (ha)	Runoff Coefficient
Track and Ballast	0.73	0.84	Track and Ballast	0.73	0.84
Industrial Impervious	-	-	Industrial Impervious	0.98	0.85
Open Space	6.53	0.30	Open Space	5.55	0.30
Total/Composite	7.26	0.35	Total/Composite	7.26	0.46

# Flow Analysis

A preliminary analysis of runoff from the site area was completed to assess the requirement of proposed measures and to mitigate the impact of the development on stormwater drainage. The Rational Formula was used to determine flows for the existing and the proposed development conditions. There is only one catchment area assumed in this analysis.

As discussed, the new development will increase the impervious area and, therefore, the stormwater runoff. Flows were computed for the 2 year to 100-year storm events using City of Toronto IDF Data Sets found in the Toronto Design Criteria for Sewers and Watermains (November 2009). The runoff for the 25mm storm was computed using equation 4.8 and 4.9 presented in the Stormwater Management Planning and Design manual by MOE (March 2003) to assess the requirements for the runoff quality control. An estimated time of concentration (Tc) of 10 minutes was used in the flow computations.

Parameters used for the computations were determined from the City of Toronto IDF Data Sets found in the Toronto Design Criteria for Sewers and Watermains (November 2009). Results are summarized below in Table 5-90. A factor of 25% is applied to the post-development flows as per the Metrolinx Climate Change Initiative.

	Exist. Flow	Post Day	Flow Increase	Metrolinx Climate Change Initiative (+25%)		
Storm Event		Flow		Post Dev. Flow	Flow Increase	% Increase
	m³/s	m³/s	m³/s	m³/s	m³/s	
25mm	0.151	0.243	0.091	0.303	0.152	100.4
2yr	0.631	0.827	0.196	1.034	0.403	63.8
5yr	0.944	1.236	0.293	1.546	0.602	63.8
10yr	1.162	1.522	0.361	1.903	0.741	63.8
25yr	1.357	1.778	0.421	2.222	0.866	63.8
50yr	1.606	2.104	0.498	2.631	1.025	63.8
100yr	1.792	2.348	0.556	2.935	1.143	63.8

TABLE 5-90 DON VALLEY LAYOVER - EXISTING AND PROPOSED DEVELOPMENT FLOWS

Development Impact on Drainage & Proposed Measures (Footprint Impacts)

The proposed Don Valley Layover Facility development will increase the industrial use of the site resulting in substantial increased discharges. As shown in Table 5-90, the theoretical increase in flows

resulting from the Don Valley Layover Facility development is significant when considering future climate changes, therefore, measures for the quantity, quality and water balance will be required to verify those post-development conditions during detailed design.

Based on the finalized RCD, the proposed site is raised above the 100-year floodplain elevation, while all proposed buildings are floodproofed to elevation 84.2 (Regulatory floodplain elevation 83.9m + 0.3m). However, part of the site under existing condition remains within the floodplain and further investigation and analysis will be required during detailed design, as well as consultation with TRCA and the City of Toronto, to mitigate flooding risks.

Runoff from the proposed site facilities, layover track and eastern access road will be collected in storm sewers, routed through an oil-grit separator for quality treatment, prior to discharging into an existing municipal storm sewer at the southern site limit. Drainage from the rest of the developed site (western access road) will discharge overland with rip-rap at three (3) localized low points. Two (2) precast culverts are proposed to carry flows through a part of the access road. Rip-rap is proposed at each of these low points and at the culvert outlets and will disperse site drainage overland prior to discharging into the Don River. TRCA criteria requires that rip-rap at culvert outlet be set at an elevation above the 25-year floodplain elevation (80.0m) (as per TRCA SWM Criteria manual, Section 2.4 Outfall Structure and Plunge Pool). All proposed outfalls need to meet TRCA Appendix E.2 criteria, as such "should be at an oblique angle to the watercourse and supported by a fluvial geomorphologist". It is anticipated that the quantity and quality control criteria will be achieved by the proposed storm sewer system and OGS. Further analysis is needed at the detailed design stage to develop a treatment train and to determine if the existing sewer in vicinity and/or Don River can accommodate the discharge from the developed portions of the proposed site.

In accordance with Metrolinx standards, storm sewer system for all new facilities shall include provisions for spill capture and containment. Automated oil shutoff valves and oil/water separators from all drainage lines from all drip trays will be installed prior to drainage entering the existing storm system. Drip trays and track drainage layouts will be confirmed and evaluated during detailed design.

Excavations for the Don Valley Layover are expected to be shallow (less than 1 m in depth) for construction. The Don River and an associated wetland is located adjacent to the proposed Layover. Suitable sedimentation controls should be in place to help control and reduce the turbidity of run-off water which may flow towards the River. The detailed design should aim to replicate existing drainage pattern and minimize grading changes. A potential significant impact of the proposed development on existing drainage features is at the west limit of the proposed layover, where the proposed modification to the existing access road is encroaching on the existing east bank of the Don River. A Geotechnical Study is required to address the overall setback distance (Erosion Hazard Limit) as described in "TRCA Geotechnical Engineering Design and Submission Requirements", with three components:

- Toe Erosion Allowance;
- Geotechnical Stable Slope Allowance; and
- Erosion Access Allowance.

Safe access will be reviewed following this investigation and to be confirmed by the Constructor during detailed design.

A detailed analysis for the quantity, quality, erosion control and water balance will be required at the detailed design stage. The analysis shall include details for a treatment train approach which prioritizes minimizing footprint impacts while satisfying quantity and quality criteria.

# 

#### **Recommendations**

From the hydrological analysis and the subsequent discussion presented in this section of the report, it is concluded that the construction of the Don Valley Layover Facility will result in significant increase to the runoff rate and quantity compared to existing conditions. A treatment train system consisting of oil-grit separator(s) will provide further quantity and quality control for a portion of the site runoff. However, extensive analysis and coordination with the City and TRCA during detailed design stage will need to be completed to determine the requirements and capacity of the existing/to-remain and proposed stormwater measures and infrastructure.

The flow contribution to existing swales, culverts and storm sewers and their capacities are not known at this stage. A firm design will be presented at detailed design stage, utilizing information from the survey and the municipal data to determine the capacity of the existing structures and the site runoff outfalls.

Some other considerations include the following:

- To avoid/minimize excavation and dewatering requirement, shallow foundations are recommended;
- Analyze and recommend Low Impact Development (LID) measures to effectively address Water Quantity and Erosion, while taking flooding risks and space constraints into account (e.g. roof retention might be more appropriate than bioswale given the flooding risk);
- Given the industrial nature of the site and potentially poor infiltration rate, innovative ESC measures that doesn't depend on infiltration should be further investigated. It is especially critical at this location for ESC design to address both the ultimate condition and the interim (during construction);
- Proposed new development of the site will minimize grading impact to existing site;
- Final site condition and temporary conditions (during construction) shall avoid alternation to the valley and other water features;
- TRCA had expressed concerns that this proposed layover is within a flood prone area and noted recent flooding events (most recently January 11, 2020). Further investigation and analysis of flooding impacts, including potential backwatering (downstream) and overflows (upstream) is required. TRCA has requested 2-D HEC RAS modelling and cut-and-fill analysis for flood control and potential Fluvial Geomorphology investigation to be completed at the site, with consideration given to the Don River Hydrology Final Report, Marshall Macklin Monaghan, 2018; and
- From a SWM perspective, this is a very challenging location and is exposed to flood risk.

# ->>> METROLINX



FIGURE 5-23 DON VALLEY LAYOVER - TRCA REGULATED MAPPING<sup>5</sup>

<sup>\*</sup>This mapping has been developed through publicly available sources for the purposes of this Report.

# 5.20.8 Traffic

A Traffic Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Additional details can be found in **Appendix I**.

5.20.8.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

Refer to EPR Chapter 6 for a summary of potential effects and mitigation.

5.20.9 Utilities

A Utilities Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-110. Additional details can be found in **Appendix J**.

#### 5.20.9.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

As part of the assessment the following potential conflicts have been identified in Table 5-91. All conflicts identified below are to be confirmed pending further investigations. All assets within the Metrolinx layover site development area will need to be removed and relocated and/or locally lowered with a casing pipe across all tracks. Reservicing of the site will be required.

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Bell	UG - Parallel	Communication Cable	Unknown	Plastic	Don ∀alley Pkwy
Hydro One Tx	OH - Crossing	Conductor (Transmission)	11kV	Metallic	Bayview Ave
Hydro One Tx	UG - Parallel	Conductor (Transmission)	115k∨	Concrete	Prince Edward Viaduct
Hydro One Tx	UG - Parallel	Conductor (Transmission)	Ok∨	Concrete	Prince Edward Viaduct
Trans-Northern	UG - Parallel	Oil Pipeline	273.1 pipe, 406.4 casing	Metallic	Bloor St E
Imperial Oil	UG - Parallel	Oil Pipeline	273.1mm	Metallic	Bloor St E
Sun-Canadian	UG - Parallel	Oil Pipeline	219.1mm	Metallic	Bloor St E
Enbridge Gas	UG - Parallel	Gas	30"	Steel	Bloor St E
City of Toronto	UG - Crossing	Storm Sewer	1650mm	Concrete	Don Valley Parkway
Hydro One Tx	UG - Crossing	Conductor (Transmission)	115k∨	Concrete	Prince Edward Viaduct
Hydro One Tx	UG - Parallel	Conductor (Transmission)	115k∨	Concrete	Don Valley Pkwy & Rosedale Valley Rd
Hydro One Tx	UG - Parallel	Conductor (Transmission)	115k∨	Concrete	Don Valley Pkwy & Rosedale Valley Rd
Hydro One Tx	UG - Parallel	Conductor (Transmission)	115kV	Concrete	Don Valley Pkwy & Rosedale Valley Rd

TABLE 5-91 DON VALLEY LAYOVER - POTENTIALLY IMPACTS UTILITIES



Owner Name	Utility Class	Description	Size	Material	Nearest Street
City of Toronto	UG - Crossing	Watermain	400mm	Cast Iron	Rosedale ∀alley Rd
Hydro One Tx	OH-Crossing	Conductor (Transmission)	115kV115	Metallic	Bayview Ave

5.20.9.2 Potential Effects & Mitigation Measures: Segment RH-1 – Mile 1.60 to Mile 2.15

# Track

Track upgrades in Segment RH-1 are occurring within the same footprint of the existing tracks. Excavations required for track upgrades do not typically exceed 0.4 m and therefore there are no anticipated utility impacts in Segment RH-1.

#### **OCS** Infrastructure

The following utilities are potentially impacted in Table 5-92. These conflicts are spatial and/or electrical in nature. Conflicts are mitigated by the removal, relocation, reconfiguration or burial of overhead utilities. It should be noted that high-voltage utilities (115 kV and higher) need to be reviewed in conjunction with Hydro One on a case-by-case basis.

TABLE 5-92 SEGMENT RH-1 POTENTIALLY IMPACTED UTILITIES DUE TO	ocs
INFRASTRUCTURE	

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communications Cable	Unknown	Unknown	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Unknown	Bayview Ave
Bell	UG - Parallel	Communications Cable	Unknown	Unknown	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Unknown	Bayview Ave
Hydro One	OH - Parallel	Electrical Conduit	115k∨	Metallic	Bayview Ave

5.20.9.3 Potential Effects & Mitigation Measures: Segment RH-2 – Mile 2.15 to Mile 2.50

#### Track

The following potential conflicts have been identified in Table 5-93. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

# TABLE 5-93 SEGMENT RH-2 POTENTIALLY IMPACTED UTILITIES DUE TO TRACK INFRASTRUCTURE

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Enbridge Gas	UG - Parallel	Gas	30"	Steel	Eastern Ave to River St
Hydro One	UG - Crossing	Electrical Duct Bank	Ok∨	Unknown	Don ∀alley Pkwy



Owner Name	Utility Class	Description	Size	Material	Nearest Street
Hydro One	UG - Crossing	Electrical Duct Bank	115kV	Unknown	South of Gerrard St E
Hydro One	UG - Parallel	Electrical Duct Bank	Ok∨	Concrete	Bayview Ave
Hydro One	UG - Parallel	Electrical Duct Bank	115kV	Concrete	Bayview Ave
Rogers	UG - Crossing	Communications Cable	Unknown	Fiber	Gerrard St E
Rogers	UG - Crossing	Communications Cable	Unknown	Fiber	Gerrard St E
Bell	UG - Crossing	Communication Conduit	Unknown	Plastic	Gerrard St E

# OCS Infrastructure

The following utilities are potentially impacted in Table 5-94. These conflicts are spatial and/or electrical in nature. Conflicts are mitigated by the removal, relocation, reconfiguration or burial of overhead utilities. It should be noted that high-voltage utilities (115 kV and higher) need to be reviewed in conjunction with Hydro One on a case-by-case basis.

TABLE 5-94 SEGMENT RH-2 POTENTIALLY IMPACTED UTILITIES DUE TO OCS INFRASTRUCTURE

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Bell	UG - Parallel	Communications Cable	Unknown	Plastic	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Hydro One	OH - Parallel	Electrical Conduit	115kV	Metallic	Bayview Ave
Assumed Toronto Hydro	OH - Parallel	Conductor	Unknown	Metallic	Dundas St E & Bayview Ave
Unknown	OH - Parallel	Cable	Unknown	Unknown	Cornwall St & Bayview Ave
Hydro One	UG - Crossing	Electrical Duct Bank	115kV	Unknown	South of Gerrard St E
Hydro One	UG - Crossing	Electrical Duct Bank	115kV	Unknown	South of Gerrard St E
Hydro One	UG - Parallel	Electrical Duct Bank	0kV	Concrete	Bayview Ave
Hydro One	UG - Parallel	Electrical Duct Bank	115kV	Concrete	Bayview Ave



5.20.9.4 Potential Effects & Mitigation Measures: Segment RH-3 – Mile 2.50 to Mile 3.10 and Retaining Wall

#### Track

The following potential conflicts have been identified in Table 5-95. These conflicts are spatial in nature. All conflicts identified below are to be confirmed pending further investigations. Conflicts can be mitigated by the removal, reconfigurations, relocation, lowering and/or casing extension of utilities.

TABLE 5-95 SEGMENT RH-3 POTENTIALLY IMPACTED UTILITIES DUE TO TRACK INFRASTRUCTURE

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Eastern Ave to River St
Enbridge Gas	UG - Parallel	Gas	30"	Steel	Bayview Ave
Hydro One	UG - Parallel	Electrical Duct Bank	0k∨	Concrete	Bayview Ave
Hydro One	UG - Parallel	Electrical Duct Bank	115k∨	Concrete	Gerrard St E
Bell	UG - Crossing	Communication Conduit	Unknown	Plastic	River St
Enbridge Gas	UG - Crossing	Gas	30" pipe, 36" casing	Steel in Unknown Casing	Bayview Ave

# **OCS Infrastructure**

The following utilities are potentially impacted in Table 5-96. These conflicts are spatial and/or electrical in nature. Conflicts are mitigated by the removal, relocation, reconfiguration or burial of overhead utilities. It should be noted that the OCS layout within the Layover site has not yet been finalised and cannot be assessed at this time. In addition, high-voltage utilities (115 kV and higher) need to be reviewed in conjunction with Hydro One on a case-by-case basis.

TABLE 5-96 SEGMENT RH-3 POTENTIALLY IMPACTED UTILITIES DUE TO OCS INFRASTRUCTURE

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Bell	UG - Parallel	Communications Cable	Unknown	Plastic	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Hydro One	OH - Parallel	Electrical Conduit	115k∨	Metallic	Bayview Ave
Assumed Toronto Hydro	OH - Parallel	Conductor	Unknown	Metallic	Dundas St E & Bayview Ave



Owner Name	Utility Class	Description	Size	Material	Nearest Street
Hydro One	UG - Parallel	Electrical Duct Bank	0k∨	Concrete	Bayview Ave
Hydro One	UG - Parallel	Electrical Duct Bank	115k∨	Concrete	Bayview Ave
Unknown	OH - Parallel	Cable	Unknown	Unknown	Gerrard St E & Bayview Ave
Enbridge Gas	UG - Crossing	Gas	Unknown	Steel in Unknown Casing	River St
Bell	UG - Parallel	Communication Conduit	Unknown	Plastic	Don Valley Pkwy
Hydro One	OH - Crossing	Electrical Conduit	11k∨	Metallic	Bayview Ave
Hydro One	UG - Parallel	Electrical Duct Bank	115kV	Concrete	Prince Edward Viaduct
Hydro One	UG - Parallel	Electrical Duct Bank	0kV	Concrete	Prince Edward Viaduct
Trans-Northern	UG - Parallel	Fuel	273.1/406.4	Metallic	Bloor St E
Imperial Oil	UG - Parallel	Fuel	273.1	Metallic	Bloor St E
City of Toronto	UG - Crossing	Storm	3400mm	Concrete	Rosedale Valley Rd
Hydro One	UG - Parallel	Electrical Duct Bank	115k∨	Concrete	Don Valley Pkwy & Rosedale Valley Rd
Hydro One	UG - Parallel	Electrical Duct Bank	115k∨	Concrete	Don ∀alley Pkwy & Rosedale ∀alley Rd
Assumed Metrolinx	UG - Crossing	Culvert	660mm	Unknown	Bayview Ave N of Rosedale Valley Rd

# Don Valley Layover Facility Structures

Refer to Section 5.20.5.1 above, which describes utilities impacts and mitigation measures for the Unionville Storage Yard and comprises Segment RH-3.

5.20.9.5 Potential Effects & Mitigation Measures: Segment RH-4 – Mile 3.10 to Mile 3.60

#### Track

There are no anticipated utility impacts in Segment RH-4. Track upgrades in Segment RH-4 are occurring within the same footprint of the existing tracks. Excavations required for track upgrades do not typically exceed 0.4m and therefore there are no anticipated utility impacts in Segment RH-4.

# OCS Infrastructure

The following utilities are potentially impacted in Table 5-97. These conflicts are spatial and/or electrical in nature. Conflicts are mitigated by the removal, relocation, reconfiguration or burial of overhead utilities. It should be noted that the OCS layout within the Layover site has not yet been



finalised and cannot be assessed at this time. In addition, high-voltage utilities (115 kV and higher) need to be reviewed in conjunction with Hydro One on a case-by-case basis.

TABLE 5-97 SEGMENT RH-4 POTENTIALLY IMPACTED UTILITIES DUE TO OCS INFRASTRUCTURE

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Bell	UG - Parallel	Communications Cable	Unknown	Plastic	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Bell	UG - Parallel	Communication Conduit	Unknown	Plastic	Don Valley Pkwy
Hydro One	OH - Crossing	Electrical Conduit	11k∨	Metallic	Bayview Ave
Hydro One	UG - Parallel	Electrical Duct Bank	1 <b>1</b> 5k∨	Concrete	Prince Edward Viaduct
Hydro One	UG - Parallel	Electrical Duct Bank	0k∨	Concrete	Prince Edward Viaduct
Trans-Northern	UG - Parallel	Fuel	273.1 pipe, 406.4 casing	Metallic	Bloor St E
Imperial Oil	UG - Parallel	Fuel	273.1	Metallic	Bloor St E
Hydro One	UG - Parallel	Electrical Duct Bank	115k∨	Concrete	Don Valley Pkwy & Rosedale Valley Rd
Hydro One	UG - Parallel	Electrical Duct Bank	115k∨	Concrete	Don Valley Pkwy & Rosedale Valley Rd
Bell	UG - Crossing	Communications Cable	Unknown	Plastic	Bloor St E
Bell	UG - Crossing	Communication Conduit	Unknown	Plastic	Bloor St E
Rogers	UG - Crossing	Communications Cable	Unknown	Fiber	Prince Edward Viaduct
Hydro One	OH - Crossing	Electrical Conduit	115kV	Metallic	Bayview Ave
Unknown	OH - Parallel	Cable	Unknown	Unknown	Bayview-Bloor Ramp

# Don Valley Layover Facility Structures

Refer to Section 5.20.5.1 above, which describes utilities impacts and mitigation measures for the Unionville Storage Yard and comprises Segment RH-4.

5.20.9.6 Potential Effects & Mitigation Measures: Segment RH-5 – Mile 3.60 to Mile 4.10 & Retaining Wall

# Track

There are no proposed track upgrades in Segment RH-5 and therefore no anticipated utility impacts caused by track work.



# **OCS Infrastructure**

The following utilities are potentially impacted in Table 5-98. These conflicts are spatial and/or electrical in nature. Conflicts are mitigated by the removal, relocation, reconfiguration or burial of overhead utilities. It should be noted that the OCS layout within the Layover site has not yet been finalised and cannot be assessed at this time.

Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Bell	UG - Parallel	Communications Cable	Unknown	Plastic	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Trans-Northern	UG - Parallel	Fuel	273.1 pipe, 406.4 casing	Metallic	Bloor St E
Imperial Oil	UG - Parallel	Fuel	273.1mm	Metallic	Bloor St E
Hydro One	OH - Crossing	Electrical Conduit	1 <b>15</b> k∨	Metallic	Bayview Ave
Unknown	OH - Parallel	Cable	Unknown	Unknown	Bayview-Bloor Ramp
Unknown	OH - Crossing	Cable	Unknown	Unknown	Bayview-Bloor Ramp
Enbridge Gas	UG - Crossing	Gas	16"	Steel Coated	Bloor St E
Toronto Hydro	OH - Crossing	Conductor	Unknown	Metallic	Bayview-Bloor Ramp
Assumed Toronto Hydro	OH - Parallel	Conductor	Unknown	Metallic	GO Transit Don Branch

TABLE 5-98 SEGMENT RH-5 POTENTIALLY IMPACTED UTILITIES DUE TO OC	S
INFRASTRUCTURE	

#### Don Valley Layover Facility Structures

Refer to Section 5.20.5.1 above, which describes utilities impacts and mitigation measures for the Don Valley Layover and comprises Segment RH-5.

5.20.9.7 Potential Effects & Mitigation Measures: Segment RH-6 – Mile 4.10 to Mile 4.65

#### Track

There are no proposed track upgrades in Segment RH- 6 and therefore no anticipated utility impacts cause by track work.

#### **OCS** Infrastructure

As part of the assessment the following potential conflicts have been identified Table 5-99. These conflicts are spatial and/or electrical in nature. Conflicts are mitigated by the removal, relocation, reconfiguration or burial of overhead utilities. It should be noted that high-voltage utilities (115 kV and higher) are currently being reviewed in conjunction with Hydro One on a case-by-case basis.



