

**yonge subway extension**  
finch station to richmond hill centre  
transit project assessment



ENVIRONMENTAL PROJECT REPORT ADDENDUM  
train storage facility

September 2014



**Yonge Subway Extension  
Transit Project Assessment Process**

**Train Storage Facility  
Environmental Project Report Addendum**

**SEPTEMBER 2014**





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## GLOSSARY OF TERMS

APEC	Areas of Potential Environmental Concern
CEAA	<i>Canadian Environmental Assessment Act</i>
CN	Canadian National Railway
EEB	Emergency Exit Building
EMI	Electromagnetic Interference
EPR	Environmental Project Report
HVAC	Heating, Ventilation, and Air Conditioning
MNR	Ministry of Natural Resources (now the Ministry of Natural Resources and Forestry)
MOE	Ministry of the Environment (now MOECC)
MOECC	Ministry of the Environment and Climate Change
TSF	Train Storage Facility
NHIC	Natural Heritage Information Centre
PIC	Public Information Centre
PTTW	Permit to Take Water
SRYNs	Subway Rail Yard Needs Study
TAC	Technical Advisory Committee
TPAP	Transit Project Assessment Process
TRCA	Toronto and Region Conservation Authority
TSF	Train Storage Facility
TSP	Total Suspended Particulate Matter
TTC	Toronto Transit Commission
YRRTC	York Region Rapid Transit Corporation
YRT	York Region Transit
YSE	Yonge Subway Extension

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## 1. INTRODUCTION

### 1.1 Purpose of the Document

On April 6, 2009, the Minister of the Environment for the Province of Ontario issued a Notice to Proceed to the Regional Municipality of York (York Region), the Toronto Transit Commission (TTC), York Region Rapid Transit Corporation (YRRTC), and the City of Toronto to construct the Yonge Subway Extension (YSE), from Finch Avenue to the Richmond Hill/Langstaff Urban Growth Centre at Highway 7 as shown in **Figure 1-1**. Subsequently, a Statement of Completion was issued that signified the completion of the Transit Project Assessment Process carried out under Ontario Regulation 231/08 (TPAP). The TPAP process assessed potential environmental impacts associated with the project, identified measures to mitigate those impacts, and committed to developing systems to monitor the progress of implementing those mitigation measures. The TPAP Completion Notice also served as an authorization for the proponents to proceed with implementation of the Project.

The Yonge Subway Extension Environmental Project Report, 2009 (2009 EPR) was undertaken by York Region, TTC, YRRTC and the City of Toronto as Proponents of the project. In October 2009, York Region and the City of Toronto authorized the TTC and YRRTC to proceed with the Conceptual Design Study for the project. The City of Toronto approved the project conditional on TTC carrying out a Subway Rail Yard Needs Study (SRYNS) and based on the outcome of that study, any additional required facilities were to be added to the project. For an overview of the SRYNS, refer to **Section 1.2.2**. On May 1, 2012, the TTC Board authorized the TTC to proceed with an Environmental Project Report Addendum.

Subsequent to the issuance of the Minister's Notice, changes to the Project were identified during the Conceptual Design Study that result in modifications to the plans presented in the 2009 EPR. As described in Section 15 of Ontario Regulation 231/08, any significant change that is inconsistent with a previously approved EPR requires a reassessment of the impacts associated with the project with respect to the propose change, the identification of potentially new mitigation measures and potentially new monitoring systems, in an addendum to the previously approved EPR.

This document serves as the EPR Addendum, and will document the impact of all changes proposed and described herein. An overview of the YSE project timeline is presented in **Figure 1-2**.



Figure 1-1: Approved Yonge Subway Extension Plan



Figure 1-2: Train Storage Facility Addendum Project Timeline



## 1.2 Background

### 1.2.1 General

As illustrated in **Figure 1-1**, the approved YSE project from Finch Avenue to the Richmond Hill Centre at Highway 7 is 7.42 km in length, with 1.61 km in the City of Toronto (south of Steeles Avenue) and 5.81 km in York Region (north of Steeles Avenue). The project comprises a total of 5.08 km of twin-bored tunnel, five stations, associated track work, two major bus terminals, two bus loops, five substations, eight emergency exit buildings (EEBs) and one bridge.

The proposed subway extension will be underground for its entire length, with the exception of the crossing of the East Don River where the subway emerges from the tunnels and crosses the river valley via a two-level bridge with automobile traffic on the upper level and subway on the lower level. The subway level of the bridge will be enclosed to maintain the integrity of the tunnel ventilation system and to mitigate against noise transfer to the surrounding community.

Between Finch Station and Langstaff Station, the alignment will run below Yonge Street. North of Langstaff Station, the subway alignment will shift east of Yonge Street to the preferred location for Richmond Hill Centre Station. The alignment of the proposed subway extension and the location of the Richmond Hill Centre Station protected for a future extension northerly towards the intersection of Yonge Street and 16th Avenue / Carville Road.

### 1.2.2 Subway Rail Yard Needs Study

The TTC conducted a SRYNS in May 2009 to identify the vehicle storage capacity of their existing facilities, and evaluate requirements and potential alternative locations for future storage and maintenance facilities. The train yard capacities were assessed based on 2030 vehicle storage requirements and included both the Spadina and Yonge Subway Extensions.

It was determined that the train car fleet would grow from 62 trains to a total of 88 trains. The increase will be driven by the following key factors:

- A gradual increase in service frequency with Automatic Train Operation (ATO);
- The additional fleet needed for the Spadina Subway Extension;
- The YSE from Finch Station to Richmond Hill Centre Station, and
- The relocation of the current Spadina Subway short turn from St. Clair West Station to Glencairn Station.

The study concluded that a 14-train Train Storage Facility (TSF) would be required, and the preferred site for the TSF was identified to be in the vicinity of the Richmond Hill Centre. Considerations for siting the TSF are shown in **Figure 1-3**.

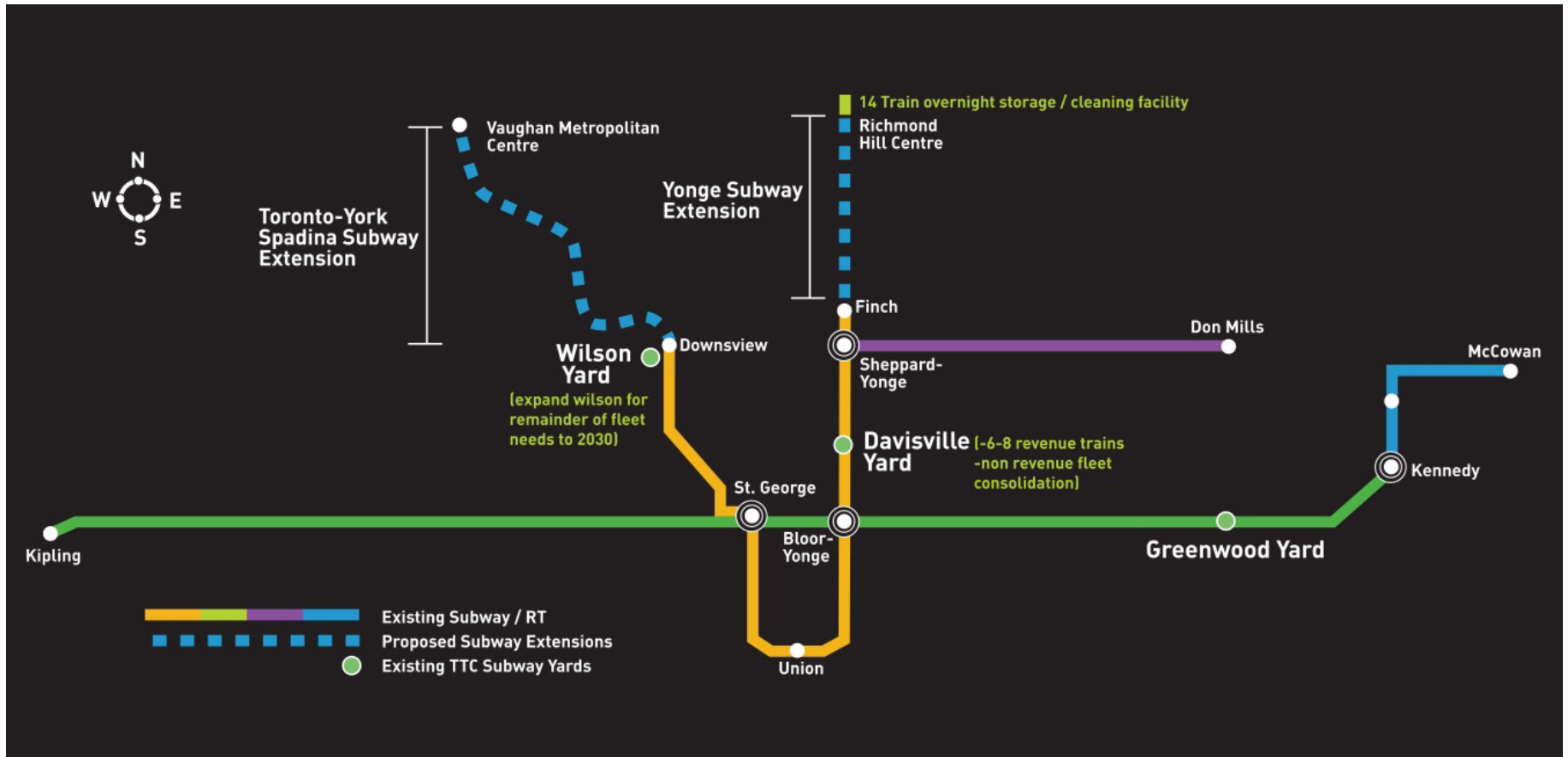


Figure 1-3: SRYNS Storage Facility Considerations

### 1.2.3 Conceptual Design

In October 2009, York Region and the City of Toronto authorized the TTC and YRRTC to proceed with the Conceptual Design Study for the YSE. MMM Group (formerly McCormick Rankin Corporation) and Hatch Mott MacDonald were retained by the TTC and YRRTC to carry out the work.

The Conceptual Design Study built upon the functional design included in the TPAP to further develop station concepts, property needs, and cost estimates. The study also assessed options to accommodate TTC train storage requirements identified in the TTC SRYNS. Various train storage locations were studied, and the preferred site for the TSF was identified to be in the vicinity of the Richmond Hill Centre.

As part of the conceptual design study, an assessment of alternative TSF sites was undertaken. This assessment resulted in the recommended changes to the YSE project being addressed by this EPR Addendum, as described in **Section 1.4**. A summary of the assessment undertaken in the Conceptual Design Study, and a detailed description of the recommended alternative are provided in **Section 3**. The Conceptual Design Report can be found on the project website at <http://www.vivanext.com/yonge-subway-extension>.

## 1.3 Relevant Planning Policies and Documents

### 1.3.1 Province of Ontario Planning Process

The Province began addressing rapid growth in the Toronto region and throughout the province by enacting the *Places to Grow Act, 2005* and the *Greenbelt Act, 2005*. These land planning reforms established new frameworks for directing urban growth into designated areas while preserving natural and agricultural landscapes. The desired outcome is a substantial increase in the development density in areas designated for growth. The change in growth from lower density sprawl to higher levels of urban density will place an even greater strain on existing urban infrastructure that already operates at capacity, notably the transportation network.

To alleviate the fragmented system of planning, funding, and implementation of the region's urban infrastructure, the Province enacted the *Metrolinx Act, 2006*. The Act created Metrolinx, a regional planning and funding agency for all modes of transportation identified in the region's long-term transportation plan, including the five-year capital investment program, and is responsible for implementation, ownership, and operation of all transportation projects identified in the plan.

The Ministry of Transportation Ontario and Infrastructure Ontario, a crown corporation, both have critical roles in delivering the provincial urban growth and transportation investment strategies, and in implementing the Metrolinx program. Specifically, Infrastructure Ontario leverages Alternative Financing and

Procurement (AFP<sup>1</sup>) in the implementation of transportation projects. The Ministry of Transportation Ontario is responsible for transportation infrastructure and policy at the provincial level and serves as the conduit for the Province's investment in Metrolinx-funded transportation improvements. In addition, the Infrastructure Ontario's Growth Secretariat is also charged with carrying out the provincial land use and growth planning mandates of the *Places to Grow Act, 2005* that serves as the basis for integrated transportation and land use planning. Numerous agencies are responsible for the local delivery of transportation, and the frameworks for delivering the multi-modal transportation system remain devolved to local implementation agencies.

The provincial Acts mentioned above are supported by the current Provincial Policy Statement (2014) with policies that set out the government's land use vision for how Ontario settles our landscape, creates our built environment, and manages our land and resources over the long term to achieve livable and resilient communities. The Provincial Policy Statement (2014) includes policy to promote the use of active transportation, transit and transit-supportive development, and provide for connectivity among transportation modes.

On June 15, 2007, the Province of Ontario announced \$17.5 billion in funding transit projects for the Greater Toronto Area and Hamilton. Named 'MoveOntario 2020', this 12-year provincial investment strategy to deliver 52 Rapid Transit projects in the Greater Toronto and Hamilton Area that forms the geographic area in which Metrolinx has the mandate to develop a comprehensive multi-modal transportation network. The Metrolinx Big Five Program was the transit capital investment program originally developed for the first five years of the implementation of the Big Move, the region's long-term transportation plan. The scope of the Big Five Program included four projects within the City of Toronto (City) and one project in York Region which would be funded through MoveOntario 2020.

The Metrolinx Regional Transportation Plan named "The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area" was approved on November 28, 2008. The plan identified the Yonge North Subway Extension as one of the top 15 priority projects as part of the regional transit expansion. Additional information is available online at: [www.metrolinx.com/thebigmove](http://www.metrolinx.com/thebigmove).

Metrolinx has subsequently identified a series of "Next Wave" transit infrastructure projects. The Next Wave projects were selected "through a business case analysis and in cooperation with municipal needs", and includes the Yonge Subway Extension project as approved in the 2009 EPR.

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<sup>1</sup> From [www.infrastructureontario.ca](http://www.infrastructureontario.ca), "AFP is an innovative way of financing and procuring large, complex public infrastructure projects...Under AFP, provincial ministries and / or agencies establish the scope and purpose of the project while the work is financed and carried out by the private sector. Only after a project is completed will the private sector company be repaid by the province...AFP allows large, complex infrastructure projects to be delivered faster and more efficiently (at a lower, long-term net cost) than traditional procurement, protects taxpayers from cost overruns, and transfers risks to the partner who has the expertise, experience and ability to handle that risk best."

### **1.3.2 Region of York Planning Policies**

North of Steeles Avenue, land use designations along Yonge Street are subject to change in order to accommodate growth in a more sustainable manner. As the study area for the EPR Addendum is located north of Steeles Avenue, as detailed in **Section 1.4.1**, this section focuses on York Region planning policy. The Province's Places to Grow: Growth Plan for the Greater Golden Horseshoe encourages new development to occur within existing built areas and designated Urban Growth Centres throughout the Greater Toronto Area.

York Region's Official Plan establishes an urban structure for the Region which consists of Regional Centres that are connected by Regional Corridors. The Official Plan promotes the intensification of these Centres and Corridors, which maximize land and infrastructure in a matter that supports rapid transit.

The structure of the Official Plan designates lands located to the east of the Highway 407 and Yonge Street interchange as a Regional Centre. Richmond Hill Centre / Langstaff Gateway is one of the four Regional Centres intended to act as hubs and equivalent to 'downtowns' for business, cultural, government and social activity. These Regional Centres act as focal points since they contain the highest concentrations and intensities of residential, social service, commercial and office activities. In addition, these Regional Centres are to be compact, pedestrian oriented, safe and accessible.

One of the Growth Centres is the Richmond Hill / Langstaff Gateway which is located along Highway 7 and adjacent to the subway extension route. Due to existing transit linkages, planned transit improvements and the Growth Plan's target of 200 jobs and residents per hectare, there are significant opportunities for transit oriented development. In support of provincial legislation, York Region and its municipalities are evaluating and updating their policies.

Regional Official Plan Amendment 43 to the Official Plan (ROPA 43), adopted in December 2004, permits intensified land uses up to 2.5 floors space index within designated areas along the Yonge Street and Highway 7 corridors. The land uses along these corridors are subject to the studies conducted by local municipalities, specifically Markham, Newmarket, Richmond Hill, and Vaughan.

The Region's Official Plan designates Yonge Street as a Regional Corridor and the Region envisions rapid transit service will be provided on Yonge Street to serve this Corridor. The development of high-density uses along the corridor will support the introduction of a rapid transit system along the Yonge Street Corridor.

## **1.4 Changes to the Project**

### **1.4.1 Study Area**

The Study Area for the TSF has evolved over a number of studies related to the YSE project. The Project Team, through the SRYNS, identified at a high-level the area in which the proposed TSF was required (i.e. in the vicinity of the

Richmond Hill Centre, near the northern end of the proposed YSE). Through the subsequent Conceptual Design Study, the Team developed a series of feasible TSF concepts within that high-level study area. The assessment of the feasible TSF concepts (summarized in **Section 3**) resulted in the identification of a preferred TSF location and layout.

The Study Area for the EPR Addendum was generally defined as the area from the proposed Richmond Hill Centre Station (as approved in the 2009 EPR) northerly to 16th Avenue, as presented in **Figure 1-4**. The Study Area for this EPR Addendum encompasses the area where physical or operational impacts are anticipated as a result of the implementation of the preferred TSF (i.e. the proposed change to the plan presented in the 2009 EPR).

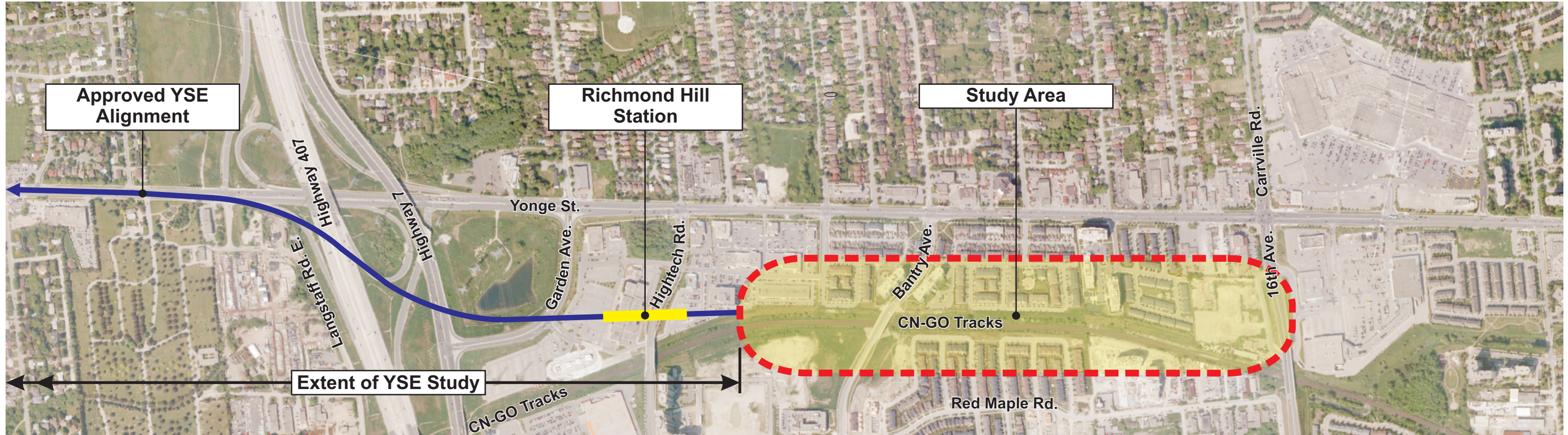
#### **1.4.2 Summary of Proposed Changes**

This Addendum focuses only on changes to the 2009 EPR proposed in the section north of the proposed Richmond Hill Centre Station to approximately Northern Heights Drive. The following is a summary of the components of the proposed changes to the approved YSE project addressed in this Addendum:

- Extension of the YSE alignment to approximately 1km north of the approved Richmond Hill Centre Station;
- Underground Train Storage Facility (TSF) for 14 trains, on the YSE alignment north of the approved Richmond Hill Centre Station;
- Maintenance building for staff access to the proposed TSF east of Coburg Crescent, and associated 25-30 space employee parking lot;
- Private access roadway connecting the proposed TSF employee parking lot to Beresford Drive;
- Ventilation shaft in the vicinity of the northern end of the TSF; and
- Emergency Exit Building.

These proposed changes are discussed in further detail in **Section 3.2**.





LEGEND:

DATE:

JANUARY 2014

SCALE:

NOT TO SCALE

**YONGE SUBWAY EXTENSION  
ENVIRONMENTAL PROJECT REPORT ADDENDUM**

ADDENDUM STUDY AREA

FIGURE

**1-4**

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### 1.4.3 Studies Prepared in Support of the YSE TPAP Addendum

The following is a list of studies that were conducted in support of this Addendum report:

- Natural Environment Memo, see **Appendix A**;
- Air Quality Assessment, see **Appendix B**;
- Noise and Vibration Assessment, see **Appendix C**;
- Contamination Overview Study, see **Appendix D**;
- Geotechnical Report, see **Appendix E**;
- Groundwater Assessment Report, see **Appendix F**;
- Stage 1-2 Archaeological Assessment Report, see **Appendix G**; and,
- Cultural Heritage Assessment Memo, see **Appendix H**.

### 1.5 TPAP Addendum Process

This TPAP Addendum is being carried out under the Transit Project Assessment Process (TPAP), Ontario Regulation (O. Reg.) 231/08. The EPR for this study was approved by the Ministry of the Environment (MOE, now the Ministry of the Environment and Climate Change [MOECC]) in 2009.

As described in **Section 1.2**, the background studies undertaken since the completion of the TPAP have concluded that modifications to the 2009 EPR are required. As described in Section 15 of O. Reg. 231/08, any significant change that is inconsistent with a previously approved EPR requires a reassessment of the impacts associated with the project where changes are proposed; including the identification of potentially new mitigation measures, and potentially new monitoring systems which are to be documented in an addendum to the previously approved EPR.

The formal public and agency review processes and timelines for finalizing an Addendum to an approved EPR are essentially the same as the TPAP; however, the proponent has discretion regarding the scope of public consultation.

The following are the key steps in the TPAP Addendum process:

- Complete assessment and evaluation of any impacts the change might have on environment;
- Complete EPR Addendum report;
- Prepare and distribute a Notice of EPR Addendum; and
- Final review by stakeholders prior to proceeding with Project.

In addition to these steps, consultation has been undertaken to review the proposed changes, potential impacts and proposed mitigation with the public, agencies and stakeholders prior to the completion of this report.

### **1.5.1 Content of the Environmental Project Report Addendum**

In accordance with O. Reg. 231/08, Section 15 (1), if after submitting a statement of completion of the transit project assessment process, the proponent wishes to make a change to the transit project that is inconsistent with the EPR referred to in that statement, the proponent shall prepare an addendum to the EPR. This Addendum to the 2009 EPR contains the following information:

- A description of the change (See **Section 1.4**);
- The reasons for the change (See **Section 1.0**);
- The proponent's assessment and evaluation of any impacts that the change might have on the environment (See **Section 5.0**);
- A description of any measures proposed by the proponent for mitigating any negative impacts that the change might have on the environment (See **Section 5.0**); and
- A statement of whether the proponent is of the opinion that the change is a significant change to the transit project, and the reasons for the opinion. O. Reg. 231/08, s. 15 (1) (See **Section 1.5.2**).

### **1.5.2 Updated Project Description Results in Significant Changes**

In accordance with Section 15 of O. Reg. 231/08, the Proponent has assessed the significance of the changes to the Project. The changes have been deemed significant as the environmental effects of the TSF were not addressed in the 2009 EPR. The addition of the TSF also requires an extension to the YSE footprint by approximately 1km north of the approved Richmond Hill Centre Station. The environmental effects of this change were not specifically addressed in the 2009 EPR.

### **1.5.3 EPR Addendum Process**

Upon publishing the Notice of EPR Addendum the report will be made available to the public, regulatory agencies, Aboriginal communities or and other stakeholders for a 30 day public review period in accordance with O. Reg. 231/08.

The Minister of the Environment is required to consider any written objections received within 30 days after the Notice of EPR Addendum is first published. Objections with respect to the significant change documented through the EPR Addendum will be considered if the Minister decides to act in respect of the significant change. The Minister may act if the significant change may have a negative impact on a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest, or on a constitutionally protected Aboriginal or treaty right.