Owner Name	Utility Class	Description	Size	Material	Nearest Street
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Bell	UG - Parallel	Communications Cable	Unknown	Plastic	Bayview Ave
Rogers	UG - Parallel	Communications Cable	Unknown	Fiber	Bayview Ave
Trans-Northern	UG - Parallel	Fuel	273.1 pipe, 406.4 casing	Metallic	Bloor St E
Imperial Oil	UG - Parallel	Fuel	273.1mm	Metallic	Bloor St E
Toronto Hydro	OH - Crossing	Conductor	3 phase	Metallic	Pottery Rd

# TABLE 5-99 SEGMENT RH-6 POTENTIALLY IMPACTED UTILITIES

5.20.10 Electromagnetic Fields/Electromagnetic Interference (EMF/EMI)

An EMI/EMF Impact Assessment Report was undertaken for the New Track & Facilities TPAP. Mitigation measures and commitments were characterized and grouped as outlined in Table 5-111. Additional details can be found in **Appendix N**.

5.20.10.1 Potential Effects & Mitigation Measures - Electrification of Richmond Hill Corridor

Throughout all segments of this corridor, as with all other corridors under study for the Impact Assessment, the potential effects and mitigations are identical. This is true regardless of the presence of a layover facility in the territory.

The potential effects due to operating an electrified transit system for this segment are largely the result of overhead catenary wires to power the train, the operation of 25kV aerial feeder lines to power the catenary, and EMI/EMF emanating from motors and other devices within the rail vehicles. They are summarized as follows:

- EMI;
- Time-Varying EMFs;
- Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables and Earth (grounding) Networks;
- Unintended Contact with High-Voltage Source; and
- ELF EMF.

The EMI would be the result of high frequency generated by the scraping of the pantograph down the catenary and the motors used to power the train. The EMFs would be the result of current flow down the catenary and within the passenger compartments of the train. The induced current would be the result of current flow down the catenary or the feeder wires. The unintended contact with the high-voltage source would be the result of access to the catenary, live wires inside the passenger compartment, or access to the feeder wires.

Mitigation for each of these potential effects has been implemented as part of the design of the system. The power methodology for the Metrolinx system—auto-transformer power—was selected specifically for its performance with regard to EMI. Additional mitigation methodologies include the following:

Implementation and use of an EMC Control Plan;



- Proper design, e.g., grounding and shielding as per applicable Canadian electrical standards, physical separation, as identified from bench-marking similar properties across North America;
- During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole will be field tested and verified to ensure EMFs are within the limits of applicable industry standards; and
- Verify ELF EMF by measurements taken before and after project implementation.

# 5.20.11 Phase I ESA

A Phase I Environment Site Assessment (ESA) was completed for the proposed Don Valley Layover site to assess and characterize potential contamination. The purpose of the Phase I ESA was to identify potential or actual environmental contamination as a result of current or past activities. The Phase I ESA was generally completed based on the requirements of the Canadian Standards Association (CSA) Phase I ESA document, Z768-01 (R2016), November 2001, reaffirmed in 2016 (CSA Standard).

# 5.20.11.1 Potential Effects & Mitigation Measures: Don Valley Layover Facility

The proposed Don Valley Layover site is bounded by the connector road linking the Don Valley Parkway (DVP) to Bayview Avenue and Bloor Street to the north, the DVP to the east, a segment of rail corridor (previously as part of Canadian Pacific Railway (CPR) – Don Branch) to the south, and the Don River to the west, within the City of Toronto

A 100 m study area was applied from the boundary of the layover site for the purposes of determining whether PCAs or APEC could lead to significant environmental contaminant impacts at the layover. The following Table presents a general description of PCAs identified through the Phase I ESA and presents recommendations from this study.

TABLE 5-100 GENERAL PCAS AND RECOMMENDATIONS FOR THE PROPOSED DON VALLEY LAYOVER FACILITY

Site	General PCA Descriptions within the 100m Study Area	Media Potentially Impacted	Recommendations
Don Valley Layover	<ul> <li>Rail yards, tracks and spurs</li> <li>Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners</li> <li>Importation of fill material of unknown quality</li> <li>Gasoline and associated products storage in fixed tanks</li> <li>Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems</li> <li>Chemical Manufacturing, Processing and Bulk Storage (de- icing salt)</li> <li>Historical quarry site with brick making plant</li> </ul>	Soil and groundwater	<ul> <li>It is recommended that, prior to the transfer of temporary easement sites to Metrolinx, Metrolinx complete a baseline condition sampling for soil and groundwater (pre- construction assessment) to the extent of the construction boundaries and depth at the proposed Don Valley Layover site to determine the quality of soils for reuse and categorize the excess soils for proper off-site disposal, if applicable.</li> </ul>

Site	General PCA Descriptions within the 100m Study Area	Media Potentially Impacted	Recommendations
	<ul> <li>Potential presence of de-icing material</li> </ul>		
	Historic spills		

#### **Conclusions**

Based on the findings of the Phase I ESA, there is the potential for environmental impact to the site, however, in consideration of the proposed design and final use and of the site (i.e., rail layover) these are understood project. Therefore, further investigation through a Phase II ESA is not recommended at this time. If the proposed use or design are to change, then further investigation may be warranted. Please note that this is a project-specific understanding established by Metrolinx.

Refer to Table 5-112 for a summary of mitigation and monitoring measures related to excavated materials, contaminated soil, groundwater management.



# 5.21 Summary of Mitigation and Monitoring Commitments

The following tables provide a summary of the key project components/activities, potential effects, mitigation/compensation/enhancement measures, and proposed monitoring activities/ associated with the Project for each discipline listed below.
### 5.21.1 Natural Environment and Vegetation

### TABLE 5-101 SUMMARY OF NATURAL ENVIRONMENTAL (INCLUDING VEGETATION) MITIGATION AND MONITORING COMMITMENTS

Project Site Project Sta	e Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
Walkers Line Layover Facility – Lakeshore West Corridor	<ul> <li>Direct removal of low-quality CUM and CUT communities.</li> <li>Encroachment into Shoreacres Creek valley and City's NHS.</li> <li>Disturbance, displacement of wildlife (including SAR species) habitat (permanent loss of habitat).</li> <li>Enclosure via culvert extension of a reach to Shoreacres Creek.</li> <li>Temporary disruption to candidate SWH habitat.</li> <li>Deposition of sediment or fines downstream into Shoreacres Creek.</li> <li>Temporary disruption of local wildlife movement corridor along Shoreacres Creek valley.</li> </ul>	<ul> <li>An Arborist Report will be prepared which meets regulatory requirements and is completed by an I.S.A. Certified Arborist. The report will also be completed with regard to the Metrolinx Vegetation Guideline (2020). Ontario Forestry Act R.S.O. 1990, the Endangered Species Act, and other regulations, municipal by-laws and best management practices as applicable.</li> <li>The Arborist Report will include, but not be limited to the individual identification of all trees within the Project Study Area including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Study Area will include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws will dictate the minimum Diameter at Breast Height (DBH) which requires inventory and additional requirements for tree inventories and tree protection plans. The Arborist Report will include all information needed to establish compensation ratios and tree end use (including identification of high value trees) as per the Metrolinx Vegetation Guideline (2020).</li> <li>If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020). Adhere to all applicable bylaws for tree removals outside of Metrolinx properties.</li> <li>Pruning of branches will be conducted through the implementation of proper arboricultural techniques.</li> <li>Tree Protection Zone (TPZ) fencing will be established to protect and prevent tree lnjuries in accordance with local by-law requirements and guidelines.</li> <li>Prior to the undertaking of tree removals, a Tree Removal Strategy, building upon the considerations and elements set out in the Metrolinx Vegetation Guideline (2020), will be developed and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections.</li> <li>Comp</li></ul>	<ul> <li>Removal of vegetation to also consider typical occupation of treed roosts (individual trees) by bats and Milkweed by Monarch caterpillars from April to September in addition to typical breeding period for birds regulated under the MBCA.</li> <li>Nests sweeps do not provide adequate levels of due diligence under SARA or MBCA. Birds can move into nest within hours after a sweep is conducted and often nests are hidden in tall grasses, cavities and tree canopies. Prevention and/or avoidance are better best practices.</li> <li>Develop wildlife reporting protocols. Reports should include species names, location, what species was doing when observed, time and weather conditions. Details contribute to an understanding of wildlife use and assist in determination of appropriate mitigation modifications (i.e., may indicate potential nesting or habitat usage).</li> <li>Pre-arrange with a local wildlife rehabilitator to provide sanctuary for recovered or accidently injured wildlife (this may require approvals or permitting) and release following completion of construction or in the spring if captured during the winter.</li> <li>Stockpiled materials or equipment shall be stored in predetermined areas and be kept at least 30 m away from watercourses and wetlands and exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion.</li> <li>All heavy machinery brought to the work site shall arrive free of soil, seeds and vegetation fragments to avoid the import and spread of invasive species.</li> <li>For works in areas with known invasive species, vehicles and equipment should be cleaned regularput met reduced for sediment.</li> <li>Where re-vegetation is required, a native seed mix, which does not contain invasive species, shall be used.</li> <li>Water or chemical dust suppressants shall be applied to mitigate fugitive dust from site preparation and construction activities.</li> <li>Consider the building design and selection of exterior materials used i</li></ul>	<ul> <li>On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.</li> <li>The success of vegetation compensation activities will be monitored in accordance with Metrolinx's <i>Vegetation Guideline (2020)</i>. The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning.</li> <li>Species-specific monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.</li> <li>A Request for Project Review should be submitted to DFO during future design phases to ensure compliance with the <i>Fisheries Act</i>. Similarly, Conservation Halton should be consulted to ensure required review and permitting requirements are achieved for works within a regulated area (<i>O. Reg. 162/06</i>).</li> </ul>

<sup>&</sup>lt;sup>6</sup> Mitigation strategies developed by Metrolinx as part of the Guideline for Impact Assessment, Mitigation and Monitoring Design, Construction and Operations – Natural Environment (2021) and Vegetation (2021). <sup>7</sup> Monitoring/Future Work Commitments as developed by Metrolinx as part of the Guideline for Impact Assessment, Mitigation and Monitoring Design, Construction and Operations - Natural Environment (2021) and Vegetation (2021).

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
			<ul> <li>Disturbance to bat roosting habitat will be avoided during the bat roosting period of April 1<sup>st</sup> to September 30<sup>th</sup> in accordance with MECP requirements.</li> </ul>		
			• All works must comply with the <i>Migratory Birds Convention Act</i> (MBCA), including timing windows for the general nesting period (April 1 <sup>st</sup> to August 31 <sup>st</sup> in Ontario).		
			<ul> <li>If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1<sup>st</sup> to August 31<sup>st</sup>), a nest search will be undertaken by a qualified biologist to confirm that no Barn and/or Bank Swallow are nesting on structures or banks that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting.</li> </ul>		
			<ul> <li>If a nest of a migratory bird is found outside of this nesting period (including a ground nest) it still receives protection.</li> </ul>		
			• Removal of ash trees, or portions of ash trees, will be carried out in compliance with the Canada Food and Inspection Agency Directive <i>D-03-08: Phytosanitary Requirements to Prevent the Introduction into and Spread within Canada of the Emerald Ash Borer, Agrilus planipennis (Fairmaire)</i> (2014), as amended from time to time. To comply with this Directive, all Ash trees requiring removal, including any wood, bark or chips, will be restricted from being transported outside of the emerald ash borer regulated areas of Canada.		
			All requirements of the Fisheries Act and the ESA will be met.		
			<ul> <li>An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), as amended from time to time, will be prepared prior to and implemented during construction to minimize the risk of sedimentation to the wetland or waterbody.</li> </ul>		
			<ul> <li>A Spill Prevention and Response Plan will be developed before work commences and implemented during construction to ensure procedures and policies are in place during construction to minimize impacts to wetlands or waterbodies.</li> </ul>		
			• Opportunities to plant Milkweed or forage vegetation outside of and within the rail Right- of-Way (ROW) will be undertaken, where possible, and in accordance with the Metrolinx <i>Vegetation Guideline (2020)</i> .		
			<ul> <li>If vegetation clearing will proceed when Monarch larvae may be present (April 1<sup>st</sup> to September 30<sup>th</sup>), Milkweed plants should be inspected for Monarch larvae prior to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch caterpillars may be moved to other Milkweed plants; for other larval stages (i.e., eggs and chrysalis). Entire Milkweed plants should be transplanted.</li> </ul>		
			Provide mitigation measures for additional migratory butterfly species as required.		
			<ul> <li>In the event that in-water and/or near water construction works are required, the restricted construction activity timing windows and appropriate mitigation measures will be followed, as identified in Applicable Law and through consultation with the relevant authorities including the Conservation Authority, MECP, MNRF and Fisheries and Oceans Canada (DFO). In water works will be planned to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.</li> </ul>		
			<ul> <li>Ensure precautions are being taken to minimize the spread of invasive species by cleaning equipment prior to moving sites.</li> </ul>		
	Operations	Incidental encounters.	No additional mitigation required.	<ul> <li>While no SAR vegetation was observed, nuts or other seeds may be dispersed by wildlife. SAR species like Butternut may occur in the future. Educate personnel with respect to Butternut seedling identification.</li> </ul>	N/A

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
Unionville Storage Yard- Stouffville Corridor	Footprint	<ul> <li>Encroachment and removal of narrow portions CUM.</li> <li>Disturbance and temporary displacement or mortality of wildlife.</li> </ul>	<ul> <li>Ensure precautions are being taken to minimize the spread of invasive species by cleaning equipment prior to moving sites.</li> <li>Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate.</li> <li>If wildlife is encountered, measures will be implemented to avoid destruction, injury or interference with the species, and/or its habitat. For example, construction activities will cease or be reduced and wildlife will be encouraged to move offsite and away from the construction area on its own. A qualified biologist will be contacted to define the appropriate buffer required from wildlife.</li> <li>All requirements of the <i>Endangered Species Act</i> (ESA) and the <i>Species at Risk Act</i> (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended studies undertaken prior to construction, and consultation with MECP/MNRF.</li> <li>All works must comply with the <i>Migratory Birds Convention Act</i> (MBCA), including timing windows for the general nesting period (April 1<sup>st</sup> to August 31<sup>st</sup> in Ontario).</li> <li>If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1<sup>st</sup> to August 31<sup>st</sup>) and subare use of these areas it possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting.</li> <li>If a nest of a migratory bird is found outside of this nesting period (including a ground nest) it still receives protection.</li> <li>An Integrated Vegetation Management (IVM) Plan will be developed and implemented that is in adherence with the Metrolinx <i>Vegetation Guideline (2020)</i> and the IVM Program. The Guideline's selection criteria will be used to asses the vegetation present as compatible or incompatible, and manage it, if necessary, in a way which meets safety needs in a timely manner, is sensitive to environmental cond</li></ul>	<ul> <li>Removal of vegetation to also consider typical occupation of treed roosts (individual trees) by bats and Milkweed by Monarch caterpillars from March to September in addition to typical breeding period for birds regulated under the MBCA.</li> <li>Nests sweeps to not provide adequate levels of due diligence under SARA or MBCA. Birds can move into nests within hours after a sweep is conducted and often nests are hidden in tail grasses, cavities and tree canopies. Prevention and/or avoidance are better best practices.</li> <li>Develop wildlife reporting protocols. Reports should include species names, location, what species was doing when observed, time and weather conditions. Details contribute to an understanding of wildlife use and assist in determination of appropriate mitigation modifications (i.e., may indicate potential nesting or habitat usage).</li> <li>Butternut nuts or other seeds may be dispersed by wildlife. SAR species like Butternut may occur in the future. Educate personnel with respect to Butternut seedling identification.</li> <li>Stockpiled materials or equipment shall be stored in predetermined areas and be kept at least 30 m away from watercourses and wetlands and exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion.</li> <li>All heavy machinery brought to the work site shall arrive free of soil, seeds and vegetation fragments to avoid the import and spread of invasive species.</li> <li>For works in areas with known invasive species, vehicles and equipment should be cleaned regularly in accordance with the Ontario Invasive Plant Council's "Clean Equipment Protocol" for cleaning of vehicles and equipment.</li> <li>Where re-vegetation is required, a native seed mix, which does not contain invasive species, shall be used.</li> <li>Water or chemical dust suppressants shall be applied to mitigate fugitive dust from site preparation and dust control mitigation.</li> <li>Consider the building design and selection of e</li></ul>	<ul> <li>On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.</li> <li>Species-specific monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.</li> <li>The success of vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2020). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning.</li> </ul>

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
	Operations	Incidental encounters.	No additional mitigation.	<ul> <li>Butternut nuts or other seeds may be dispersed by wildlife. SAR species like Butternut may occur in the future. Educate personnel with respect to Butternut seedling identification.</li> <li>Barn swallows (if appropriate structures are present) may occur in the future. Educate personnel with respect to working and cohabitating with urban tolerant wildlife.</li> <li>Develop wildlife reporting protocols. Reports should include species names, location, what species was doing when observed, time and weather conditions. Details contribute to an understanding of wildlife use and assist in determination of appropriate mitigation modifications (i.e., may indicate potential nesting or habitat usage).</li> </ul>	N/A
Don Valley Layover Facility – Richmond Hill Corridor	Footprint Construction	<ul> <li>Potential displacement and/or habitat loss of nesting/shelter habitat for urban tolerant birds and mammals.</li> <li>Potential increase in light pollution which may affect nesting/shelter habitat for urban tolerant birds and mammals.</li> <li>Temporary displacement of SAR known to occur in broader area of Don Valley. No interior habitat loss of treed forest communities or wetlands suitable to support woodland and wetland SAR birds. Short term - expected to be infrequent events.</li> <li>Deposition of sediment or fines into adjacent wetland and Don Valley.</li> </ul>	<ul> <li>An Arborist Report will be prepared which meets regulatory requirements and is completed by an I.S.A. Certified Arborist. The report will also be completed with regard to the Metrolinx Vegetation <i>Guideline</i> (2020). <i>Ontario Forestry Act. R.S.O. 1990</i>, the <i>Endangered Species Act</i>, and other regulations, municipal by-laws and best management practices as applicable.</li> <li>The Arborist Report will include, but not be limited to the individual identification of all trees within the Project Study Area including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Study Area will include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws will dictate the minimum Diameter at Breast Height (DBH) which requires inventory and additional requirements for tree inventories and tree protection plans. The Arborist Report will include all information needed to establish compensation ratios and tree end use (including identification of high value trees) as per the Metrolinx <i>Vegetation Guideline</i> (2020).</li> <li>If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's <i>Vegetation Guideline</i> (2020). Adhere to all applicable bylaws for tree removals outside of Metrolinx properties.</li> <li>Pruning of branches will be conducted through the implementation of proper arboricultural techniques.</li> <li>Tree Protection Zone (TPZ) fencing will be established to protect and prevent tree injuries in accordance with local by-law requirements.</li> <li>Prior to the undertaking of tree removals, ar Tree Removal Strategy, building upon the considerations and elements set out in the Metrolinx Vegetation <i>Guideline</i> (2020), will be developed and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections.</li> <li>An In</li></ul>	<ul> <li>Avoid temporary stockpiling of debris in areas where snakes and other mammals may be attracted for gestation and/or hibernation.</li> <li>Removal of vegetation to also consider typical occupation of treed roosts by bats and Milkweed by Monarch caterpillars from April to September in addition to typical breeding period for birds regulated under the MBCA.</li> <li>Nests sweeps do not provide adequate levels of due diligence under SARA or MBCA. Birds can move into nest within hours after a sweep is conducted and often nests are hidden in tall grasses, cavities and tree canopies. Prevention and/or avoidance are better best practices.</li> <li>Sediment fence to act as temporary wildlife exclusion measures to keep wildlife from the work zone and include areas near the wetland community. This will discourage potential nesting from turtles (if present) from using newly exposed soils and or substrates and wildlife encounters during construction.</li> <li>Pre-arrange with a local wildlife rehabilitator to provide sanctuary for recovered or accidently injured wildlife (this may require approvals or permitting) and release following completion of construction or in the spring if captured during the winter.</li> <li>Drainage will be directed away from the wetland feature and Don River and any ditching be designed and constructed to mitigate potential impacts to the adjacent wetland and Don River.</li> <li>Compensate in accordance with Metrolink Vegetation Compensation Protocol with consideration for the Toronto Biodiversity Strategy (City of Toronto 2019). For example, opportunities may exist to provide additional invasive species management and naturalization of existing and disturbed habitat associated with the proposed Don Valley Layover Facility footprint.</li> <li>During building design ecologist to work with design team to review and selection of exterior materials used in construction to avoid or reduce attraction to wildlife(e.g. reduce overhangs and incorporate materials whi</li></ul>	<ul> <li>On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.</li> <li>Species-specific monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.</li> <li>The success of vegetation compensation activities will be monitored in accordance with Metrolinx's <i>Vegetation Guideline (2020)</i>. The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning.</li> </ul>

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations
			<ul> <li>If wildlife is encountered, measures will be implemented to avoid destruction, injury or interference with the species, and/or its habitat. For example, construction activities will cease or be reduced and wildlife will be encouraged to move offsite and away from the construction area on its own. A qualified biologist will be contacted to define the appropriate buffer required from wildlife.</li> </ul>	
			<ul> <li>Disturbance to bat roosting habitat will be avoided during the bat roosting period of April 1<sup>st</sup> to September 30<sup>th</sup> in accordance with MECP requirements.</li> </ul>	
			<ul> <li>All requirements of the Endangered Species Act (ESA) and Species at Risk Act (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended studies undertaken prior to construction, and consultation with MECP/MNRF.</li> </ul>	
			<ul> <li>All works must comply with the <i>Migratory Birds Convention Act</i> (MBCA), including timing windows for the general nesting period (<sup>April</sup> 1<sup>st</sup> to August 31<sup>st</sup> in Ontario).</li> </ul>	
			<ul> <li>If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1<sup>st</sup> to August 31<sup>st</sup>), a nest search will be undertaken by a qualified biologist to confirm that no Barn and/or Bank Swallow are nesting on structures or banks that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting.</li> </ul>	
			<ul> <li>If a nest of a migratory bird is found outside of this nesting period (including a ground nest) it still receives protection.</li> </ul>	
			<ul> <li>Ensure precautions are being taken to minimize the spread of invasive species by cleaning equipment prior to moving sites.</li> </ul>	
			All requirements of the Fisheries Act will be met.	
			<ul> <li>An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), as amended from time to time, will be prepared prior to and implemented during construction to minimize the risk of sedimentation to the waterbody.</li> </ul>	
			<ul> <li>A Spill Prevention and Response Plan will be developed before work commences and implemented during construction to ensure procedures and policies are in place during construction to minimize impacts to wetlands or waterbodies.</li> </ul>	
			<ul> <li>Opportunities to plant Milkweed or forage vegetation outside of and within the rail Right- of-Way (ROW) will be undertaken, where possible, and in accordance with the Metrolinx Vegetation Guideline (2020).</li> </ul>	
			<ul> <li>If vegetation clearing will proceed when Monarch larvae may be present (April 1<sup>st</sup> to September 30<sup>th</sup>), Milkweed plants should be inspected for Monarch larvae prior to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch caterpillars may be moved to other Milkweed plants; for other larval stages (i.e., eggs and chrysalis). Entire Milkweed plants should be transplanted.</li> </ul>	
			<ul> <li>Provide mitigation measures for additional migratory butterfly species as required.</li> <li>In the event that in-water and/or near water construction works are required, the restricted construction activity timing windows and appropriate mitigation measures will be followed, as identified in Applicable Law and through consultation with the relevant authorities including the Conservation Authority, MECP, MNRF and Fisheries and Oceans Canada (DFO). In water works will be planned to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.</li> </ul>	

Monitoring/Future Work Commitments <sup>7</sup>

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
	Operations	Incidental encounters.	<ul> <li>If wildlife is encountered, measures will be implemented to avoid destruction, injury or interference with the species. On-site personnel will be provided with information (e.g., factsheets) that address the existence of potential SAR on site, the identification of the SAR species and the procedure(s) to follow if an individual is encountered or injured.</li> </ul>	<ul> <li>Where lighting is required for safety and security the design and intensity will consider <i>Wildlife Friendly Lighting</i> to reduce possible harmful adverse effects.</li> <li>Develop wildlife reporting protocols. Reports should include species names, location, what species was doing when observed, time and weather conditions. Details contribute to an understanding of wildlife use and assist in determination of appropriate mitigation modifications (i.e., may indicate potential nesting or habitat usage).</li> <li>Butternut nuts or other seeds may be dispersed by wildlife. SAR species like Butternut may occur in the future. Educate personnel with respect to Butternut seedling identification.</li> <li>Barn swallows (if appropriate structures are present) may occur in the future. Educate personnel with respect to working and cohabitating with urban tolerant wildlife.</li> <li>Stockpiled materials or equipment shall be stored in predetermined areas and be kept at least 30 m away from watercourses and wetlands and exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion.</li> <li>All heavy machinery brought to the work site shall arrive free of soil, seeds and vegetation fragments to avoid the import and spread of invasive species.</li> <li>For works in areas with known invasive species, vehicles and equipment should be cleaned regularly in accordance with the Ontario Invasive Plant Council's "Clean Equipment Protocol" for cleaning of vehicles and equipment.</li> <li>Where re-vegetation is required, a native seed mix, which does not contain invasive species, shall be used.</li> <li>Water or chemical dust suppressants shall be applied to mitigate fugitive dust from site preparation and construction activities.</li> <li>Consider the building design and selection of exterior materials used in construction to avoid or reduce attraction to wildlife.</li> </ul>	<ul> <li>On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.</li> <li>The success of vegetation compensation activities will be monitored in accordance with Metrolinx's <i>Vegetation Guideline (2020)</i>. The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning.</li> </ul>

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
Project Site GO Station Platforms	Project Stage         Footprint         Construction	<ul> <li>Potential Effects</li> <li>Temporary disturbance, displacement or mortality of wildlife (incidental encounters).</li> <li>Temporary disturbance or displacement of wildlife habitat (e.g., Barn Swallow nest or bat roost sites).</li> </ul>	<ul> <li>Mitigation Measures/Commitments<sup>6</sup></li> <li>Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate.</li> <li>If wildlife is encountered, measures will be implemented to avoid destruction, injury, or interference with the species, and/or its habitat. For example, construction activities will cease or be reduced and wildlife will be encouraged to move offsite and away from the construction area on its own. A qualified biologist will be contacted to define the appropriate buffer required from wildlife.</li> <li>All requirements of the <i>Endangered Species Act</i> (ESA) and <i>Species at Risk Act</i> (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended studies undertaken prior to construction, and consultation with MECP/MNRF.</li> <li>All works must comply with the <i>Migratory Birds Convention Act</i> (MBCA), including timing windows for the general nesting period (April 1<sup>st</sup> to August 31<sup>st</sup> in Ontario).</li> <li>If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1<sup>st</sup> to August 31<sup>st</sup>), a nest search will be undertaken by a qualified biologist to confirm that no Barn and/or Bank Swallow are nesting on structures or banks that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting.</li> <li>If a nest of a migratory bird is found outside of this nesting period (including a ground nest) it still receives protection.</li> <li>An Arborist Report will be prepared which meets regulatory requirements and is completed by an 1.5.A. Certified Arborist. The report will also be completed with regard to the Metrolinx <i>Vegetation Guideline</i> (2020). <i>Ontario Forestry Act R.S.O. 1990</i>, the <i>Endangered Species Act</i>, and other regulatons, municip</li></ul>	<ul> <li>Additional Considerations</li> <li>Develop wildlife reporting protocols. Reports should include species names, location, what species was doing when observed, time and weather conditions. Details contribute to an understanding of wildlife use and assist in determination of appropriate mitigation modifications (i.e., may indicate potential nesting or habitat usage.</li> <li>Removal of vegetation to also consider typical occupation of treed roosts (individual trees) by bats and Milkweed by Monarch caterpillars from April to September in addition to typical breeding period for birds regulated under the MBCA.</li> <li>Stockpiled materials or equipment shall be stored in predetermined areas and be kept at least 30 m away from watercourses and wetlands and exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion.</li> <li>All heavy machinery brought to the work site shall arrive free of soil, seeds and vegetation fragments to avoid the import and spread of invasive species.</li> <li>For works in areas with known invasive species, vehicles and equipment should be cleaned regularly in accordance with the Ontario Invasive Plant Council's "Clean Equipment Protocol" for cleaning of vehicles and equipment.</li> <li>The use of hay should be avoided and only certified weed-free straw or use fiber roll logs should be used for sediment containment.</li> <li>Where re-vegetation is required, a native seed mix, which does not contain invasive species, shall be used.</li> <li>Water or chemical dust suppressants shall be applied to mitigate fugitive dust from site preparation and construction activities.</li> </ul>	<ul> <li>Monitoring/Future Work Commitments<sup>7</sup></li> <li>On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.</li> <li>Species-specific monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.</li> </ul>
			• If vegetation cleaning will proceed when Moharch larvae may be present (April 14 to September 30 <sup>th</sup> ), Milkweed plants should be inspected for Monarch larvae prior to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch caterpillars may be moved to other Milkweed plants; for other larval stages (i.e., eggs and chrysalis). Entire Milkweed plants should be transplanted.	e ts	
	Orrenti		Provide mitigation measures for additional migratory butterfly species as required.		
	Operations	Incidental encounters.	No additional mitigation.		
Thickson Road Bridge Expansion	Footprint Construction	<ul> <li>Indirect harassment and mortality of wildlife (incidental encounters).</li> <li>Temporary disturbance or displacement of wildlife habitat (e.g., Barn Swallow</li> </ul>	<ul> <li>All requirements of the <i>Endangered Species Act</i> (ESA) and <i>Species at Risk Act</i> (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended studies undertaken prior to construction, and consultation with MECP/MNRF.</li> <li>All works must comply with the <i>Migratory Birds Convention Act</i> (MBCA), including timing windows for the general nesting period (April 1<sup>st</sup> to August 31<sup>st</sup> in Ontario).</li> </ul>	<ul> <li>Survey the structure one season prior to the active period for Barn Swallows. If evidence of active nests is observed register with MECP and pre-plan work in accordance with Ontario Regulation 242/08 section 23.5.</li> <li>Develop a long-term program for inspections of bridges and overpasses to evaluate potential use by Barn Swallows and</li> </ul>	On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and
		nest or bat roost sites)	<ul> <li>If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1<sup>st</sup> to August 31<sup>st</sup>), a nest search will be undertaken by a qualified</li> </ul>	birds protected under the MBCA. For example, every 5 years. This would assist in facilitating future needs for ESA, 2007	impacts.

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
		Deposition of sediment or fines into Corbett Creek or its associated riparian marsh community.	<ul> <li>biologist to confirm that no Barn and/or Bank Swallow are nesting on structures or banks that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting.</li> <li>If a nest of a migratory bird is found outside of this nesting period (including a ground nest) if still receives protection.</li> <li>Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate.</li> <li>If wildlife is encountered, measures will be implemented to avoid destruction, injury or interference with the species, and/or its habitat. For example, construction activities will cease or be reduced and wildlife will be encouraged to move offsite and away from the construction area on its own. A qualified biologist will be contacted to define the appropriate buffer required from wildliffe.</li> <li>All requirements of the <i>Fisheries Act</i> will be met.</li> <li>Construction activities will maintain the buffers established during the design phase to minimize potential negative impacts to wetlands and waterbodies.</li> <li>An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction for sustand or waterbodies.</li> <li>A Spill Prevention and Response Plan will be developed before work commences and implemented during construction to minimize the risk of sedimentation to the wetlands or waterbodies.</li> <li>Opportunities to plant Milkweed or forage vegetation outside of and within the rail Right-of-Way (ROW) will be undertaken, where possible, and in accordance with the Metrolinx <i>Vegetation Guideline (2202)</i>.</li> <li>If vegetation clearing will proceed when Monarch Larvae may be moved to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch</li></ul>	<ul> <li>requirement when maintenance may be required modifications (i.e., may indicate potential nesting or habitat usage).</li> <li>Removal of vegetation to also consider typical occupation of treed roosts (individual trees) by bats and Milkweed by Monarch caterpillars from March to September in addition to typical breeding period for birds regulated under the MBCA.</li> <li>Consider utilizing an experienced bat researcher (e.g., from a recognized university) to be on site during initial bridge expansion works to better understand habitat use by bats (if present).</li> <li>Pre-arrange with a local wildlife rehabilitator to provide sanctuary for recovered or accidently injured wildlife (this may require approvals or permitting) and release following completion of construction.</li> <li>Butternut nuts or other seeds may be dispersed by wildlife. SAR species like Butternut may occur in the future. Educate personnel with respect to Butternut seedling identification.</li> <li>Stockpiled materials or equipment shall be stored in predetermined areas and be kept at least 30 m away from watercourses and wetlands and exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion.</li> <li>All heavy machinery brought to the work site shall arrive free of soil, seeds and vegetation fragments to avoid the import and spread of invasive species.</li> <li>For works in areas with known invasive species, vehicles and equipment should be cleaned regularly in accordance with the Ontario Invasive species, shall be used.</li> <li>Where re-vegetation is required, a native seed mix, which does not contain invasive species, shall be used.</li> </ul>	<ul> <li>Species-specific monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.</li> <li>The success of vegetation compensation activities will be monitored in accordance with Metrolinx's <i>Vegetation Guideline</i> (2020). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning.</li> </ul>
	Operations	Incidental encounters.	No additional mitigation.	<ul> <li>Barn swallows may occur in the future. Educate personnel with respect to working and cohabitating with urban tolerant wildlife</li> <li>Develop a long-term program for inspections of bridges to evaluate potential use by Barn Swallows and birds protected under the MBCA. For example, every 5 years. This would help facilitate future needs for ESA, 2007 requirement when maintenance may be required.</li> </ul>	N/A

Electrification of Richmond Hill Corridor using OCS       Footprint <ul> <li>Temporary disturbance, displacement or mortality of wildlife (incidental encounters).</li> <li>Removal of individual trees which may provide roost and pasts sites for SAR birds and bats</li> </ul> <ul> <li>Construction</li> </ul> <ul> <li>Construction</li> <li>Construction</li> </ul> <ul> <li>Footprint</li> <li>Temporary disturbance, displacement or mortality of wildlife (incidental encounters).</li> <li>An Arborist Report will be prepared which meets regulatory requirements and is completed by an I.S.A. Certified Arborist. The report will also be completed with regard to the Metrolinx Vegetation Guideline (2020). Ontario Forestry Act R.S.O. 1990, the Endangered Species Act, and other regulations, municipal by-laws and best</li> <li>The Arborist Report will include, but not be limited to the individual identification of all trees within the Project Study Area including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within hrups and bats</li> <li>The Arborist Report will include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws will dictate the minimum Diameter at Breast Height (DBH) which requires inventory and additional requirements for tree inventores and tree protection plans. The Arborist Report will include al information proded to extablic to empenees the rest protocels. Reports should include</li> <li>Develop wildlife reporting protocols. Reports should include</li> </ul> <ul> <li>Develop wildlife reporting protocols. Reports should include</li> <li>Develop wildlife reporting protocols. Reports should include</li></ul>	
<ul> <li>The stream is the transmission of properties.</li> <li>The protection construction of properties.</li> <li>Pruning of pranches will be conducted through the implementation of proper abbricultural stream is construction with the stream is the str</li></ul>	spection will be undertaken the implementation of the measures and identify actions if required. actions may include site maintenance and of activities to minimize pecific monitoring activities reloped in accordance with ation and/or permitting nts under the ESA. ss of vegetation tion activities will be in accordance with <i>Vegetation Guideline</i> e approach to compensation will be determined by wnership, applicable bylaws/regulations and ith respect to ecological 3.

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
	Operations	<ul> <li>Proximity of Don River increases Accipiter species potential use of poles and OCS facilities for nest platforms, perch sites and bridging issues leading to electrification.</li> <li>Vegetation Maintenance</li> </ul>	<ul> <li>recommended studies undertaken prior to construction, and consultation with MECP/MNRF.</li> <li>Disturbance to bat roosting habitat will be avoided during the bat roosting period of April 1<sup>st</sup> to September 30<sup>th</sup> in accordance with MECP requirements.</li> <li>Opportunities to plant Milkweed or forage vegetation outside of and within the rail Right-of-Way (ROW) will be undertaken, where possible, and in accordance with the Metrolinx <i>Vegetation Guideline (2020)</i>.</li> <li>If vegetation clearing will proceed when Monarch larvae may be present (April 1<sup>st</sup> to September 30<sup>th</sup>), Milkweed plants should be inspected for Monarch larvae prior to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch caterpillars may be moved to other Milkweed plants; for other larval stages (i.e., eggs and chrysalis). Entire Milkweed plants should be transplanted.</li> <li>Provide mitigation measures for additional migratory butterfly species as required.</li> <li>An Integrated Vegetation Management (IVM) Plan will be developed and implemented that is in adherence with the Metrolinx <i>Vegetation Guideline (2020)</i> and the IVM Program. The Guideline's selection criteria will be used to assess the vegetation present as compatible or incompatible, and manage it, if necessary, in a way which meets safety needs in a timely manner, is sensitive to environmental conditions, and maximizes cost-effectiveness.</li> <li>Trees requiring removal, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's <i>Vegetation Guideline (2020)</i>. Adhere to all applicable bylaws for tree removals outside of Metrolinx properties.</li> <li>Pruning of branches will be conducted through the implementation of proper arboricultural techniques.</li> <li>Prior to the undertaking of tree removals, a Tree Removal Strategy, building upon the considerations and elements et out in the Metrolinx</li></ul>	N/A	<ul> <li>Develop an initial 5-year inspection program in consultation with industry experts (from the competition date) to evaluate potential nest attempts by accipiter species.</li> <li>Develop wildlife reporting protocols with emphases on mortality of birds (electrification) and identification of</li> </ul>
			on safety, environmental and wildlife protections.		nest attempts from accipiter's (Hawks / Eagles / Osprey). Reports should include species names, location, nest location / attempt time and weather conditions etc. Details contribute to an understanding of use and assist in determination of appropriate future operational considerations.
Richmond Hill Corridor OCS - Installation of Grounding and Bonding and Construction and Modifications of Bridge/Rail	Footprint	<ul> <li>Indirect harassment and mortality of wildlife (incidental encounters).</li> <li>Temporary disturbance or displacement wildlife habitat of (e.g., Barn Swallow nest or bat roost sites).</li> </ul>	<ul> <li>Requirements of the <i>Endangered Species Act</i> (ESA) and <i>Species at Risk Act</i> (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended studies undertaken prior to construction, and consultation with MECP/MNRF.</li> <li>All works must comply with the <i>Migratory Birds Convention Act</i> (MBCA), including timing windows for the general nesting period (April 1<sup>st</sup> to August 31<sup>st</sup> in Ontario).</li> <li>If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1<sup>st</sup> to August 31<sup>st</sup>), a nest search will be undertaken by a qualified biologist to confirm that no Barn and/or Bank Swallow are nesting on structures or banks</li> </ul>	<ul> <li>Survey the structure one season prior to the active period for Barn Swallows. If evidence of active nests is observed register with MECP and pre-plan work in accordance with Ontario Regulation 242/08 section 23.5.</li> <li>Develop wildlife reporting protocols. Reports should include species names, location, what species was doing when observed, time and weather conditions. Details contribute to an understanding of wildlife use and assist in determination of</li> </ul>	<ul> <li>On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.</li> <li>Species-specific monitoring activities will be developed in accordance with</li> </ul>

Project Site	Project Stage	Potential Effects	Mitigation Measures/Commitments <sup>6</sup>	Additional Considerations	Monitoring/Future Work Commitments <sup>7</sup>
& Overpass Modifications	Construction		<ul> <li>that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting.</li> <li>Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate.</li> <li>If wildlife is encountered, measures will be implemented to avoid destruction, injury or interference with the species, and/or its habitat. For example, construction activities will cease or be reduced and wildlife will be encouraged to move offsite and away from the construction area on its own. A qualified biologist will be contacted to define the appropriate buffer required from wildlife.</li> </ul>	<ul> <li>appropriate mitigation modifications (i.e., may indicate potential nesting or habitat usage).</li> <li>Consider utilizing an experienced bat researcher (e.g., from a recognized university) to be on site during initial bridge expansion works to better understand habitat use by bats (if present).</li> <li>Pre-arrange with a local wildlife rehabilitator to provide sanctuary for recovered or accidently injured wildlife (this may require approvals or permitting) and release following completion of construction.</li> </ul>	any registration and/or permitting requirements under the ESA.
	Operations	N/A	No additional mitigation.	Develop a long-term program for inspections of bridges and overpasses to evaluate potential use by Barn Swallows and birds protected under the MBCA. For example, every 5 years. This would assist in facilitating future needs for ESA, 2007 requirement when maintenance may be required.	N/A

\*NOTES: Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time. If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

### 5.21.2 Hydrogeology

### TABLE 5-102 SUMMARY OF HYDROGEOLOGY MITIGATION AND MONITORING COMMITMENTS

Track Infrastructure (Various Rail Corridors) <ul> <li>Poderalia for groundwater quilty impacts sectors and the induction a split action response plan, should be in place. In additional contactors working at the Site should ensure that construction equipment is in antiferance activities</li> </ul> <ul> <li>Poderalia fasts and quilty impacts sectors and the place. In additional sectors antiferance activities</li> <li>Poderalia fasts and quilty impacts sectors and the place in addition operations onate equipment mathemate activities</li> <li>Construction operations and/or sectors and/or sectors provide a Soil and Excervated Materials Management Plan (SEMMP) for the sector and the Environment and Climate Constructions operations on addition and/or sectors preading of contaminates and/or result in the sectors and/or sectors and/or sectors and/or sectors and/or sectors and/or addition and/or sectors and/or sectors and/or sectors and/or addition and/or sectors and/or sectors and/or sectors and/or sectors and/or sectors and/or sectors and/or addition and/or sectors and/or sectors and/or sectors and/or sectors and/or addition and/or sectors and/or addition and/or sectors and/or secoresectors and/or sectors and/or sectors and/or sectors</li></ul>	Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
Walkers Line Layver Facility - Lakeshore West Corridor <ul> <li>Poetprist means A Maintenance Could expose contaminated materials and result in the spreading of contaminated materials and result in the spreading of contaminated materials in the spreading of contaminated materials and result in the spreading of contaminated materials and inscreading MICEC (S) Management of Excess Solis: A Guide for Best MICE (S) memory the Millisty of the Environment. Concervation and Parisis. Including Handing, Tanagement of Excess Solis: A Guide for Best Mice Mill describe how to address the management of the works and in according event with the solicitable regulator is the spreading of the management and disposal of the works and in according event with the solicitable regulator is the spreading of the works and reading and All Applicable Law. The plan will describe how to address the management and disposal of contravity of the service and applicable is the definer in the spreading of the works and reading the spreading of the spreading of the works and reading the works and provide and approved by Metrein the spreadi</li></ul>	Track Infrastructure (Various Rail Corridors)	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> <li>Excavation for service utilities</li> </ul>	<ul> <li>Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel handling, storage and onsite equipment maintenance activities</li> </ul>	<ul> <li>Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.</li> </ul>	<ul> <li>A Spill Response</li> <li>Any accident groundwater required, the follow-up model</li> </ul>
The GMP should also be reviewed by appropriate regulatory agencies prior to	Walkers Line Layover Facility – Lakeshore West Corridor	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> <li>Excavation for service utilities, building foundations</li> <li>Potential for septic installation</li> <li>Site grading and drainage work</li> <li>Construction of walkways, sidewalks and roadways</li> </ul>	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials     Construction operations could expose groundwater and associated contamination	<ul> <li>Develop a Soil and Excavated Materials Management Plan (SEMMP) for the handling, management, and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management), the Ministry of the Environment and Climate Change (MOECC): Management of Excess Soils: A Guide for Best Management Practices, (MECP, April 2019, as amended) and All Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.</li> <li>Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and All Applicable Law.</li> <li>The SEMMP should consider the current use of the property and be based on field measured data.</li> <li>The plan will be reviewed and approved by Metrolinx prior to construction.</li> <li>Develop a Groundwater Management Plan (GMP) to guide the handling, management, and disposal of groundwater encountered during the Works. The GMP will be overseen by a QP and will comply with Ontario Regulations 406/79 (On-Site and Excess Soil Management). Full 614 and 387/04, as amended under the Ontario Water Resources Act.</li> <li>The GMP will describe the handling, transfer, testing, monitoring, disposal of groundwater guoridwater quantity and dewatering Zone of Influenc</li></ul>	<ul> <li>A Soil and Exite Construct and performa</li> <li>Upon complet Implementation</li> <li>A Groundwat on a monthly data/results a</li> <li>Upon complet Implementation</li> </ul>