Following the 30-day public comment period, the Minister of the Environment has 35 days to issue one of three notices:

1. a notice allowing the proponent to change the transit project in accordance with the addendum;
2. a notice requiring further consideration of the change described in the addendum; or
3. a notice allowing the proponent to change the transit project in accordance with the addendum, subject to conditions set out in the notice.

Further detail regarding the EPR Addendum process is provided in Section 15 of O. Reg. 231/08.

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## **2. OUTLINE OF STUDY CONSULTATION PROCESS**

This section and the corresponding appendices provide the Consultation Record for the EPR Addendum. The consultation program for the EPR Addendum study was developed based on the public and stakeholder consultation requirements specified under Ontario Regulation 231/08 for a TPAP.

Those consulted included potentially affected land owners, Aboriginal communities, government review agencies, technical agencies, local municipalities, elected officials, and the general public. The following approach was used:

- Prepared Contact/Property Owner Lists: Maintained an active contact list from the TPAP to know who needs to be informed of project updates.
- Established a Technical Advisory Committee made up of key agency representatives and provide an opportunity for input at project milestones.
- Maintained Website ([www.vivanext.com/yonge-subway-extension](http://www.vivanext.com/yonge-subway-extension)): Updates to the website advertised and summarized information shared at the Public Information Centres.
- Notice of Public Information Centre (PIC): To notify area residents of the two public open houses and provide information on how to participate/provide comment.
- Hosted PICs: Advertised by newspaper, website and through mailed notification to names on the contact list. Sign-in sheet for meeting attendees and comment stations provided opportunities for input to the project.
- Community Liaison: Project team representatives available to provide information, answer questions and manage comments received during the project.
- Notice of EPR Addendum: To notify relevant technical stakeholders, the general public, and all residents of the Study Area about the completion of the project, and provide information on how to access the final report and provide comment.

### **2.1 Agency, Municipal and Aboriginal Community Consultation**

Notification and consultation were carried out to encourage the involvement of government agencies, technical agencies, municipal staff and Aboriginal community representatives. It was important to facilitate the involvement of these groups to develop a better understanding the project Study Area. Agencies and Aboriginal community representatives were invited to participate in the PICs.

The following have been notified of this EPR Addendum:

### Government Review Agencies

- Aboriginal Affairs and Northern Development Canada
- Canadian Environmental Assessment Agency
- Environment Canada
- Metrolinx (including GO Transit)
- Ministry of Aboriginal Affairs
- Ministry of Community and Social Services
- Ministry of Economic Development, Employment and Infrastructure
- Ministry of the Environment and Climate Change (Environmental Assessment and Approvals Branch and Central Region)
- Ministry of Municipal Affairs and Housing
- Ministry of Natural Resources and Forestry
- Ministry of Tourism, Culture and Sport
- Ministry of Transportation
- Transport Canada

### Technical Agencies and Interest Groups

- 407 ETR
- Allstream Corporation
- Architectural Conservancy of Ontario
- Bell Canada
- Cogeco
- Conservation Council of Ontario
- CN Rail
- Enbridge Gas Distribution Inc.
- Enbridge Pipelines Inc.
- GO Transit
- Heritage Canada The National Trust
- Hydro One
- Imperial Oil
- Ontario Heritage Trust

- Ontario Power Generation
- PowerStream
- Telus
- Toronto and Region Conservation Authority
- Toronto Transit Commission
- TransCanada
- Trans-Northern Pipelines Inc.
- Rogers Cable
- Sun-Canadian Pipe Line Company
- Union Gas
- York Region Transit
- YRRTC

*Municipal Staff*

- City of Markham
- City of Toronto
- City of Vaughan
- York Region
- Town of Richmond Hill

*Aboriginal Communities*

- Alderville First Nation
- Algonquins of Pikwàkanagàn First Nation
- Association of Iroquois and Allied Indians
- Beausoleil First Nation
- Chippewas of Georgina Island
- Chippewas of Mnjikaning (Rama) First Nation
- Chippewas of Nawash (Cape Croker) First Nation
- Curve Lake First Nation
- Hiawatha First Nation
- Huron-Wendat Nation
- Iroquois Confederacy / Haudenosaunee
- Kawartha-Nishnawbe of Burleigh Falls First Nation

- Métis Nation of Ontario
- Mississaugas of Scugog Island First Nation
- Mississaugas of the New Credit First Nation
- Mohawks of the Bay of Quinte
- Moose Deer Point First Nation
- Munsee-Delaware Nation
- Nipissing First Nation
- Oneida First Nation
- Six Nations of the Grand River
- Union of Ontario Indians
- Wahta Mohawks

### 2.1.1 Technical Advisory Committee

Key stakeholder agencies were consulted through a Technical Advisory Committee. A meeting was held with the Technical Advisory Committee on March 18, 2013, to provide a project update and introduce the need and justification for a TPAP Addendum. A follow-up meeting was held on May 29, 2013, to review project progress, discuss the outcome of PIC #1 and prepare for PIC #2. Participating TAC agency representatives are listed in the meeting minutes found in **Appendix J**.

In addition to the TAC meetings, a CN specific meeting was held on September 25, 2013 to discuss the proposed design and impacts to the CN right-of-way. A copy of the meeting notes is provided in **Appendix J**.

### 2.1.2 Feedback from Aboriginal Communities

Potentially interested Aboriginal communities listed in **Section 2.1** were sent notification in advance of the two Public Information Centres (PICs) with the exception of: Kawartha-Nishnawbe of Burleigh Falls First Nation, Métis Nation of Ontario and Oneida First Nation.

All of the Aboriginal communities listed in **Section 2.1** have been sent notification regarding completion of this EPR Addendum. The communities listed in **Section 2.1** include communities notified of the 2009 EPR as well as communities that, in the opinion of the proponents, may be interested in the change to the transit project.

A response letter, dated April 19, 2013, was sent by Curve Lake First Nation. The letter acknowledged receipt of the PIC#1 notification and:

- Indicated that the proposed project is situated within the Traditional Territory of Curve Lake First Nation and is incorporated within the Williams



Treaty Territory which is the subject of a claim under Canada's Specific Claims Policy.

- Provided contact information for the Williams Treaty First Nations Claims Coordinator.
- Indicated that Curve Lake First Nation Council is not currently aware of any issues that would cause concern with respect to their Traditional, Aboriginal or Treaty rights.
- Indicated a particular concern for the remains of ancestors and the need for notification should excavation unearth bones, remains or other such evidence of a native burial site or any Archaeological findings.
- Noted the need for notification should any new, undisclosed or unforeseen issues arise that has potential for anticipated negative environmental impacts or anticipated impacts on Treaty and Aboriginal rights.

In keeping with the response from Curve Lake First Nation, the Williams Treaty First Nations Claims Coordinator has been copied on notification to Curve Lake First Nation regarding completion of this EPR Addendum.

## **2.2 Public Consultation**

### **2.2.1 Public Information Centre #1**

The following provides an overview of PIC#1. The PIC#1 Summary Report is provided in **Appendix I**.

PIC #1 was held Wednesday, May 1, 2013, at the York Region Building, 50 High Tech Road, Richmond Hill. The purpose of PIC #1 was to present the detailed analysis of the various design options for the TSF, and obtain feedback from agencies and members of the public on the preferred plan.

#### **2.2.1.1 Notification of Public Information Centre #1**

Notice was published in *The Richmond Hill Liberal* Thursday April 18, 2013. Three weeks prior to PIC #1, an invitation letter was sent to Aboriginal communities, elected officials, municipal representatives, special interest groups, and media.

Properties within the vicinity of the proposed Richmond Hill Centre Station and TSF were sent notification letters three weeks prior to PIC #1 and a follow-up invitation postcard two weeks prior to the event. In addition, properties on the West and East side of Yonge Street from Silverwood Avenue, South of Silverwood, to North of Highway 7; South of Gamble Road to north of Bernard Avenue; and the East side of Yonge Street between 16th Avenue and Highway 7, were sent an invitation postcard two weeks prior to the event.

Email notification was sent to the Yonge subway email distribution group, on April 17, 2013. A second email serving as a reminder was sent on April 29, 2013.

### **2.2.1.2 Format of Public Information Centre #1**

PIC #1 was organized as an open house. Display boards were arranged to present project information and attendees were encouraged to speak with members of the project team who were on hand to receive feedback, address any comments or concerns, and facilitate discussion on the information provided.

Both online and paper feedback forms were made available at the open house and at [www.vivanext.com](http://www.vivanext.com) to solicit comments from those in attendance and from those unable to attend. Feedback forms were available in accessible formats. Those with comments were asked to submit their feedback forms on or before May 15, 2013. A copy of the feedback form and all display materials are included in **Appendix I**.

### **2.2.1.3 Summary of Public Information Centre #1 Attendance**

PIC #1 was well attended. Approximately 225 people attended over the course of the evening; 100 individuals signed the register.

## **2.2.2 Public Information Centre #2**

The following provides an overview of PIC#2. The PIC#2 Summary Report is provided in **Appendix I**.

Based on feedback generated through PIC #1 from consultation with members of the public, stakeholders, affected agencies, and interest groups, design elements and construction impacts of the preferred plan were further analyzed. New mitigation strategies were identified, and revisions were made to the preferred option for the proposed TSF as presented at PIC #1 on May 1, 2013.

PIC #2 was held Wednesday, June 12, 2013, at the Sheraton Parkway Toronto North, 600 Highway 7 East, Richmond Hill. The purpose of PIC #2 was to update the public on the revised designs and construction techniques, and provide an opportunity for additional feedback.

### **2.2.2.1 Notification of Public Information Centre #2**

Notice was published in *The Richmond Hill Liberal* Thursday, June 6, 2013. Three weeks prior to PIC #2, an invitation letter was sent to Aboriginal communities, elected officials, municipal representatives, special interest groups, and media.

Properties within the vicinity of proposed Richmond Hill Centre Station and TSF were sent notification letters three weeks prior to PIC #2, and a follow-up invitation postcard two weeks prior to the event.

In addition, properties on the west and east side of Yonge Street from Silverwood Avenue South of Silverwood to north of Highway 7; south of Gamble Road to north of Bernard Avenue; and the east side of Yonge Street between 16th Avenue and Highway 7, were sent an invitation postcard two weeks prior to the event

Email notification was sent to the Yonge subway email distribution group, on June 5, 2013. A second email serving as a reminder was sent June 10, 2013.

The same Aboriginal communities who were notified of PIC #1 (See **Section 2.1**) were sent notification letters three weeks prior to PIC #2.

### 2.2.2.2 Format of Public Information Centre #2

PIC #2 was organized as an open house. Display Boards were arranged to present project information and attendees were encouraged to speak with members of the Project Team who were on hand to receive feedback, address any comments or concerns, and facilitate discussion on the information provided.

Both online and paper feedback forms were made available at the open house and at [www.vivanext.com](http://www.vivanext.com) to solicit comments from those in attendance and from those unable to attend. Feedback forms were available in accessible formats. Those with comments were asked to submit their feedback forms on or before June 26, 2013. A copy of the feedback form and all display materials are included in **Appendices I and J**.

### 2.2.2.3 Summary of Public Information Centre #2 Attendance

PIC #2 was well attended. Approximately 100 people attended over the course of the evening and signed the register.

### 2.2.2.4 Summary of Public Consultation Comments and Responses

**Table 2-1: Summary of Public Consultation Comments and Responses**

Comment / Issue	Response
Noise and Vibration Impacts	<ul style="list-style-type: none"> <li>• Noise and vibration studies are being completed as part of the Environmental Assessment Addendum to identify and mitigate any possible negative noise and vibration issues as a result of construction. During operation noise and vibration will be minimal, as trains will be moving slowly to and from the facility.</li> <li>• Whenever possible, construction of this facility will take place during normal work hours [7am – 7pm]. If construction hours are extended we will ensure the public is informed in advance.</li> <li>• The emergency fan vent required for the TSF will be located a sufficient distance from residential properties and will be equipped with silencers to ensure noise levels are kept to a minimum.</li> </ul>
Air Quality Impacts	<ul style="list-style-type: none"> <li>• Construction of the facility will follow best practices for dust suppression and construction vehicles will be monitored and well maintained.</li> </ul>
Visual Impacts of TSF Surface Facilities	<ul style="list-style-type: none"> <li>• The Town of Richmond Hill Site Plan Application process will determine the specific look/style of the building and the extent and type of landscaping on the site. The Proponent will work with the Town throughout this process and inform residents and stakeholders of future public consultation sessions.</li> </ul>

Comment / Issue	Response
Traffic Closures and Local Road Disruption	<ul style="list-style-type: none"> <li>• There are no permanent displacement impacts associated with the Transit Project. There are transient impacts that relate to the construction of the TSF and localized impacts associated with bus and automobile operations at Richmond Hill Centre Station.</li> <li>• The traffic analysis conducted indicates that the streets surrounding this construction zone [High Tech Road and 16th Avenue] have capacity to accommodate displaced traffic from Bantry Avenue. The closure of Bantry Avenue is anticipated to last 12 – 16 months for the TSF construction.</li> <li>• To minimize traffic disruptions, an access driveway off of Beresford Drive has been included in the revised design for access to the train storage and maintenance facility.</li> </ul>
Natural Environment Impacts	<ul style="list-style-type: none"> <li>• Vegetation to be removed for the TSF construction includes common species, many of which are invasive. None of the plants within the vegetation clearing zone are considered uncommon, rare, or species of concern in Ontario.</li> <li>• Impacts to fish and aquatic habitat within the Study Area for the TSF are not anticipated. The local surficial drainage feature does not appear to provide either direct or indirect fish habitat as it likely contains negligible amounts of water.</li> <li>• Prior to construction, we will prepare a landscape restoration plan in consultation with the Town of Richmond Hill.</li> </ul>
Groundwater Impacts	<ul style="list-style-type: none"> <li>• Existing soil and groundwater conditions for the proposed TSF have been investigated as part of the TPAP Addendum. Recommendations have also been provided as a basis for the conceptual design and may be utilized for future planning and design purposes.</li> <li>• Based on currently available information, it is anticipated that no permanent dewatering systems would be required for the groundwater control at the TSF. All groundwater impacts are transient and relate to dewatering required for construction of the TSF.</li> <li>• Before construction begins, we will prepare a groundwater management plan and permit applications to ensure impacts caused by construction are minimized. Water quality testing will be ongoing throughout construction.</li> </ul>
Property Impacts related to the TSF	<ul style="list-style-type: none"> <li>• There will be some permanent property impacts associated with the TSF. The preliminary property requirements identified in this section will be confirmed during the detailed design/implementation phase of the study.</li> <li>• Temporary property easements will be required during the construction phase to establish work zones, material laydown areas, equipment maintenance/storage (pocket) and to obtain access for construction activities.</li> <li>• Construction activities (e.g. excavation and protection system) may result in potential for ground settlement, and impacts to existing buildings/structures adjacent to construction. Prior to the commencement of construction operations, a pre-condition survey will be undertaken to document existing ground elevations and building/structure conditions.</li> </ul>

### 2.3 Circulation of Draft Environmental Project Report Addendum

In April 2014 the draft Environmental Project Report Addendum was provided to the Technical Advisory Committee. Distribution occurred by email on April 2,

2014 with subsequent distribution of hardcopies to those requesting a hardcopy. **Appendix K** provides a comment-response table documenting comments received during the review of the draft EPR Addendum and how those comments have been addressed.

## **2.4 Review of the Environmental Project Report Addendum**

In accordance with the Transit Project Assessment Process (Regulation 231/08 under Ontario's Environmental Assessment Act) a Notice of EPR Addendum was issued alongside public release of this EPR Addendum. The notice was distributed in accordance with Section 15(5) of the Regulation.

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### **3. ALTERNATIVES CONSIDERED AND FEATURES OF THE RECOMMENDED TRANSIT PROJECT**

The purpose of this section is to define the recommended changes to the Project as described in **Section 1.4**.

#### **3.1 Background**

As discussed in **Section 1.2.2**, the TTC undertook a review of the future subway rail yard needs in 2009 for the Yonge Subway to the year 2030. The study determined that the car fleet would grow from 62 trains to a total of 88 trains. The increase would be driven by the following key factors:

- A gradual increase in service frequency with Automated Train Operation;
- The additional fleet needed for the Spadina Subway extension;
- The proposed YSE from Finch Station to Richmond Hill Centre Station, and
- The relocation of the current Spadina Subway short turn from St. Clair West Station to Glencairn Station.

The implication for the YSE project was the need for a 14-train TSF in the area of Richmond Hill Centre, which was endorsed by the YRRTC Board in May of 2010 and the TTC Board in May of 2012. Through the subsequent Conceptual Design Study (2012), the TTC and YRRTC assessed alternative locations for the proposed TSF and identified a preferred location and layout for the facility. That assessment is summarized in the following sections.

#### **3.1.1 Design Criteria**

##### **3.1.1.1 Planning Requirements and Design Considerations**

The primary maintenance site for vehicles using the Yonge Subway will continue to be at Wilson Yard located south of Downsview Station. However, in order to facilitate start-of-service requirements, overnight train storage will be provided in the area of Richmond Hill Centre Station and within the TSF light-duty maintenance and cleaning of the subway vehicles will occur.

The determination that a 14-train TSF in the area of Richmond Hill Centre was a requirement for the YSE was premised on four trains being displaced from the current Finch Station and an additional 10 trains being necessary to meet the service requirements for the extension. During preliminary assessment of this need, it was concluded that two trains could be stored at Richmond Hill Centre Station and the remaining 12 trains could be stored in a below grade facility.

Additional design considerations for the TSF were as follows:

- The facility should be designed in a way that will allow easy conversion of the TSF to a mainline track section for future revenue service;

- The next station on the line, forming part of a future northern extension, should be located in close proximity to the Yonge Street/16th Avenue intersection; and
- The facility should be designed in a way that any future construction of a northerly extension should not impact or disrupt train storage or train operation.

### **3.1.1.2 Operational Requirements**

The following operational requirements were compiled following several meetings with TTC Subway Operations:

- The facility will be below grade/enclosed and will be used for storage, as well as light-duty maintenance and cleaning of the vehicles;
- Maintenance crew will access/egress the underground facility from the Richmond Hill Centre Station Platform, from EEB #8 provided in the vicinity of the TSF;
- Trains entering revenue service will be delivered by maintenance crew to the south end of the Richmond Hill Centre Station platform to be picked up by the operator, and
- The facility will be staffed overnight to perform light-duty maintenance and cleaning of the vehicles, and to provide a permanent presence (overnight security) in the facility.

### **3.1.1.3 Supporting Facility Requirements**

The following facilities were similarly developed with TTC Subway Operations as part of the Conceptual Design Study, to support the operation of the underground TSF:

- A transportation reporting centre;
- A parking lot for 25-30 spaces premised on 13-14 people needed to bring trains into operation;
- Cargo elevator;
- Garbage storage room, and
- Small office, lunch room and locker room.

An assessment of the traction power and electrical requirements for the TSF has identified the need for an Electrical Service Building including a high voltage room, communication room, emergency power room, HVAC mechanical room and a switchgear-switchboard room.

An assessment of the ventilation requirements for the YSE including the TSF has identified the need for an emergency ventilation fan, a fan room and a ventilation shaft to be located at the north end of the TSF.



### **3.1.2 Alignment and Configuration Alternatives**

In order to address the requirements identified in **Section 3.1.1**, during the Conceptual Design phase, alternative TSF alignments were developed, reviewed and analysed in the vicinity of the Richmond Hill Centre. These included options which extended under Yonge Street north of the Langstaff Station, under the commuter parking lot within the hydro corridor and extending easterly within the hydro corridor north of Highway 7. **Figure 3-1** displays the train storage options studied. Each option was compared, based on the following criteria:

- Future Station Location;
- Subway operations;
- Not to preclude a future extension of the Yonge Subway north from Richmond Hill Centre;
- Property and building impacts;
- Constructability (traffic, property, tunneling versus open cut); and
- Cost (initial and future).

All options developed would remain underground.

Based on a high-level screening assessment, Options 3, 4 and 5 did not meet the design criteria and were not pursued further for the following reasons:

#### **Option #3**

- Significant constructability issues with building under the Highway 407 bridge;
- Operational issues with trains backtracking to Richmond Hill Centre; and
- Requires property for facility building along Yonge Street.

#### **Option #4**

- Constructability issues with building between major highways and under rail corridor; and
- Special track work increases the distance between Richmond Hill Centre Station and Langstaff/Longbridge station.

#### **Option #5**

- Significant environmental impacts expected as train storage extends into West Don River Valley; and
- Operational issues associated with reverse movements of trains in and out of the mainline.



- Approved Yonge Subway alignment
- Intended future Yonge Subway alignment
- Subway station
- > **Option 1**
  - Train storage - north of Highway 7, east of Yonge Street beside GO rail tracks
  - Special track work
- > **Option 2**
  - Train storage - under Yonge Street, north of Bantry Avenue
  - Special track work
  - Special tunnel work
- > **Option 3**
  - Train storage - under Yonge Street, starting at Highway 407
  - Special track work
- > **Option 4**
  - Train storage - east of Yonge Street, between Highway 7 and Highway 407
  - Special track work
- > **Option 5**
  - Train storage - west of Yonge Street, in the hydro corridor south of Highway 407
  - Special track work

Figure 3-1: Train Storage Options Studied in the Conceptual Design

The following were the key considerations regarding the remaining two location options:

### **Option #1**

- Requires Bantry bridge to be rebuilt;
- Minimizes impacts to existing property;
- Minimizes impacts to transit/traffic on Yonge Street during Construction;
- Lower capital costs expected;
- Shorter than Option #2;
- More efficient operation for storage facility;
- Associated TTC surface facilities located off of Yonge Street;
- Future 16th Avenue station platform located approximately 150m east of Yonge Street; and
- Potential impacts on future development.

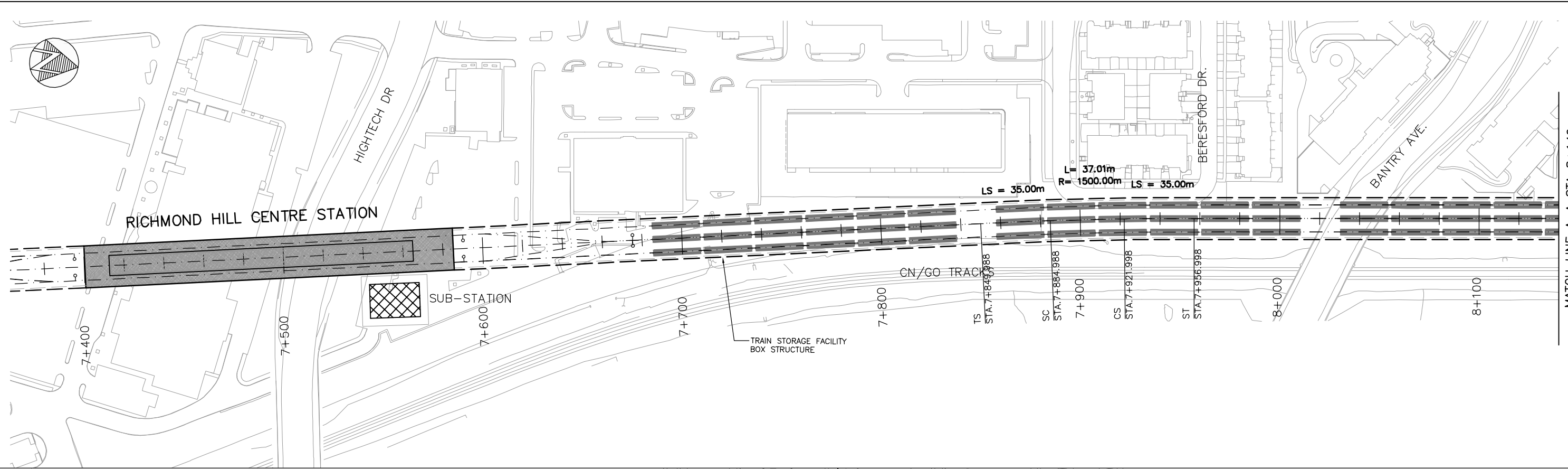
### **Option #2**

- More impact on transit and traffic on Yonge Street during construction;
- Longer and therefore more expensive than Option #1;
- Impacts a number of existing residential properties that would need to be expropriated;
- Pushes future 16th Avenue station north of 16th Avenue;
- Less efficient storage operation as trains would have to be stored in tunnels;
- Associated TTC surface facilities located close to Yonge Street; and
- No impact to the Bantry Bridge.