Monitoring/Future Work Commitments

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Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
		<ul> <li>Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel handling, storage and onsite equipment maintenance activities</li> </ul>	Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.	<ul> <li>A Spill Respo</li> <li>Any accidenta groundwater required, the follow-up mor</li> </ul>
		Temporary lowering of groundwater table due to excavation dewatering; discharge of pumped water	<ul> <li>Additional investigations are required during detailed design and will include evaluation of the volume of water to be pumped and the need for a Permit to Take Water. If a PTTW is required, a detailed water management plan is required.</li> </ul>	<ul> <li>Additional inv dewatering pl</li> </ul>
Unionville Storage Facility – Stouffville Corridor	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> <li>Excavation for service utilities</li> <li>Site grading and drainage work</li> <li>Construction of walkways, sidewalks and roadways</li> </ul>	Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel handling, storage and onsite equipment maintenance activities	<ul> <li>Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.</li> </ul>	<ul> <li>A Spill Respo</li> <li>Any accidenta groundwater required, the follow-up mor</li> </ul>
Don Valley Layover Facility – Richmond Hill Corridor	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> <li>Excavation for service utilities, building foundations</li> <li>Potential for septic installation</li> <li>Site grading and drainage work</li> <li>Construction of walkways, sidewalks and roadways</li> </ul>	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials	<ul> <li>Develop a SEMMP for the handling, management, and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices, (MECP, April 2019, as amended) and All Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.</li> <li>Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and All Applicable Law.</li> <li>The SEMMP will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	<ul> <li>A Soil and Ex the Construct and performa</li> <li>Upon comple Implementation</li> </ul>
		Construction operations could expose groundwater and associated contamination	<ul> <li>Develop a GMP to guide the handling, management, and disposal of groundwater encountered during the Works. The GMP will be overseen by a QP and will comply with Ontario Regulations 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the Ontario Water Resources Act.</li> <li>The GMP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMP will outline general groundwater monitoring considerations during the Works and provide guidance for groundwater monitoring following the Works where considered applicable.</li> <li>The GMP will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the Works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity Sector Registry (EASR).</li> </ul>	<ul> <li>A Groundwate on a monthly data/results a</li> <li>Upon comple Implementation</li> </ul>

#### Monitoring/Future Work Commitments

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Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
			<ul> <li>The GMP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the Works, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality.</li> <li>The GMP will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	
		<ul> <li>Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel handling, storage and onsite equipment maintenance activities</li> </ul>	<ul> <li>Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.</li> </ul>	<ul> <li>A Spill Respo</li> <li>Any accidenta groundwater required, the follow-up mor</li> </ul>
		Temporary lowering of groundwater table due to excavation dewatering; discharge of pumped water	<ul> <li>Additional investigations are required during detailed design and will include evaluation of the volume of water to be pumped and the need for a Permit to Take Water. If a PTTW is required, a detailed water management plan is required.</li> </ul>	<ul> <li>Additional inv dewatering pl</li> </ul>
Mount Joy GO Station Platform	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> <li>Excavation for service utilities, pedestrian tunnels and elevators</li> <li>Site grading and drainage work</li> <li>Construction of walkways and sidewalks</li> </ul>	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials	<ul> <li>Develop a SEMMP for the handling, management, and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person pursuant to <i>Ontario Regulation 153/04</i> under the <i>Environmental Protection Act</i> (QP) and will comply with <i>Ontario Regulation 406/19</i> (On-Site and Excess Soil Management), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management <i>Practices</i>, (MECP, April 2019, as amended) and All Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.</li> <li>Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per <i>Ontario Regulation 347</i> (as amended) and All Applicable Law.</li> </ul>	<ul> <li>A Soil and Ex the Construct and performa</li> <li>Upon comple Implementation</li> </ul>
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		<ul> <li>Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel handling, storage and onsite equipment maintenance activities</li> </ul>	<ul> <li>Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.</li> </ul>	<ul> <li>A Spill Resp</li> <li>Any acciden groundwater required, the follow-up mod</li> </ul>
		Temporary lowering of groundwater table due to excavation dewatering; discharge of pumped water	<ul> <li>Additional investigations are required during detailed design and will include evaluation of the volume of water to be pumped and the need for a Permit to Take Water. If a PTTW is required, a detailed water management plan is required.</li> </ul>	<ul> <li>Additional in dewatering p</li> </ul>
Oshawa GO Station Platform	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> <li>Excavation for service utilities, pedestrian tunnels and elevators</li> <li>Site grading and drainage work</li> <li>Construction of walkways and sidewalks</li> </ul>	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials	<ul> <li>Develop a SEMMP for the handling, management, and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices, (MECP, April 2019, as amended) and All Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.</li> <li>Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and All Applicable Law.</li> <li>The SEMMP will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	<ul> <li>A Soil and E the Construct and performation</li> <li>Upon complete Implementat</li> </ul>
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		onsite equipment maintenance activities			
		Temporary lowering of groundwater table due to excavation dewatering; discharge of pumped water	<ul> <li>Additional investigations are required during detailed design and will include evaluation of the volume of water to be pumped and the need for a Permit to Take Water. If a PTTW is required, a detailed water management plan is required.</li> </ul>	•	Additional in dewatering p
Unionville GO Station Platform	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> <li>Excavation for service utilities, pedestrian tunnels and elevators</li> <li>Site grading and drainage work</li> <li>Construction of walkways and sidewalks</li> </ul>	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials     Construction operations could expose groundwater and associated contamination	<ul> <li>Develop a SEMMP for the handling, management, and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices, (MECP, April 2019, as amended) and All Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted rallway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.</li> <li>Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and All Applicable Law.</li> <li>The SEMMP will be reviewed and approved by Metrolinx prior to construction.</li> <li>Develop a GMP to guide the handling, management, and disposal of groundwater encountered during the Works. The GMP will be overseen by a QP and will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMP will be overseen by a QP and will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and provide guidance for groundwater</li></ul>	•	A Soil and Ex the Construct and performa Upon comple Implementation A Groundwar on a monthly data/results a Upon comple Implementation
		Temporary lowering of groundwater table due to excavation dewatering; discharge of pumped water	<ul> <li>Additional investigations are required during detailed design and will include evaluation of the volume of water to be pumped and the need for a Permit to Take Water. If a PTTW is required, a detailed water management plan is required.</li> </ul>	•	Additional in dewatering p
		Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel	Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.	•	A Spill Resp Any acciden groundwate

#### Monitoring/Future Work Commitments

vestigations on the need for a PTTW and preparation of a plan.

Excavated Material Monthly Monitoring Report will be submitted by ctor for Metrolinx review on a monthly basis that includes monitoring ance data related to the management of excavated materials. etion of the earthworks, a Soil and Excavated Material Management tion Report will be issued to Metrolinx by the Constructor.

ater Monthly Monitoring Report will be submitted by the Constructor y basis for Metrolinx review to document performance monitoring and any corrective actions implemented. etion of the earthworks, a Groundwater Management

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Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
		handling, storage and onsite equipment maintenance activities		required, the follow-up mo
Thickson Road Bridge Expansion	<ul> <li>Footprint Impacts</li> <li>Excavation for foundations</li> <li>Site grading and drainage work</li> </ul>	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials	<ul> <li>Develop a SEMMP for the handling, management, and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person pursuant to <i>Ontario Regulation 153/04</i> under the <i>Environmental Protection Act</i> (QP) and will comply with <i>Ontario Regulation 406/19</i> (On-Site and Excess Soil Management), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management <i>Practices</i>, (MECP, April 2019, as amended) and All Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.</li> <li>Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per <i>Ontario Regulation 347</i> (as amended) and All Applicable Law.</li> <li>The SEMMP will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	<ul> <li>A Soil and Extra Construct and performa</li> <li>Upon complete Implementation</li> <li>A Groundwate</li> </ul>
		Construction operations could expose groundwater and associated contamination	<ul> <li>Bevelop a GMP to guide the handling, management, and disposal of groundwater encountered during the Works. The GMP will be overseen by a QP and will comply with Ontario Regulations 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the Ontario Water Resources Act.</li> <li>The GMP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMP will outline general groundwater monitoring considerations during the Works and provide guidance for groundwater monitoring following the Works where considered applicable.</li> <li>The GMP will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the Works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity Sector Registry (EASR).</li> <li>The GMP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the Works, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality.</li> <li>The GMP will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	<ul> <li>A Groundwal on a monthly data/results a</li> <li>Upon comple Implementation</li> </ul>
		<ul> <li>Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel handling, storage and onsite equipment maintenance activities</li> </ul>	<ul> <li>Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.</li> </ul>	<ul> <li>A Spill Response</li> <li>Any accident groundwater required, the follow-up mo</li> </ul>
		Temporary lowering of groundwater table due to excavation dewatering; discharge of pumped water	<ul> <li>Additional investigations are required during detailed design and will include evaluation of the volume of water to be pumped and the need for a Permit to Take Water. If a PTTW is required, a detailed water management plan is required.</li> </ul>	Additional inv dewatering p
OCS – Richmond Hill Corridor	<ul><li>Footprint Impacts</li><li>Installation of OCS</li></ul>	Temporary lowering of groundwater table due to	<ul> <li>Additional investigations are required during detailed design and will include evaluation of the volume of water to be pumped and the need for a Permit to</li> </ul>	Additional inv dewatering p

#### Monitoring/Future Work Commitments

e spill should be reported to appropriate regulatory agencies and onitoring completed to ensure no residual contamination is present.

Excavated Material Monthly Monitoring Report will be submitted by ctor for Metrolinx review on a monthly basis that includes monitoring ance data related to the management of excavated materials. etion of the earthworks, a Soil and Excavated Material Management tion Report will be issued to Metrolinx by the Constructor.

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Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
	<ul> <li>Construct Modifications to Bridges</li> <li>Install duct banks</li> <li>Construct 25k∨ feeder routes</li> <li>Tree removals</li> </ul>	excavation dewatering; discharge of pumped water	Take Water. If a PTTW is required, a detailed water management plan is required.	
Operation/Maintenance of OCS	• N/A	• N/A	• N/A	• N/A
Installation/Construction of OCS	<ul> <li>Excavate soil</li> <li>Install OCS foundations at an approximate depth of 5m</li> <li>Erect poles</li> <li>Install wiring</li> <li>Tree removals</li> </ul>	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials	<ul> <li>Develop a SEMMP for the handling, management, and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person pursuant to <i>Ontario Regulation 153/04</i> under the <i>Environmental Protection Act</i> (QP) and will comply with <i>Ontario Regulation 406/19</i> (On-Site and Excess Soil Management), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s <i>Management of Excess Soils: A Guide for Best Management Practices</i>, (MECP, April 2019, as amended) and All Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.</li> <li>Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per <i>Ontario Regulation 347</i> (as amended) and All Applicable Law.</li> <li>The SEMMP will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	A Soil and Extra Construct and performa     Upon comple Implementati
		Construction operations could expose groundwater and associated contamination	<ul> <li>Develop a GMP to guide the handling, management, and disposal of groundwater encountered during the Works. The GMP will be overseen by a QP and will comply with Ontario Regulations 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the Ontario Water Resources Act.</li> <li>The GMP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMP will outline general groundwater monitoring considerations during the Works and provide guidance for groundwater monitoring following the Works where considered applicable.</li> <li>The GMP will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the Works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity Sector Registry (EASR).</li> <li>The GMP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the Works, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality.</li> <li>The GMP will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	<ul> <li>A Groundwar on a monthly data/results a</li> <li>Upon completing Implementation</li> </ul>
		<ul> <li>Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel handling, storage and onsite equipment maintenance activities</li> </ul>	Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.	<ul> <li>A Spill Response</li> <li>Any accident groundwater required, the follow-up mo</li> </ul>
		Temporary lowering of groundwater table due to	Additional investigations are required during detailed design and will include     evaluation of the volume of water to be pumped and the need for a Permit to	Additional inv dewatering p

#### Monitoring/Future Work Commitments

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vestigations on the need for a PTTW and preparation of a plan.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
		excavation dewatering; discharge of pumped water	Take Water. If a PTTW is required, a detailed water management plan is required.	
Installation of Grounding and Bonding – Richmond Hill Corridor	<ul> <li>Excavate the soil to the required depth (approximately 1m)</li> <li>Install grounding mats, conductors and rods, as per design</li> <li>Connect the grounding system internally and with adjacent existing grounding system, where required</li> <li>Backfill the grounding system, as per design</li> <li>Install the junction boxes and connect grounding conductors, where required</li> </ul>	Potential for groundwater quality impacts resulting from accidental leaks and spills associated with fuel handling, storage and onsite equipment maintenance activities	Best Management Practices should be implemented and spill contingency plan, including a spill action response plan, should be in place. In addition, contractors working at the Site should ensure that construction equipment is in good working order.	<ul> <li>A Spill Response</li> <li>Any accidenting groundwater required, the follow-up motion</li> </ul>
Bridge/Rail Overpass Modifications – Richmond Hill Corridor	• N/A	• N/A	• N/A	• N/A
Construction of Bridge/Rail Overpass Modifications – Richmond Hill Corridor	• N/A	• N/A	• N/A	• N/A

### Monitoring/Future Work Commitments

ponse Plan should be developed and implemented. Intal release of materials that can result in contamination of the r should be cleaned and remediated as soon as possible. If e spill should be reported to appropriate regulatory agencies and ponitoring completed to ensure no residual contamination is present.

### 5.21.3 Land Use & Socio-Economic

### TABLE 5-103 SUMMARY OF LAND USE & SOCIO-ECONOMIC MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
All Project Components as Identified in this Report	<ul> <li>Footprint Impacts</li> <li>Construction</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>Footprint impact (minor zoning conflicts)</li> <li>Property acquisition – permanent and temporary</li> <li>Land use and access disruption</li> <li>Nuisance effects from construction activities</li> <li>Potential temporary road closures</li> </ul>	<ul> <li>Further coordination (which may include a series of meetings, discussions, and agreements) with municipalities and property owners will be undertaken during detailed design to finalize design details and minimize conflicts on adjacent uses.</li> <li>Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures.</li> <li>Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Develop a community notification protocol for Metrolinx review and approval which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any.</li> <li>Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required.</li> <li>Provide temporary lighting and wayfinding signs and cues for navigation around the construction site.</li> <li>Access to businesses during working hours will be maintained, where feasible. Where regular access cannot be maintained, alternative access and signage will be provided.</li> <li>Ensure that proper fencing is erected prior to any earth moving, clearing or construction in order to prevent encroachment.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> <li>Potential conflicts with recreational amenities and businesses will be re-examined during the detailed design phase, and if required relevant municipalities will be consulted to determine appropriate design solu</li></ul>	<ul> <li>Additional consult that local business that staging optior to the extent poss</li> <li>When applicable, Visual, EMI/EMF,</li> <li>Temporary access</li> <li>Continuing evalua infrastructure.</li> </ul>
Track Infrastructure (Various Rail Corridors)	<ul> <li>Footprint Impact</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>Footprint impact (minor zoning conflicts)</li> <li>Property acquisition – permanent and temporary</li> <li>Nuisance effects</li> </ul>	<ul> <li>Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF, Air Quality and Noise and Vibration commitment tables.</li> </ul>	<ul> <li>When applicable, Visual, EMI/EMF,</li> </ul>
Construction of Track Infrastructure (Various Rail Corridors)	Construction of track infrastructure	<ul> <li>Land use and access disruption Requirement</li> <li>Nuisance effects from construction activities</li> <li>Potential temporary road closures</li> </ul>	<ul> <li>Further coordination (which may include a series of meetings, discussions, and agreements) with municipalities and property owners will be undertaken during detailed design to finalize design details and minimize any conflicts on adjacent uses.</li> <li>Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Develop a community notification protocol for Metrolinx review and approval which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any.</li> <li>Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required.</li> <li>Provide temporary lighting and wayfinding signs and cues for navigation</li> </ul>	<ul> <li>Additional consult that local business that staging optior patterns to the ext</li> <li>When applicable, Visual, EMI/EMF,</li> <li>Temporary access</li> <li>Continuing evaluation</li> </ul>

#### Monitoring/Future Work Commitments

tation during the detailed design and construction phases to ensure ses and properties owners are aware of construction scheduling and ns can be developed to minimize impacts to local access and travel sible.

monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. s paths, walkways, cycling routes and fencing should be monitored. ation of the progress and potential effects of the proposed

monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables.

tation during the detailed design and construction phases to ensure ses and properties owners are aware of construction scheduling and ns can be developed to minimize impacts to local access and travel tent possible.

monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables.

s paths, walkways, cycling routes and fencing should be monitored. ation of the progress and potential effects of the track infrastructure.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
			<ul> <li>Access to businesses during working hours will be maintained, where feasible. Where regular access cannot be maintained, alternative access and signage will be provided.</li> <li>Ensure that proper fencing is erected prior to any earth moving, clearing or construction in order to prevent encroachment.</li> <li>Develop a Construction Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> <li>If there are any proposed modifications to the existing culverts or an expansion of development (i.e., structures, fill, grading, etc.) beyond the existing developed track area, further details will be provided to Conservation Halton staff to advise of any typical requirements under <i>Ontario Regulation 162/06</i> (see track segments LSW-2 and LSW-3).</li> </ul>	
Walkers Line Layover Facility – Lakeshore West Corridor	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>Property acquisition – permanent and temporary</li> <li>Nuisance effects</li> </ul>	<ul> <li>Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures.</li> <li>Metrolinx will continue to work with the business owner of the adjacent lands to find integrated solutions to accommodate the development and existing land uses. Potential conflicts with recreational amenities and businesses will be reexamined during the detailed design phase, and if required the City of Burlington will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities and/or businesses.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> </ul>	<ul> <li>When applicable, Visual, EMI/EMF,</li> <li>Continuing evalua Layover.</li> </ul>
Unionville Storage Yard Facility- Stouffville Corridor	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>Footprint impact (minor zoning conflicts)</li> <li>Property acquisition – permanent and temporary</li> <li>Nuisance effects</li> </ul>	<ul> <li>Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures.</li> <li>Metrolinx will continue to work with the developer of nearby adjacent lands to confirm proposed site plans and find integrated solutions to accommodate all development.</li> <li>Potential conflicts with recreational amenities and businesses will be re-examined during the detailed design phase, and if required the City of Markham will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities and/or businesses.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> </ul>	<ul> <li>When applicable, Visual, EMI/EMF,</li> <li>Continuing evalua Yard.</li> </ul>
Don Valley Layover Facility – Richmond Hill Corridor	Footprint Impacts     Operations & Maintenance	<ul> <li>Footprint impact (minor zoning conflicts)</li> <li>Property acquisition – permanent and temporary</li> <li>Nuisance effects</li> </ul>	<ul> <li>Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures.</li> <li>To minimize adverse effects on recreational amenities resulting from the implementation of the proposed layover infrastructure identified as part of the conceptual design, the following recommendations have been provided:         <ul> <li>Buildings setbacks will allow for recreational amenities to be maintained adjacent to site;</li> <li>Buildings/structures will achieve Ontario Building Code requirements;</li> <li>Structures will be oriented to maximize public access and views to the park, where feasible given various site constraints;</li> <li>Structures are to be designed in keeping with the characteristics of the surrounding area and Metrolinx Design Excellence Standards;</li> <li>Locate loading/servicing areas away from the Lower Don River Trail and park spaces, where feasible.</li> </ul> </li> <li>Potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the City of Toronto will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> </ul>	<ul> <li>When applicable, Visual, EMI/EMF,</li> <li>When applicable, Environment com</li> <li>The City of Toron land use effects a</li> <li>Continuing evaluation</li> </ul>

Monitoring/Future Work Commitments
nonitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. Ion of the progress and potential effects of the Walkers Line
nonitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. ion of the progress and potential effects of the Unionville Storage
nonitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. nonitoring related to potential effects outlined in the Natural hitments table. In will continue to be consulted during detailed design regarding d/or effects on the adjacent parks and Lower Don River Trail. It ion of the progress and potential effects of the Don Valley Layover.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
Construction of Layover/Storage Yard Facilities	<ul> <li>Site clearing</li> <li>Excavate soil</li> <li>Grade and seed</li> <li>Install OCS foundations at an approximate depth of 5 meters</li> <li>Construction of infrastructure, access route, and associate fencing</li> <li>Install building foundation</li> <li>Construct access roads</li> <li>Install fencing</li> <li>Construct buildings</li> <li>Road paving</li> </ul>	<ul> <li>Land use and access disruption Requirement</li> <li>Nuisance effects from construction activities</li> <li>Potential temporary road closures</li> <li>Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Develop a community notification protocol for Metrolinx review and approva which will indicate how and when surrounding property owners and tenants be informed of anticipated upcoming construction works, including work at night, if any.</li> <li>Provide well connected, clearly delineated, and appropriately signed walkwa and cycling route options, with clearly marked detours where required.</li> <li>Provide temporary lighting and wayfinding signs and cues for navigation around the construction site.</li> <li>Access to businesses during working hours will be maintained, where feasil Where regular access cannot be maintained, alternative access and signag will be provided.</li> <li>Ensure that proper fencing is erected prior to any earth moving, clearing or construction and circulate to local municipalities/road authorities for revie and discussion.</li> <li>The Lower Don River Trail is to remain open and accessible to the public during the construction of the Don Valley Layover Facility. If the trail cannot remain open, due to public safety reasons, an alternative temporary detour be provided for the duration of construction. The City of Toronto Parks, Forestry and Recreation Department and Ward Councilors will be notified p</li> </ul>		<ul> <li>Additional consulta that local business that staging options patterns to the exte</li> <li>When applicable, r Visual, EMI/EMF, A</li> <li>Temporary access</li> <li>Continuing evaluat</li> </ul>
GO Station Platforms	<ul> <li>Footprint Impacts</li> <li>Operation &amp; Maintenance</li> </ul>	<ul> <li>Property acquisition – permanent and temporary</li> <li>Nuisance effects</li> </ul>	<ul> <li>Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures.</li> <li>Potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the City of Markham will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities surrounding Mount Joy GO Station (see track segments ST-3 and ST-4).</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> </ul>	<ul> <li>When applicable, n Visual, EMI/EMF, A</li> <li>Continuing evaluat</li> </ul>
Construction of GO Station Platforms	<ul> <li>Site clearing</li> <li>Excavate soil</li> <li>Construction of infrastructure</li> </ul>	<ul> <li>Land use and access disruption Requirement</li> <li>Nuisance effects from construction activities</li> <li>Potential temporary road closures</li> </ul>	<ul> <li>Further coordination (which may include a series of meetings, discussions, and agreements) with municipalities and property owners will be undertaken during detailed design to finalize design details and minimize any conflicts on adjacent uses.</li> <li>Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Develop a community notification protocol for Metrolinx review and approval which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any.</li> <li>Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required.</li> </ul>	<ul> <li>Additional consulta that local business that staging options patterns to the exte</li> <li>When applicable, n Visual, EMI/EMF, A</li> <li>Temporary access</li> <li>Continuing evaluat</li> </ul>

#### Monitoring/Future Work Commitments

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monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables.

paths, walkways, cycling routes and fencing should be monitored. tion of the progress and potential effects of layovers.

monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. tion of the progress and potential effects of GO Station Platforms.

ation during the detailed design and construction phases to ensure ses and properties owners are aware of construction scheduling and ns can be developed to minimize impacts to local access and travel tent possible.

monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and ∀ibration commitment tables.

paths, walkways, cycling routes and fencing should be monitored. tion of the progress and potential effects of GO Station Platforms.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
Thickson Road Bridge Expansion	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>Provide temporary lighting and wayfinding signs and cues for navigation around the construction site.</li> <li>Access to businesses during working hours will be maintained, where feasible Where regular access cannot be maintained, alternative access and signage will be provided.</li> <li>Ensure that proper fencing is erected prior to any earth moving, clearing or construction in order to prevent encroachment.</li> <li>Develop a Construction Management Plan prior to construction and circulate local municipalities/road authorities for review and discussion.</li> <li>Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will he identify appropriate site-specific mitigation measures.</li> <li>Potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the Town of Whitby will be consulted t determine appropriate design solutions to minimize/mitigate effects to recreational amenities.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the</li> </ul>		<ul> <li>When applicable, Visual, EMI/EMF,</li> <li>Continuing evalua</li> </ul>
Construction of Thickson Road Bridge Expansion	<ul> <li>Site clearing</li> <li>Excavate soil</li> <li>Construction of infrastructure</li> <li>Road paving</li> </ul>	<ul> <li>Land use and access disruption Requirement</li> <li>Nuisance effects from construction activities</li> <li>Potential temporary road closures</li> </ul>	<ul> <li>Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Further coordination (which may include a series of meetings, discussions, and agreements) with municipalities and property owners will be undertaken during detailed design to finalize design details and minimize any conflicts on adjacent uses.</li> <li>Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Develop a community notification protocol for Metrolinx review and approval which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any.</li> <li>Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required.</li> <li>Provide temporary lighting and wayfinding signs and cues for navigation around the construction site.</li> <li>Access to businesses during working hours will be maintained, where feasible. Where regular access cannot be maintained, alternative access and signage will be provided.</li> <li>Ensure that proper fencing is erected prior to any earth moving, clearing or construction in order to prevent encroachment.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> </ul>	<ul> <li>Additional consulta that local business that staging option patterns to the ext</li> <li>When applicable, I Visual, EMI/EMF,</li> <li>Temporary access</li> <li>Develop a Constru- municipalities/road fencing.</li> <li>Continuing evalua Expansion.</li> </ul>
Operation/Maintenance of OCS	<ul> <li>Footprint Impacts</li> <li>Operation of OCS</li> <li>Tree pruning/maintenance</li> </ul>	<ul> <li>Property acquisition – permanent and temporary</li> <li>Vegetation removals</li> <li>Nuisance effects</li> </ul>	<ul> <li>Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures.</li> <li>Potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the City of Toronto will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> </ul>	<ul> <li>When applicable, Visual, EMI/EMF,</li> <li>Continuing evalua Richmond Hill Cor</li> </ul>
Installation/Construction of OCS	<ul> <li>Excavate soil</li> <li>Install OCS foundations at an approximate depth of 5 meters</li> <li>Erect poles</li> <li>Install wiring</li> </ul>	<ul> <li>Land use and access disruption Requirement</li> <li>Nuisance effects from construction activities</li> <li>Potential temporary road closures</li> </ul>	<ul> <li>Further coordination (which may include a series of meetings, discussions, and agreements) with municipalities and property owners will be undertaken during detailed design to finalize design details and minimize any conflicts on adjacent uses.</li> </ul>	<ul> <li>Additional consultation that local business that staging option patterns to the ext</li> <li>When applicable, Visual, EMI/EMF,</li> </ul>

Monitoring/Future Work Commitments
nonitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. ion of the progress and potential effects of GO Station platforms.
Ition during the detailed design and construction phases to ensure es and properties owners are aware of construction scheduling and s can be developed to minimize impacts to local access and travel ent possible. Inonitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. paths, walkways, cycling routes and fencing should be monitored. ction Management Plan prior to construction and circulate to local authorities for review and discussion. Periodic monitoring of ion of the progress and potential effects of Thickson Road Bridge
nonitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. ion of the progress and potential effects of OCS along the ridor.
ition during the detailed design and construction phases to ensure es and properties owners are aware of construction scheduling and s can be developed to minimize impacts to local access and travel ent possible.