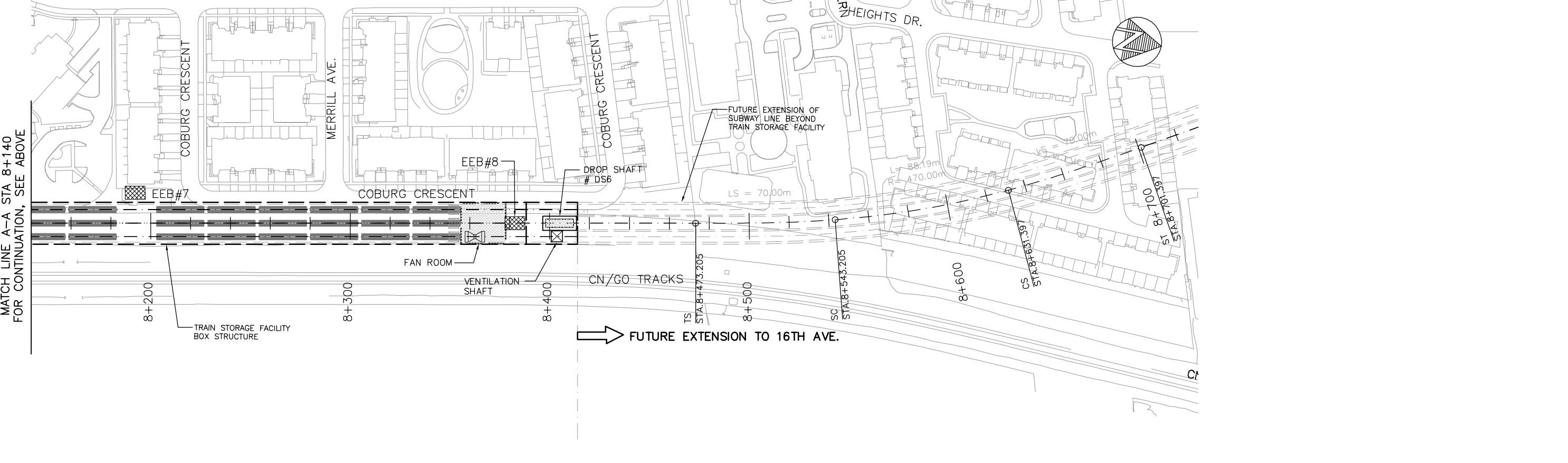
Option #1 was expanded to include an additional option at the same location that involved four parallel tracks as compared to three. These three alternatives were developed further for detailed assessment. These were renamed:

- **Alignment Alternative A (Bi)** - construction of a three-track structure extending north from the Richmond Hill Centre Station adjacent to the existing CN Rail corridor; **(See Figure 3-2)**;
- **Alignment Alternative B (Cii)** - construction of a two-track storage tunnel extending north from the Richmond Hill Centre Station and curving westerly to run under the Yonge Street road alignment **(See Figure 3-3)**, and
- **Alignment Alternative C (Gi)** - construction of a four-track storage structure extending north from the Richmond Hill Centre Station adjacent to the existing CN Rail corridor. **(See Figure 3-4)**.




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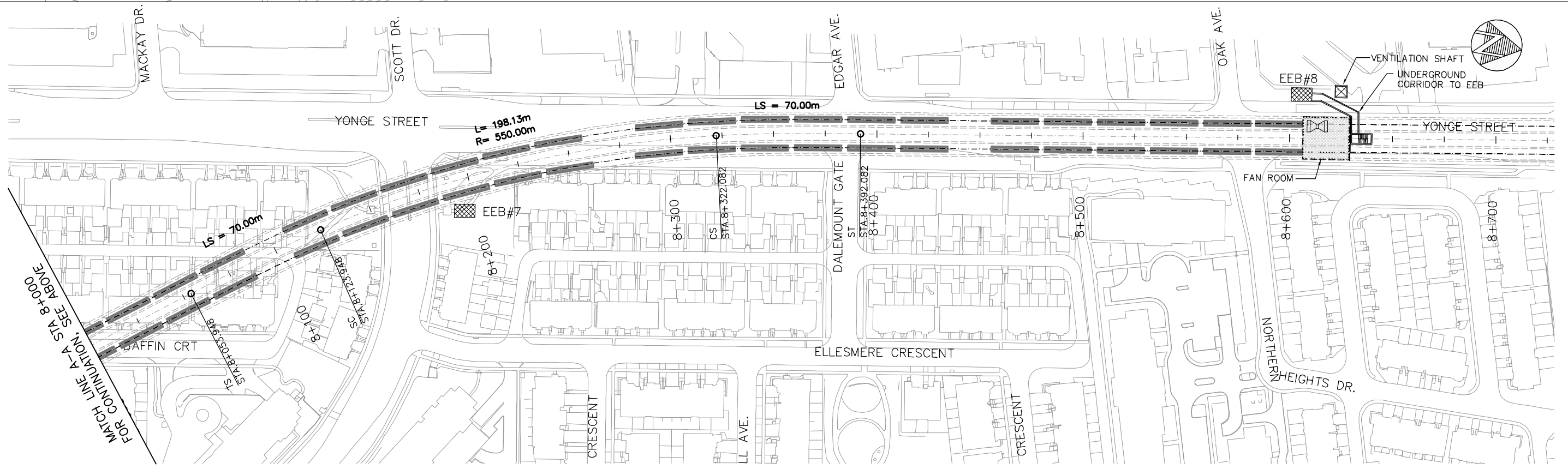
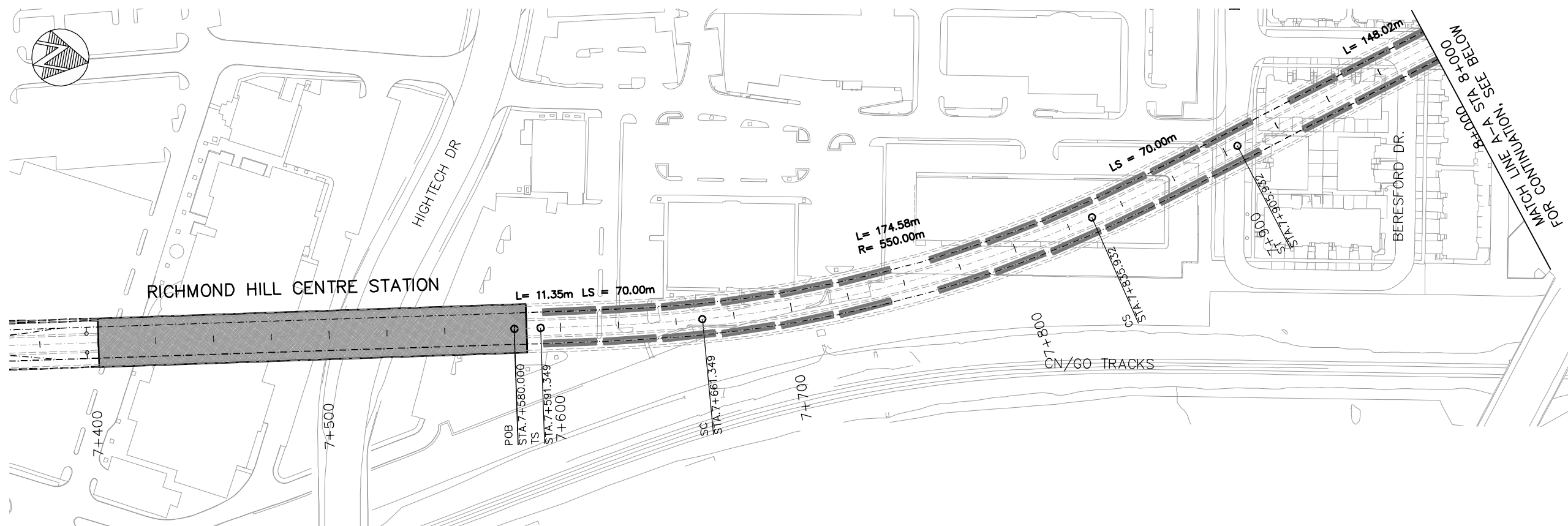
MATCH LINE A-A STA 8+140  
FOR CONTINUATION, SEE BELOW



MATCH LINE A-A STA 8+140  
FOR CONTINUATION, SEE ABOVE

  	LEGEND:	DATE: JANUARY 2014	<b>YONGE SUBWAY EXTENSION ENVIRONMENTAL PROJECT REPORT ADDENDUM</b>	FIGURE  <b>3-2</b>
		SCALE: 1:2000		





LEGEND:

DATE:  
JANUARY 2014

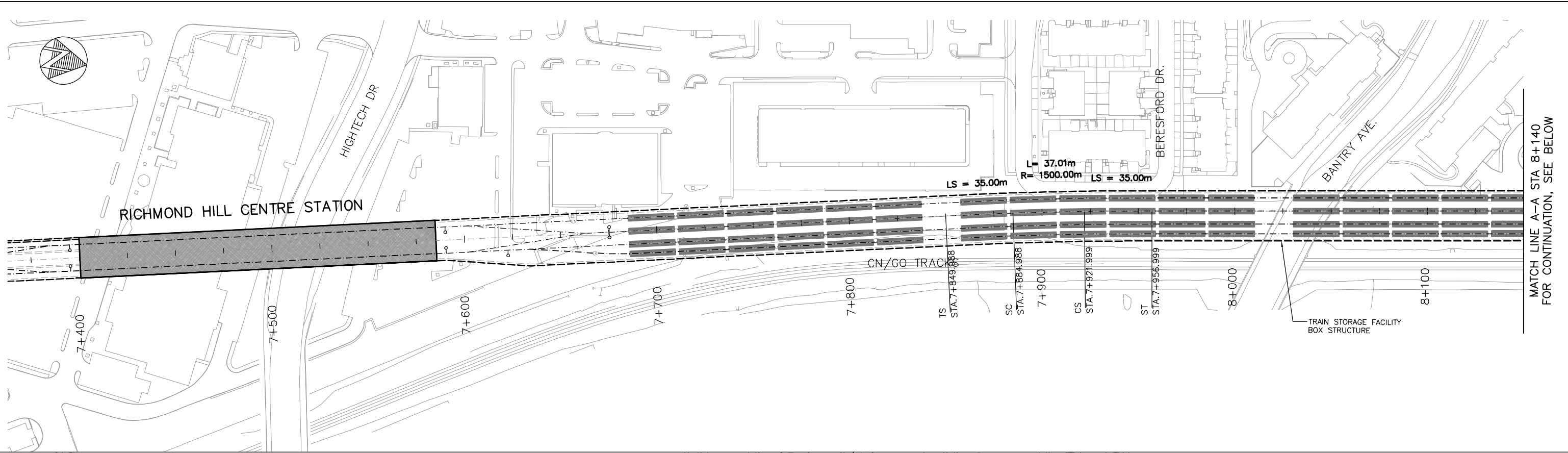
SCALE:  
1:2000

**YONGE SUBWAY EXTENSION  
ENVIRONMENTAL PROJECT REPORT ADDENDUM**

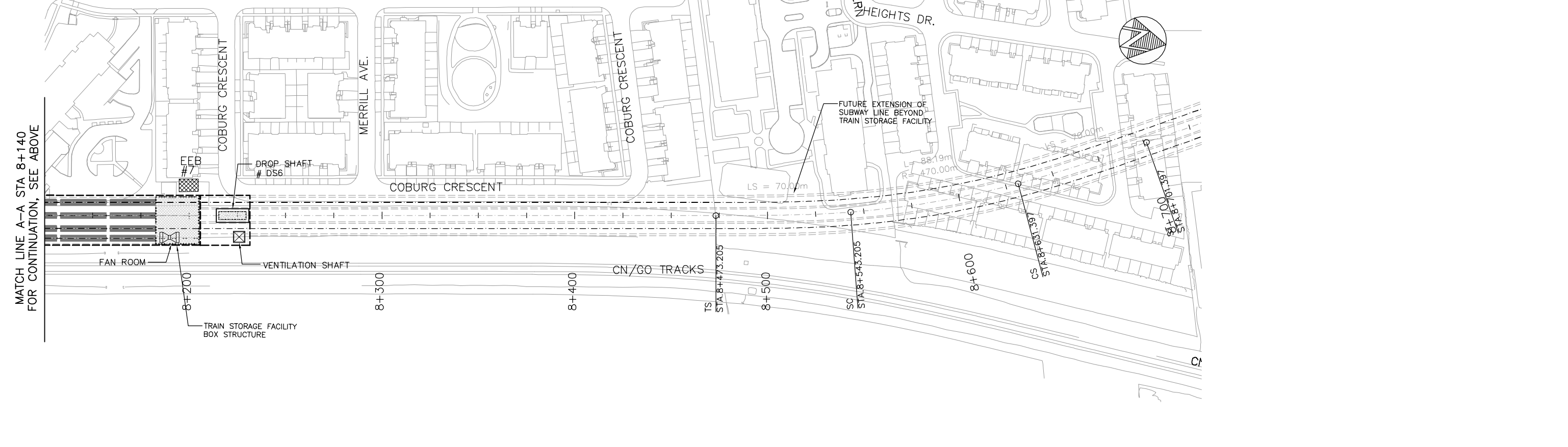
ALIGNMENT ALTERNATIVE Cii

FIGURE

**3-3**



MATCH LINE A-A STA 8+140 FOR CONTINUATION, SEE BELOW



MATCH LINE A-A STA 8+140 FOR CONTINUATION, SEE ABOVE



LEGEND:

DATE: JANUARY 2014

SCALE: 1:2000

### YONGE SUBWAY EXTENSION ENVIRONMENTAL PROJECT REPORT ADDENDUM

ALIGNMENT ALTERNATIVE Gi

FIGURE

3-4

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### **3.1.3 Evaluation of Alternatives and Selection of Preferred Alignment**

These three options were evaluated in terms of;

#### **1. Train Storage Facility:**

- 1.1. Land use types adjacent to storage facility;
- 1.2. Construction method required;
- 1.3. Traffic impacts as a result of cut-and-cover construction;
- 1.4. Number of buildings and structures within the tunnel easement;
- 1.5. Number of potential noise and vibration-sensitive receptors within 100m of the storage facility;
- 1.6. Horizontal and vertical alignments – compliance with TTC standards;
- 1.7. Approximate length of storage facility;
- 1.8. Encroachment on the CN rail corridor;
- 1.9. Location of ancillary facilities (e.g. staff parking, office, ventilation shafts, EEBs, etc.);
- 1.10. Construction cost; and
- 1.11. Residential property acquisition cost.

#### **2. Protection for future subway extension to 16<sup>th</sup> Avenue:**

- 2.1. Location of the future 16<sup>th</sup> Avenue station relative to the intersection of Yonge Street and 16<sup>th</sup> Avenue;
- 2.2. Number of redevelopment sites bisected by or crossed by tunnel easement;
- 2.3. Number of buildings and structures within the tunnel easement;
- 2.4. Horizontal and vertical alignments – compliance with TTC design standards;
- 2.5. Construction method required;
- 2.6. Future subway construction allowances (i.e. future TBM exit shaft or future ventilation shaft);
- 2.7. Impact of future extension to 16<sup>th</sup> Avenue on the train storage facility;
- 2.8. Impact on subway turnback operation at Richmond Hill Centre Station;
- 2.9. Additional tunneling cost to extend to future 16<sup>th</sup> Avenue Station; and
- 2.10. Residential property acquisition cost (\$2011, est.).

The following matrix (see **Table 3-1**) summarizes the technical evaluation of these various alignment alternatives, as presented in the Conceptual Design Study. Based on this evaluation **Alignment Alternative A (Bi)** (see **Figure 3-2**) was selected as the recommended alternative.

It should be noted that the final alignment of the TSF has been subsequently refined to address the need to avoid the existing caisson foundations for the condo located at 29 Northern Heights Drive and the need to establish tunnel/station easements for proposed new developments by landowners on the east side of Yonge Street south of 16th Avenue.

**Table 3-1: Summary of Assessment of Alternatives**

Measure		Note	Alternative Bi	Alternative Cii	Alternative Gi
<b>Description</b>			Construction of a 3-track storage structure extending north from the Richmond Hill station adjacent to the existing CN Rail corridor.	Construction of a 2-track storage tunnel extending north from the Richmond Hill station and curving westerly to run under the Yonge Street road alignment	Construction of a 4-track storage structure extending north from the Richmond Hill station adjacent to the existing CN Rail corridor.
<b>1.0 Train Storage Facility</b>					
1.1	Land use types adjacent to storage facility	General description	Mostly residential to the west. CN rail corridor to the east.	Residential and commercial on both sides	Mostly residential to the west. CN rail corridor to the east.
			●	●	●
1.2	Construction method required	General description	Cut-and-cover between CN rail corridor and residential properties	Tunneling under residential properties from Beresford Drive to 60m north of Oak Avenue/Northern Heights Drive .	Cut-and-cover between CN rail corridor and residential properties (wider construction area than Alternative Bi)
			●	●	●
1.3	Traffic impacts as a result of cut-and-cover construction	Preliminary assessment	Low - requires partial lane closure on Coburg Crescent and Beresford Drive. Access to residential properties can be maintained.	Low to Medium - requires lane closures on Yonge Street around Oak Avenue	Low - requires partial lane closure on Coburg Crescent and Beresford Drive. Access to residential properties can be maintained.
			●	●	●
1.4	Number of buildings and structures within the tunnel easement	tunnel easement defined as a 30 to 32m swath centred on tunnel reference line			
		Commercial - Office	1 (50 High Tech)	1 (50 High Tech)	1 (50 High Tech)
		Commercial - Retail	0	1	0
		Residential - Townhouse Units	0	53	0
		Overpass	1 (Bantry Avenue)	0	1 (Bantry Avenue)
			●	●	●
1.5	Number of potential noise and vibration sensitive receptors within 100m of the storage facility	Preliminary - to be confirmed by future studies	210 townhouse units 4 apartment buildings	179 townhouse units 4 apartment buildings	121 townhouse units 2 apartment buildings
			●	●	●
1.6	Horizontal and vertical alignments - compliance with TTC Design Standards		Complies with technical design standards	Complies with technical design standards	Complies with technical design standards
			●	●	●
1.7	Approx. length of storage facility		820 metres	1049 metres	630 metres
			●	●	●
1.8	Encroachment on CN rail corridor		No	No	Yes
			●	●	●
1.9	Location of ancillary facilities (e.g. staff parking, office, ventilation shafts, EEBs, etc.)		Can be accommodated within the train storage facility easement between the adjacent townhouses and the CN rail corridor.	Will need to be accommodated off Yonge Street on existing commercial/retail properties on the west side of Yonge Street - commercial/business impact.	Can be accommodated within the train storage facility easement between the adjacent townhouses and the CN rail corridor.
1.10	Construction Cost		Initial review would indicate similar capital costs for all 3 alternatives.		
1.11	Residential Property Acquisition Cost	Based on the number of units affected (See 1.4) multiplied by average neighbourhood sales price between April 2010 and April 2011. Intended for qualitative comparison only - does not represent actual property acquisition cost.	No residential property acquisition anticipated	\$22,655,000	No residential property acquisition anticipated

		Alternative Bi	Alternative Cii	Alternative Gi
Measure	Note			
<b>2.0 Future Subway Extension to 16th Avenue</b>				
2.1	Centroid of the station platform relative to centre of the intersection	120 metres east of the intersection	At the intersection	120 metres east of the intersection
	Location of the future 16th Avenue Station relative to the intersection of Yonge Street and 16th Avenue			
	Option Cii situated at equal distance between Hillcrest Mall and South Hill Plaza - station box could straddle the intersection or positioned further north to connect with any preferred entrance location.			
2.2	Number of redevelopment sites bisected or crossed by tunnel easement	2 (Great Lands, Haulover)	0	2 (Great Lands, Haulover)
	Despite the subway tunnels crossing the development sites, consultation with land owners indicated that impact on site plan and built-form will be minimal.			
2.3	Number of buildings and structures within the tunnel easement			
	tunnel easement defined as a 30 to 32m swath centred on tunnel reference line			
	Residential - Townhouse Units	37	0	37
	Residential - Condominium Units	198	0	198
2.4	Horizontal and vertical alignments - compliance with TTC Design Standards	Complies with technical design standards	Complies with technical design standards	Complies with technical design standards
2.5	Construction method required	General description	Tunneling under residential properties from the north end of the storage facility to the station box at 16th Avenue. Cut-and-cover for station box.	Tunneling or cut-and-cover for 250 metres of tunnels between the north end of the storage facility and 16th Avenue Station. Cut-and-cover for station box.
2.6	Future subway construction allowances (ie future TBM exit shaft or future ventilation shafts)	Yes	Yes (extraction shaft within Yonge Street ROW)	Yes
2.7	Impact of future extension to 16th Avenue on the train storage facility	Storage facility must be relocated in the future	Storage facility must be relocated in the future	Storage facility must be relocated in the future
2.8	Impact on subway turnback operation at Richmond Hill Centre Station	Permits provision of double-ended pocket tracks north of the station platform. Two turnback options. Can accommodate train headways that are less than 3 minutes and 30 seconds.	Excludes the ability to provide double-ended pocket tracks north of the station platform. One turnback option. Limits the ability to operate trains at headways less than 3 minutes and 30 seconds.	Permits provision of double-ended pocket tracks north of the station platform. Two turnback options. Can accommodate train headways that are less than 3 minutes and 30 seconds.
2.9	Additional Tunnelling Cost to Extend to Future 16th Avenue Station (2011\$)	\$22 Million (430 metres)	\$13 Million (250 metres)	\$31 Million (620 metres)
	Excludes station at 16th Avenue. Based on length of tunnels multiplied by unit cost for twin tunnelling (\$50,000 per metre). Includes tunnel boring, tunnel liners, and finishes only. Does not include contingencies or mark-ups.			
2.10	Residential Property Acquisition Cost (2011\$)	\$17,848,000	No residential property acquisition anticipated	\$17,848,000
	Based on the number of townhouse units affected (See 2.3) multiplied by average neighbourhood sales price between April 2010 and April 2011. Intended for qualitative comparison only - does not represent actual property acquisition cost. Includes a \$5 Million placeholder for monitoring/remedial work on condo at 29 Northern Heights Drive.			

<b>SUMMARY</b>			
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<b>Legend</b>			
Least Preferred			Most Preferred

## 3.2 Update of the Project Description

The purpose of this section is to define the recommended changes to the Project as described in **Section 1.4.2**. The YSE plan, as presented in the 2009 EPR remains intact, and the changes presented herein do not affect the design, operations, or impacts assessed in the 2009 EPR. As discussed in **Section 1.4.2**, this Addendum addresses a proposed extension of the proposed YSE to accommodate an underground Train Storage Facility north of the previously-identified terminus of the proposed YSE at Richmond Hill Centre Station.

The following sections describe the revised Project within the defined Addendum study area.

### 3.2.1 Subway Extension Alignment

The implementation of the proposed Train Storage Facility would require an underground extension of the Yonge Subway of approximately 800m beyond the end of the approved Richmond Hill Centre Station. The subway extension would continue northerly along the west side of the rail corridor to minimize encroachment on the residential development to the west of the rail corridor.

The subway alignment would rise at an approximate 3% grade as it continues northerly from the Station, with the top-of-rail remaining at an elevation approximately 20m below surface grade.

North of the Station, cross-over tracks would be provided to facilitate the transfer of trains to/from the centre track of the storage facility. Crossover tracks are required to facilitate subway operations in this corridor. Crossovers enable trains to transfer between mainline tracks in order to change direction or for failure management purposes (such as manoeuvring around a disabled train). In this facility, the crossover track north of Richmond Hill Centre Station would allow for trains being put into /taken out of service to transfer between the storage facility and the main line.

The final alignment of the TSF would encroach on the current CN right-of-way and a subsurface easement will be required. Based on initial consultation with CN, the following CN non-residential criteria for development next to the rail line are applicable to the proposed TSF:

- A minimum 15 metre building setback, from the railway right-of-way, is recommended for heavy industrial, warehouse, manufacturing and repair use (i.e. factories, workshops, automobile repair and service shops);
- A chain link fence of minimum 1.83 metre height is required to be installed and maintained along the mutual property line;
- Any proposed alterations to the existing drainage pattern affecting Railway property require prior concurrence from the Railway and be substantiated by a drainage report to the satisfaction of the Railway; and,

- Noise and vibration impacts of the project should be evaluated; if the construction of the facility changes the acoustic environment of the immediate setting, it could trigger new discomfort (due to the railway or other sources) for nearby occupants.