, monitoring related to potential nuisance effects are outlined in the , Air Quality and Noise and ∀ibration commitment tables.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
Installation of Grounding and Bonding – Richmond Hill Corridor	<ul> <li>Tree removals</li> <li>Excavate the soil to the required depth (approximately 1 meter)</li> <li>Install grounding mats, conductors and rods, as per design</li> <li>Connect the grounding system internally and with adjacent existing grounding system, where required</li> <li>Backfill the grounding system, as per design</li> <li>Install the junction boxes and connect grounding conductors, where required</li> </ul>	<ul> <li>Land use and access disruption Requirement</li> <li>Nuisance effects from construction activities</li> <li>Potential temporary road closures</li> </ul>	<ul> <li>Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Develop a community notification protocol for Metrolinx review and approval which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any.</li> <li>Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required.</li> <li>Provide temporary lighting and wayfinding signs and cues for navigation around the construction site.</li> <li>Access to businesses during working hours will be maintained, where feasible. Where regular access cannot be maintained, alternative access and signage will be provided.</li> <li>Ensure that proper fencing is erected prior to any earth moving, clearing or construction in order to prevent encroachment.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> <li>Further coordination (which may include a series of meetings, discussions, and agreements) with municipalities and property owners will be undertaken during detailed design to finalize design details and minimize any conflicts on adjacent uses.</li> <li>Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Develop a community notification protocol</li></ul>	<ul> <li>Temporary access</li> <li>Develop a Construmunicipalities/road fencing.</li> <li>Continuing evaluat Richmond Hill Cor</li> <li>Additional consultat that local business that staging option patterns to the externational the staging option patterns to the externational, EMI/EMF, J.</li> <li>Temporary access</li> <li>Develop a Construmunicipalities/road fencing.</li> <li>Continuing evaluat along the Richmore</li> </ul>
Bridge/Rail Overpass	Operations & Maintenance	Nuisance effects	<ul> <li>to construction and circulate to local municipalities/road authorities for review and discussion.</li> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> </ul>	<ul> <li>When applicable, in Visual, EMI/EMF, J</li> </ul>
Corridor				Continuing evaluation     the Richmond Hill
Construction of Bridge/Rail Overpass Modifications – Richmond Hill Corridor	<ul> <li>Install bridge barriers</li> <li>Install OCS attachments</li> <li>Install flash plates</li> </ul>	<ul> <li>Land use and access disruption Requirement</li> <li>Nuisance effects from construction activities</li> <li>Potential temporary road closures</li> </ul>	<ul> <li>Further coordination (which may include a series of meetings, discussions, and agreements) with municipalities and property owners will be undertaken during detailed design to finalize design details and minimize any conflicts on adjacent uses.</li> <li>Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.</li> </ul>	<ul> <li>Additional consultation that local business that staging option patterns to the externation of the applicable, in Visual, EMI/EMF, Journal Construction of the externation of the applicable of the a</li></ul>

#### Monitoring/Future Work Commitments

s paths, walkways, cycling routes and fencing should be monitored. Inction Management Plan prior to construction and circulate to local a authorities for review and discussion. Periodic monitoring of

tion of the progress and potential effects of OCS along the rridor.

ation during the detailed design and construction phases to ensure ses and properties owners are aware of construction scheduling and ns can be developed to minimize impacts to local access and travel tent possible.

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paths, walkways, cycling routes and fencing should be monitored. Inction Management Plan prior to construction and circulate to local I authorities for review and discussion. Periodic monitoring of

tion of the progress and potential effects of grounding and bonding nd Hill Corridor.

monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. tion of the progress and potential effects bridge modifications along Corridor.

ation during the detailed design and construction phases to ensure ses and properties owners are aware of construction scheduling and ns can be developed to minimize impacts to local access and travel tent possible.

monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables.

paths, walkways, cycling routes and fencing should be monitored.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
			<ul> <li>Mitigation measures related to potential nuisance effects are outlined in the Visual, EMI/EMF Air Quality and Noise and Vibration commitment tables.</li> <li>Develop a community notification protocol for Metrolinx review and approval which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any.</li> <li>Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required.</li> <li>Provide temporary lighting and wayfinding signs and cues for navigation around the construction site.</li> <li>Access to businesses during working hours will be maintained, where feasible. Where regular access cannot be maintained, alternative access and signage will be provided.</li> <li>Ensure that proper fencing is erected prior to any earth moving, clearing or construction in order to prevent encroachment.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> </ul>	<ul> <li>Develop a Construmunicipalities/road fencing.</li> <li>Continuing evaluat along the Richmon</li> </ul>

### Monitoring/Future Work Commitments

action Management Plan prior to construction and circulate to local a authorities for review and discussion. Periodic monitoring of

tion of the progress and potential effects of bridge modifications nd Hill Corridor.

### 5.21.4 Visual/Aesthetics

### TABLE 5-104 SUMMARY OF VISUAL/AESTHETICS MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
All Project Components as Identified in this Report	<ul> <li>Footprint Impacts</li> <li>Construction</li> <li>Operations &amp; Maintenance</li> </ul>	Potential Effect         Mitigation Measures/Commitments           • Visual impacts affecting existing viewsheds and visual receptors         • Develop and implement an Environmental Management System (EMS) to ensure the environmental protection/mitigation measures identified as part of the GO Rail Network Electrification TPAP are fulfilled and functioning as expected. The overall intent of the EMS will be to integrate environmental management into the daily operations and other quality management systems of the project.           • As part of detailed design, efforts will be made to minimize visual impacts where possible/feasible.         • Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.           • A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.           • Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.           • Municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.           • The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.           • Placement of infrastructure in relation to supporting infrastructure such as viaducts (e.g., place OCS poles in alignment with bridge piers if possible).           • Offset		<ul> <li>Construction actic confirm that all a within specified of Measure illumina RP-8-18 Chapter</li> <li>Monitor effective</li> <li>Construction mai</li> <li>Periodic inspective</li> <li>Monitor installation</li> </ul>
Track Infrastructure (Various Rail Corridors)	Footprint impacts	No effects anticipated	No mitigation measures required.	No mitigation me
Construction of Track Infrastructure (Various Rail Corridors)	Construction     Activities	<ul> <li>Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction</li> <li>A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.</li> <li>Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.</li> <li>Municipal by-laws and Ministry of Transportation (MTO) practices for ligh will be followed and incorporate industry best practices provided in ANSI/ RP-8-18.</li> <li>The Construction lighting are controlled or mitigated in such a way a avoid unnecessary and obtrusive light with respect to adjoining residents communities and/or businesses.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities to review and discussion.</li> </ul>		<ul> <li>Construction actic confirm that all a within specified c</li> <li>Measure illumina RP-8-18 Chapter</li> <li>Monitor effective</li> </ul>
Walkers Line Layover Facility – Lakeshore West Corridor	Footprint impacts	<ul> <li>Visual impacts affecting existing viewsheds from natural areas nearby</li> </ul>	<ul> <li>As part of detailed design, efforts will be made to minimize visual impacts where possible.</li> <li>A Design Excellence process will be followed to integrate the new infrastructure design into the existing environment to reduce the extent of visual impacts.</li> </ul>	Construction man

Monitoring/Future Work Commitments

tivities will be monitored by a qualified Environmental Inspector to activities are conducted in accordance with mitigation plans and construction work zones.

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easures required.

tivities will be monitored by a qualified Environmental Inspector to activities are conducted in accordance with mitigation plans and construction work zones.

ance levels using an illuminance meter in accordance with ANSI/IES or 4.

eness of light pollution mitigation measures.

nagement to enforce adherence to requirements in contract.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
			<ul> <li>Local municipalities and key stakeholders will be consulted during detail design, as required.</li> </ul>	
Unionville Storage Yard Facility – Stouffville Corridor	Footprint impacts	<ul> <li>Visual impacts affecting existing viewsheds from secondary school and recreational areas nearby</li> </ul>	<ul> <li>As part of detailed design, efforts will be made to minimize visual impacts where possible.</li> <li>A Design Excellence process will be followed to integrate the new infrastructure design into the existing environment to reduce the extent of visual impacts.</li> <li>Local municipalities and key stakeholders will be consulted during detail design, as required.</li> </ul>	Construction
Don Valley Layover Facility – Richmond Hill Corridor	Footprint impacts	<ul> <li>Visual impacts affecting existing viewsheds from nearby recreational areas</li> <li>Altered views of Heritage Prince Edward viaduct</li> </ul>	<ul> <li>As part of detailed design, efforts will be made to minimize visual impacts as much as possible.</li> <li>A Design Excellence process and urban design review with the City of Toronto will be continued during future project phases with the intent of minimizing footprint, maximizing distance to the trail and heritage bridge, securing high quality architecture and landscape design, securing Toronto Green Standards to the extent feasible (as determined by Metrolinx), and considering public art potential for the site, where possible.</li> <li>Special consideration should be given to the aesthetic design of the Don Valley Layover as much as possible during detailed design, with consideration that the proposed facility is within the City of Toronto's natural heritage system and the Lower Don Valley Layover, mitigation recommendations include the use of concrete patterning where walls are adjacent to sensitive receptors, and consideration for grading design to minimize wall heights and maximize planting of trees and shrubs, where applicable.</li> <li>Offsetting tree removals where feasible, as per Metrolinx's Vegetation Management Protocol (January 2020) in affected areas and parks may minimize visual impacts.</li> <li>Local municipalities and key stakeholders will be consulted during detailed design, as required.</li> <li>To the extent possible, Metrolinx will aim to minimize the facility to the extent possible, Metrolinx will aim to provide a landscape buffer around the facility to the extent possible to minimize visual impacts.</li> <li>The detailed design will adhere to Metrolinx design guidelines for layover facilities, with the expertise of an architect and landscape architect. Metrolinx will consider the natural park setting to minimize visual impacts, where feasible to minimize visual impacts.</li> <li>The detailed design will adhere to Metrolinx design guidelines for layover facilities, with the expertise of an architect and landscape architect. Metrolinx will avor to m</li></ul>	Construction
Construction of Layover/Storage Yard Facilities	Construction     Activities	Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction	<ul> <li>Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.</li> <li>A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.</li> <li>Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.</li> <li>Municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.</li> <li>The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.</li> </ul>	Construction confirm that a within specifie Measure illum ANSI/IES RP     Monitor effect

### Monitoring/Future Work Commitments

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ctivities will be monitored by a qualified Environmental Inspector to activities are conducted in accordance with mitigation plans and a construction work zones.

nance levels using an illuminance meter in accordance with 8-18 Chapter 4.

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Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
			<ul> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> </ul>	
GO Station Platforms	Footprint impacts	<ul> <li>Visual impact to passengers waiting on station platforms, or walking to the platform from surroundings</li> <li>Visual impacts affecting existing viewsheds from nearby recreational areas</li> </ul>	<ul> <li>As part of detailed design, efforts will be made to minimize visual impacts as much as possible.</li> <li>A Design Excellence process will be followed to integrate the design of new platforms into GO Stations to reduce the extent of visual impacts.</li> </ul>	Adherence to I     Design Excelle
Construction of GO Station Platforms	Construction     Activities	Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction	<ul> <li>Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.</li> <li>A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.</li> <li>Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.</li> <li>Municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.</li> <li>The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> <li>A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses.</li> <li>Local municipalities and key stakeholders will be consulted during detail</li> </ul>	<ul> <li>Construction acconfirm that all within specified</li> <li>Measure illumin 8-18 Chapter 4</li> <li>Monitor effectiv</li> </ul>
Thickson Road Bridge Expansion	Footprint impacts	No effects anticipated	No mitigation measures required.	No monitoring
Construction of Thickson Road Bridge Expansion	Construction     Activities	Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction	<ul> <li>Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.</li> <li>A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.</li> <li>Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.</li> <li>Municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.</li> <li>The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> </ul>	Construction m

#### Monitoring/Future Work Commitments

Design Guidelines will be developed in consultation with Metrolinx's nce Committee.

ctivities will be monitored by a qualified Environmental Inspector to activities are conducted in accordance with mitigation plans and a construction work zones.

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measures required.

anagement to enforce adherence to requirements in contract.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
OCS – Richmond Hill Corridor	Footprint impacts	<ul> <li>Footprint impacts</li> <li>The Installation of OCS will affect the viewshed especially in areas of vegetative clearing</li> </ul>	<ul> <li>As part of detailed design, efforts will be made to minimize visual impacts where possible/feasible Placement of infrastructure in relation to supporting infrastructure such as viaducts (e.g., place OCS poles in alignment with bridge piers if possible)</li> <li>Offsetting tree removals where feasible as per Metrolinx's Vegetation Management Protocol (January 2020) in affected areas and parks may minimize visual impacts.</li> </ul>	<ul> <li>Periodic inspective required.</li> <li>Placement of ir (e.g., place OC</li> <li>Monitor installa</li> </ul>
Operation/Maintenance of OCS	<ul> <li>Operation of OCS</li> <li>Tree pruning/</li> <li>maintenance</li> </ul>	<ul> <li>Vegetation removals</li> <li>Damage to adjacent to the removal areas</li> <li>Minimal temporary visual impacts due to exposure of infrastructure</li> </ul>	<ul> <li>Adherence to relevant guidelines and OPSS for clearing and grubbing (OPSS 201), site preparation and tree protection (OPSS 801).</li> </ul>	<ul> <li>Construction ac confirm that all within specified</li> <li>Monitor installa</li> </ul>
Installation/Construction of OCS	<ul> <li>Excavate soil</li> <li>Install OCS foundations at an approximate depth of 5m</li> <li>Erect poles</li> <li>Install wiring</li> <li>Tree removals</li> </ul>	<ul> <li>Vegetation removals</li> <li>Damage to trees adjacent to the removal areas</li> <li>Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction</li> </ul>	<ul> <li>Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.</li> <li>A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.</li> <li>Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.</li> <li>The Constructor will develop for Metrolinx review and approval an outdoor construction Light Pollution Plan that complies with all local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.</li> <li>The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> <li>A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers where suitable with surrounding land uses.</li> <li>Local municipalities and key stakeholders will be consulted during detailed design design as required</li> </ul>	<ul> <li>Construction ac confirm that all within specified</li> <li>Measure illumir 8-18 Chapter 4</li> <li>Monitor effectiv</li> <li>Monitor installa</li> </ul>
Installation of Grounding and Bonding – Richmond Hill Corridor	<ul> <li>Excavate the soil to the required depth (approximately 1m)</li> <li>Install grounding mats, conductors and rods, as per design</li> <li>Connect the grounding system internally and with adjacent existing grounding system, where required</li> <li>Backfill the grounding system, as per design</li> <li>Install the junction boxes and connect grounding conductors, where required</li> <li>Tree removals</li> </ul>	<ul> <li>Vegetation removals</li> <li>Damage to trees adjacent to the removal areas</li> <li>Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction</li> </ul>	<ul> <li>Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.</li> <li>A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.</li> <li>Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.</li> <li>The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> </ul>	<ul> <li>Construction ac confirm that all within specified</li> <li>Measure illumir 8-18 Chapter 4</li> <li>Monitor effectiv</li> <li>Monitor installa</li> </ul>

### Monitoring/Future Work Commitments

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reness of light pollution mitigation measures. Ition of compensation plantings to ensure they are installed properly.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	
Bridge/Rail Overpass Modifications – Richmond Hill Corridor	Operations & Maintenance	<ul> <li>No effects anticipated</li> </ul>	No mitigation measures required.	No mitigation m
Construction of Bridge/Rail Overpass Modifications – Richmond Hill Corridor	<ul> <li>Excavate soil</li> <li>Install OCS foundations at an approximate depth of 5m</li> <li>Erect poles</li> <li>Install wiring</li> </ul>	No effects anticipated	<ul> <li>Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.</li> <li>A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.</li> <li>Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.</li> <li>Municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18. The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.</li> <li>Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.</li> </ul>	<ul> <li>Construction ac confirm that all a within specified</li> <li>Measure illumin ANSI/IES RP-8-</li> <li>Monitor effective</li> <li>Monitor installat</li> </ul>

### Monitoring/Future Work Commitments

easures required.

ctivities will be monitored by a qualified Environmental Inspector to activities are conducted in accordance with mitigation plans and construction work zones.

nance levels using an illuminance meter in accordance with 8-18 Chapter 4.

eness of light pollution mitigation measures.

tion of compensation plantings to ensure they are installed properly.