Further consultation with CN Rail will be required in subsequent design stages to ensure CN Guidelines and Standards are met.

The proposed extension of the YSE is presented in **Figure 3-5A to C**.

### 3.2.2 Train Storage Facility

The proposed underground Train Storage Facility would be located adjacent to the CN Rail corridor, beginning approximately 100m north of the Richmond Hill Centre Station. The storage facility itself would be comprised of three parallel tracks to accommodate additional storage capacity, side-by-side in a triple box structure along the west side of the GO/CN rail corridor that will extend to the north section of Coburg Crescent. The box structure would be approximately 21m wide and 6m in height, generally located at a depth from surface of approximately 14-20m (top of structure/bottom of structure). The structure would be approximately 700m in length.

This facility will house 12 trains for overnight storage and one or two trains will be kept at the Richmond Hill Centre Station platforms overnight.

The proposed TSF is presented in **Figure 3-5A to C**.

### 3.2.3 Surface Facilities

In addition to the underground storage facilities, supporting surface facilities will be required. As discussed in **Section 3.1**, these would be comprised of:

- A combined maintenance operators facility and electrical services building, including:
  - A transportation reporting centre;
  - Cargo elevator;
  - Garbage storage room;
  - Small lunch room and locker room;
  - High voltage room;
  - Communications room;
  - Emergency power room;
  - HVAC mechanical room; and
  - Switchgear-switchboard room.
- A ventilation shaft;
- A drop shaft;

- An Emergency Exit Building (EEB); and
- A parking lot for 25-30 spaces premised on 13-14 people needed to bring trains into operation;

It is proposed that these facilities be located at the northern end of the TSF. In order to minimize the impact of these facilities on local the adjacent residential development, access to the facility would be provided by a new roadway constructed at the surface above the subway extension alignment, connecting the facility parking lot to Beresford Drive.

The detailed plan of the proposed TSF is illustrated in **Figures 3-5A, B, and C**. Cross-sections of the proposed works are also provided in **Figure 3-6**.

### **3.3 Construction Staging Approach**

In order to confirm the feasibility of constructing the transit project, the proponent included, in the conceptual design study, the development of a construction staging plan for the project. This staging plan was used as the basis for an assessment of the anticipated construction-related impacts. It should be noted, however, that the ultimate construction approach will be determined by the construction contractor, and they will be responsible for the assessment of any significant impacts that result from a change in construction approach.

The construction of the TSF will be a large earth-moving exercise, with an overall length of more than 830m and a depth of between 21.5m and 23m, the total excavated quantity will be approximately five times that of a typical passenger station. It is therefore proposed to split the work into two contract packages.

#### **Cut and Cover Construction**

For some portions of the subway line, excavation by a Tunnel Boring Machine (TBM) is not practical or economical. Typically, stations, crossovers and emergency exit facilities are constructed by cut-and-cover methods. This would also apply to the TSF. This practice was most recently used for the TTC Subway stations along Sheppard Avenue and the Spadina Subway Extension, and will also be used for the TYSSE facilities. Cut-and-cover construction for these facilities will require a series of measures to initially divert traffic and utilities to permit installation of the selected excavation support system.

In cut-and-cover construction, the ground surface is opened (cut) a sufficient depth to construct the subway tunnel structure and ancillary facilities. The sides of the excavation are usually supported by vertical temporary walls to minimize the volume of material excavated and to protect adjacent facilities and buildings. The walls require cross-bracing or tiebacks for support. Once the construction excavation is complete, the contractor builds the structure from the bottom to the top of the structure. When the structure construction is complete, the remaining excavation is backfilled and the surface is reinstated.

The cut-and-cover method results in larger quantities of excavated material and is suitable for shallow cuts (no more than 20 m depth). It also requires few special procedures and can be constructed in an expedited manner. Recognizing that cut-and-cover can be more disruptive than tunnelling, the environmental effects and mitigation measures were assessed as part of the Transit Project Assessment Process.

The following sections provide an overview of this construction methodology.

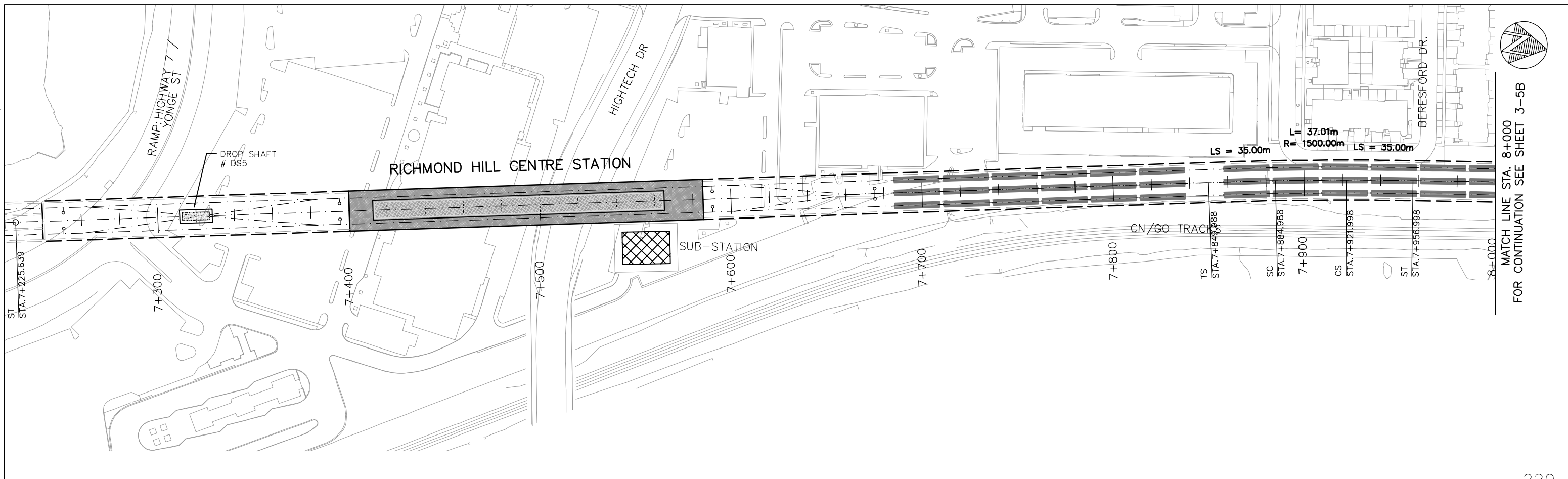
When the excavation occurs within a road or street, existing utilities are often encountered and these must be maintained by temporary support or by relocation. When vehicular traffic must be maintained, temporary decking is placed over the cut using the side walls for support. The top down procedure may be used to minimize the length of time that the surface areas are disturbed.

In an urban setting all residents and businesses are serviced by a wide range of utilities. To avoid effects to these services, cut-and-cover requires special consideration for the maintenance of utilities. To facilitate cut-and-cover construction, utilities can be relocated. This is often completed in advance of the subway construction. Alternatively, the utility can be temporarily suspended / supported through the construction site. The most appropriate method for the utilities that may be affected will be determined during the detailed design phase.

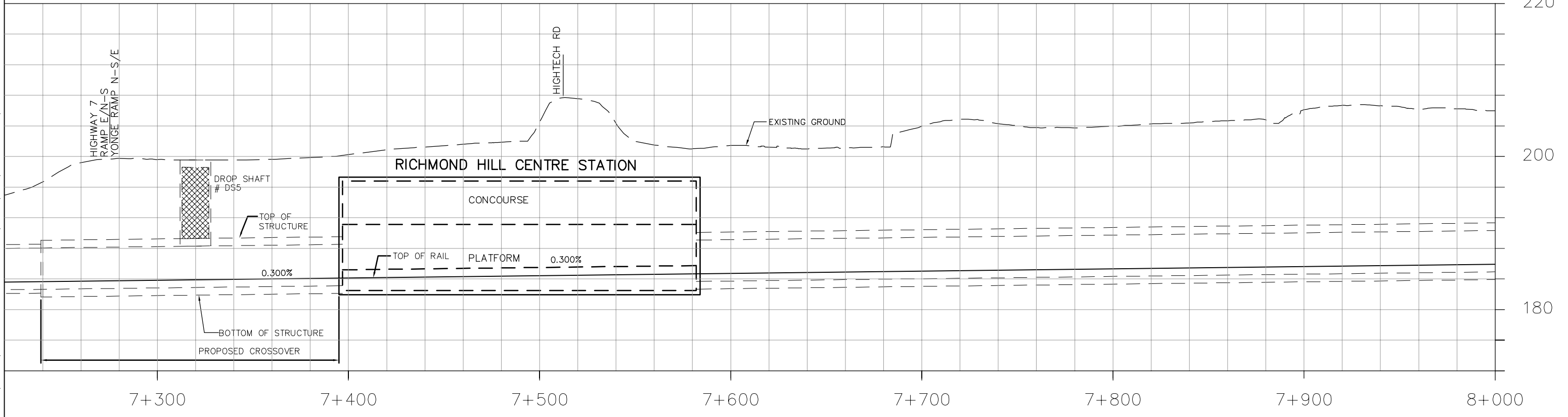


MODIFIED: Apr. 01, 2014 11:07 AM

DRAWING NAME: I:\DRAWINGS\TRANSIT\7767 YONGE SUBWAY EXTENSION\DESIGN\16TH\EPRA ADDENDUM\7767-FIG 3-5A\_B PROPOSED YSE PLAN AND PROFILE.DWG



MATCH LINE STA. 8+000  
FOR CONTINUATION SEE SHEET 3-5B



LEGEND:

DATE:

JANUARY 2014

SCALE:

1:2000 - HOR.  
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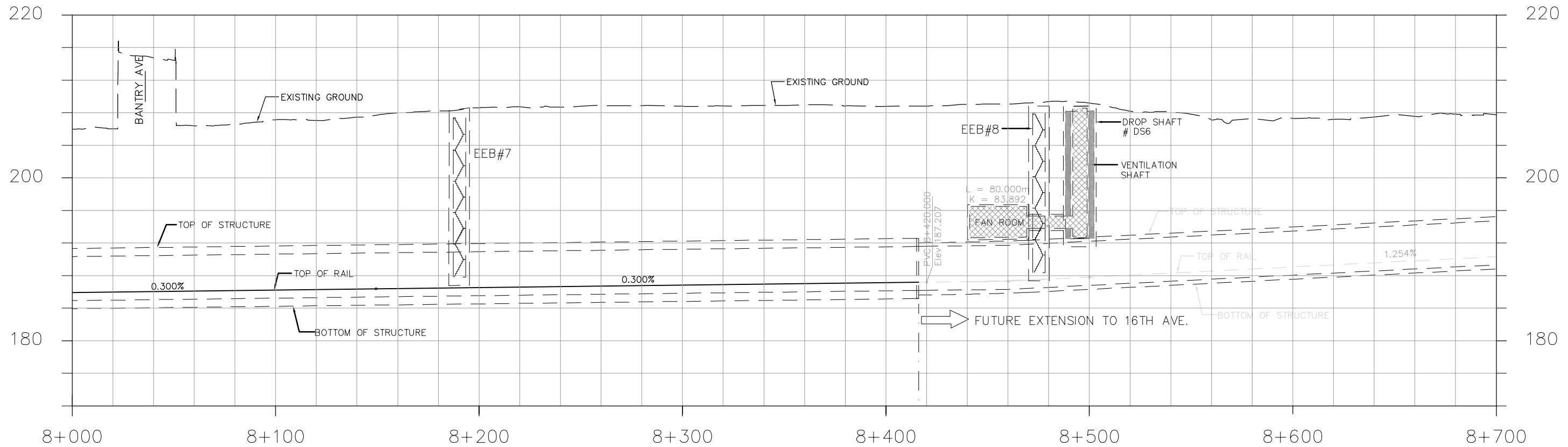
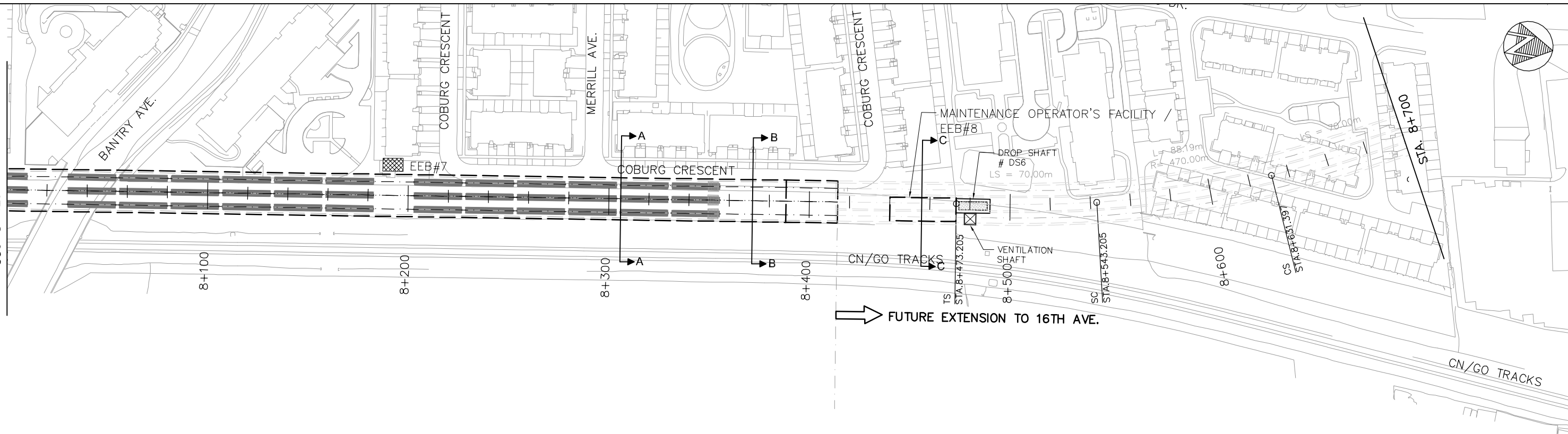
### YONGE SUBWAY EXTENSION ENVIRONMENTAL PROJECT REPORT ADDENDUM

PROPOSED YSE TSF  
PLAN AND PROFILE  
FROM RICHMOND HILL CENTRE STATION TO STA. 8+000

FIGURE

3-5A

MATCH LINE STA. 8+000  
FOR CONTINUATION SEE SHEET 3-5A



LEGEND:

DATE:  
JANUARY 2014

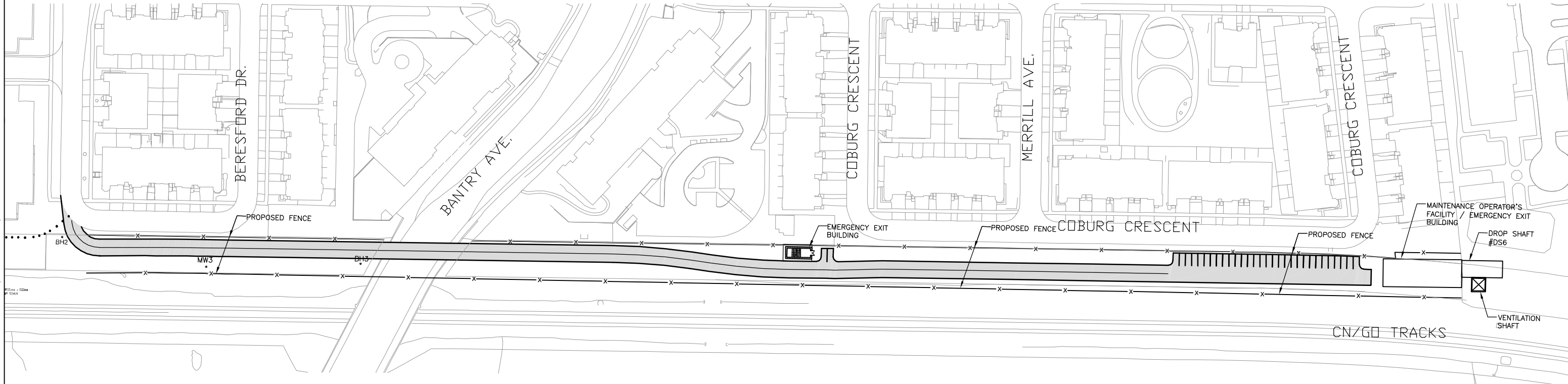
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**YONGE SUBWAY EXTENSION  
ENVIRONMENTAL PROJECT REPORT ADDENDUM**

PROPOSED YSE TSF  
PLAN AND PROFILE  
STA. 8+000 TO STA. 8+700

FIGURE

**3-5B**



LEGEND:

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JANUARY 2014

SCALE:  
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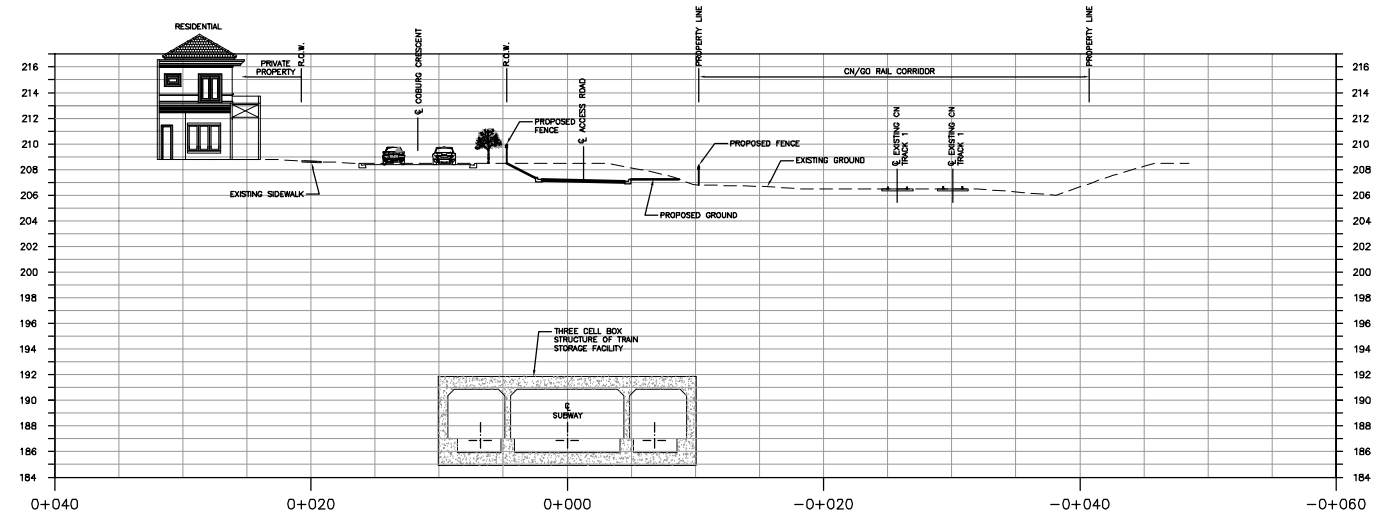
**YONGE SUBWAY EXTENSION  
ENVIRONMENTAL PROJECT REPORT ADDENDUM**

PROPOSED YSE TSF  
PLAN  
STA. 7+900 TO STA. 8+500

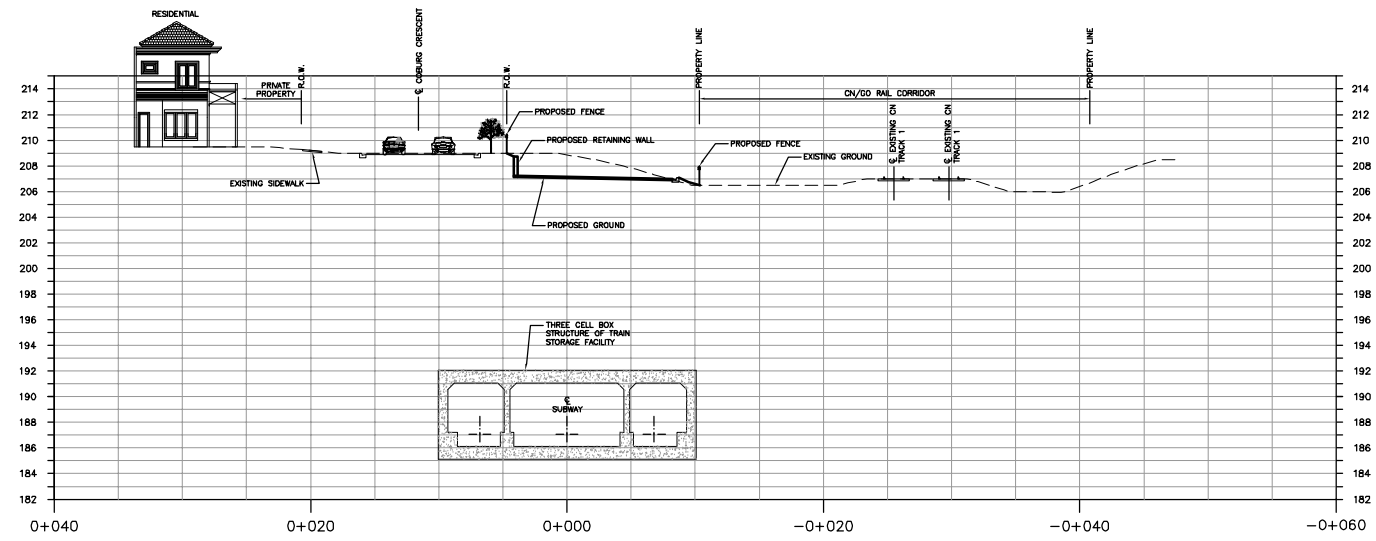
FIGURE

**3-5C**

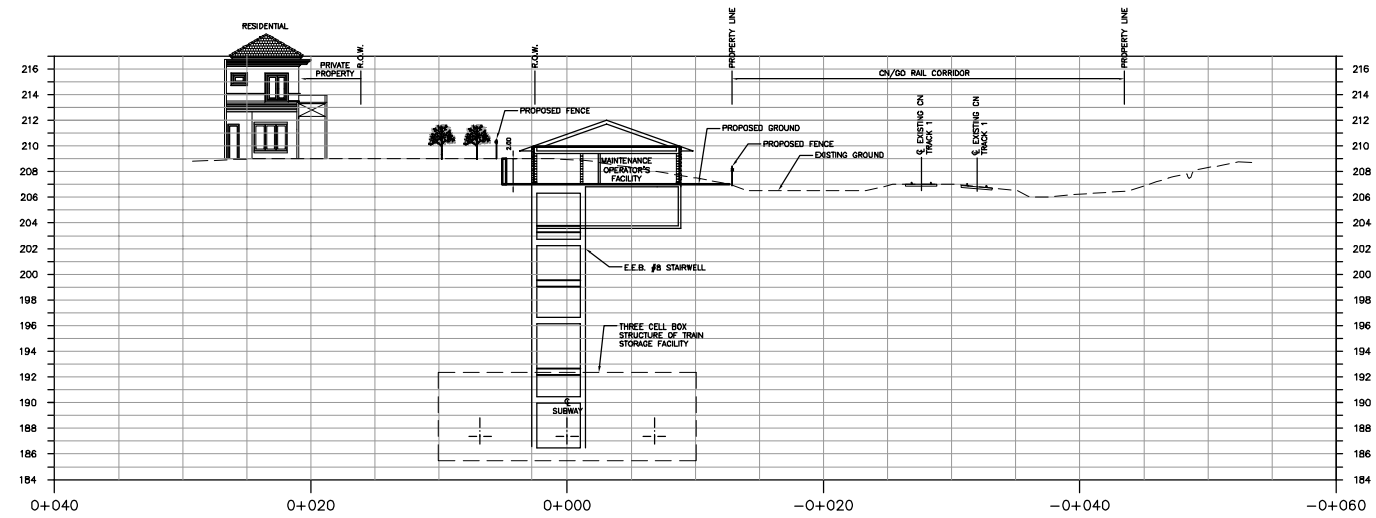
SECTION A-A



SECTION B-B



SECTION C-C



LEGEND:

DATE:

JANUARY 2014

SCALE:

NOT TO SCALE

**YONGE SUBWAY EXTENSION  
ENVIRONMENTAL PROJECT REPORT ADDENDUM**

PROPOSED CROSS SECTIONS

FIGURE

**3-6**

## 4. STUDY AREA CONDITIONS

The existing environmental conditions described in the 2009 EPR were reviewed for applicability to conditions at the time of this Addendum (2014) and were determined to be unchanged except as specifically stated in the following sections. The following sections provide a summary of the existing conditions as described in the 2009 EPR and an update on existing conditions in the study area considered as part of the EPR Addendum where appropriate. This chapter presents the existing conditions relate to:

- Natural Environment (**Section 4.1**),
- Socio-Economic Environment (**Section 4.2**),
- Cultural Environment (**Section 4.3**),
- Transportation (**Section 4.4**) and
- Utilities (**Section 4.5**).

Detailed information for these factors is provided in the specialist and technical reports provided as Appendices to the EPR Addendum.

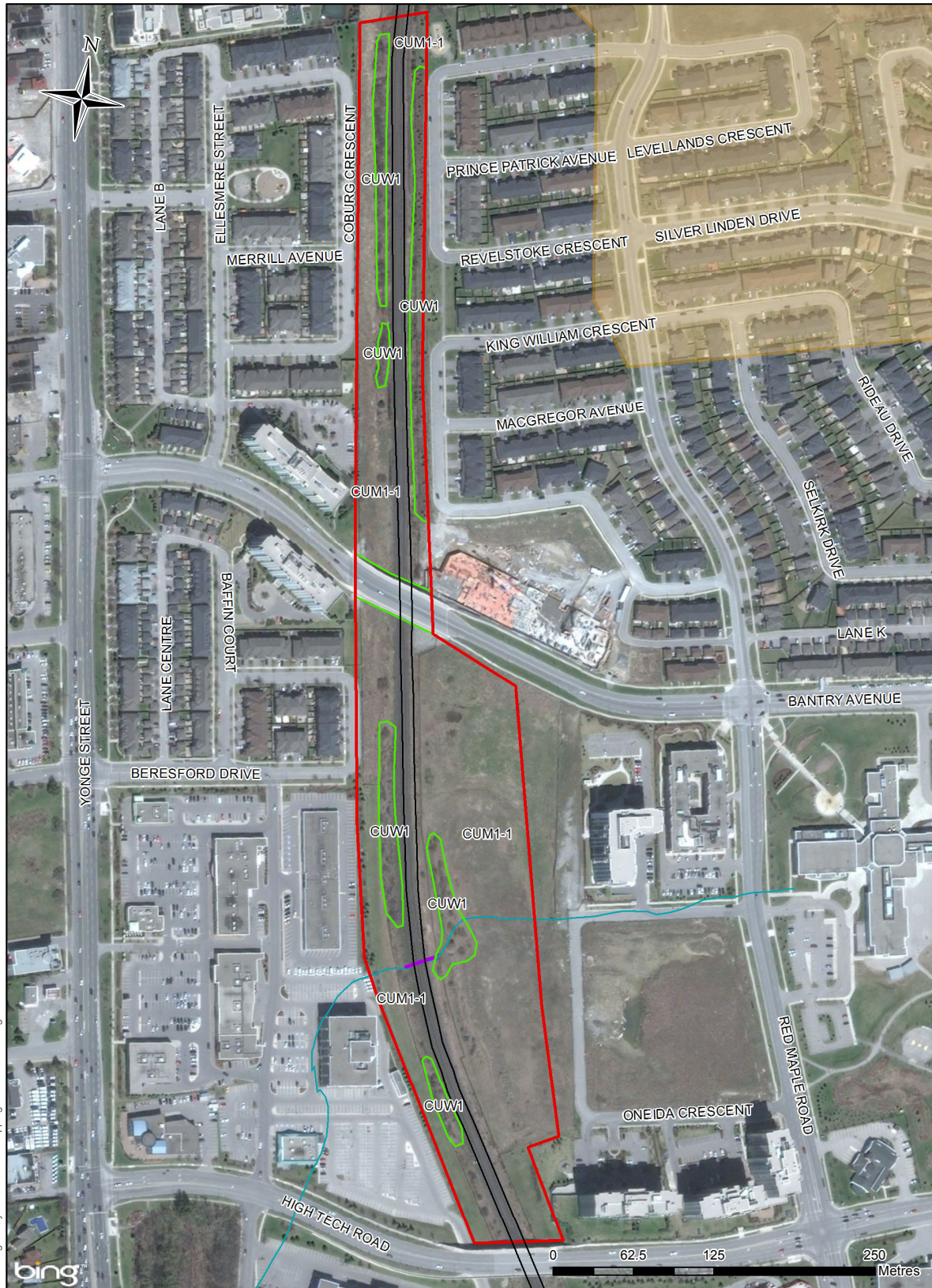
### 4.1 Natural Environment

A Natural Environment Memorandum was prepared by MMM Group as part of the EPR addendum process to update the natural environment existing conditions and potential impacts of the TSF. A copy of the Natural Environment Memorandum is included in **Appendix A**.

Site-specific field surveys were conducted in 2013, and a review of local, regional, and provincial (MNR Natural Heritage Information Centre database - NHIC), on-line data was undertaken. Updated information on Species at Risk (SAR) and designated natural areas in the vicinity of the Study Area was requested from the Aurora District Office of the Ministry of Natural Resources (now the Ministry of Natural Resources and Forestry) on May 16, 2013.

The study area for the natural environment analysis conducted for the Addendum is a 50 to 100 m wide corridor between High Tech Road and the northern extent of Coburg Crescent (**Figure 4-1**). An effort was made during the 2013 surveys to remain cognizant of uncommon or rare species and species of concern, noted in the 2008 Natural Environment Report prepared by MMM Group (formerly Ecoplans) for the 2009 EPR. Field observations were limited to vegetation discernible when viewed from the edge of the rail right-of-way. Incidental wildlife and wildlife signs seen during the vegetation surveys were noted.





M:\Ecology\_Group\Jobs\2013\277670\_000\_800\_091 - Yonge Hwy 7 Addendum\Mapping\MXD\2013\_05\Figure 1 - ELC Communities.mxd

**Legend**

- Study Area
- ELC Communities
- Floodline (Approximate Location)  
\* based on TRCA Flood Plain Mapping Program - 2010-06-28
- Rail Corridor
- Pomona Mills Creek (Underground Pipe)
- Culvert

**ELC Code**

- CUM1-1 Dry - Moist Old Field Meadow Type
- CUW1 Mineral Cultural Woodland Ecosite

Client: **TORONTO TRANSIT COMMISSION AND  
YORK REGION RAPID TRANSIT CORPORATION**

Title: **Yonge Subway Train Storage TPAP Addendum  
Natural Environment Features**

Prepared by: **MMM GROUP**

32.77670.000.800.091

Scale as Shown

Review: PM

Date: May 2013

© 2010 DigitalGlobe Image courtesy of USGS  
© 2013 Microsoft Corporation

**Figure: 4-1**

#### 4.1.1 Terrestrial Habitat

##### 4.1.1.1 Designated Natural Areas

According to the NHIC database, there are no Provincially Significant Wetlands, Areas of Natural and Scientific Interest, Ecologically Sensitive Areas or other designated natural areas within 1 km of the TSF. The Study Area does not fall within the regulated limits of TRCA's Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (TRCA 2010), or within the Greenlands System of York Region (York Region 2013).

##### 4.1.1.2 Vegetation Communities and Species

Vegetation surveys were carried out in the Study Area on May 21 and 22, 2013. The Study Area contains natural habitat within the rail corridor and outside of the rail corridor in the southeast quadrant (where there is open space). Elsewhere outside the rail corridor, private property, including warehouses and commercial properties have some manicured lawn with planted trees. Vegetation communities within the habitat include cultural woodland and cultural meadow. These communities are described below and shown in **Figure 4-1**.

###### CUW1: Mineral Cultural Woodland

This ecosite occurs as a narrow band along the east and west sides of the rail tracks and the dominant species vary. The westerly CUW unit contains a row of Black Walnut (*Juglans nigra*) that dominates the canopy, with occasional Green Ash (*Fraxinus pennsylvanica*) and Manitoba Maple (*Acer negundo*). A species of honeysuckle (*Lonicera sp.*) dominates the understory. The canopy of the easterly CUW unit, is dominated by a row of Black Locust (*Robinia pseudo-acacia*) and Siberian Elm (*Ulmus pumila*), and honeysuckle is dominant in the understory. North of Bantry Avenue, Green Ash is the dominant canopy species on both sides of the track, occurring with an understory of scattered Choke cherry (*Prunus virginiana var. virginiana*) and honeysuckle species on the east side, with abundant English Hawthorn (*Crataegus monogyna*), Buckthorn (*Rhamnus cathartica*) and Green Ash on the west side. Nearing the north end of the Study Area on the west side of the track, American Elm (*Ulmus americana*) becomes abundant in the canopy. The east side of this area contains about 15 Eastern Red Cedar (*Juniperus virginiana*) and one White Spruce (*Picea glauca*). The west side contains another Eastern Red Cedar. Ground flora species in this narrow community are the same as those occurring in the surrounding meadow (described below). There are also scattered Riverbank Grape (*Vitis riparia*), Garlic Mustard (*Alliaria petiolata*) and European Swallow-wort (*Cynanchum rossicum*) in this woodland.

###### CUM1-1: Dry-Moist Old Field Meadow

The cultural meadow is dominated by Reed Canary Grass (*Phalaris arundinacea*) and Kentucky Bluegrass (*Poa pratensis ssp. pratensis*). Canada Goldenrod (*Solidago canadensis*) is scattered through much of this area and in some parts forms large dense patches. Dense European Swallow-wort lines the

rail track north of Bantry Avenue but is not apparent along the track south of Bantry Avenue. Herbaceous species within this ecosite include Canada Thistle (*Cirsium arvense*), Common Milkweed (*Asclepias syriaca*), Tufted Vetch (*Vicia cracca*), Common Mullein (*Verbascum thapsus*), Common Teasel (*Dipsacus fullonum*), Queen Anne's Lace (*Daucus carota*), and Black Medic (*Medicago lupulina*). Trees and shrubs scattered through the cultural meadow in the open space area and the rail corridor right-of-way include Manitoba Maple, Eastern Cottonwood (*Populus deltoides ssp. deltoides*), Staghorn Sumac (*Rhus typhina*), Red-osier Dogwood (*Cornus sericea*), Russian Olive (*Elaeagnus angustifolia*) and species of hawthorn and honeysuckle. Small patches of cattail were observed in the railside ditches.

#### 4.1.1.3 Wildlife and Wildlife Habitat

European Starlings (*Sturnus vulgaris*), Rock Doves (*Columba livia*) and House Sparrows (*Passer domesticus*) were observed possibly nesting under the High Tech Road and Bantry Avenue bridges. Other birds observed and/or heard included Red-winged Blackbird (*Agelaius phoeniceus*), Mourning Dove (*Zenaidura macroura*), American Robin (*Turdus migratorius*), Common Grackle (*Quiscalus quiscula*), Baltimore Oriole (*Icterus galbula*); Mallard (*Anas platyrhynchos*), Northern Mockingbird (*Mimus polyglottos*) and Gray Catbird (*Dumetella carolinensis*). Two common butterfly species, one Spring Azure (*Celastrina lucia*) and one Cabbage White (*Pieris rapae*), were encountered in the cultural meadow. No mammal species were observed during the survey.

#### 4.1.2 Fish and Aquatic Habitat

Pomona Mills Creek crosses the Study Area from east to west before it flows outside of the rail right-of-way to the west and then south to join with the East Don River. The channel is piped through the Study Area. A surficial drainage feature appears to remain on site and may take some local surface runoff, which then flows through a culvert beneath the rail line. This feature does not appear to provide either direct or indirect fish habitat. The creek is designated as coldwater (Ecoplans 2009), but does not provide direct fish habitat. If the piped watercourse still provides coldwater inputs downstream, it may be identified as providing indirect fish habitat.

#### 4.1.3 Species at Risk

No TRCA species of concern were recorded within the Study Area (TRCA 2009). An NHIC search on May 1, 2013 revealed four provincial species records within about 1 km of the Study Area, including one Species at Risk (Redside Dace, Endangered, last observed May 23, 2000) and three provincially rare wildlife species including one salamander and two dragonflies. Two of the three, Jefferson X Blue-spotted Salamander (Jefferson genome dominates) (*Ambystoma hybrid pop.1*), last seen in 1978, and Painted Skimmer (*Libellula semifasciata*) are considered imperiled and the other, Green-striped Darner (*Aeshna verticalis*), is considered vulnerable. During the 2013 surveys, four species of significance were observed including Eastern Red Cedar (uncommon



in Greater Toronto Area and York Region); White Spruce and Gray Catbird (TRCA species of concern); and Northern Mockingbird (Bird Studies Canada species of conservation priority). The Northern Mockingbird is also regarded as provincially uncommon (NHIC 2013).

#### **4.1.4 Soil and Groundwater Conditions**

The following description refers to existing soil and groundwater conditions within the Study Area on the regional scale (i.e. in a broader context) as well as on the local scale (i.e. within the TSF vicinity) and draws on information outlined in the Groundwater Assessment Report provided in **Appendix F** and Contamination Overview Study provided in **Appendix D**.

##### **4.1.4.1 Topography**

The topography within the Study Area is flat to gently sloping. Based on the design drawing (see **Figure 3-5A-C**), the ground surface elevations along the YSE alignment from the Richmond Hill Centre Station (north of High Tech Road) to near Coburg Crescent increases from about 201 meters above sea level (masl) to about 209 masl. In the areas where High Tech Road and Bantry Avenue cross the subway extension line and the existing CN/GO rail tracks, the road embankment surface increases by about 8 m to 10 m to approximately 208 and 215 masl, respectively.

##### **4.1.4.2 Physiography**

According to Chapman and Putnam's "The Physiography of Southern Ontario, Third Edition" (1984), the Study Area is located within the physiographic region known as the Peel Plain. The Peel Plain is a level-to-undulating tract of clay soils and covers an area of 300 square miles across the central portions of the Regional municipalities of York, Peel, and Halton. The ground surface within the Peel Plain slopes toward Lake Ontario with elevations ranging between 152 to 213 metres above sea level. Deep valleys have been cut across this plain by several south flowing rivers and water streams. Much of the Peel Plain has been modified by a veneer of clay that occasionally, when deep enough, have been observed to be varved. The water supply within the plain is generally poor and the high degree of evaporation from the deforested clay surface limits the adequate recharge of groundwater (Chapman and Putnam 1984).

##### **4.1.4.3 Geology**

Preliminary geotechnical and groundwater assessments were undertaken as part of this Transit Project. The detailed reports are provided in **Appendices E** and **F** and existing conditions from these reports are summarized below. It should be noted that the local Study Area of the groundwater assessment included a 250 m buffer zone from the TSF footprint.

#### **4.1.4.3.1 Quaternary Geology**

According to the Ontario Geological Survey (OGS) mapping “The Surficial Geology of Southern Ontario” (OGS, 2003), glaciolacustrine deposits of silt and clay with minor sand content are predominant in the regional Study Area, with Halton Till exposed at the surface in the southern portion (see Figure 4 of **Appendix F**). Urban fill should be expected in the upper 1 m to 5 m below ground surface (mbgs), except for areas where extensive development has taken place (see **Appendix E**).

The glaciolacustrine deposits generally form a thin veneer over the underlying deposits, although they can be several meters thick. The youngest deposits present beneath the glaciolacustrine deposits and sometime exposed at the surface in the watershed of Don River is Halton Till. Halton Till was deposited in the area approximately 13,000 years ago. It is a sandy silt to clayey silt till interbedded with silt, clay, sand and gravel. The Halton Till is a 3 to 6 m thick aquitard unit (TRCA, 2009).

The Oak Ridges Moraine was deposited in the Don River watershed about 13,300 years ago. The Oak Ridges Moraine is a regionally extensive stratified sediment complex, which could be 150 m thick to the north. The Oak Ridges Moraine sediments are arranged from coarse to fine in a down flow direction and vertically up section. Rhythmically interbedded fine sands and silts are the predominant sediments, but coarse, diffusely-bedded sands and gravel may also be present locally. The Oak Ridges Moraine aquifer sits on the Newmarket Till and lower sediments. These deposits are generally encountered only in boreholes.

The Newmarket (Northern) Till is a dense over-consolidated aquitard unit, deposited in the area about 18,000-20,000 years ago. It is a dense silty sand diamicton (glacial till) and has been found beneath the Oak Ridges Moraine unit. It contains interbeds of sand and silt, boulder pavements, fractures and joints. Discontinuous sand beds may also be present in this unit (TRCA, 2009).

Three lower units were deposited during the Wisconsin glacial period in the Study Area. This includes the Thorncliffe Formation aquifer, Sunnybrook Drift aquitard and Scarborough Formation aquifer. The Thorncliffe Formation represents sand and silty sand of glaciofluvial origin deposited approximately 45,000 years ago. The Sunnybrook Drift unit was deposited about 45,000 years ago. It is interpreted to be a clast-poor mud (i.e. silt and clay), which is generally less than 10 to 20 m thick. The Scarborough Formation unit consists of organic-rich (peat) sands deposited over silts and clay, between 70,000 and 90,000 years ago.

#### **4.1.4.3.2 Bedrock Geology**

According to the Ontario Geological Survey “Bedrock Geology of Ontario” (OGS, 1991), the Study Area is mapped as grey to black shale interbedded with limestone and siltstone layers of the Georgian Bay Formation and limestone of the Simcoe Group.

The bedrock has deeply eroded forming valleys which were infilled with sediments. The best documented buried valley is the Laurentian Channel, which extends from Georgian Bay to Lake Ontario, to the west - southwest of the Study Area. It is buried by sediment up to 270 m thick (TRCA, 2009).

The bedrock is interpreted from well records (Table B-1 in Appendix B of **Appendix F**) to be at least 50 m deep in the Study Area.

#### 4.1.4.4 Hydrogeology

The Study Area does not rely on the groundwater supply and is municipally serviced with a lake based supply.

As described in the 2009 EPR, groundwater conditions are expected to vary along the YSE alignment. Based on preliminary geotechnical reports prepared by Golder (December 2013; January 2014 – copies provided in **Appendix E**), several water-bearing geological units are expected to be encountered within the Study Area, depending on the final construction depths. A description of these units is provided below.

The Study Area falls under the jurisdiction of the TRCA. According to “The Hydrogeology of Southern Ontario” (Singer et al, 2003), the overburden is an important source of water supply for areas within the TRCA’s jurisdiction. The aquifers potentially present within the Study Area include the Oak Ridges Moraine or equivalent aquifer, the Thorncliffe Formation and the Scarborough Formation aquifers. The most notable water-bearing units within the Study Area include the Oak Ridges Moraine aquifer and the Thorncliffe Formation aquifer.

Based on Golder’s report (December 2013 – copy provided in **Appendix E**), the Oak Ridges Moraine or equivalent aquifer is present at elevations ranging between approximately 192 and 202 masl in along the YSE alignment near Beresford Drive (borehole 126 A/B) and is present at elevations of 189 to 197 masl in to the south of High Tech Road east of Yonge Street (monitoring well 14). A deep groundwater unit containing silty sand to sandy silt appears to be present at elevations 181 masl and 179 masl in the central and southern portions of the Study Area, respectively (see Figure 3-1 of **Appendix F**).

Static groundwater levels were measured as part of the Contaminant Investigation (see **Section 4.1.7** and **Appendix D**). Measurements were taken at monitoring wells MW4 and MW5 located along the alignment north of Bantry Avenue (see Figure 2 of **Appendix D**). Those measurements indicate that shallow groundwater is present at depths of 7.6 to 8.3 mbgs.

A deep groundwater unit of silty sand to sandy silt equivalent to Thorncliffe Formation is present at least in the area of Beresford Drive at elevations ranging between below 173 and 181 masl. Additional geotechnical and/or hydrogeological investigations are required to delineate the extent of this aquifer in the Study Area. According to Singer et al (2003), well yields within the Thorncliffe Aquifer range from about 10.0 to 275.0 L/min, which indicates the presence of significant groundwater resources in this unit.

The Georgian Bay hydrogeologic unit is the main bedrock aquifer within the Study Area. This unit consists of shale interbedded with limestone and siltstone and is generally regarded as a poor source of groundwater due to relatively poor interconnections of pore space in shale (Singer et al, 2003).

#### **4.1.5 Drainage and Stormwater Management**

The Study Area is located within the Don River Watershed. The East Don River crosses Yonge Street approximately 1.5 km south of the Highway 407 interchange, with a tributary crossing directly through (underneath) the interchange.

Stormwater run-off within the Study Area is from both urban areas and natural areas in transition to urban land use. Stormwater is conveyed through storm sewers in the urban areas, and ditches in the natural areas. All stormwater is eventually discharged into surface water courses draining into the East Don River. On the regional scale, water from the Don River is eventually discharged into Lake Ontario.

#### **4.1.6 Air Quality**

An Air Quality Analysis Report was prepared as part of the original Transit Project Assessment for the proposed extension of the Yonge Subway. Existing ambient air quality conditions are documented in the 2009 EPR.

A Construction Air Quality Assessment was conducted by Novus Environmental Inc. in 2013 to assess the potential air quality impacts related to the proposed construction of the TSF. Findings from this report are discussed in **Section 5.1.6**. A copy of this report is included in **Appendix B**.

#### **4.1.7 Contaminated Properties**

MMM Group conducted a Contamination Overview Study in support of the EPR Addendum study in 2013. The Contaminant Overview Study focused on identifying and reviewing actual or potential contaminated areas and properties that could affect/be affected by the TSF, and identify appropriate future environmental work and mitigation measures. For the purposes of the Contaminant Overview Study, a 250 m buffer zone was added to either side of the train storage facility (herein referred to as the Study Area) to account for contamination migration from properties and areas surrounding the facility. A copy of this report is included in **Appendix D**.

An inspection of the Study Area was carried out on April 15, 2013. The purpose of the inspection was to document land uses and/or business operations which may represent a potential source of contamination within the Study Area.

The inspection completed for the Contamination Overview Study did not include any building inspections or comprehensive exterior inspections of any of the properties in the Study Area. Therefore, any interferences regarding the

presence or absence of site contamination is strictly based on visual observations made from the roadside.

The land use activities noted within the Study Area include:

- Retail Commercial (Shopping plazas, cafes, restaurants, etc.)
- Office Commercial (office buildings, financial institutions)
- Medical offices
- One theatre
- Two car dealerships
- One motorcycle dealership
- One centre for truck sales
- One gas station
- One dry cleaning facility
- Residential developments
- One CN/GO railway line
- One construction site
- Vacant/undeveloped land

### **Actual Sources of Contamination**

Based on the information collected through the Contamination Overview Study, no areas of actual site contamination are within the Study Area. However, Areas of Potential Environmental Concern (APECs) were noted.

### **Potential Sources of Contamination**

Potential soil and groundwater contamination may exist within the Study Area as a result of current and historical commercial/industrial land uses. Due to the typical activities and operations associated with the land uses there is potential that some or any of their products and wastes may have been released into the environment, impacting the soil and groundwater. Potential sources of contamination are described below.

### **Fuel Storage Tanks**

Automotive centres, maintenance facilities and gas stations may operate pump islands (underground storage tanks for storing fuel), small storage areas, and service areas for changing engine oil. Gasoline and diesel fuel are transferred from bulk container trucks to large underground storage tanks. Spills at transfer areas and pumps, along with overfilling of and leakage from the underground storage tanks, are potential sources of site contamination.

## **Manufacturing Facilities, Registered Waste Generators and Polychlorinated Biphenyl Storage Sites**

A wide range of chemicals are used at facilities that manufacture and distribute parts/products for industrial and commercial use. These chemical products may include acids and bases, dyes and pigments, polymers, plastics, surfactants, solvents, soaps, and waxes. These manufacturing processes are highly variable, depending on the product being produced. There are however, certain types of process components that are frequently encountered in these facilities, including bulk storage for gaseous, liquid and solid materials, blending and packaging equipment, storage areas for drums, Polychlorinated Biphenyl storage areas, waste piles and disposal pits.

## **Existing Railway Lines and Rail Yard**

Several factors associated with railways including brake dust, cargo spills, oils and lubricants, and diesel fuels can cause potential environmental concern. Soil contamination may exist within the land on or adjacent to railway tracks as railways are often developed on poor quality fill and ballast material in addition to railway ties being impregnated with creosote compounds.

## **Vehicular Traffic and Road Debris**

The cumulative effects of many years of heavy road traffic within the Study Area may have resulted in soil contamination. This contamination, typically resulting from vehicle exhaust (e.g., lead and other metals), general wear and tear (e.g., heavy metals, oils and lubricants), and winter road maintenance activities (e.g., de-icing salt) is probably most prevalent on the road shoulders and roadside drainage ditches in areas of high traffic volume.