### 5.21.5 Cultural Heritage

### TABLE 5-105 SUMMARY OF CULTURAL HERITAGE MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
All Project Components as Identified in this Report	<ul> <li>Footprint Impacts</li> <li>Construction</li> <li>Operations &amp; Maintenance</li> </ul>	• N/A	• N/A	• N/A
Track Infrastructure (Various Rail Corridors)	• N/A	• N/A	• N/A	• N/A
Construction of Track Infrastructure (Various Rail Corridors)	Construction Impacts	<ul> <li>Potential indirect impacts to the heritage attribute(s) if known or potential Cultural Heritage Value or Interest (CHVI) due to construction activities.</li> <li>No direct impacts to identified BHRs or CHLs were identified.</li> </ul>	<ul> <li>Selection of construction staging and laydown areas will follow the Contracting Authority's selection procedures which include avoiding heritage attributes wherever possible or effectively mitigating impacts where not possible.</li> <li>To ensure BHRs and CHLs are not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure will be subject to vibration impacts:         <ul> <li>Preferred Option: Plan construction activities to avoid adverse vibration impacts to BHRs and CHLs.</li> <li>Alternative Option: Should it not be feasible to avoid adverse vibration impacts, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations.</li> </ul> </li> </ul>	<ul> <li>Implement and comply with monitoring requirements and commitments pertaining to Built Heritage Resources/Cultural Heritage Landscapes/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHERs, HIAs and SCPs.</li> <li>The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken.</li> </ul>
Walkers Line Layover Facility – Lakeshore West Corridor	• N/A	• N/A	• N/A	• N/A
Unionville Storage Yard Facility- Stouffville Corridor	• N/A	• N/A	• N/A	• N/A
Don Valley Layover Facility – Richmond Hill Corridor	Construction Impacts	Potential indirect or direct impacts to the heritage attribute(s) if known or potential Cultural Heritage Value or Interest (CHVI) due to construction activities.	<ul> <li>Selection of construction staging and laydown areas will follow the Contracting Authority's selection procedures which include avoiding heritage attributes wherever possible or effectively mitigating impacts where not possible.</li> <li>In order to reduce the visual impacts of the layover facility on the Prince Edward Viaduct, a HIA should be conducted to help inform subsequent design stages. Such a study should consider and address the scale and massing of the ancillary buildings, as well as siting and building finishes and palettes as well as post-construction landscaping plans. Consideration should be given to using materials, colours, and finishes that will make these structures physically and visually compatible with, subordinate to, and distinguishable from the surrounding landscape and the subject bridge.</li> <li>To ensure the Prince Edward Viaduct is not adversely impacted during adjacent construction activities, baseline vibration monitoring should be undertaken in advance of construction:         <ul> <li>Preferred Option: Plan construction activities to avoid the placement of buildings under the bridge, and to avoid adverse vibration impacts to the structure on this property.</li> <li>Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the bridge a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations. In addition, should it not be feasible to relocate the planned layover site buildings, an HIA is required to determine appropriate site-specific mitigation measures.</li> </ul> </li> </ul>	<ul> <li>Implement and comply with monitoring requirements and commitments pertaining to Built Heritage Resources/Cultural Heritage Landscapes/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHERs, HIAs and SCPs.</li> <li>The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken.</li> </ul>
Construction of Layover Facilities	Construction Impacts	See above	See above	See above
GO Station Platforms	• N/A	• N/A	• N/A	• N/A
Construction of GO Station Platforms	Construction Impacts	• N/A	• N/A	• N/A
Thickson Road Bridge Expansion	• N/A	• N/A	• N/A	• N/A

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments
Construction of Thickson Road Bridge Expansion	• N/A	• N/A	• N/A
OCS – Richmond Hill Corridor	<ul> <li>Footprint Impacts</li> <li>Installation of OCS</li> <li>Construct Modifications to Bridges</li> <li>Install duct banks</li> <li>Construct 25kV feeder routes</li> <li>Tree removals</li> </ul>	• N/A	• N/A
Operation/Maintenance of OCS	<ul><li> Operation of OCS</li><li> Tree pruning/maintenance</li></ul>	• N/A	• N/A
Installation/Construction of OCS	<ul> <li>Excavate soil</li> <li>Install OCS foundations at an approximate depth of 5m</li> <li>Erect poles</li> <li>Install wiring</li> <li>Tree removals</li> </ul>	<ul> <li>Construction activities associated with the OCS infrastructure area and vegetation clearing area may result in indirect impacts to the bridge piers through soil disturbance and vibration impacts.</li> </ul>	<ul> <li>To ensure this bridge is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure will be subject to vibration impacts:         <ul> <li>Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on the property.</li> <li>Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages cause by vibrations.</li> <li>The area should be monitored for vibration impacts during construction, and immediately cease work acceptable vibration thresholds are exceeded until the above has been undertaken.</li> </ul> </li> </ul>
Installation of Grounding and Bonding – Richmond Hill Corridor	<ul> <li>Excavate the soil to the required depth (approximately 1m)</li> <li>Install grounding mats, conductors and rods, as per design</li> <li>Connect the grounding system internally and with adjacent existing grounding system, where required</li> <li>Backfill the grounding system, as per design</li> <li>Install the junction boxes and connect grounding conductors, where required</li> </ul>	• N/A	• N/A
Bridge/Rail Overpass Modifications – Richmond Hill Corridor	• N/A	• N/A	• N/A
Construction of Bridge/Rail Overpass Modifications – Richmond Hill Corridor	<ul> <li>Install bridge barriers</li> <li>Install OCS attachments</li> <li>Install flash plates</li> <li>Raise bridge</li> <li>Lower tracks</li> <li>Replace bridges</li> <li>Replace pedestrian bridges</li> </ul>	Direct impacts to the heritage attribute(s) of a known or potential Provincial Heritage Property (PHP) or Provincial Heritage Properties of Provincial Significance (PHPPS) due to installation of new/modified infrastructure.	<ul> <li>Where no previous assessment has been completed or a Statement of Cultural Heritage Value (SCHV) had not been approved by Metrolinx, undertake a CHER as per the forthcoming Metrolinx <i>I&amp;E Process</i> (2020). In the event that the Metrolinx <i>I&amp;E Process</i> (2020) is not approved, follow the Metrolinx <i>Interim Cultural Heritage Management</i> (2013).</li> <li>If warranted, complete a HIA in accordance with MHSTCI Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties (2017) to identify alternatives and mitigation and monitorin commitments to avoid or lessen impacts on the Cultural Heritage Value and heritage attributes of the PHP based on the PHP's SCHV. Mitigation measures and alternatives should be consistent with the relevant conservation strategies established and adopted in a SCP. A SCP will be prepared and implemented for PHPs and PHPPS.</li> <li>During design, the recommendations of all HIAs and Cultural Heritage Reports will be followed and adhere to during design and construction, including but not limited to strategies to protect heritage attributes.</li> </ul>

	Monitoring/Future Work Commitments		
	•	N/A	
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be iis ed if	•	Implement and comply with monitoring requirements and commitments pertaining to Built Heritage Resources/Cultural Heritage Landscapes/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHERs, HIAs and SCPs. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken. N/A	
	•	N/A	
ng Y,	•	Implement and comply with monitoring requirements and commitments pertaining to Built Heritage Resources/Cultural Heritage Landscapes/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHERs, HIAs and SCPs.	

### 5.21.6 Archeology

### TABLE 5-106 SUMMARY OF ARCHAEOLOGY MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
All Project Components as Identified in this Report	<ul> <li>Footprint Impacts</li> <li>Construction</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>Potential for the disturbance of unassessed or documented deeply buried archaeological resources within a 200 metre radius of Allandale Site</li> <li>Potential for the disturbance of unassessed or documented archaeological resources</li> <li>Potential to impact cemetery located in proximity to the Project footprint</li> </ul>	<ul> <li>Due to the previously documented evidence of disturbed human remains on the historic Allandale Station site, archaeological monitoring of any proposed impacts to the historic station property as well as to any crawl spaces or soils beneath existing structures without basements is recommended within the area between Essa Road and Milbum Street.</li> <li>Stage 2 survey required prior to any construction impacts within the Don Valley layover impact footprint.</li> <li>Develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan shall be amended to incorporate any additional actions required resulting from subsequent Archaeological Assessment Reports.</li> <li>All work shall be performed in accordance with Applicable Law, including but not limited to the Ontario Heritage Arc, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formery the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists in Chroin (2011).</li> <li>In the event that archaeologist in Chroin (2010).</li> <li>In the event that archaeological resource</li></ul>	<ul> <li>With the appropriate mitigation measures in place, effects from construction are not anticipated and the potential for long-term negative effects are reduced.</li> <li>Performance of the work will occur within land previously subject to an Archaeological Assessment.</li> <li>Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered.</li> <li>Further Archaeological Assessment may identify the need for monitoring during construction.</li> </ul>
(Various Rail Corridors)	Operations & Maintenance	<ul> <li>Potential for the disturbance of unassessed or documented deeply buried archaeological resources within a 200 metre radius of Allandale Site</li> <li>Potential to impact cemetery located in proximity to the Project footprint</li> <li>No potential for the disturbance of unassessed or documented</li> </ul>	<ul> <li>site, archaeological monitoring of any proposed impacts to the historic station property as well as to any crawl spaces or soils beneath existing structures without basements is recommended within the area between Essa Road and Milburn Street.</li> <li>Develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan shall be amended to incorporate any additional actions required resulting from subsequent Archaeological Assessment Reports.</li> </ul>	<ul> <li>effects from construction are not anticipated and the potential for long-term negative effects are reduced.</li> <li>Performance of the work will occur within land previously subject to an Archaeological Assessment.</li> <li>Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered.</li> </ul>

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments
		archaeological resources in all other track infrastructure impact areas	<ul> <li>All work shall be performed in accordance with Applicable Law, including but not limited to the Ontaric Heritage Act, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists in Ontario (2011).</li> <li>In the event that archaeological resources are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If resources are confirmed to possess cultural heritage value/interest then they will be reported to the MHSTCI. and further Archaeological Assessment of the resources may be required. If it is determined that there is a potential for Indigenou artifacts, the Contracting Authority should be contacted and Applicable Law will be followed.</li> <li>If final limits of the Project footprint are altered and fall outside of the assessed study area, additional Archaeological Assessments will be conducted by a professionally licensed archaeologist prior to disturbance and prior to construction activities. This will include completing all required Archaeologica Assessments resulting from the Stage 1 Archaeological Assessment (Stage 2, Stage 3 and Stage 4, a required) as early as possible, prior to the completion of design, and in advance of any ground disturbance.</li> <li>For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional Archaeological Assessment will be conducted by a professionally licensed archaeological investigation. Once human remains have been cleared of police concern, the MHSTCI work, all activitie must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontario behalf of the Ministry o</li></ul>
Construction of Track Infrastructure (Various Rail Corridors)	Construction of track infrastructure	<ul> <li>Potential for the disturbance of unassessed or documented deeply buried archaeological resources within a 200 metre radius of Allandale Site</li> <li>Potential to impact cemetery located in proximity to the Project footprint</li> <li>No potential for the disturbance of unassessed or documented archaeological resources in all other track infrastructure impact areas</li> </ul>	<ul> <li>Due to the previously documented evidence of disturbed human remains on the historic Allandale Sta site, archaeological monitoring of any proposed impacts to the historic station property as well as to a crawl spaces or soils beneath existing structures without basements is recommended within the area between Essa Road and Milburn Street.</li> <li>Develop and implement an Archaeological Risk Management Plan that addresses any recommendati resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan sh be amended to incorporate any additional actions required resulting from subsequent Archaeological Assessment Reports.</li> <li>All work shall be performed in accordance with Applicable Law, including but not limited to the Ontaric Heritage Act, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologis (2011), and the MHSTCI document, Engaging Aboriginal Communities in Archaeology: A Draft Bulleti for Consultant Archaeological resources are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If resources are confirmed to possess cultural heritage value/interest then they will be reported to the MHSTCI, and further Archaeological Assessment of the resources may be required. If it is determined that there is a potential for Indigenou artifacts, the Contracting Authority should be contacted and Applicable Law will be followed.</li> <li>If final limits of the Project footprint are altered and fall outside of the assessed study area, additional Archaeological Assessment will be conducted by a professionally licen</li></ul>

	Monitoring/Future Work Commitments
>	<ul> <li>Further Archaeological Assessment may identify the need for monitoring during construction</li> </ul>
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ition ny ons iall sts in	<ul> <li>With the appropriate mitigation measures in place, effects from construction are not anticipated and the potential for long-term negative effects are reduced.</li> <li>Performance of the work will occur within land previously subject to an Archaeological Assessment.</li> <li>Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered.</li> <li>Further Archaeological Assessment may identify the need for monitoring during construction</li> </ul>

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments
			<ul> <li>disturbance and prior to construction activities. This will include completing all required Archaeological Assessments resulting from the Stage 1 Archaeological Assessment (Stage 2, Stage 3 and Stage 4, required) as early as possible, prior to the completion of design, and in advance of any ground disturbance.</li> <li>For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional Archaeological Assessment will be conducted by a professionally licensed archaeologist prior to disturbance.</li> <li>If human remains are encountered or suspected of being encountered during project work, all activitie must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontaric behalf of the Ministry of Government and Consumer Services must be contacted. Archaeological investigations of human remains will not proceed until police have confirmed the remains are not subjut to forensic investigation. Once human remains have been cleared of police concern, the MHSTCI will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the <i>Ontario Heritage Act</i>. If the human remains are determined to be of Indigenous origin, the Contracting Authority should be contacted and all Applicable Law must be adhered to.</li> <li>All Archaeological Assessment findings will be shared with Indigenous communities, as per Metrolinx <i>Guide to Engaging with Indigenous Communities (2020)</i>.</li> <li>Work in proximity to known cemeteries requires completion of an Archaeological Assessment prior to any proposed ground disturbance in accordance with the MHSTCI's <i>Standards and Guidelines for Consultant Archaeologists</i> (2011) and the <i>Funeral, Burial, and Cremation Services Act</i> and regulation under that Act.</li> </ul>
Walkers Line Layover Facility – Lakeshore West Corridor	Footprint Impacts     Operations & Maintenance	Potential for the disturbance of unassessed or documented archaeological resources	<ul> <li>No turner archaeological assessment required.</li> <li>Stage 2 survey required prior to any construction impacts within the layover impact footprint.</li> <li>Develop and implement an Archaeological Risk Management Plan that addresses any recommendati resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan sh be amended to incorporate any additional actions required resulting from subsequent Archaeological Assessment Reports.</li> <li>All work shall be performed in accordance with Applicable Law, including but not limited to the Ontaric Heritage Act, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologis (2011), and the MHSTCI document, Engaging Aboriginal Communities in Archaeology: A Draft Bullet for Consultant Archaeologist in Ontario (2011).</li> <li>In the event that archaeological resources are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If resources are confirmed to possess cultural heritage value/interest then they will be reported to the MHSTCI. And further Archaeological Assessment of the resources may be required. If it is determined that there is a potential for Indigeno artifacts, the Contracting Authority should be contacted and Applicable Law will be followed.</li> <li>If final limits of the Project footprint are altered and fall outside of the assessed study area, additional Archaeological Assessments will be conducted by a professionally licensed archaeologist prior to disturbance.</li> <li>For areas determined to have archaeological potential o</li></ul>

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nall	<ul> <li>Performance of the work will occur within land previously</li> </ul>
	<ul><li>subject to an Archaeological Assessment.</li><li>Any site personnel responsible for carrying out or</li></ul>
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Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
Unionville Storage Yard Facility- Stouffville Corridor	<ul> <li>Footprint Impacts</li> <li>Operations &amp; Maintenance</li> </ul>	No potential for the disturbance of unassessed or documented archaeological resources	No further archaeological assessment required.	• N/A
Don Valley Layover Facility – Richmond Hill Corridor	Footprint Impacts     Operations & Maintenance	Potential for the disturbance of unassessed or documented archaeological resources	<ul> <li>Stage 2 survey required prior to any construction impacts within the layover impact footprint.</li> <li>Develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Resessments all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan shall be amended to incorporate any additional actions required resulting from subsequent Archaeological Assessment Reports.</li> <li>All work shall be performed in accordance with Applicable Law, including but not limited to the Ontario Heritage Act, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists (2011), and the MHSTCI document, Engaging Aboriginal Communities in Archaeology: A Draft Bulletin for Consultant Archaeological resources are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from Impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If resources are confirmed to possess cultural heritage value/interest then they will be reported to the MHSTCI, and further Archaeological Assessments of the resources may be required. If it is determined that there is a potential for Indigenous artifacts, the Contracting Authority should be contacted and Applicable Law will be followed.</li> <li>If final limits of the Project footprint are altered and fall outside of the assessed study area, additional Archaeological Assessments resulting from the Stage 1 Archaeological Assessment (Stage 2, Stage 3 and Stage 4, as required) as early as possible, prior to the completion of design, and in advance of any ground disturbance.</li> <li>For areas determined to have archaeological potential or contain a</li></ul>	<ul> <li>With the appropriate mitigation measures in place, effects from construction are not anticipated and the potential for long-term negative effects are reduced.</li> <li>Performance of the work will occur within land previously subject to an Archaeological Assessment.</li> <li>Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered.</li> <li>Further Archaeological Assessment may identify the need for monitoring during construction.</li> </ul>
Layover/Storage Yard Facilities	<ul> <li>Excavate soil</li> <li>Grade and seed</li> <li>Install OCS foundations at an approximate depth of 5 meters</li> <li>Construction of infrastructure, access route, and associate fencing</li> <li>Install building foundation</li> <li>Construct access roads</li> <li>Install fencing</li> <li>Construct buildings</li> <li>Road paving</li> </ul>	Potential for the disturbance of unassessed or documented archaeological resources	<ul> <li>Develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan shall be amended to incorporate any additional actions required resulting from subsequent Archaeological Assessment Reports.</li> <li>All work shall be performed in accordance with Applicable Law, including but not limited to the Ontario Heritage Act, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists (2011), and the MHSTCI document, Engaging Aboriginal Communities in Archaeology: A Draft Bulletin for Consultant Archaeologists in Ontario (2011).</li> <li>In the event that archaeological resources are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If resources are confirmed to possess</li> </ul>	<ul> <li>effects from construction are not anticipated and the potential for long-term negative effects are reduced.</li> <li>Performance of the work will occur within land previously subject to an Archaeological Assessment.</li> <li>Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered.</li> <li>Further Archaeological Assessment may identify the need for monitoring during construction</li> </ul>
Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
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			<ul> <li>cultural heritage value/interest then they will be reported to the MHSTCI, and further Archaeological Assessment of the resources may be required. If it is determined that there is a potential for Indigenous artifacts, the Contracting Authority should be contacted and Applicable Law will be followed.</li> <li>If final limits of the Project footprint are altered and fall outside of the assessed study area, additional Archaeological Assessments will be conducted by a professionally licensed archaeologist prior to disturbance and prior to construction activities. This will include completing all required Archaeological Assessments resulting from the Stage 1 Archaeological Assessment (Stage 2, Stage 3 and Stage 4, as required) as early as possible, prior to the completion of design, and in advance of any ground disturbance.</li> <li>For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional Archaeological Assessment will be conducted by a professionally licensed archaeologist prior to disturbance.</li> <li>If human remains are encountered or suspected of being encountered during project work, all activities must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontario on behalf of the Ministry of Government and Consumer Services must be contacted. Archaeological investigations of human remains will not proceed until police have confirmed the remains are not subject to forensic investigation. Once human remains have been cleared of police concern, the MHSTCI will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the <i>Ontario Heritage Act</i>. If the human remains are determined to be of Indigenous origin, the Contracting Authority should be contacted and all Applicable Law must be adhered to.</li> <li>All Archaeological Assessment findings will be shared with Indigenous communities, as per Metrolinx's <i>Guide to Encaging wi</i></li></ul>	
GO Station Platforms	<ul><li>Footprint Impacts</li><li>Operation &amp; Maintenance</li></ul>	<ul> <li>No potential for the disturbance of unassessed or documented archaeological resources</li> </ul>	No further archaeological assessment required.	• N/A
Construction of GO Station Platforms	<ul><li>Site clearing</li><li>Excavate soil</li><li>Construction of infrastructure</li></ul>	<ul> <li>No potential for the disturbance of unassessed or documented archaeological resources</li> </ul>	No further archaeological assessment required.	• N/A
Thickson Road Bridge Expansion	<ul><li>Footprint Impacts</li><li>Operations &amp; Maintenance</li></ul>	<ul> <li>No potential for the disturbance of unassessed or documented archaeological resources</li> </ul>	No further archaeological assessment required.	• N/A
Construction of Thickson Road Bridge Expansion	<ul> <li>Site clearing</li> <li>Excavate soil</li> <li>Construction of infrastructure</li> <li>Road paving</li> </ul>	<ul> <li>No potential for the disturbance of unassessed or documented archaeological resources</li> </ul>	No further archaeological assessment required.	• N/A
Operation/Maintenance of OCS	<ul><li>Footprint Impacts</li><li>Operation of OCS</li><li>Tree pruning/maintenance</li></ul>	<ul> <li>No potential for the disturbance of unassessed or documented archaeological resources</li> </ul>	No further archaeological assessment required.	• N/A
Installation/Construction of OCS	<ul> <li>Excavate soil</li> <li>Install OCS foundations at an approximate depth of 5 meters</li> <li>Erect poles</li> <li>Install wiring</li> <li>Tree removals</li> </ul>	No potential for the disturbance of unassessed or documented archaeological resources	No further archaeological assessment required.	• N/A
Installation of Grounding and Bonding – Richmond Hill Corridor	<ul> <li>Excavate the soil to the required depth (approximately 1 meter)</li> <li>Install grounding mats, conductors and rods, as per design</li> <li>Connect the grounding system internally and with adjacent existing grounding system, where required</li> </ul>	No potential for the disturbance of unassessed or documented archaeological resources	No further archaeological assessment required.	• N/A

# **∠** METROLINX

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
	<ul> <li>Backfill the grounding system, as per design</li> <li>Install the junction boxes and connect grounding conductors, where required</li> </ul>			
Bridge/Rail Overpass Modifications – Richmond Hill Corridor	Operations & Maintenance	<ul> <li>No potential for the disturbance of unassessed or documented archaeological resources</li> </ul>	No further archaeological assessment required.	• N/A
Construction of Bridge/Rail Overpass Modifications – Richmond Hill Corridor	<ul> <li>Install bridge barriers</li> <li>Install OCS attachments</li> <li>Install flash plates</li> </ul>	No potential for the disturbance of unassessed or documented archaeological resources	No further archaeological assessment required.	• N/A

\*NOTES: Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time. If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

#### 5.21.7 Stormwater Management/Drainage

### TABLE 5-107 SUMMARY OF STORMWATER MANAGEMENT – WALKERS LINE LAYOVER MITIGATION AND MONITORING COMMITMENTS

Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Futu
<ul> <li>Footprint Impacts</li> <li>Construction</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>The proposed works will result in increases to impervious areas, with potential effects to water quantity and quality.</li> <li>In addition to the increases in impervious coverage, there may be alterations to the local drainage system, both overland (major drainage system) and storm sewers (minor drainage system).</li> <li>The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure.</li> <li>Extension/replacement of existing 3-cell precast concrete box culvert and potential realignment of Shoreacres Creek.</li> <li>Potential slope stability issues in the vicinity of the Shoreacres Creek. A Geotechnical Study is required to address the overall setback distance (Erosion Hazard Limit) and Slope Stability in accordance with Conservation Halton requirements.</li> </ul>	<ul> <li>A Drainage and Stormwater Report, an Erosion and Sediment Control Plan and detailed drainage design and erosion and sediment control drawings will be prepared by Metrolinx, implemented and monitored in accordance with the Ministry of the Environment, Conservation and Parks (MECP) Stormwater Management Planning and Design Manual (2003), the Erosion and Sediment Control Guideline for Urban Construction (2019), and the guidelines and regulatory requirements of the Conservation Authority having jurisdiction.</li> <li>To mitigate potential increases in peak flows and potential adverse impacts to water quality and to adhere to the local stormwater quality and quantity control strategy will be developed in accordance with all relevant municipal, provincial and federal requirements, as amended, as well as the requirements of Conservation Authorities having jurisdiction.</li> <li>At the outset of detailed design, an assessment of the receiving capacity of the minor and major drainage systems will be required.</li> <li>A detailed assessment of proposed ditches/svales along the rail corridor is required to ensure adequate drainage conveyance in accordance with municipal requirements and American Railway Engineering (2019).</li> <li>All area grading and resulting drainage patterns shall not adversely affect adjacent lands.</li> <li>To offset the potential impacts to wetlands, the grades and drainage system on the periphery of the layover site may need to be designed to result in minor local drainage diversions to the wetland features. An annual water budget to existing, future (without mitigation) and future (with mitigation) would have to be conducted. Input from a terrestrial biologist is required to represent will be descriptionemined will be sized to maxing and the site requiremine design duration requirements for municipalities will be determined/confirmed as per the design guidelines and standards. Detailed geotechnical and hydrogeological investigations should be complete/updated at</li></ul>	<ul> <li>Turbidity levels shall be monitored upstream and dow watercourses. Turbidity levels within discharges from visually to determine potential impacts from construction is considered stabilized. Samples for watercourses and/or wetland will be conducted for pre-construction is considered stabilized. Samples for watercourses any also be Monitoring will be conducted for potential oil spills and requirements.</li> <li>Functionality of stormwater quantity controls including range. Monitoring would require local rainfall data.</li> <li>Low Impact Development (LID) features will be monit regional, and conservation authority requirements.</li> <li>Infiltration targets measured by flow monitoring on inf Practices (BMPs).</li> <li>Stormwater quality measures will be assessed to proper the MECP Stormwater Management Planning an shall apply as per Conservation Haiton (CH).</li> <li>Within Conservation Haiton's jurisdiction, phosphorus compared to baseline conditions determined prior to determine prior</li></ul>

#### ure Work Commitments

wnstream of sites at watercourse crossings or adjacent to m sites and within receiving storm sewers will also be monitored ction (i.e., Shoreacres Creek).