A high volume of traffic was observed during the site inspection along Yonge Street, High Tech Road, and Bantry Road. There is the potential for residual salt impacts, metals and Petroleum Hydrocarbons to be present in the shallow soil and groundwater resulting from winter road salting operations along the right-of-way, vehicular exhausts, transportation accidents and spills.

## **Contaminant Mobility**

Contaminants on or in the soils may move within and beyond the Study Area through a number of different routes. The soils themselves retain contaminants through adsorption. The movement of contaminants from soil occurs through evaporation and dust generation, intake into plants through their roots, and by flushing or dissolution by water seeping into the soil. Water transport of chemicals will usually result in contamination of surface water bodies through surface water drainage, and by way of groundwater aquifers.

In general, contaminant mobility will be greatest when:

- Overburden deposits consist of sand and gravel, or other permeable deposits;
- Fractured bedrock is located at or near the surface, or is overlain by a thin layer of permeable deposits;
- Distance to surface water courses is less than 50 m;
- Water table is less than 5 mbgs;
- Preferential flow pathways (e.g., trenches, tree roots, ditches) exist in the soils above the water table.

The surficial geology within the Study Area is composed of soils with variable permeability. Deposits of silt and clay of glaciolacustrine origin and sandy silt to clayey silt till deposits are present within the upper portion of the Study Area. Other deeper deposits may include fine sand and silts (Oak Ridges Moraine), dense silty sand till (Newmarket Till), sand and silty sand (Thornccliffe Formation), and at greater depth, silt and clay of the Sunnybrook Drift Formation and silt and clay of the Scarborough Formation.

Heterogeneities exist in the various overburden units that will inhibit or allow the lateral and vertical movement of contaminants adding to the potential complexity of contaminant movement.

Deposits of clay and sand and till deposits present within the upper portion of Study Area will inhibit the movement of contamination within the overburden. Therefore, contamination mobility within the Study Area is expected to be low.

As discussed in **Section 4.1.4**, the Georgian Bay formation is a poor source of groundwater. The water well information presented in the Ecolog ERIS report confirms that the bedrock within the Study Area is fairly deep, on the order of 50 mbgs. Therefore, it can be concluded that contamination is unlikely to reach the bedrock that the contamination transport will be limited in the bedrock.

### **Contaminant Investigation**

Subsequent to the Contamination Overview Study a Contaminant Investigation was completed. The Contaminant Investigation focused on a Study Area along the proposed alignment is an area within a 250 m radius of the proposed northern portion of the TSF, located approximately 0.2 m south of Bantry Avenue extending northerly alongside Coburg Crescent.

The purpose of the Contaminant Investigation was to assess soil and groundwater quality within the upper 10 m of the Study Area and to provide recommendations for additional contaminant investigations. A copy of the Contaminant Investigation Report is provided in **Appendix D**.

Investigations were not completed south of Bantry Avenue due to difficulties in locating a storm sewer. Future assessment related to this area is discussed in **Section 5.1.7**.

Soil samples collected within five boreholes (BH4, MW4, BH5, MW5 and BH6 – see Figure 2 of **Appendix D**) were tested for Total Organic Vapours. Groundwater samples collected from two monitoring wells (MW4 and MW5 – see Figure 2 of **Appendix D**) were analyzed for concentrations of metals/ inorganic parameters, Petroleum Hydrocarbons and Volatile Organic Compounds.

Generic site condition standards established by the MOE (now MOECC) in the document titled “Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act” (MOE, April 2011) (the “Standards”) were used to assess soil and groundwater quality in the Study Area. Those Standards are often referred to by the associated Tables within the Standards document. The Study Area is not a sensitive site as defined in O. Reg. 153/04 and is municipally serviced. Therefore, Table 3 Standards established for non-potable groundwater conditions for industrial/commercial/community land uses with fine-textured soil were considered to be applicable for the Study Area. For comparison purposes, results were also compared to Table 1 Standards, since soils that meet Table 1 Standards have no off-site disposal/re-use restrictions.

All samples taken met the Table 3 Standards; however, some samples did not meet the Table 1 Standards:

- The soil sample at MW4 showed concentration of Petroleum Hydrocarbon F4 of 180 µg/g exceeding the Table 1 Standard of 120 µg/g but below the Table 3 Standard of 6,600 µg/g
- The groundwater samples showed:
  - Concentrations of molybdenum of 150 and 27 µg/L in MW4 and MW5 exceeded the Table 1 Standard of 23 µg/L but were below the Table 3 Standard of 9,200 µg/L
  - Concentration of uranium of 58 µg/L in MW4 exceeded the Table 1 Standard of 8.9 µg/L but was below the Table 3 Standard of 420 µg/L
  - Concentration of vanadium of 5.2 µg/L in MW5 was above the Table 1 Standard of 3.9 µg/L but was below Table 3 Standard of 250 µg/L

It is believed that elevated concentrations of molybdenum, uranium and vanadium in shallow groundwater may be naturally occurring.

## 4.2 Socio-Economic Environment

### 4.2.1 Noise and Vibration

The TSF will extend approximately 20 m underground, just to the west of the existing CN / GO Richmond Hill rail line. Noise sensitive receptors are present within the study area, including residential properties on Cobourg Crescent, Merrill Avenue, Bantry Avenue and west of the CN / GO Richmond Hill rail line. Novus Environmental Inc. (Novus) was retained by MMM Group to assess the



potential for noise and vibration impacts from construction and operation of the TSF. Findings from this report are discussed in **Sections 5.2.2**. A copy of this report is included in **Appendix C**.

#### **4.2.2 Land Use**

Current surrounding land use within the Study Area is predominantly residential and commercial. Low-density with occasional high-density residential land use is present primarily in the central and northern portions of the Study Area, to the north of Beresford Drive and Bantry Road. Commercial land use is present as businesses in the southwestern portion and along the western boundary of the Study Area. Medical offices can be found in the southeastern portion of the Study Area. Office buildings are present in the southwestern portion of the Study Area.

Several land use planning studies along the Corridor are currently underway or will commence upon completion of this study. The Richmond Hill Official Plan (2010) was adopted by the Council of the Town of Richmond Hill on July 12, 2010. The Plan was endorsed, as modified, by York Region on May 19, 2011. The Official Plan has been partially approved by orders from the Ontario Municipal Board, which brings specific policies of the new Official Plan into effect, save and except those policies which have been deferred and which remain under town-wide, site or area-specific appeal (Town of Richmond Hill, 2014).

The Richmond Hill Regional Centre Design and Land Use Study (2010) was undertaken for the Town of Richmond Hill by Urban Strategies Inc., iTrans and Morrison Hershfield. The purpose of the study was to provide background information for the Official Plan, to guide future development in the Richmond Hill Regional Centre area as an inter-modal transit hub and Urban Growth Centre (Town of Richmond Hill, 2014).

### **4.3 Cultural Environment**

#### **4.3.1 Built Heritage and Cultural Heritage Landscapes**

A cultural heritage resource survey of built heritage resources and cultural heritage landscapes older than 40 years of age was undertaken along Yonge Street within the study corridor for the 2009 EPR. An updated Cultural Heritage Assessment Memo was prepared by Unterman McPhail Associates to support of the EPR Addendum to address areas within Study Area not previously assessed. A copy of that Memo can be found in **Appendix H**. No cultural heritage resources, including provincially or federally designated properties, will be impacted by the proposed works.

#### **4.3.2 Archaeological Resources**

Stage 1-2 Archaeological Assessment Reports were prepared by Archaeological Services Inc. for the 2009 EPR. It was ultimately found that with the exception of the East Don River crossing, no additional archaeological assessment was required and the Ministry of Culture (now the Ministry of Tourism, Culture and Sport) concurred with the findings of the reports.

A subsequent Stage 1-2 Archaeological Assessment was carried out in 2012 by New Directions Archaeology, in support of the EPR Addendum to address areas within Study Area not previously assessed. A copy of that report can be found in **Appendix G**. The majority of the study corridor lies within the existing right-of-way and is generally disturbed due to roadway construction and surrounding residential and commercial land uses and utilities.

A search of the Ministry of Tourism, Culture and Sport's archaeological site registry database identified seven registered archaeological sites within one kilometre of the Study Area. Due to the high number of sites in close proximity to the Study Area, topography suitable for habitation, and historic transportation routes, the potential for finding archaeologically significant materials is high. During field investigations the Study Area was visually determined to be disturbed by roadway, parking lot, building, and railroad track construction and subsequent berming and was therefore not subject to test pit survey. No cultural material was recovered during the assessment. As a result, the Stage 1-2 Archaeological Assessment Report (**Appendix G**) recommended that no further archaeological assessment is required. Should the boundaries of the Study Area change to include lands outside the current plan, further Stage 2 archaeological assessment is recommended.

#### **4.4 Transportation Network**

This section summarizes aspects of the existing transportation environment in which the Transit Project is proposed to take place.

##### **4.4.1 Transit Network**

In the vicinity of the Study Area, there are both local and regional transit operating on surface routes and commuter rail (see **Figure 4-2**). Presently YRT operates 9 regular bus services within the Study Area. In addition there are 3 Viva Bus Rapid Transit routes operating out of the Richmond Hill Centre Terminal. Existing service levels are described in the original EPR and are assumed to be similar. No Brampton Transit or Toronto Transit Commission (TTC) routes operate within the Study Area.

The key operations in the vicinity of the Study Area include:

##### **VIVA & YRT**

- Viva Blue (Yonge North & South)
- Viva Purple (Hwy 7 West & East)
- Viva Pink (Yonge North & South, turning onto Hwy 7 and continuing East)
- Route 16 (16th Avenue West & East)
- Route 85 & 85C (16th Avenue West & East)
- Route 86 (Red Maple Road North & South)

- Route 1 (High Tech Road East & West)
- Route 99 (Yonge North & South)
- Route 83 (Garden Avenue East & West)
- Route 87 (Garden Avenue East & West)
- Route 91B (Hwy 7 East & West)
- Route 91 & 91A (Bayview Avenue North & South)

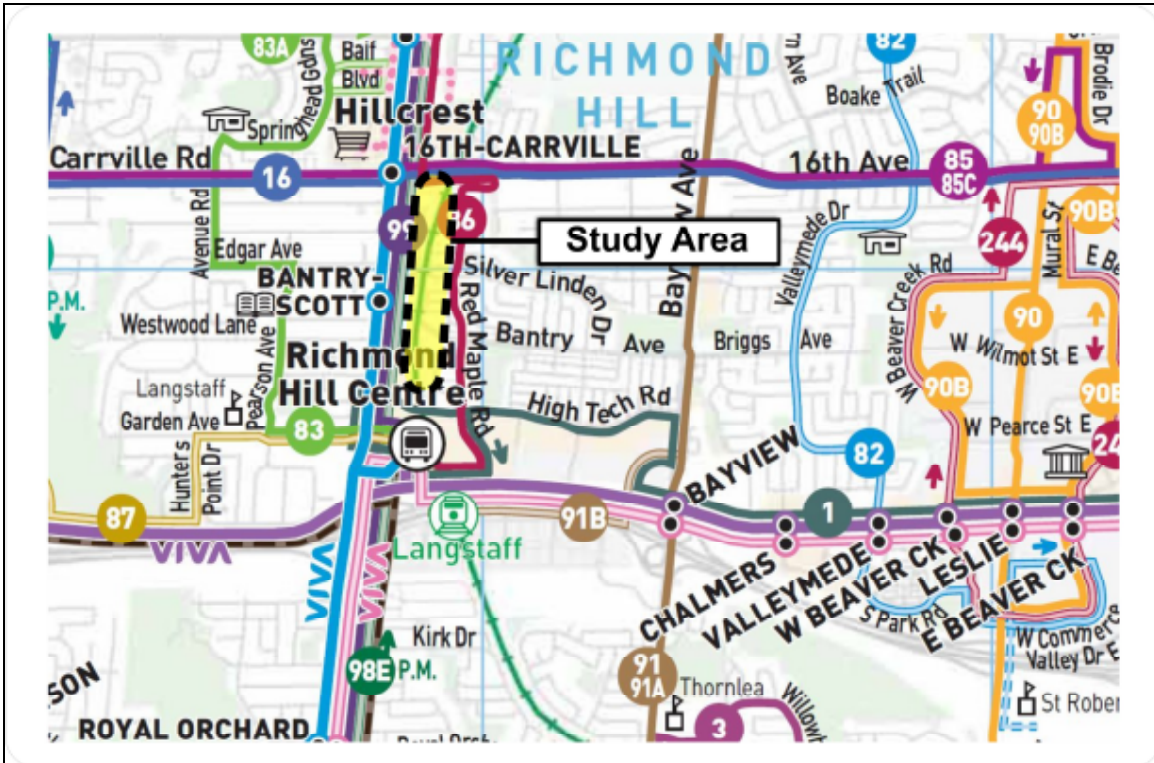


Figure 4-2: Local Transit Network<sup>2</sup>

### Commuter Rail<sup>3</sup>

Presently GO Transit operates commuter peak-only commuter rail service on the Richmond Hill Line (CN Bala Subdivision) between Union Station and Richmond Hill GO Station as described below and shown in **Figure 4-3**:

- Richmond Hill Rail Line – stops at Richmond Hill Centre Terminal. There are 5 southbound trains during the AM Peak and 6 northbound during the PM Peak.
- GO Bus<sup>4</sup>

<sup>2</sup> From YRT/viva - [http://www.yrt.ca/en/schedulesmaps/resources/YRT-ShelterMap\\_Dec2013\\_web.pdf](http://www.yrt.ca/en/schedulesmaps/resources/YRT-ShelterMap_Dec2013_web.pdf)

<sup>3</sup> From GO Transit - <http://www.gotransit.com/timetables/en/schedules/maps.aspx#>

<sup>4</sup> From GO Transit - <http://www.gotransit.com/timetables/en/schedules/maps.aspx#>



**Figure 4-3: Regional Transit Network**

Bus Routes provide service to Richmond Hill Centre Terminal (via Yonge Street) during off-peak hours (when trains are not in service) at 60 minute headways and 30 minute headways closer to the AM and PM peak start times (Bus route #61). The following express GO bus services operated along Highway 407, also stop at Richmond Hill Centre:

- #51 Pickering – York University
- #52 Oshawa – York University
- #54 Markham - York University

#### Pedestrian and Cycling Network

The Study Area is mainly residential and commercial with sidewalks on one or both sides of the street for pedestrian use. There is a multi-use trail that connects Duncan Road to Red Maple Road along the river just east of the Study Area.

The following is a description of sidewalk locations for key streets in the vicinity of the Study Area:

- Bantry Avenue; sidewalks on both the north and south sides throughout the Study Area;
- Coburg Crescent; sidewalk on the west side of the road only through the north-south segment of the roadway;
- Beresford Drive; sidewalk on the west side of the road only through the north-south segment of the roadway; and
- 16th Avenue; sidewalk on both the north and south sides through the Study Area;

The following is a list of designated cycling routes in the vicinity of the Study Area (see **Figure 4-4**):

- High Tech Road Signed Route (Runs from Yonge Street to Bayview Avenue);
- Bantry Avenue Signed Route (Runs between Yonge Street and Bayview Avenue and beyond);
- Red Maple Road Signed Route (Runs from 16th Avenue to Highway 7);
- Silver Linden Drive Signed Route (Runs from Red maple Road to High Tech Road);
- Elm Avenue Signed Route (Runs from 16th Avenue to Springbrook Drive);
- Springbrook Drive Signed Route (Runs from Elm Avenue to Bayview Avenue and beyond); and,
- Fern Avenue Signed route (Runs from Springbrook Drive to 16th Avenue and beyond).



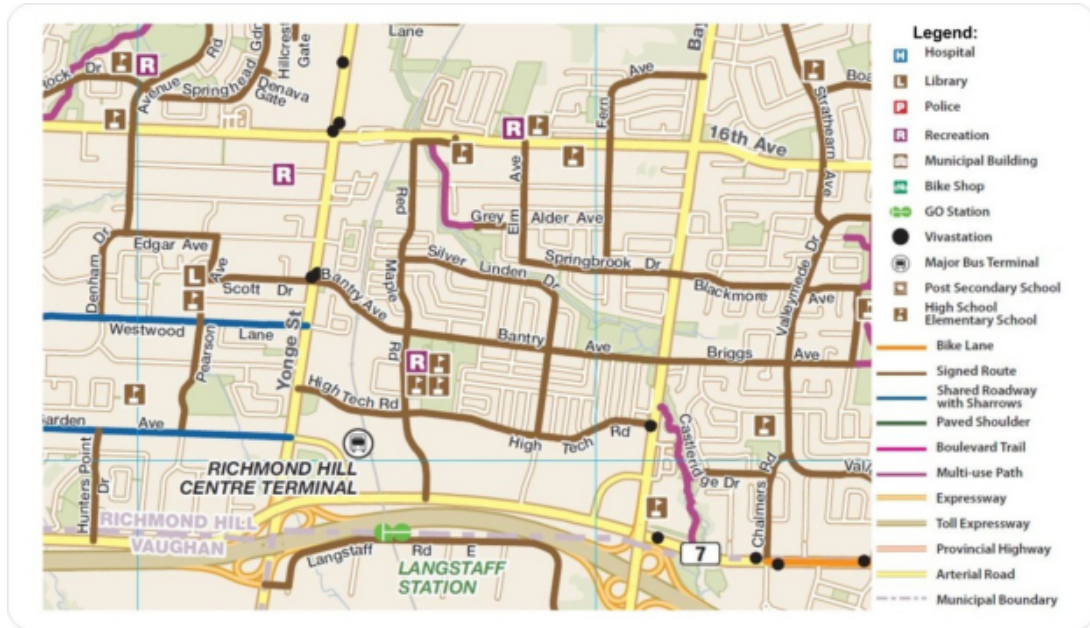


Figure 4-4: Cycling Routes within Study Area<sup>5</sup>

#### 4.4.2 Existing Roadway Network

The road network in the vicinity of the Study Area has not notably changed since the 2009 EPR for the YSE.

As described in the 2009 EPR, Yonge Street operates as a six lane facility from the 407 to High Tech Road where it narrows to four basic lanes. The other arterial roadways are Highway 7 which operates six basic lanes and 16th Avenue which operates 4 basic lanes. York Region’s VivaNext project will begin construction in 2014, and will result in the implementation of two additional dedicated bus lanes on Yonge Street from approximately Garden Avenue northerly, resulting in a 6-lane cross-section.

Bantry Avenue and High Tech Road are collector roadways operating in the east-west direction that cross over the railway corridor. Bantry Avenue operates 2 basic lanes with 2 cycling lanes over the railway corridor and expands to 4 basic lanes with 2 cycling lanes as it approaches Yonge Street. High Tech Road operates with 4 basic lanes. Red Maple Road is the only notable north-south collector roadway which operates with 4 basic lanes.

Minor residential roadways in close proximity to the proposed works include Coburg Crescent, Ellesmere Street, Merrill Avenue, Beresford Drive and Baffin Court. These roadways are generally two-lane cross-sections with at least one sidewalk.

<sup>5</sup> From 2013-2014 York Region Bike Map - [http://www.york.ca/wps/wcm/connect/yorkpublic/695f3394-71af-4f81-9ff8-01659b6fa9eb/York\\_Bike\\_Map\\_MS.pdf?MOD=AJPERES](http://www.york.ca/wps/wcm/connect/yorkpublic/695f3394-71af-4f81-9ff8-01659b6fa9eb/York_Bike_Map_MS.pdf?MOD=AJPERES)

## 4.5 Utilities

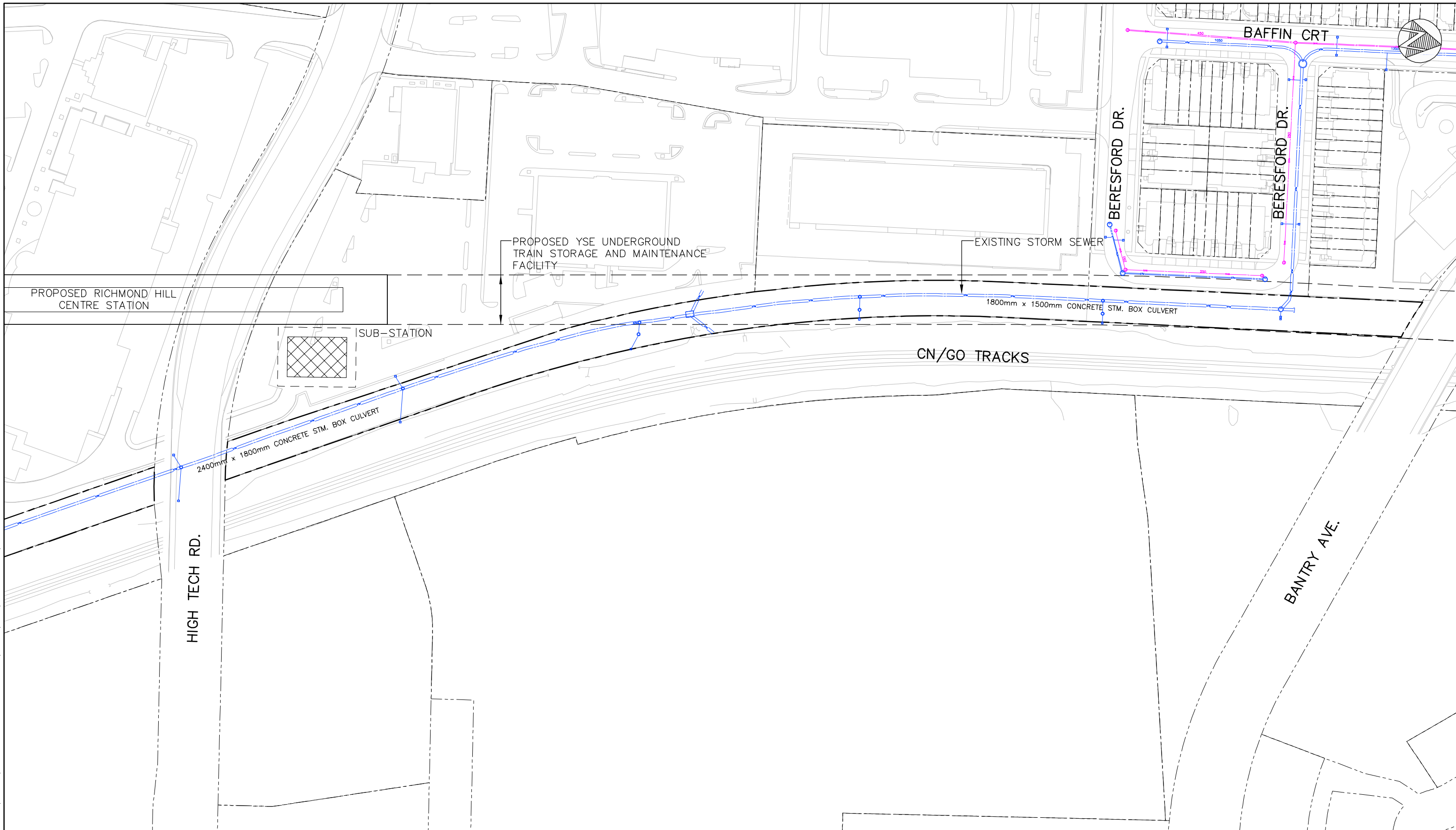
There is an existing, large, trunk storm sewer system that runs within the proposed YSE corridor approximately 8m below existing grade (**see Figure 4-5**). A 975mm diameter concrete pipe runs along the north portion of Beresford Drive and connects to a 1.8m x 1.5m concrete box trunk sewer within the Town of Richmond Hill right-of-way that drains southerly. North of Richmond Hill Centre Station, the trunk sewer converges with a 3.0m x 2.1m concrete box culvert storm sewer from Red Maple Road that crosses under the CN railway corridor. The twin sewer system then outlets under Richmond Hill Centre Station in twin 3.0m x 2.4m concrete box culverts into a stormwater detention pond located in the north east quadrant of Yonge Street and Highway 7.

A watermain running along Coburg Crescent crosses easterly through the Study Area, under the railway corridor and continues along King William Crescent.

Residential services (hydro, gas, watermain, sewers, etc.) exist throughout the local road network. A thorough review of existing and proposed future utilities plans, as well as all necessary relocations or modifications will be undertaken during detailed design of this Transit Project.