Atlands, when runoff from the site discharges to a watercourse n, during construction, and post construction conditions until the site and wetlands will be taken for non-precipitation events and for nding of the turbidity levels (i.e., Shoreacres Creek). Postbe required depending on input from Conservation Authorities. and containment of spills to be conducted as per provincial

ng peak flows and water levels for storm events within the design

itored to assess applicable parameters in accordance with local,

filtrative Low Impact Development (LID) Best Management

ovide a minimum 80% Total Suspended Solids (TSS) removal as nd Design Manual (2003). Additional water quality requirements

is levels immediately downstream of sites will be monitored and construction.

Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Fu
		<ul> <li>Given the potential extension/replacement of existing 3-cell precast concrete box culvert and realignment of Shoreacres Creek, 2-D HEC-RAS modelling, cut-and-fill analysis for flood control, Geotechnical investigation for toe erosion allowance and stable slope allowance, and Fluvial Geomorphology investigation are required for this site during detailed design. Further consultation with CH will be carried out through this process.</li> <li>The Constructor will develop and implement a Spill Prevention and Response Plan in accordance with the Project Agreement.</li> <li>The stormwater servicing of the site to align with the recommendations of the Area Specific Servicing Plans prepared for Burlington Mobility Hub and the Downtown Lands.</li> <li>Safe access and egress to the site will be provided considerate of the Regulatory Storm's floodplain and/or associated spills.</li> <li>The City of Burlington has developed new Stormwater Management Design Guidelines (2020) at the time of finalizing this report. Recalculation of run-off flows is required at subsequent design stages to confirm the findings of this report.</li> <li>For establishing quantity controls, CH noted preference for using the City of Burlington's proposed SWM criteria for re-development sites, which applies a maximum runoff coefficient C of 0.50 (i.e. 36% imperviousness) for establishing predevelopment conditions. A computer-based model will be developed to assess the site's hydrology and hydraulics.</li> <li>In order to meet Provincial Water Quality Objective (PWQO) and the Canadian Water Quality Guidelines for the Protection of Aquatic Life, mitigation measures to enhance water quality will be considered, particularly for the treatment discharge from the washing facility.</li> <li>As per Metrolinx standards, automated oil shutoff valves and oil/water separators from all drainage lines and from all drip trays should be installed prior to drainage entering the existing storm drain system, for all new layover facilities. Additionally, a very r</li></ul>	

uture Work Commitments

### TABLE 5-108 SUMMARY OF STORMWATER MANAGEMENT – UNIONVILLE STORAGE YARD MITIGATION AND MONITORING COMMITMENTS

Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
<ul> <li>Footprint Impacts</li> <li>Construction</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>The proposed works will result in increases to impervious areas, with potential effects to water quantity and quality.</li> <li>In addition to the increases in impervious coverage, there may be alterations to the local drainage system, both overland (major drainage system) and storm sewers (minor drainage system).</li> <li>The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure.</li> <li>Potential requirements for stormwater management infrastructure (i.e. end-of-pipe controls) to address the required stormwater management design criteria due to the proposed development at the storage facility.</li> <li>Potential slope stability issues at the far north end of the storage yard in the vicinity of the Rouge River. A Geotechnical Study is required to address the overall setback distance (Erosion Hazard Limit) as described in "TRCA Geotechnical Engineering Design and Submission Requirements".</li> </ul>	<ul> <li>A Drainage and Stornwater Report, an Erosion and Sediment Control Plan and detailed drainage design and erosion and sediment control drawings wills prepared by Project Co., Implemented and monitored in accordance with the Ministry of the Environment, Conservation and Prake (MECP) Storwater Management Planning and Design Manual (2003). Erosion and Sediment Control Guideline for Urban Construction (TRCA. December 2015), and the guideline and regulatory requirements of the Conservation Authorities having juridiciton.</li> <li>To mitigate potential increases in peak flows and potential adverse impacts to vater quality and to adhere to the local stormwater management guidelines, the decay and the adverse impacts to vater quality and to adhere to the coal stormwater management guidelines.</li> <li>A It ho cutest of detailed design, an assessment of the receiving capacity of the mino and major drainage systems will be required.</li> <li>A detailed assessment of proposed dichestswales along the rail corrior is required to ensure adequate drainage conveyance in accordance with municipal requirements and American Railway Engineering and Matiensance-CHV vas Association (AREMA) Manual for Rainway Engineering (2019).</li> <li>All area grading and resulting drainage patterns shall not adversely affect adjacent lands.</li> <li>To offset the potential impacts to valends, the grades and drainage system on the patchesis valents and supported to value (without mitigation) and Matue (with mitigation) vould minion drainage diversions and cutver treplacements will be elasing to previsely detamine the soil type and runoff coefficient for open space and inform drainage diversions and cutver topiacements will be scale to maintain or improve local flood levels and supported by hydroiogic/hydraulic calculations and draines and/matue (Without mitigation).</li> <li>Any proposed bridge expansions and cutver topiacements will be scale on patinal soil and the read sing of the SWM features.</li> <li>Any</li></ul>	<ul> <li>Turbidity levels shall be monitored upstream and downstream of sites at watercourse crossings or adjacent to watercourses. Turbidity levels within discharges from sites and within receiving storm sewers will also be monitored visually to determine potential impacts from construction.</li> <li>Collect samples for existing watercourses and/or wetlands, when runoff from the site discharges to a watercourse and/or wetland will be conducted for pre-construction, during construction, and post construction conditions until the site is considered stabilized. Samples for watercourses and wetlands will be taken for non-precipitation events and for precipitation events to obtain a reasonable understanding of the turbidity levels. Post-construction monitoring of wetland areas may also be required depending on input from Conservation Authorities.</li> <li>Monitoring will be conducted for potential oil spills and containment of spills to be conducted as per provincial requirements.</li> <li>Functionality of stormwater quantity controls including peak flows and water levels for storm events within the design range. Monitoring would require local rainfall data.</li> <li>Low Impact Development (LID) features will be monitored to assess applicable parameters in accordance with local, regional, and conservation authority requirements.</li> <li>Infiltration targets, measured by flow monitoring on infiltrative Low Impact Development (LID) Best Management Practices (BMPs).</li> <li>Stormwater quality measures will be assessed to provide a minimum 80% Total Suspended Solids (TSS) removal as per the MECP Stormwater Management Planning and Design Manual (2003). Additional water quality requirements shall apply as per Toronto and Region Conservation Authority (TRCA).</li> <li>Within TRCA's jurisdiction, phosphorus levels immediately downstream of sites will be monitored and compared to baseline conditions determined prior to construction.</li> </ul>

### TABLE 5-109 SUMMARY OF STORMWATER MANAGEMENT – DON VALLEY LAYOVER MITIGATION AND MONITORING COMMITMENTS

Project Activities	Potential Effect	Mitigation Measures/Commitments	Monit
<ul> <li>Footprint Impacts</li> <li>Construction</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>The proposed works will result in increases to impervious areas, with potential effects to water quantity and quality.</li> <li>In addition to the increases in impervious coverage, there may be alterations to the local drainage system, both overland (major drainage system) and storm sewers (minor drainage system).</li> <li>The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure.</li> <li>Risk of erosion hazard (both slope stability and toe erosion) in the proposed layover area in proximity of the Don River.</li> </ul>	<ul> <li>A Drainage and Stornwater Report, an Erosion and Sediment Control Plan and detailed drainage design and erosion and sediment control drawings will be prepared, implemented and monitored in accordance with the Ministry of the Environment; Conservation and Parks (MECP) Stornwater Management Planning and Design Manual (2003), the Erosion and Sediment Control Guideline for Urban Construction (2019), and the guidelines and regulatory requirements of the Conservation Authority having jurisdiction.</li> <li>To mitigate potential increases in peak flows and potential adverse impacts to water quality and to adhere to the local stornwater management guidelines, requirements for stornwater quality and quality control strategy will be developed in accordance with all relevant municipal, provincial and federal requirements, as amended, as well as the requirements of Conservation Authorities having jurisdiction.</li> <li>A the outset of detailed design, an assessment of the receiving capacity of the minor and major drainage systems will be required.</li> <li>A detailed assessment of proposed ditches/swales along the rail corridor is required to ensure adequate drainage conveyance in accordance with municipal requirements and American Railway Engineering (2019).</li> <li>All area grading and resulting drainage patterns shall not adversely affect adjacent lands.</li> <li>To offset the potential impacts to wellands, the grades and drainage systems will brie were budget variations for existing and future (without mitigation) and future (with mitigation) would have to be conducted. Input from a terrestrial biologist is required to review the annual water budget variations for existing and future conditions.</li> <li>Infiltration requirements for municipalities will be determined/confirmed as per the design grudelines and standards. Detailed design at proposel differentiat biologist is required to review the annual water budget variations of existing and future (without mitigation) and future (</li></ul>	<ul> <li>Turbidity levels within discharges monitored upstream and downstr Turbidity levels within discharges monitored visually to determine p</li> <li>Grab samples for existing watero watercourse and/or wetland will the construction conditions until the s wetlands will be taken for non-prounderstanding of the turbidity lew input from Conservation Authoriti</li> <li>Monitoring will be conducted for provincial requirements.</li> <li>Functionality of stormwater quan within the design range. Monitori</li> <li>Low Impact Development (LID) for accordance with local, regional, a Infiltration targets, measured by f Management Practices (BMPs).</li> <li>Stormwater quality measures will (TSS) removal as per the MECP Additional water quality requirem (TRCA).</li> <li>Within TRCA's jurisdiction, Phosg and compared to baseline conditional water co</li></ul>

#### toring/Future Work Commitments

- s from sites to be monitored visually. Turbidity levels will be tream of sites at watercourse crossings or adjacent to watercourses. s from sites and within receiving storm sewers will also be potential impacts from construction.
- courses and/or wetlands, when runoff from the site discharges to a be conducted for pre-construction, during construction, and post site is considered stabilized. Grab samples for watercourses and recipitation event and for precipitation events to obtain a reasonable vels. Post-construction monitoring of wetland areas depending on ties.
- potential oil spills and containment of spills to be conducted as per
- ntity controls including peak flows and water levels for storm events ing would require local rainfall data.
- features will be monitored to assess applicable parameters in and conservation authority requirements.
- flow monitoring on infiltrative Low Impact Development (LID) Best
- II be assessed to provide a minimum 80% Total Suspended Solids Stormwater Management Planning and Design Manual (2003). ments shall apply as per Toronto and Region Conservation Authority
- phorus levels immediately downstream of sites will be monitored tions determined prior to construction.

Project Activities	Potential Effect	Mitigation Measures/Commitments	Monit
		<ul> <li>factor of safety of 1.5 and appropriate toe erosion allowance (as per TRCA Geotechnical Engineering Design and Submission Requirements - November 2007).</li> <li>TRCA had expressed concerns that this proposed layover is within a flood prone area and noted recent flooding events. TRCA has requested 2-D HEC RAS modelling and cut-and-fill analysis for flood control and potential Fluvial Geomorphology investigation to be completed at the site, with consideration given to the Don River Hydrology Final Report, Marshall Macklin Monaghan, 2018. Further consultation with TRCA during detailed design will be carried out.</li> <li>TRCA criteria requires that rip-rap at culvert outlet be set at an elevation above the 25-year storm flood line (as per TRCA SWM Criteria manual, Section 2.4 Outfall Structure and Plunge Pool).</li> <li>All proposed outfalls need to meet TRCA Appendix E.2 criteria, as such "should be at an oblique angle to the watercourse and supported by a fluvial geomorphologist".</li> <li>TRCA noted the following stormwater management criteria for the additional impervious areas:</li> <li>Erosion Control: Retention of the 5mm storm onsite with the use of LIDs (Green</li> </ul>	
		<ul> <li>roofs, permeable pavers, bioswales, etc.)</li> <li>Quantity Control: No quantity control for direct watercourse discharge to main Humber River. If discharging to a City sewer, then the City's criteria would govern.</li> <li>Quality Control: 80% TSS removal. Note that TRCA only credits oil-grit separators to provide 50% TSS removal when sized for 80% TSS removal. They must be placed in a treatment train to be credited the full 80% TSS removal. If there are space constraints, TRCA accepts a filtration system (e.g. Jellyfish) when sized correctly to provide 80% TSS removal.</li> </ul>	
		<ul> <li>As per Metrolinx standards, automated oil shutoff valves and oil/water separators from all drainage lines and from all drip trays should be installed prior to drainage entering the existing storm system, for all new facilities.</li> <li>As per MECP, lot level controls should be employed whenever possible to help achieve both water quantity and water quality targets.</li> <li>A Wetland Water Balance Risk Evaluation will be completed at detail design as soon as the design is sufficiently advanced to make such an assessment possible to limit the risk of unexpected delays due to potential monitoring requirements.</li> </ul>	

itoring/Future Work Commitments

### 5.21.8 Utilities

### TABLE 5-110 SUMMARY OF UTILITIES MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
All Project Components as Identified in this Report	<ul> <li>Footprint Impacts</li> <li>Construction</li> <li>Operations &amp; Maintenance</li> </ul>	<ul> <li>Any/all potential natural environmental effects as identified in this table/report</li> </ul>	• Develop and implement an Environmental Management System (EMS) to ensure the environmental protection/mitigation measures identified as part of the NT&F TPAP are fulfilled and functioning as expected. The overall intent of the EMS will be to integrate environmental management into the daily operations and other quality management systems of the project.	
Track Infrastructure (Various Rail Corridors)	• N/A	<ul> <li>Footprint impacts</li> <li>Future Utility Maintainability</li> </ul>	<ul> <li>Implementation/amendment of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> <li>Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.</li> <li>Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition.</li> </ul>	Develop and implement tracking system for as- built deliverables.
Construction of Track Infrastructure (Various Rail Corridors)	<ul> <li>Excavation</li> <li>Backfilling</li> <li>Compaction</li> <li>Installation of ties fastened by rail anchors.</li> </ul>	<ul> <li>Spatial conflicts</li> <li>Utility serviceability effects due to design requirements and construction</li> </ul>	<ul> <li>Where feasible, all work shall follow applicable standards / policies provided by the public and private utility providers.</li> <li>During detailed design, develop and implement a detailed Utility Infrastructure Relocation Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Relocation Plan will be developed in accordance with the Project Agreement.</li> <li>During detailed design, CCTV investigations and surveys will be performed to field locate and verify the existing utilities within the project area and document their condition.</li> <li>Undertake pre-submission consultation with the relevant regulatory authorities to develop an early approach to securing the permits and approvals for utility infrastructure works to ensure they proceed in a timely manner to support the design and construction schedule.</li> <li>In the event unexpected utility conflicts are encountered during construction, these will be documented and communicated immediately to Metrolinx and all relevant stakeholders. A field conflict resolution process will be implemented to mitigate the conflict and will include input from all relevant stakeholders. Metrolinx will be notified at the first indication of a delay to their relocation schedule due to the unknown conflict. Metrolinx will review the impact of the delay on the overall utility relocation plan.</li> <li>In the event of damage resulting in service interruptions during construction, the damage will be reported immediately to Metrolinx and Utility Owner representatives, and all work adjacent to the damage utility will stop to prevent further damage.</li> <li>Perform all work identified in the Utility Infrastructure Relocation Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure.</li> <li>Obtain permits and consents from and with all Utility Companies with respect to the desig</li></ul>	<ul> <li>Develop and implement detailed mitigation plans</li> <li>Coordinate construction scheduling</li> <li>Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies.</li> <li>Record all installation tolerances and how they are to be monitored.</li> <li>Perform inspection and testing to ensure successful utility relocation and safe and efficient installation.</li> <li>A post- construction CCTV inspection of the new utility infrastructure may be required upon completion of the construction works to document condition.</li> <li>In the event of potential impacts to critical utilities, instrumentation and monitoring will be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.</li> </ul>
Walkers Line Layover Facility – Lakeshore West Corridor	• N/A	<ul> <li>Footprint impacts</li> <li>Future Utility Maintainability</li> </ul>	<ul> <li>Implementation/amendment of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> <li>Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.</li> <li>Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition.</li> </ul>	Develop and implement tracking system for as- built deliverables.
Unionville Storage Yard Facility - Stouffville Corridor	• N/A	<ul> <li>Footprint impacts</li> <li>Future Utility Maintainability</li> </ul>	<ul> <li>Implementation/amendment of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> <li>Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.</li> <li>Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition.</li> </ul>	<ul> <li>Develop and implement tracking system for as- built deliverables.</li> </ul>

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
Don Valley Layover Facility — Richmond Hill Corridor	• N/A	<ul> <li>Footprint impacts</li> <li>Future Utility Maintainability</li> </ul>	<ul> <li>Implementation/amendment of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> <li>Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.</li> <li>Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition.</li> </ul>	<ul> <li>Develop and implement tracking system for as- built deliverables.</li> </ul>
Construction of Layover Facilities	<ul> <li>Site clearing</li> <li>Ground improvements.</li> <li>Installation of culverts and retaining walls</li> <li>Site grading must occur</li> <li>Utility modifications or extensions</li> <li>Coordination with multiple service providers and municipalities</li> <li>Shoring</li> <li>Demolition</li> <li>Excavation</li> <li>Installation of either a sub- station, new transformer or wayside power</li> <li>Construction of access roads</li> <li>Track construction</li> <li>Drainage work</li> <li>Building installations</li> </ul>	<ul> <li>Spatial conflicts</li> <li>Utility serviceability effects due to design requirements and construction</li> <li>Footprint impacts</li> <li>Future Utility Maintainability</li> </ul>	<ul> <li>Where feasible, all work shall follow applicable standards / policies provided by the public and private utility providers.</li> <li>During detailed design, develop and implement a detailed Utility Infrastructure Relocation Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Relocation Plan will be developed in accordance with the Project Agreement.</li> <li>During detailed design, CCTV investigations and surveys will be performed to field locate and verify the existing utilities within the project area and document their condition.</li> <li>Undertake pre-submission consultation with the relevant regulatory authorities to develop an early approach to securing the permits and approvals for utility infrastructure works to ensure they proceed in a timely manner to support the design and construction schedule.</li> <li>In the event unexpected utility conflicts are encountered during construction, these will be documented and communicated immediately to Metrolinx and all relevant stakeholders. A field conflict resolution process will be implemented to mitigate the conflict and will include input from all relevant stakeholders. Metrolinx will be notified at the first indication of a delay to their relocation schedule due to the unknown conflict. Metrolinx will review the impact of the delay on the overall utility relocation plan.</li> <li>In the event of damage resulting in service interruptions during construction, the damage will be reported immediately to Metrolinx and Utility Infrastructure. Relocation Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure.</li> <li>Perform all work identified in the Utility Infrastructure Relocation Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure.</li> <li>Obtain permits and consents from and with all Utility Companies with respect to</li></ul>	<ul> <li>Develop and implement detailed mitigation plans</li> <li>Coordinate construction scheduling</li> <li>Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies.</li> <li>Record all installation tolerances and how they are to be monitored.</li> <li>Perform inspection and testing to ensure successful utility relocation and safe and efficient installation.</li> <li>A post- construction CCTV inspection of the new utility infrastructure may be required upon completion of the construction works to document condition.</li> <li>In the event of potential impacts to critical utilities, instrumentation and monitoring will be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.</li> <li>Develop and implement tracking system for asbuilt deliverables.</li> </ul>
		Future Utility Maintainability	<ul> <li>Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> <li>Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.</li> <li>Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition.</li> </ul>	built deliverables.
Construction of GO Station Platforms	<ul> <li>Demolition and site preparation</li> <li>Grading and drainage work</li> <li>Platform paving and construction of concrete curbs</li> <li>Installation of tunnels, ramps, stairs, elevator shafts and elevators</li> <li>Construction of canopies and shelters</li> <li>Installation of site lighting (potentially high-mast lighting), communication systems, and ancillary</li> </ul>	<ul> <li>Spatial conflicts</li> <li>Utility serviceability effects due to design requirements and construction</li> </ul>	<ul> <li>Where feasible, all work shall follow applicable standards / policies provided by the public and private utility providers.</li> <li>During detailed design, develop and implement a detailed Utility Infrastructure Relocation Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Relocation Plan will be developed in accordance with the Project Agreement.</li> <li>During detailed design, CCTV investigations and surveys will be performed to field locate and verify the existing utilities within the project area and document their condition.</li> <li>Undertake pre-submission consultation with the relevant regulatory authorities to develop an early approach to securing the permits and approvals for utility infrastructure works to ensure they proceed in a timely manner to support the design and construction schedule.</li> <li>In the event unexpected utility conflicts are encountered during construction, these will be documented and communicated immediately to Metrolinx and all relevant stakeholders. A field conflict resolution process will be implemented to mitigate the conflict and will include input from all relevant stakeholders. Metrolinx will be notified at the first indication of a delay to their relocation schedule due to the unknown conflict. Metrolinx will review the impact of the delay on the overall utility relocation plan.</li> </ul>	<ul> <li>Develop and implement detailed mitigation plans</li> <li>Coordinate construction scheduling</li> <li>Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies.</li> <li>Record all installation tolerances and how they are to be monitored.</li> <li>Perform inspection and testing to ensure successful utility relocation and safe and efficient installation.</li> <li>A post- construction CCTV inspection of the new utility infrastructure may be required upon completion of the construction works to document condition.</li> </ul>