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LEGEND:

- EXISTING SANITARY SEWER
- EXISTING STORM SEWER

DATE:

JANUARY 2014

SCALE:

1:1500

**YONGE SUBWAY EXTENSION  
ENVIRONMENTAL PROJECT REPORT ADDENDUM**

EXISTING UTILITIES

FIGURE

**4-5**



## 5. DETAILED ASSESSMENT OF THE IMPACTS, PROPOSED MITIGATION, AND MONITORING OF THE TRANSIT PROJECT

Section 15(1) of the Transit Projects Regulation (Ontario Regulation 231/08) requires the proponent to prepare an EPR Addendum for a change to the transit project that is inconsistent with the approved EPR. The EPR Addendum is to contain the following information, among other requirements:

- The proponent's assessment and evaluation of the impacts that the change might have on the environment; and
- A description of any measure proposed by the proponent for mitigating any negative impacts that the change might have on the environment.

The purpose of this chapter is to review the anticipated impacts, proposed mitigation measures, and recommended monitoring activities as presented in the 2009 EPR, identify changes to the potential impacts, mitigation, and monitoring that result from the addition of the TSF, and then present that information for public review and comment. Similar to **Chapter 4**, the information presented herein contains a summary of the impact assessment, mitigation and monitoring that appeared in the 2009 EPR, along with specific changes that are attributable to the changes described in **Chapter 3**.

The environmental effects of the undertaking can be classified under three categories:

- Displacement of Existing Features – These include existing features within the Study Area which will be directly affected by the TSF;
- Construction Impacts – These are short-term potential impacts resulting from construction activities; and
- Operation and Maintenance Impacts – These are ongoing, long-term effects arising from the operation and maintenance of the Transit Project.

For each of the factor areas presented in this section, potential impacts, mitigation measures, monitoring, and any contingency measures are included where applicable / required. The preliminary monitoring and contingency plans for the Transit Project are considered preliminary, dynamic and subject to refinements during design in consultation with regulatory agencies and the public. The specific monitoring requirements of any environmental permits/approvals/exemptions secured during design will be incorporated into the monitoring and contingency plan at that time. The details of the monitoring and contingency plan will be incorporated into provisions included in the construction contracts package.

## **5.1 Natural Environment**

Impacts from the TSF are similar to those described in the Natural Environment Report prepared for the 2009 EPR and many of the general mitigation measures outlined in that report are reflected in the EPR Addendum, as outlined in the following sections.

### **5.1.1 Terrestrial Habitat**

#### **5.1.1.1 Displacement of Existing Features**

The TSF consists of underground structures and railway infrastructure, as well as services to support the utility building and staff parking lot. Two EEBs are proposed. One is located in the TSF parking lot and the other is beyond the TSF in a manicured area beyond the rail right-of-way just south of Coburg Crescent. The surface portions of the proposed underground structures are not anticipated to impact natural vegetation communities.

The utility building and staff parking lot will require the removal of approximately 20 x 100 m (2,000 m<sup>2</sup>) of cultural meadow in the northwest corner of the Study Area. Vegetation to be removed includes common species, many of which are invasive. None of the plants within the vegetation clearing zone are considered uncommon, rare, or species of concern in Ontario.

Existing wildlife within the Study Area are accustomed to dense urban conditions with high levels of noise and light, and impacts to these species are expected to be minimal. If construction occurs during the bird breeding season, it may interrupt or curtail the nesting efforts of bird species.

#### **Mitigation Measures**

Zones to be cleared of vegetation will be clearly delineated to minimize vegetation impacts.

No permit for tree removal will be required under the Town of Richmond Hill's tree preservation by-law (By-law No. 41-07, Article 3.8).

No additional specific measures have been proposed to mitigate impacts to wildlife and wildlife habitat resulting from the TSF.

#### **5.1.1.2 Construction Impacts**

Impacts to terrestrial habitat from construction of the TSF are expected to cause temporary disturbance that can be managed using best practice mitigation and restoration measures to be refined based on the final design details.

Underground portions of the YSE will be constructed using tunnelling with the tunnel ingress point located at Richmond Hill Centre in the middle of a parking lot. The TSF, however, will be constructed using cut-and-cover construction.

If construction occurs during the bird breeding season, it may interrupt or curtail nesting efforts.

## Mitigation Measures

The mitigation measures proposed in the 2009 EPR to address the construction impacts associated with terrestrial habitat remain valid and apply to the works proposed in the EPR Addendum. The key relevant measures are:

- Zones to be cleared of vegetation will be clearly delineated to minimize vegetation impacts and avoid incidental impacts from temporary stockpiling, debris disposal and site access.
- Vegetation clearing will be conducted outside the breeding bird season (May 1 to July 31) to avoid removal or destruction of active bird nests and remain consistent with the Migratory Birds Convention Act. An avian biologist will conduct a nest survey if vegetation removal is proposed during this period. Wildlife of any species incidentally encountered during construction will not be knowingly harmed.
- Where there is provincial or federal interest, all works will be completed in accordance with applicable legislation including, but not necessarily limited to, the *Migratory Birds Convention Act*, the *Endangered Species Act* and the *Species at Risk Act*.

## Monitoring

It is possible that additional mitigation measures, monitoring, and commitments may be identified in consultation with relevant provincial and federal agencies during the design/construction phase of the project. Any additional mitigation measures, monitoring, and commitments agreed to will be complied with.

### 5.1.1.3 Operations and Maintenance Impacts

No permanent impacts are anticipated to result from the operation and maintenance associated with the TSF. Therefore, potential impacts should be limited to temporary disturbance-related impacts that can be addressed using standard mitigation measures.

### 5.1.2 Fish and Aquatic Habitat

#### 5.1.2.1 Displacement of Existing Features

Permanent impacts to fish and aquatic habitat within the Study Area for the TSF are not anticipated. The local surficial drainage feature does not appear to provide either direct or indirect fish habitat as it likely contains negligible amounts of water.

Although the Pomona Mills Creek travels through the Study Area, it is contained within a pipe. Therefore it is expected that there will be no interaction between the piped watercourse and the below ground tunneling for the TSF.

## **Mitigation Measures**

No specific mitigation measures for fish and aquatic habitat are required as a result of the TSF. To mitigate potential impacts to fish and aquatic habitat, erosion and sediment impacts from the TSF will be addressed as part of a comprehensive strategy for the entire YSE project developed during detailed design to meet the requirements, guidelines and design standards provided in TRCA's 2006 Erosion and Sediment Control Guidelines for Urban Construction.

### **5.1.2.2 Construction Impacts**

Impacts to fish and aquatic habitat from construction of the TSF are expected to cause temporary disturbances that can be managed using best practice mitigation and restoration measures to be refined based on the final design details.

#### **Mitigation Measures**

Where there is provincial or federal interest, all works will be completed in accordance with applicable legislation including, but not necessarily limited to, the Fisheries Act, the *Endangered Species Act* and the *Species at Risk Act*.

#### **Monitoring**

It is possible that additional mitigation measures, monitoring, and commitments may be identified in consultation with relevant provincial and federal agencies during the design/construction phase of the project. Any additional mitigation measures, monitoring, and commitments agreed to will be complied with.

### **5.1.2.3 Operations and Maintenance Impacts**

No permanent impacts are anticipated to result from the operation and maintenance associated with the TSF. Future maintenance activities would not be expected to involve any in-water works or any new permanent footprint impacts. Therefore, potential impacts should be limited to temporary disturbance-related impacts that can be addressed using standard mitigation measures.

### **5.1.3 Species at Risk**

#### **5.1.3.1 Displacement of Existing Features**

There are no designated natural areas within 1km of the TSF. No additional impacts to designated natural areas beyond those outlined in the 2009 EPR are anticipated.

NHIC records of four provincially significant species in the Study Area (Redside Dace, Jefferson X Blue-spotted Salamander (Jefferson genome dominates), Painted Skimmer and Green-striped Darner) were likely derived from the vicinity of German Mills Creek owing to the aquatic habitat requirements of these species. The likelihood of encountering them in the Study Area is minimal.

### **Mitigation Measures**

Vegetation clearing will be conducted outside the breeding bird season (May 1st to July 31st) to avoid removal or destruction of active bird nests and remain consistent with the *Migratory Birds Convention Act*. An avian biologist will conduct a nest survey if vegetation removal is proposed during this period. Wildlife of any species incidentally encountered during construction will not be knowingly harmed.

Given that there are no designated natural areas within 1km of the proposed TSF. No additional mitigation measures for designated natural areas beyond those outlined in the 2009 EPR are required for the TSF.

Since Species at Risk and locally or regionally rare species are not expected to be present within the Study Area, no species-specific mitigation measures for Species at Risk are proposed.

#### **5.1.3.2 Construction Impacts**

Locally or regionally rare species and Species at Risk are not expected in the Study Area, therefore no there are no anticipated construction impacts to Species at Risk associated with the TSF.

### **Mitigation Measures**

Locally or regionally rare species and Species at Risk are not expected in the Study Area, therefore, no Species at Risk species-specific mitigation measures are proposed.

### **Monitoring**

It is possible that additional mitigation measures, monitoring, and commitments may be identified in consultation with relevant provincial and federal agencies during the design/construction phase of the project. Any additional mitigation measures, monitoring, and commitments agreed to will be complied with.

#### **5.1.3.3 Operations and Maintenance Impacts**

No permanent impacts are anticipated to result from the operation and maintenance associated with the TSF. Therefore, potential impacts should be limited to temporary disturbance-related impacts that can be addressed using standard mitigation measures.

#### **5.1.4 Soil and Groundwater**

##### **5.1.4.1 Displacement of Existing Features**

Existing soil and groundwater conditions for the proposed TSF have been investigated and are summarized **Section 4.1.4**. Recommendations have also been provided as a basis for the conceptual design and may be utilized for future planning and design purposes. The Geotechnical Report for Conceptual Design (copy provided in **Appendix E**) provides an interpretation of the geotechnical

data for the design of the TSF. Additional subsurface information will be required during subsequent stages of design and construction.

There are no permanent displacement impacts to soils associated with the TSF. All soil impacts are transient and relate to the construction of the TSF.

Based on currently available information, groundwater impacts are anticipated to be transient and relate to dewatering required for construction of the TSF.

### **Mitigation Measures**

Groundwater flow to nearby watercourses (East Don River and Pomona Creek) is expected to be maintained at environmentally acceptable levels by dewatering and groundwater inflow measures and contingency plans developed through additional investigations, during detailed design and continued consultation with the TRCA and MOECC regulatory agencies. It is anticipated that these measures will adequately mitigate groundwater impacts from the TSF construction.

Please refer to **Section 5.1.7.1** for mitigation measures related to contaminated property.

#### **5.1.4.2 Construction Impacts**

The Geotechnical Report highlights several geotechnical requirements to be considered for the TSF construction, which may include temporary ground support systems, design of dewatering systems and backfilling specifications. The Report also provides insight into the potential for ground movement and monitoring program to be completed during excavation activities, which are anticipated to go the depth of up to 31 mbgs.

In addition, recommendations related to the management and disposal of excess soils is also included in the Geotechnical Report. An environmental intrusive investigation is currently being completed by MMM Group for evaluation of soil quality in the local Study Area, which will provide recommendations for management of excess soils to be generated during the construction stage of the project.

Based on currently available geotechnical and groundwater information, it is anticipated that dewatering will likely be required to temporarily reduce the groundwater levels and pressure in the upper and lower aquifers for construction of the TSF structure. Detailed geotechnical and groundwater investigations will be completed to fully delineate the impacts of the construction to the groundwater resources in the Study Area, once design details are available.

### **Mitigation Measures**

A Permit to Take Water (PTTW) will be obtained from the MOECC for dewatering purposes and groundwater control, prior to the TSF construction. The PTTW will specify the rates and duration of the dewatering program, a monitoring program, and mitigation and contingency measures to be used during dewatering.



As outlined in the 2009 EPR, a Soil Management Strategy Plan will be developed for re-use or disposal of excavated soils (i.e. excess soils), consistent with past TTC practice. This plan will be part of the Excess Materials Management Plan and require that management of excess soils is conducted in accordance with the applicable MOE (now MOECC) recommendations outlined in the documents titled "*Protocol for Analytical Methods Used in the Assessment of Properties*" (MOE, March 2004, amended in July 2011) and "*Management of Excess Soils – A Guide for Best Management Practices*" (MOE, January 2014).

The dewatering program is likely required to be completed for the groundwater control during the TSF construction. This may include using multi-stage eductors, localized vacuum points, deep wells, etc. Temporary support systems may need to be utilized in space-restricted areas and high groundwater level conditions. Detailed mitigation measures for the groundwater control will be prepared following completion of detailed geotechnical investigations and groundwater assessments.

Please refer to **Section 5.1.7.2** for mitigation measures related to contaminated property.

### **Monitoring**

Ground movement will be monitored by a qualified geotechnical specialist during construction to ensure that existing infrastructure (roads, structures, utilities, etc.) are protected. Baseline readings and existing condition reports will be completed prior to any construction activities.

All construction activities will be conducted in a manner that maintains ground movement/vibration within a specified limit (pre-approved).

An environmental inspector will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.

A monitoring program will be completed by a dewatering contractor as per conditions of the PTTW. This program will include monitoring dewatering rates and drawdown in monitoring wells and implementing erosion control measures to comply with the conditions imposed by the MOECC in the PTTW.

#### **5.1.4.3 Operations and Maintenance Impacts**

No permanent effects are anticipated after construction of the facility. However, general recommendations for the design stage are outlined below, to mitigate any possible groundwater issues.

As noted in the Groundwater Assessment Report (copy provided in **Appendix F**), additional hydrogeological/groundwater investigations are required to better understand the hydrogeological conditions present in the Study Area, especially in the southern portion where productive aquifers may potentially be present. These studies are to be completed at the detail design stage of the project, when

details of the TSF design are confirmed. Conclusions whether permanent dewatering measures are required to be used during operation of the TSF should be provided once hydrogeology of the Study Area is well understood and design of the TSF is confirmed.

It is recommended to design structures in the cut-and-cover sections as “water-tight” structures to minimize the inflow of water into the structure and avoid permanent changes to the groundwater flow regime. Although such designs are intended to be “water-tight” it is recognized and anticipated that there may be some inflow of water into the structure particularly at construction joints and shrinkage cracks. This can be addressed by grouting from within the structure and, in some cases, mineral precipitation associated with seepage through concrete shrinkage cracks largely reduces seepage over a period of a few years. Using current subway design and construction practices it is anticipated that seepage flows and the effect of the permanent subway structures on the surrounding groundwater regime should be minimal provided appropriate design and construction measures are implemented.

As outlined in the 2009 EPR, a Soil Management Strategy Plan will be developed for disposal of excavated material, consistent with past TTC practice. That plan will be part of the Excess Materials Management Plan. As no permanent impacts to soil are anticipated after the construction of the facility, no further mitigation measures are recommended.

Please refer to **Section 5.1.7.3** for mitigation measures related to contaminated property.

### **5.1.5 Drainage and Stormwater Management**

#### **5.1.5.1 Displacement of Existing Features**

Given that most of the infrastructure for the TSF will be underground, and the urban nature of the Study Area, this project will not add significant impervious areas. It is anticipated that the drainage characteristics of the Study Area will not be significantly altered. The introduction of the TSF access roadway and employee parking lot will result in a minor increase in impervious area (and therefore a minor increase in stormwater run-off) within the catchment area for the drainage system.

#### **Mitigation Measures**

In the design of the roadway and parking facility for the TSF, consideration will be given to ensure that run-off is directed away from the residential properties and the rail corridor.

General drainage and stormwater management mitigation measures were outlined in the 2009 EPR, including stormwater management design criteria and a conceptual stormwater management plan (to be further defined in the design phase of the project in consultation with the Town of Richmond Hill and TRCA). These same stormwater management design criteria will apply to the works

proposed in this EPR Addendum, and the design of the stormwater management plan will incorporate the proposed TSF as presented in this EPR Addendum.

In addition, subsequent to the approval of the 2009 EPR, the TRCA has developed a Stormwater Management Criteria document. Therefore, in the development of the stormwater management plan (to be completed in the design/construction phase of the project), consideration will be given to implementing recommendations from TRCA's Stormwater Management Criteria, as appropriate, for the works proposed in the EPR Addendum.

#### **5.1.5.2 Construction Impacts**

Construction of the TSF will be completed by open-cut excavation. Runoff into this excavation zone will require a dewatering system that will pump flow into the local storm sewer system until the proposed box structure is complete. Management of the additional flow to be handled by the local drainage network shall be reviewed in further detail during the detailed design phase of the project.

#### **Mitigation Measures**

Groundwater flow to nearby watercourses (East Don River and Pomona Creek) is expected to be maintained at environmentally acceptable levels through dewatering and groundwater inflow measures, and contingency plans developed through additional investigations, detailed design, and continued consultation with the TRCA and MOECC regulatory agencies. It is anticipated that these measures will adequately mitigate groundwater impacts from the TSF construction.

The detailed design phase will include specifications for sediment and erosion control to be complied with during construction. These specifications will be prepared in accordance with the TRCA's Erosion and Sedimentation Guidelines which are based on Provincial and Regional legislation, guidelines and by-laws on the matter.

#### **Monitoring**

An environmental inspector will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.

#### **5.1.5.3 Operations and Maintenance Impacts**

No permanent impacts are anticipated to result from the operation and maintenance associated with the TSF. Given that most of the infrastructure for the TSF will be underground, and the urban nature of the Study Area, this project will not add significant impervious areas. It is anticipated that the drainage characteristics of the Study Area will not be significantly altered.

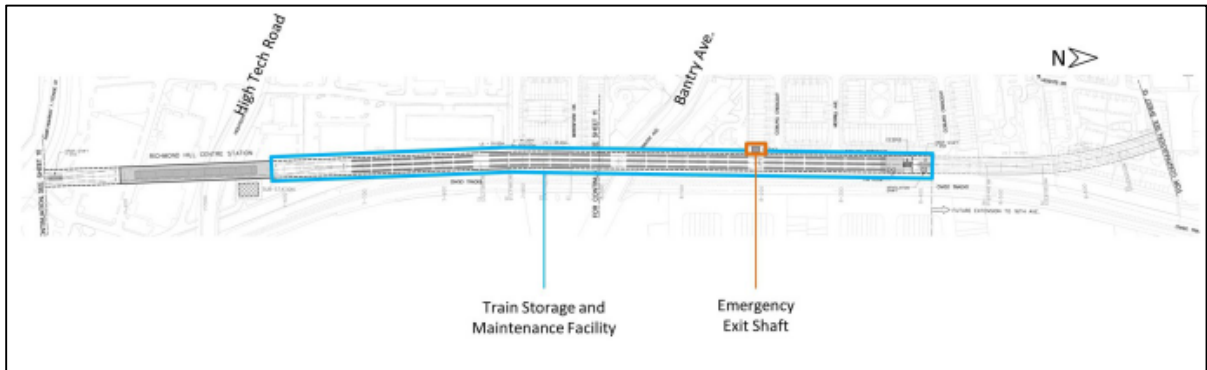
## 5.1.6 Air Quality

### 5.1.6.1 Displacement of Existing Features

There are no permanent air quality impacts associated with the TSF.

### 5.1.6.2 Construction Impacts

Air quality impacts will occur where exposed construction activities are conducted. Areas where these activities are anticipated are identified in **Figure 5-1**. The construction area includes the location of the TSF and associated structures, and covers a total area of approximately 16,000 m<sup>2</sup>.



**Figure 5-1: Location of Construction Activities**

The area surrounding the exposed construction activities contains a mixture of commercial and residential land uses. Land uses which are defined as sensitive receptors for evaluating air quality effects are:

- Health care facilities;
- Senior citizen long-term care facilities;
- Child care facilities;
- Educational facilities;
- Places of worship; and
- Residential dwellings

The worst-case sensitive receptor is shown relative to the exposed construction activities in **Figure 5-2**. Impacts at sensitive receptors further from the activities will be lower.



**Figure 5-2: Location of Sensitive Receptors**

The contaminants of interest from construction and demolition activities include particulate matter, carbon dioxide, nitrogen dioxide, sulphur dioxide, and volatile organic compounds.

Results of the dispersion modelling are discussed in the Construction Air Quality Assessment Report included in **Appendix B**. Modelling was performed both with and without mitigation to show the improvements in ground level dust concentrations that can be achieved. Due to the large amount of dust generated during construction processes, mitigation is often required.

It should be understood that the maximum predicted total suspended particulate matter (TSP) concentrations were assessed using conservative assumptions and that for the majority of time experienced TSP levels off-site will be substantially less than those provided in the Construction Air Quality Assessment Report.

Based on the discussed mitigation techniques, a reduction of particulate emissions of up to 98% can be achieved. The U.S. Environmental Protection Act AP-42 chapter 13.2.2 suggests that by doubling the surface moisture content, 75% control efficiency can be achieved. Furthermore, increasing surface moisture content five-fold times can achieve 95% control efficiency; although less efficient than doubling the moisture content, in some cases this additional control efficiency will be beneficial. Due to the inevitable nature of construction, in order to meet high efficiency reduction targets (i.e. 98%) at nearby receptors large barriers will likely be required.

Based on these recommendations an emission reduction target of 75% was applied in this assessment in order to estimate an achievable reduction in TSP concentrations with the inclusion of mitigation. It should be noted that this

reduction was not applied to the construction vehicle emissions as watering will not have any impact on these sources.

### **Mitigation Measures**

As with any major construction project, dust concentrations are at times expected to be highly visible in the surrounding area. As such, mitigation is recommended in most cases to reduce the nuisance associated with construction activities.

As documented in the Construction Air Quality Assessment Report, applying a mitigation strategy at a 75% reduction target will greatly reduce construction impacts. Therefore, it is recommended that a dust management plan be developed by the contractor.

Along with good dust management practices, best management practices should include activities such as:

- Providing signage with appropriate contact information for public inquiries;
- Choosing work plans which are likely to reduce dust generation (i.e. performing dust generating tasks individually as opposed to all at one time);
- Ensuring that local businesses are aware of the impacts which are likely to occur; and
- Providing adequate training to employees with respect to reducing dust generation.

Additionally, methods such as barrier construction will not reduce site-wide emissions but rather act to reduce off-site impacts of such emissions.

Specific mitigation techniques are described in the Construction Air Quality Assessment Report, and include:

- Material Wetting or Chemical Suppressants;
- Construction of Barriers;
- Limiting Exposed Areas; and
- Equipment Washing.

Different levels of mitigation may be required at different construction phases. The focus of the mitigation plan is to reduce the dust emissions from the material processing activities, the major contributor to total dust emissions, and not to reduce vehicle emissions.

Environment Canada “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities” provides guidance for mitigation techniques, not only for dust but for other pollutants such as carbon monoxide and oxides of nitrogen as well (Environment Canada, 2005). Common best practices for these emission sources include reformulated fuels, emulsified fuels, catalysts and filtration technologies, and cleaner engine repowers.

A mitigation plan will be developed during the design / construction phase of the project to reduce the dust emissions generated during construction processes with guidance from Environment Canada's "Best Practices for the Reduction of Air Emissions from Construction or Demolition Activities", 2005;

### **Monitoring**

The 2009 EPR outlines monitoring requirements for air quality construction impacts to ensure that construction operations meet Regulation 419/05 requirements. There are no changes to air quality monitoring requirements as a result of the works proposed in this EPR Addendum.

#### **5.1.6.3 Operations and Maintenance Impacts**

There are no notable permanent air quality impacts associated with the TSF, , and therefore no specific mitigation or monitoring measures have been proposed.

#### **5.1.7 Contaminated Properties**

##### **5.1.7.1 Displacement of Existing Features**

Based on the findings of the Contamination Overview Study, Areas of Potential Environmental Concern (APECs) within the Study Area have been identified and are described below.

##### *APECs with High Potential for Contamination*

The APECs with high potential for contamination correspond to locations within the Study Area where land uses consist of commercial or industrial operations that could impact soil and/or groundwater. APECs with high potential for contamination include the following:

- One gas station, located in the north-western corner of the intersection of Roosevelt Drive and Yonge Street;
- One dry cleaning facility, located in southwestern corner of the intersection of Scott Drive and Yonge Street;
- Three records of fuel storage tanks, located at 8830, 9076 and 9137 Yonge Street.