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
	<ul> <li>features such as CCTV, fare handling units, etc.</li> <li>Installation of a standby generator or UPS</li> <li>Construction of walkways and sidewalks</li> <li>Potential adjustments to parking areas if affected by construction of other platform elements</li> <li>Installation of wayfinding and signage</li> <li>Utility modifications, as required</li> <li>HVAC systems for mini-hubs and radiant heating for shelters</li> <li>Building modifications for mechanical pumps or heat tracing systems</li> <li>Fibre optic cable installation</li> </ul>		<ul> <li>In the event of damage resulting in service interruptions during construction, the damage will be reported immediately to Metrolinx and Utility Owner representatives, and all work adjacent to the damaged utility will stop to prevent further damage.</li> <li>Perform all work identified in the Utility Infrastructure Relocation Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure.</li> <li>Obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Infrastructure.</li> <li>During construction, ensure minimizing impact to the Train Service Plans and to continuity of service and disruption to property owners and customers of the Utility Companies to the satisfaction of the Utility Companies and Metrolinx.</li> </ul>	In the event of potential impacts to critical utilities, instrumentation and monitoring will be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.
Thickson Road Bridge Expansion	• N/A	<ul> <li>Footprint impacts</li> <li>Future Utility Maintainability</li> </ul>	<ul> <li>Implementation/amendment of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> <li>Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.</li> <li>Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition.</li> </ul>	Develop and implement tracking system for as- built deliverables.
Construction of Thickson Road Bridge Expansion	<ul> <li>Pile-driving machine for installing the H-Piles</li> <li>Caisson machine for temporary shoring</li> <li>Excavators/bulldozers for excavation</li> <li>Dump trucks for soil removal</li> <li>Concrete pumps for pouring concrete</li> <li>Compactors for soil compactor before installing concrete elements or paving the road</li> <li>Pavement machine for pouring asphalt and paving the roadway below the bridge</li> <li>Cranes for lifting different construction elements in the site</li> </ul>	Spatial conflicts     Utility serviceability effects     due to design requirements     and construction	<ul> <li>Where feasible, all work shall follow applicable standards / policies provided by the public and private utility providers.</li> <li>During detailed design, develop and implement a detailed Utility Infrastructure Relocation Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Relocation Plan will be developed in accordance with the Project Agreement.</li> <li>During detailed design, CCTV investigations and surveys will be performed to field locate and verify the existing utilities within the project area and document their condition.</li> <li>Undertake pre-submission consultation with the relevant regulatory authorities to develop an early approach to securing the permits and approvals for utility infrastructure works to ensure they proceed in a timely manner to support the design and construction schedule.</li> <li>In the event unexpected utility conflicts are encountered during construction, these will be documented and communicated immediately to Metrolinx and all relevant stakeholders. A field conflict resolution process will be implemented to mitigate the conflict and will include input from all relevant stakeholders. Metrolinx will review the impact of the delay on the overall utility relocation plan.</li> <li>In the event of damage resulting in service interruptions during construction, the damage will be reported immediately to Metrolinx and all work adjacent to the damaged utility will stop to prevent further damage.</li> <li>Perform all work identified in the Utility Infrastructure Relocation Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure.</li> <li>Obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Inf</li></ul>	<ul> <li>Develop and implement detailed mitigation plans</li> <li>Coordinate construction scheduling</li> <li>Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies.</li> <li>Record all installation tolerances and how they are to be monitored.</li> <li>Perform inspection and testing to ensure successful utility relocation and safe and efficient installation.</li> <li>A post- construction CCTV inspection of the new utility infrastructure may be required upon completion of the construction works to document condition.</li> <li>In the event of potential impacts to critical utilities, instrumentation and monitoring will be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.</li> </ul>
OCS – Richmond Hill Corridor	• N/A	<ul> <li>Footprint impacts</li> <li>Future Utility Maintainability</li> </ul>	<ul> <li>Implementation/amendment of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> </ul>	Develop and implement tracking system for as- built deliverables.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
			<ul> <li>Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.</li> <li>Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition.</li> </ul>	
Operation/Maintenance of OCS	Operation of OCS	<ul> <li>Spatial Conflicts</li> <li>Electrical Conflicts</li> <li>Cable fail</li> <li>De-energizing costs</li> <li>Future Utility Maintainability (Limited operational windows for access)</li> </ul>	<ul> <li>Implementation/amendment of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> </ul>	<ul> <li>Develop and implement tracking system for as-built deliverables.</li> </ul>
Installation/Construction of OCS	<ul> <li>Excavate soil</li> <li>Install OCS foundations at an approximate depth of 5m</li> <li>Erect poles</li> <li>Install wiring</li> <li>Tree removals</li> </ul>	<ul> <li>Spatial Conflicts</li> <li>Electrical Conflicts</li> <li>Utility serviceability effects due to design requirements and construction</li> </ul>	<ul> <li>Where feasible, all work shall follow applicable standards / policies provided by the public and private utility providers.</li> <li>During detailed design, develop and implement a detailed Utility Infrastructure Relocation Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Relocation Plan will be developed in accordance with the Project Agreement.</li> <li>During detailed design, CCTV investigations and surveys will be performed to field locate and verify the existing utilities within the project area and document their condition.</li> <li>Undertake pre-submission consultation with the relevant regulatory authorities to develop an early approach to securing the permits and approvals for utility infrastructure works to ensure they proceed in a timely manner to support the design and construction schedule.</li> <li>In the event unexpected utility conflicts are encountered during construction, these will be documented and communicated immediately to Metrolinx and all relevant stakeholders. A field conflict resolution process will be implemented to mitigate the conflict and will include input from all relevant stakeholders. Metrolinx will review the impact of the delay on the overall utility relocation plan.</li> <li>In the event of damage resulting in service interruptions during construction, the damage will be reported immediately to Metrolinx and all work adjacent to the damage dutility will stop to prevent further damage.</li> <li>Perform all work identified in the Utility Infrastructure Relocation Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure.</li> <li>Obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation plan and or commissioning of Utility</li></ul>	<ul> <li>Develop and implement detailed mitigation plans</li> <li>Coordinate construction scheduling</li> <li>Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies.</li> <li>Record all installation tolerances and how they are to be monitored.</li> <li>Perform inspection and testing to ensure successful utility relocation and safe and efficient installation.</li> <li>A post- construction CCTV inspection of the new utility infrastructure may be required upon completion of the construction works to document condition.</li> <li>In the event of potential impacts to critical utilities, instrumentation and monitoring will be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.</li> </ul>
Installation of Grounding and Bonding – Richmond Hill Corridor	<ul> <li>Excavate the soil to the required depth (approximately 1m)</li> <li>Install grounding mats, conductors and rods, as per design</li> <li>Connect the grounding system internally and with adjacent existing grounding system, where required</li> <li>Backfill the grounding system, as per design</li> <li>Install the junction boxes and connect grounding conductors, where required</li> </ul>	<ul> <li>Electrical interference conflict.</li> <li>Utility serviceability effects due to design requirements and construction</li> </ul>	<ul> <li>Where feasible, all work shall follow applicable standards / policies provided by the public and private utility providers.</li> <li>During detailed design, develop and implement a detailed Utility Infrastructure Relocation Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Relocation Plan will be developed in accordance with the Project Agreement.</li> <li>During detailed design, CCTV investigations and surveys will be performed to field locate and verify the existing utilities within the project area and document their condition.</li> <li>Undertake pre-submission consultation with the relevant regulatory authorities to develop an early approach to securing the permits and approvals for utility infrastructure works to ensure they proceed in a timely manner to support the design and construction schedule.</li> <li>In the event unexpected utility conflicts are encountered during construction, these will be documented and communicated immediately to Metrolinx and all relevant stakeholders. A field conflict resolution process will be implemented to mitigate the conflict and will include input from all relevant stakeholders. Metrolinx will be notified at the first indication of a delay to their relocation schedule due to the unknown conflict. Metrolinx will be reported immediately to Metrolina and all work adjacent to the damage will be reported immediately to Metrolina and all work adjacent to the damage will be prevent further damage.</li> <li>Perform all work identified in the Utility Infrastructure Relocation Plan to protect, support, safeguard, remove, and relocate all Utility infrastructure.</li> <li>Obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Infrastructure.</li> </ul>	<ul> <li>Develop and implement detailed mitigation plans</li> <li>Coordinate construction scheduling</li> <li>Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies.</li> <li>Record all installation tolerances and how they are to be monitored.</li> <li>Perform inspection and testing to ensure successful utility relocation and safe and efficient installation.</li> <li>A post- construction CCTV inspection of the new utility infrastructure may be required upon completion of the construction works to document condition.</li> <li>In the event of potential impacts to critical utilities, instrumentation and monitoring will be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.</li> </ul>

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Future Work Commitments
			<ul> <li>During construction, ensure minimizing impact to the Train Service Plans and to continuity of service and disruption to property owners and customers of the Utility Companies to the satisfaction of the Utility Companies and Metrolinx.</li> </ul>	
Bridge/Rail Overpass Modifications – Richmond Hill Corridor	• N/A	<ul> <li>Footprint impacts</li> <li>Future Utility Maintainability</li> </ul>	<ul> <li>Implementation/amendment of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required.</li> <li>After construction, obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11.</li> <li>Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.</li> <li>Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition.</li> </ul>	Develop and implement tracking system for as- built deliverables.
Construction of Bridge/Rail Overpass Modifications – Richmond Hill Corridor	<ul> <li>Install bridge barriers</li> <li>Install OCS attachments</li> <li>Install flash plates</li> <li>Raise bridge</li> <li>Lower tracks</li> <li>Replace bridges</li> <li>Replace pedestrian bridges</li> </ul>	<ul> <li>Spatial Conflicts</li> <li>Electrical Conflicts</li> <li>Utility serviceability effects due to design requirements and construction</li> </ul>	<ul> <li>Where feasible, all work shall follow applicable standards / policies provided by the public and private utility providers.</li> <li>During detailed design, develop and implement a detailed Utility Infrastructure Relocation Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Relocation Plan will be developed in accordance with the Project Agreement.</li> <li>During detailed design, CCTV investigations and surveys will be performed to field locate and verify the existing utilities within the project area and document their condition.</li> <li>Undertake pre-submission consultation with the relevant regulatory authorities to develop an early approach to securing the permits and approvals for utility infrastructure works to ensure they proceed in a timely manner to support the design and construction schedule.</li> <li>In the event unexpected utility conflicts are encountered during construction, these will be implemented to mitigate the conflict and will include input from all relevant stakeholders. Metrolinx will be notified at the first indication of a delay to their relocation schedule due to the unknown conflict. Metrolinx will review the impact of the delay on the overall utility relocation plan.</li> <li>In the event of damage resulting in service interruptions during construction, the damage will be reported immediately to Metrolinx and utility Infrastructure Relocation Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure.</li> <li>Obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Infrastructure.</li> <li>During construction, ensure minimizing impact to the Train Service Plans and to continuity of service and disruption to property owners and</li></ul>	<ul> <li>Develop and implement detailed mitigation plans</li> <li>Coordinate construction scheduling</li> <li>Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies.</li> <li>Record all installation tolerances and how they are to be monitored.</li> <li>Perform inspection and testing to ensure successful utility relocation and safe and efficient installation.</li> <li>A post- construction CCTV inspection of the new utility infrastructure may be required upon completion of the construction works to document condition.</li> <li>In the event of potential impacts to critical utilities, instrumentation and monitoring will be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.</li> </ul>

#### 5.21.9 Electromagnetic Fields/Electromagnetic Interference (EMF/EMI)

#### TABLE 5-111 SUMMARY OF EMI/EMF MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Monitoring/Fut
All Electrification Project Components as Identified in this Report	<ul> <li>Design and development strategy for Electromagnetic Compatibility (EMC); and,</li> <li>Prepare and Implement a Frequency Management Plan.</li> </ul>	<ul> <li>Effects related to Extremely Low Frequency (ELF) and Electromagnetic Fields (EMF); and,</li> <li>EMI/EMF/EMC effects due to operation of electrified infrastructure.</li> </ul>	<ul> <li>The Constructor will prepare and implement an EMC Control Plan, in accordance with the requirements of the American Public Transportation Association (APTA) Standard SS-E-010-98 and the European Committee for Electrotechnical Standardization (CENELEC) Standard EN 50121, to communicate the design and development strategy for addressing and identifying the interference risk areas and developing solutions to mitigate the risk of the EMIs/EMCs of the project system elements in the operating environment, and to catalogue the types of electrics and electronics that will be installed.</li> <li>A frequency management plan will be developed and implemented by the constructor, to capture the operating frequencies at the system engineering level from all intentional emitters in the vicinity of the railway.</li> <li>Continue to coordinate and consult with CN, CP, and VIA as appropriate where there are interfaces with freight/VIA territory.</li> <li>Coordinate with Industry Canada throughout the Project Term to ensure that EMC requirements are addressed and that the necessary licenses and approvals are acquired and maintained.</li> </ul>	Demonstra operating c are exceed
Track Infrastructure (Various Rail Corridors)	• N/A	• N/A	N/A	• N/A
Construction of Track Infrastructure (Various Rail Corridors)	• N/A	• N/A	• N/A	• N/A
Walkers Line Layover Facility – Lakeshore West Corridor	<ul> <li>Installation of OCS;</li> <li>Install duct banks;</li> <li>Construct 25k∨ feeder routes; and,</li> <li>Tree removals.</li> </ul>	<ul> <li>Time-Varying EMFs;</li> <li>Induced Current in Neighbouring Metallic Wires and Fences;</li> <li>Unintended Contact with High-Voltage Source; and,</li> <li>ELF EMF.</li> </ul>	<ul> <li>Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation.</li> <li>Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation.</li> <li>Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources.</li> <li>ELF EMF – Mitigated by proper design; Verified by before-and-after measurements.</li> <li>Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields.</li> </ul>	<ul> <li>ELF EMF v</li> <li>Industry-sta Sites)</li> </ul>
Unionville Layover Facility- Stouffville Corridor	<ul> <li>Installation of OCS;</li> <li>Install duct banks;</li> <li>Construct 25k∨ feeder routes; and,</li> <li>Tree removals.</li> </ul>	<ul> <li>Time-Varying EMFs;</li> <li>Induced Current in Neighbouring Metallic Wires and Fences;</li> <li>Unintended Contact with High-Voltage Source; and,</li> <li>ELF EMF.</li> </ul>	<ul> <li>Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation.</li> <li>Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation.</li> <li>Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources.</li> <li>ELF EMF – Mitigated by proper design; Verified by before-and-after measurements.</li> <li>Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields.</li> </ul>	<ul> <li>ELF EMF s</li> <li>Industry-sta Sites)</li> </ul>
Don Valley Layover Facility – Richmond Hill Corridor	<ul> <li>Installation of OCS;</li> <li>Install duct banks;</li> <li>Construct 25kV feeder routes; and,</li> <li>Tree removals.</li> </ul>	<ul> <li>Time-Varying EMFs;</li> <li>Induced Current in Neighbouring Metallic Wires and Fences;</li> <li>Unintended Contact with High-Voltage Source; and,</li> <li>ELF EMF.</li> </ul>	<ul> <li>Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation.</li> <li>Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation.</li> <li>Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources.</li> <li>ELF EMF – Mitigated by proper design; Verified by before-and-after measurements.</li> <li>Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields</li> </ul>	ELF EMF v     Industry-sta

#### ure Work Commitments

ate compliance through field measurements and testing under actual conditions, as well as remediation measures if allowable thresholds led.

vill be measured post-electrification. (All Sites) andard practices for handling high-voltage should be followed. (All

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vill be measured post-electrification. andard practices for handling high-voltage should be followed.

Project Component	Project Activities	Potential Effect	Mitigation Measures/Commitments	Мо	nitoring/Futu
Construction of Layover Facilities	<ul> <li>Installation of OCS;</li> <li>Install duct banks;</li> <li>Construct 25k∨ feeder routes; and,</li> <li>Tree removals.</li> </ul>	<ul> <li>Time-Varying EMFs;</li> <li>Induced Current in Neighbouring Metallic Wires and Fences;</li> <li>Unintended Contact with High-Voltage Source; and,</li> <li>ELF EMF.</li> </ul>	<ul> <li>Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation.</li> <li>Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation.</li> <li>Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources.</li> <li>ELF EMF – Mitigated by proper design; Verified by before-and-after measurements.</li> <li>Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields.</li> </ul>	•	ELF EMF w Industry-sta
GO Station Platforms	• N/A	• N/A	• N/A	•	N/A
Construction of GO Station Platforms	• N/A	• N/A	• N/A	•	N/A
Thickson Road Bridge Expansion	• N/A	• N/A	• N/A	•	N/A
Construction of Thickson Road Bridge Expansion	• N/A	• N/A	• N/A	•	N/A
Operation/Maintenance of OCS (Richmond Hill Corridor)	<ul> <li>Operation of OCS</li> <li>Tree pruning/maintenance</li> </ul>	<ul> <li>Time-Varying EMFs</li> <li>Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables and Earth (grounding) Networks</li> <li>Unintended Contact with High-Voltage Source</li> </ul>	<ul> <li>Time-Varying EMFs – mitigate through design, e.g., grounding and shielding, physical separation.</li> <li>Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables and Earth (grounding) Networks – mitigate through design, e.g., grounding and shielding, and, physical separation.</li> <li>Unintended Contact with High-Voltage Source – mitigate by strict adherence to industry-standard guidelines for handling live voltage sources.</li> </ul>	•	ELF EMF w locations wh assessment
Installation/Construction of OCS	• N/A	• N/A	• N/A	•	N/A
Installation of Grounding and Bonding – Richmond Hill Corridor	• N/A	• N/A	• N/A	•	N/A
Bridge/Rail Overpass Modifications – Richmond Hill Corridor	• N/A	• N/A	• N/A	•	N/A
Construction of Bridge/Rail Overpass Modifications – Richmond Hill Corridor	• N/A	• N/A	• N/A	•	N/A
Operation of Electric Rolling Stock	Operation of Electric Rolling Stock	<ul> <li>EMI</li> <li>Time-Varying EMFs</li> <li>Radiated Magnetic Fields</li> <li>ELF EMF</li> </ul>	<ul> <li>EMI – mitigate via EMC Control Plan.</li> <li>Time-Varying EMFs – mitigate through design, e.g., grounding and shielding, physical separation.</li> <li>Radiated Magnetic Fields – mitigate through design, e.g., grounding and shielding.</li> </ul>	•	During deta once the ele immunity ar During the e emanating f tested and v standards. Verify ELF f implementa

re Work Commitments				
ill be measured post-electrification. ndard practices for handling high-voltage should be followed.				
ill be confirmed/re-assessed post-electrification, specifically at nich exhibited ELF EMF levels above 10 mG post-electrification re- ; cut-off.				
iled design, further analysis and measurements will be conducted actric rolling stock specifications are known in order to ensure EMI id emissions compliance for the electrified GO system. electrification commissioning phase, overall ELF and RF emissions rom the GO electrified railway system as a whole will be field verified to ensure EMFs are within the limits of applicable industry				
EMF by measurements taken before and after project tion.				

### 5.21.10 Contaminated Soils, Excavated Materials and Groundwater Management

#### TABLE 5-112 CONTAMINATED SOILS, EXCAVATED MATERIALS AND GROUNDWATER MANAGEMENT MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Potential Effect	Mitigation Measure(s)	Monitoring/Future	
Excavated Materials	Construction of tracks, switches layover/storage facilities, electrification infrastructure, bridge expansion, GO Station Platforms	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials.	<ul> <li>Develop a Soil and Excavated Materials Management Plan for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management – to be enacted into law on July 1, 2020), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable.</li> <li>Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and all Applicable Law.</li> <li>The Soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	<ul> <li>A Soil and by the Con performanc preceding r</li> <li>Upon comp Excavated</li> </ul>	
Groundwater	Construction of tracks, switches layover/storage facilities, electrification infrastructure, bridge expansion, GO Station Platforms.	Construction operations could expose groundwater and associated contamination.	<ul> <li>Develop a Groundwater Management and Dewatering Plan to guide the handling, management, and disposal of groundwater encountered during the works. The Groundwater Management and Dewatering Plan will be overseen by a QP and will comply with Ontario Regulations 406/19 (On-Site and Excess Soil Management – to be enacted into law on July 1, 2020), 64/16 and 387/04, as amended under the Ontario Water Resources Act.</li> <li>The Groundwater Management and Dewatering Plan will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement. The Groundwater Management and Dewatering Plan will outline general groundwater monitoring considerations during the works and provide guidance for groundwater monitoring following the works where considered applicable.</li> <li>The Groundwater Management and Dewatering Plan will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) from the MECP.</li> <li>The Groundwater Management and Dewatering Plan will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the works, and approvals for the water disposal, and/or treatment if applicable, based on the quantity and quality.</li> <li>The Groundwater Management and Dewatering Plan will be reviewed and approved by Metrolinx prior to construction.</li> </ul>	<ul> <li>A Groundwithe Construct data/results month.</li> <li>Upon composition Management</li> </ul>	
Excavated Materials – Walkers Line Layover Facility	Construction of Walkers Line Layover Facility	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials.	<ul> <li>Prior to construction, a Phase II ESA (a preliminary sampling plan) is recommended at the proposed Walkers Line Layover site to assess the quality of the soils and groundwater in accordance with the current applicable MECP Standards.</li> <li>If contamination is confirmed from previous sampling, further subsurface investigation (i.e. delineation – a detailed sampling plan) will be conducted to determine the extent of contamination and develop a remedial action plan (i.e. remediation program).</li> </ul>	<ul> <li>Upon comp conducted clean-up re future land</li> <li>The contra transported</li> <li>Any backfil the remove standard fo documented</li> </ul>	
Excavated Materials – Unionville Storage Yard	Construction of Unionville Storage Yard	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials.	It is recommended that, prior to the transfer of temporary easement sites to Metrolinx, Metrolinx complete a baseline condition sampling for soil and groundwater (pre-construction assessment) to the extent of the construction boundaries and depth at the Unionville Storage Yard to determine the quality of soils for reuse and categorize the excess soils for proper off-site disposal, if applicable.	A Soil and by the Con performanc preceding r	

#### Work Commitments

Excavated Material Monthly Dashboard Report will be developed astructor for Metrolinx review that includes monitoring and ce data related to the management of excavated materials for the month.

pletion of the work, the Constructor will submit a Soil and Material Management Implementation Report to Metrolinx.

vater Management Monthly Dashboard Report will be developed by uctor for Metrolinx review to document performance monitoring s and any corrective actions implemented during the previous

bletion of the work, the Constructor will submit a Groundwater ent and Dewatering Implementation Report to the Metrolinx.

pletion of remediation program, a confirmatory sampling will be from the walls and floor of the excavation limits to ensure the esult meets the current application MECP standard for proposed use.

ctor must ensure that the excavated contaminated soils will be d to an approved landfill for proper off-site disposal.

Il material which is brought to the site during site cleanup to replace ed contaminated soil must meet the current application MECP or proposed future land use and the information will be properly ed for future risk management perspective.

Excavated Material Monthly Dashboard Report will be developed astructor for Metrolinx review that includes monitoring and ce data related to the management of excavated materials for the month.

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Project Component	Project Activities	Potential Effect	Mitigation Measure(s)		Monitoring/Future	
				•	Upon comp conduct a p transferring	
Excavated Materials – Don Valley Layover Facility	<ul> <li>Construction of Don ∨alley Layover Facility     </li> </ul>	Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials.	<ul> <li>It is recommended that, prior to the transfer of temporary easement sites to Metrolinx, Metrolinx complete a baseline condition sampling for soil and groundwater (pre-construction assessment) to the extent of the construction boundaries and depth at the proposed Don Valley Layover site to determine the quality of soils for reuse and categorize the excess soils for proper off-site disposal, if applicable.</li> </ul>	•	A Soil and by the Con- performance preceding r Upon comp conduct a p transferring	

#### Work Commitments

pletion of the construction, the Constructor (Project Co.) should post-construction assessment for soil and groundwater prior to g temporary easement sites back to the property owner.

Excavated Material Monthly Dashboard Report will be developed nstructor for Metrolinx review that includes monitoring and ce data related to the management of excavated materials for the month.

pletion of the construction, the Constructor (Project Co.) should post-construction assessment for soil and groundwater prior to g temporary easement sites back to the property owner