##### *APECs with Moderate Potential for Contamination*

Several areas were found to be of moderate contamination potential. These areas include land uses that are small commercial properties suspected of using chemical compounds or performing activities that could negatively impact soil and/or groundwater. However, these areas may not be directly impacted by construction of the TSF. APECs with moderate potential for contamination include the following:

- Two car dealerships, located in the northwestern quadrant of the intersection of Yonge Street and Oak Avenue and in the southwestern quadrant of the intersection of Yonge Street and Roosevelt Drive;

- One motorcycle dealership, located in the northeastern corner of Yonge Street and High Tech Road;
- One centre for truck sales, located in the southwestern corner of Yonge Street and Roosevelt Drive;
- Several retail companies, an office building and businesses, located to the west of Yonge Street between High Tech Road and Spruce Avenue;
- Several commercial companies and offices, located to the east of Yonge Street between High Tech Road and Beresford Drive;
- One construction site, located in the northwestern corner of the intersection of Yonge Street and Edgar Avenue;
- Medical offices, located in southwestern corner of the intersection of Bantry Road and Red Maple Road;
- One railway, adjacent to the TSF from north to south;
- Office buildings, located to the north of High Tech Road between the TSF and Yonge Street;
- One theatre, located in the southeastern quadrant of the intersection of Yonge Street and High Tech Road.

#### *APECs with Low Potential for Contamination*

All other areas consist of land use features considered to have a low potential for site contamination. These areas are generally classified as open space or residential areas that are not suspected of using chemical compounds harmful to the environment or human health.

Another source for areas with low potential for contamination is residual road salt impacts, metals and Petroleum Hydrocarbons along right-of-ways, roads, and in parking lots. These may be present in the shallow soil and groundwater resulting from winter road salting operations along the right-of-way, vehicular exhausts, transportation accidents, and spills. This does not represent a significant environmental concern.

A Contaminant Investigation (copy of report provided in **Appendix D**) was also completed north of Bantry Avenue to provide information regarding existing conditions. Existing condition findings are described in **Section 4.1.7** and recommendations from the Contaminant Investigation are reflected below.

#### **Mitigation Measures**

Since there are no APECs with high potential for contamination within close proximity of the TSF, no additional environmental investigations are recommended to be carried out with respect to this classification.

Several areas with *moderate potential* for contamination were identified to be present within the Study Area; however, the only property/area likely to be



impacted by construction of the TSF is a CN/GO railway line present to the east of the proposed TSF.

Where there are property acquisitions that will be directly impacted by construction of the TSF (i.e. impacted properties) footprint or in the areas immediately adjacent to the railway line, Phase I and/or Phase II Environmental Site Assessments (in accordance with O.Reg.153/04, as amended) will be completed for these properties. These studies will support both property acquisition and construction activities.

For *moderate* APECs where there are no property impacts, soil contaminant investigation will be completed in areas where excavation may be required, to assess soil quality and soil management options during construction. Some investigations have already been completed through the Contaminant Investigation (**Appendix D**).

No additional environmental investigations are recommended for APECs with low potential for contamination. However, along existing road right-of-ways there is the potential for residual salt impacts, metals and Petroleum Hydrocarbons to be present in the shallow soil and groundwater resulting from winter road salting operations, vehicular exhausts, transportation accidents and spills. Where works are required along existing road right-of-ways appropriate management of salt, metal and Petroleum Hydrocarbons impacted soils (and groundwater) may be required with regard to environmental regulations.

Soil and groundwater quality will be evaluated for the area where the Train Storage Facility is proposed to be constructed south of Bantry Avenue. This area was not evaluated as part of the Contaminant Investigation due to difficulties in locating a storm sewer.

Additional groundwater sampling will be completed in wells MW4 and MW5 and wells to be installed during future investigations in the area south of Bantry Avenue, to provide recommendations for groundwater discharge options during dewatering for the TSF construction.

#### **5.1.7.2 Construction Impacts**

A number of broad APECs were identified in the Contaminant Overview Study Report. These areas, as outlined in **Section 4.1.7**, have been categorized by assessing the overall relative potential of contamination.

#### **Mitigation Measures**

An Excess Materials Management Plan will be implemented to provide a mitigation strategy to effectively manage any contaminated excess materials (both soil and groundwater) encountered during construction. This plan will develop a sampling program to collect soil confirmatory samples for evaluation of options for soil re-use, recycling or disposal, as recommended in the MOE (now MOECC) Guide for Best Management Practices for Soil Management (MOE, 2014) and according to applicable regulations.

In addition to managing contaminated materials generated during construction, it is equally important to ensure that off-site contamination (i.e. contamination outside of the subway corridor excavation area) does not migrate back into the corridor. This may require engineered containment barriers/walls such as grout curtains and sheet piling; and/or hydraulic traps to contain, capture and treat contaminant plumes. These requirements will be integrated into the detailed design of the subway corridor.

### Monitoring

A monitoring program will be included in the Soil and Groundwater Management Strategy which will be developed prior to construction. A contingency plan will be developed prior to construction where appropriate.

#### 5.1.7.3 Operations and Maintenance Impacts

There is the potential for soil and/or groundwater contamination to occur as a result of the operation and maintenance of the TSF.

### Monitoring

Additional environmental investigations may be required to be completed to evaluate the impacts to soil and/or groundwater quality during operations and maintenance. A monitoring program and a contingency plan to deal with potential spills and releases of contaminants into soil and groundwater will be developed at the detail design stage of the project.

## 5.2 Socio-Economic Environment

### 5.2.1 Property

#### 5.2.1.1 Displacement of Existing Features

The following table (**Table 5-1**) summarizes the properties located within the Study Area (See **Section 1.4.1**). A plan of the impacted properties is shown in **Figure 5-3**. The preliminary property requirements identified in this section will be confirmed during the detailed design/implementation phase of the study.

**Table 5-1: Permanent Property Impact Summary**

Property #	Street	PIN #	Impact Under This Addendum	Public/ Private
1	N/A	031092029	Permanent Subsurface Easement Required	Private
2	N/A	031092025	Permanent Subsurface Easement Required	Private
3	35 Beresford Dr	031090583	Permanent Subsurface Easement Required	Private
4	N/A	031091893	Town of Richmond Hill Permanent Subsurface Easement Required	Public

<b>Property #</b>	<b>Street</b>	<b>PIN #</b>	<b>Impact Under This Addendum</b>	<b>Public/ Private</b>
5	N/A	031090140	Permanent Town of Richmond Hill Property Required	Public
6	Beresford Dr	031090157	Permanent sub-surface easement required	Public
7	N/A	031090153	Permanent Town of Richmond Hill Property Required	Public
8	N/A	031090141	Permanent Town of Richmond Hill Property Required	Public
9	Adjacent to Coburg Cres	031090093	Permanent Town of Richmond Hill Property Required	Public
10	N/A	031090092	Permanent Town of Richmond Hill Property Required	Public
11	N/A	031090859	Permanent Subsurface Easement Required	Public

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LEGEND:

DATE:  
JANUARY 2014

SCALE:  
1:2000

### YONGE SUBWAY EXTENSION ENVIRONMENTAL PROJECT REPORT ADDENDUM

IMPACTED PROPERTIES

FIGURE

5-3

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## Mitigation Measures

Per the 2009 EPR, if property acquisition is required for this project, it will be undertaken by the Proponent. In acquiring property, the Proponent balances community need and the rights of the property owner. The objective is to ensure that individual rights are respected and protected and to provide fair compensation within the framework of the Expropriations Act for any property acquired or affected by civic projects. The acquisition process emphasizes negotiation and the achievement of a mutually satisfactory agreement between the Proponent and the owner. If necessary, in order to protect the ability to proceed with the Project, expropriation may be required to acquire the necessary property. In general, property acquisition uses the following steps:

- The Proponent contacts the property owner to indicate its interest in the property and to identify issues and concerns;
- The Proponent conducts legal surveys, appraisals, environmental site assessments and other property-related assessments;
- An offering price is discussed. If a tentative agreement is reached, an Offer to Sell is signed by the owner. The Offer is then sent to the Proponent for approval and acceptance;
- If discussions do not result in an agreement, the Proponent initiates the expropriations procedures. The expropriation process may be initiated while negotiations are occurring;
- If expropriation is pursued, the owner has a right to an independent inquiry called a Hearing of Necessity, which determines whether the property requirements are fair, sound and reasonably necessary;
- The Proponent approves the settlement/expropriation, and acquires the property; and
- If expropriated, the owner has the right to have compensation payable referred to arbitration at the Ontario Municipal Board.

The objective of the Expropriations Act is to put tenants and property owners in the same position that they were in prior to the beginning of the civic project directly affecting their properties. Compensation is determined having regard for the Expropriations Act by experienced, qualified appraisers and other experts. Compensation is generally based on three factors:

- **Market Value** – Market value is defined as “the amount that the land will be expected to realize if sold on the open market by a willing seller to a willing buyer.” The date of expropriation is usually determined as the date to determine market value.
- **Damages Attributable to Disturbance** – These refer to the economic loss suffered by an owner as a result of having to vacate expropriated property. This can include moving costs, temporary accommodation, redundant



furnishings, or loss of business revenues and profitability. Compensation for damages of this type is determined after expropriation.

- Damages for Injurious Affection – Injurious affection is sometimes referred to as “consequential damages.” It has very precise and limited applications according to the law and can include items such as reduced market value and increased business operating expenses. Injurious affection is usually determined after expropriation.

The total property acquisition process and resulting compensation is intended to leave the affected owner “whole” and thereby mitigating the negative impact.

Partial property takings required include underground easements and surface facilities. The Proponent will conduct a Property Protection Study during the detailed design of the TSF, which will determine detailed property requirements, including temporary construction easements. The acquisition of these properties will follow the same principles described above.

Any brownfield sites will be managed in accordance with the Ontario Regulation 153/04 as amended. A Designated Substances Surveys for any buildings or structures which require demolition will be undertaken during the design phase.

#### 5.2.1.2 Construction Impacts

Temporary property easements will be required during the construction phase to establish work zones, material laydown areas, equipment maintenance/storage (pocket) and to obtain access for construction activities.

Construction activities (e.g. excavation and protection system) may result in potential for ground settlement, and impacts to existing buildings/structures adjacent to construction.

Property requirements for this project are noted in **Table 5-2**.

**Table 5-2: Construction Property Impact Summary**

Property #	Street	PIN #	Impact Under This Addendum	Public/ Private
1	N/A	031092029	Temporary Construction Easement Required	Private
2	N/A	031092025	Temporary Construction Easement Required	Private
3	35 Beresford Dr	031090583	Temporary Construction Easement Required	Private
4	N/A	031091893	Town of Richmond Hill Temporary Construction Easement Required	Public
5	N/A	031090140	Permanent Town of Richmond Hill Property Required	Public
6	Beresford Dr	031090157	Temporary Construction Easement Required,	Public



Property #	Street	PIN #	Impact Under This Addendum	Public/ Private
7	3 Ellesmere St	N/A (Property is located in NE quadrant of CN Rail & Bantry Ave Intersection)	Temporary Construction Easement Required	Private
8	Coburg Cres	031090107	Temporary Construction Easement Required	Public
9	N/A	031090859	Temporary Construction Easement Required	Public

### Mitigation Measures

The Proponent will negotiate temporary construction easements with property owners on a case-by-case basis following the procedures described in **Section 5.2.1.1**. Following construction, the Proponent will reinstate lands to pre-construction conditions, if feasible.

### Monitoring and Contingency

Prior to the commencement of construction operations, a pre-condition survey will be undertaken to document existing ground elevations and building/structure conditions.

During construction, surveys will be undertaken to monitor any movement to existing ground and buildings/structures within 50m of the work zone. Surveys will be undertaken on a weekly basis (minimum). This monitoring schedule is reduced to every three months for up to a year following backfilling.

The monitoring program will include review and alert levels. If instrument readings exceed “review” levels, the Proponent and its Contractor will jointly assess the necessity of altering the method, rate or sequence of construction. At “alert” levels, the Proponent can order construction operations to cease until the necessary mitigation measures are undertaken.

Following construction, the Proponent and its contractors will arrange for a joint post-construction inspection of buildings/structures and utilities with the respective Owners. The results of these surveys will be compared with the pre-construction surveys.

The Proponent will monitor horizontal and vertical movements on a daily basis during active excavation or backfilling. In the event that instrument readings reach “alert” levels, (as to be defined on a structure-specific basis in the construction contract documents), the Proponent site supervisory staff will order construction operations to cease and take necessary actions to mitigate

unacceptable movements, including, but not limited to alternative construction methods or construction equipment and/or additional support/protection measures.

In the event that a property owner submits a claim for property damage, the Proponent will conduct further investigations and, if appropriate, will negotiate a settlement.

### **5.2.1.3 Operations and Maintenance Impacts**

The proposed changes to the 2009 EPR are not expected to result in any operations and maintenance-related impacts to property ownership.

## **5.2.2 Noise and Vibration**

### **5.2.2.1 Displacement of Existing Features**

No surface subway operations are anticipated in the Study Area. Therefore, surface transportation noise has not been considered as part of the TSF Addendum.

Based on the TTC requirement for all ancillary equipment to meet 60 dBA at 1 m in all public spaces, no adverse impacts are expected from the HVAC equipment to be located at the surface electrical service building.

Vibration levels due to operations are expected to be below the MOECC/TTC guideline limit of 0.10 mm/s root mean square (RMS) at all locations. Therefore, no adverse vibration impacts from normal operations are anticipated.

### **Mitigation Measures**

Should noise emissions or operations vary significantly from those outlined in the Noise and Vibration Assessment (**Appendix C**), noise impacts will be reassessed to assure compliance with all relevant legislative requirements.

### **5.2.2.2 Construction Impacts**

As indicated in the 2009 EPR, construction noise and vibration impacts are temporary in nature and depend on the type of work required and its location relative to sensitive receptors.

A Noise and Vibration Report was prepared by Novus Environmental to model and assess potential noise impacts associated with the construction of the TSF. The Noise and Vibration report is included in **Appendix C**.

Cut-and-cover and open construction will be required for the proposed facility. Construction activity may include:

- Installation of secant or soldier piling, to hold up the sides of excavations;
- Removal of overburden, excavation of foundations and excavation for vent shafts and stairway shafts;

- Front end loaders and trucks for removal of material from the site;
- Concrete trucks and pumps for foundation and building construction; and
- Backfilling, finishing, repaving, and landscaping.

#### *Noise*

Construction noise levels will vary over time as the activities at the site change. Worst-case sound levels from construction activity, at the closest noise-sensitive receptors, will range from:

- 75 dBA to 104 dBA, for removal of original surface material (including a +10 dB annoyance penalty applied to the hoe ram / mounted impact hammer).
- 73 dBA to 96 dBA, for pile driving.
- 74 dBA to 85 dBA, for general excavation and removal of material.

These worst-case impacts are expected to occur immediately to the west of the cut-and-cover construction. Noise sensitive areas to the east, across the CN / GO Richmond Hill rail line can expect worst-case sound levels at least 17 dB lower than those outlined above.

#### *Vibration*

Construction vibration within the City is controlled by By-law 514-2008, which provides limits on maximum allowable vibration levels for construction and demolition activities (Toronto, 2008).

The by-law identifies requirements for:

- a) Preliminary studies of vibration impacts;
- b) The identification of a “vibration zone of influence”, where such a zone will extend beyond the property line / legal boundary of the construction site;
- c) The existence within the zone of influence of any buildings that have been designated under the Ontario Heritage Act;
- d) Pre-construction consultation with property owners within the zone of influence;
- e) Pre-construction measurements of ambient background vibration levels, and site inspections; and,
- f) Development of a monitoring plan and continuous measurements of construction vibration during activities which may affect off-site receptors.

The vibration Zone of Influence is identified in the by-law as the area beyond the property line of the construction site where vibration levels may exceed 5 mm/s.

Vibration from pile driving and other general construction activities at the TSF could affect buildings on Coburg Crescent.

### *Human Health and Safety*

Local employees and residents as well as TSF construction workers will be potentially affected by construction-related noise, vibration and dust. Another important issue is the health and safety of construction workers.

### **Mitigation Measures**

#### *Noise*

Construction noise impacts are temporary in nature, and generally unavoidable. Although construction noise will be noticeable for some periods and types of work, with adequate controls impacts can be minimized. A Construction Code of Practice and the following provisions have been identified to mitigate the potential impacts from construction noise:

- Construction should be limited to the time periods allowed by the locally applicable by-laws (0700h to 2300h, except in the case of emergencies). If construction activities are required outside of these hours, the Contractor must seek permits / exemptions directly from the Town of Richmond Hill.
- There will be explicit indication that Contractors are expected to comply with all applicable requirements of the contract and local noise by-laws. Enforcement of noise control by-laws is the responsibility of the Municipality for all work done by Contractors.
- All equipment will be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order.
- The Contract documents will contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to, are in effect.
- In the presence of persistent noise complaints, all construction equipment will be verified to comply with MOECC NPC-115 guidelines.
- In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measures may be required where reasonably available. In selecting appropriate noise control and mitigation measures, consideration would be given to the technical, administrative and economic feasibility of the various alternatives.
- Any blasting works will be designed to meet any applicable overpressure and vibration limits established by the MOECC in Publication NPC-119 and by the Ministry of Transportation Ontario in OPSS 120.
- Since the sound levels from the construction activity are anticipated to be quite high during some periods, and the site is located adjacent to public space, construction hoarding/temporary fences are to be used where feasible.

### *Vibration*

The Town of Richmond Hill does not have a by-law addressing construction vibration. Although not directly applicable within Richmond Hill, City of Toronto By-law 514-2008 provides limits on maximum allowable vibration levels for construction and demolition activities (Toronto, 2008). Under the terms of the City of Toronto Vibration By-law, a vibration control form should be provided with the Building Permit or Demolition Permit application. Pre-construction consultation, vibration monitoring, and site inspections will likely be required. Care should be taken where structures are located within the zone of influence.

### *Human Health and Safety*

As documented in the 2009 EPR, the Proponent and its contractors will monitor noise, vibration and dust effects during construction. In addition, the proponent will monitor contractor compliance with applicable legislation and regulations.

### **Monitoring**

The Proponent will conduct a noise and vibration study, in accordance with the MOECC protocols. Specifically, this will include additional base line noise and vibration surveys (as required), similar to those already undertaken as part of the Transit Project. Post construction measurement will be undertaken to confirm “no adverse impact” as predicted in the noise and vibration impact analysis undertaken as part of the Transit Project (see **Appendix C** for details).

#### **5.2.2.3 Operations and Maintenance Impacts**

##### *Noise*

No surface subway operations are anticipated in the Study Area. Therefore, surface transportation noise has not been considered.

The TSF and associated ventilation shafts / HVAC are considered to be “Ancillary Facilities” under the MOECC / TTC guidelines. The TSF will have an HVAC system for station comfort ventilation, and an emergency fire ventilation system to supply air to the stations and tunnel system.

TTC Design Manual DM-0403-00 (TTC 1994) sets out requirements for ancillary equipment in public areas. Noise from “Ancillary Equipment” (excluding emergency ventilation fans) should not exceed 60 dBA at 1 m distance in all public areas.

In addition, MOECC Publication NPC-205 noise guidelines apply for these facilities. These guidelines state that the 1-hour average sound level from the equipment ( $L_{eq}$  (1-hr) values measured in dBA), must meet the following limits at all off-site noise sensitive points of reception:

The MOECC guidelines require that impacts be assessed for the “predictable worst-case operating scenario”. The four tunnel ventilation fans are the dominant noise sources, and will be used in one of three modes:

## 1. Regular Operations

During regular operations of the subway system, the fans operate on half ( $\frac{1}{2}$ ) speed on a continuous basis during warm days.

## 2. Emergency Operation

In emergency operation, all fans will operate at full speed. As an emergency, this situation is excluded from the MOECC's noise guidelines.

## 3. Track Maintenance

During overnight track maintenance, the fans will be operated at three-quarter ( $\frac{3}{4}$ ) speed. The fans could run for extended periods of time between 0200 – 0600h.

## 4. Testing

Full speed testing of the fans occurs on a weekly basis. The fans are operated in both directions (supply and discharge) at full speed for up to 60 seconds for each direction (2 minute total test times).

From the above, the “predictable worst-case scenario” is the track maintenance operations, which occurs for extended periods of time, during the over-night period. Despite the 2-minute long higher sound level during full speed testing, average hourly sound levels will be higher for maintenance operations.

Excesses over the guideline limits are not expected in any noise sensitive areas. Noise sensitive points of reception include but are not limited to:

- Permanent and seasonal residences;
- Hotels, motels, campgrounds;
- Noise sensitive institutional uses such as hospitals, daycares, nursing homes, and schools; and
- Places of worship.

Stationary noise sources have been assessed cumulatively. Cumulative noise impacts include ventilation noise and noise from HVAC in the mechanical rooms of the electrical and access buildings.

Based on the generic sound power emission data and silencer insertion loss data used in this assessment the emergency fire ventilation fans are expected to meet the applicable MOECC NPC-205 guideline limits at all noise sensitive locations.

Based on the TTC requirement for all ancillary equipment to meet 60 dBA at 1 m in all public spaces, no adverse impacts are expected from the HVAC equipment to be located at the surface electrical service building.

### *Vibration*

Ground-borne vibration from subway operations is addressed under the MOECC/TTC Protocols. Criteria are provided for maximum vibration levels outside of the premises of the receptor (outside of the foundation). Similar to noise, the point

of assessment is any outdoor point on the property more than 15 m from the track centreline.

Vibration is measured in terms of Root-Mean-Squared (rms) vibration velocity in units of mm/s. Only vertical axis vibration is included in the assessment. For subway systems, this is the dominant direction of vibration excitation.

In terms of human perception, a 0.10 mm/s vibration velocity level is just perceptible for most people.

Meeting the vibration perceptibility criteria of 0.10 mm/s discussed above is generally more than adequate for most commercial and industrial uses, which are usually less vibration-sensitive than residential uses (ISO, 1985). However, in situations where vibration-sensitive equipment is in use, such as magnetic resonance imaging (MRI) machines or scanning electron microscopes, stricter limits are required.

Ground-borne noise is created by ground-borne vibration transmitting into a building structure and causing the surface of interior walls and structural member to vibrate, resulting in potentially audible noise. According to the MOECC / TTC protocol, it is unlikely that audible ground-borne noise will result from vibration levels that meet the 0.10 mm/s rms residential vibration criterion. Vibration levels of 0.20 mm/s rms should generate indoor sound levels less than 35 dBA, which is reasonable for sleeping and unlikely to disturb residences (FTA 2006).

The vibration impact assessment assumes the track will be constructed using current TTC track bed and “double tie” designs, which reduce ground-borne noise and vibration. In accordance with the MOECC/TTC guidelines, the assessment also assumes the vehicles are in good operating condition, with minimal wheel flats, operating on well-maintained rail, with minimal rail corrugation.

Operational vibration impacts were estimated assuming no coupling losses related to transmission from ground to building. In practice, vibration levels inside a residence are lower than those measured outside the building at grade due to attenuation from the foundation. However, MOECC/TTC guidelines require vibration criteria to be met outside the residence, at grade. Coupling losses for a standard wood-framed house have the potential to lead to vibration impacts approximately 2 times lower than those outside of the structure.

Ground-borne vibration will be generated by underground operations of the subway travelling through the TSF. In assessing the potential for impacts, conservative worst-case speeds of 60 km/h have been assumed. Actual speeds are anticipated to be much lower. The distances required to meet the criteria are provided in the Noise and Vibration Report (**Appendix C**).

Throughout the Study Area, the track is planned to be approximately 20 m underground. Although train speeds operating through the TSF will be very slow, a future scenario where the subway is extended to 16<sup>th</sup> Avenue may bring higher speeds through along this section of track. With the conservative assumption of

trains travelling of 60 km/h through the TSF, the guideline limit is not expected to be exceeded at any of the sensitive receptors. Therefore, mitigation investigation is not required.

Vibration levels due to operations are expected to be below the MOECC/TTC guideline limit of 0.10 mm/s rms at all locations. Therefore, no adverse vibration impacts from normal operations are anticipated.

### **5.2.3 Electromagnetic Interference**

There are no additional Electromagnetic Interference (EMI) impacts as a result of the TSF beyond those identified in the 2009 EPR.

### **5.2.4 Stray Current**

There are no additional stray current impacts as a result of the TSF beyond those identified in the 2009 EPR.

## **5.3 Cultural Environment**

### **5.3.1 Built Heritage and Cultural Heritage Landscapes**

No known built heritage resources or cultural heritage landscapes will be displaced or permanently impacted by the proposed TSF, including those identified in the 2009 EPR. No mitigation measures are proposed as known built heritage resources or cultural heritage landscapes will not be impacted during construction of the proposed TSF. Should additional property be required outside of the current plan, further cultural heritage assessment may be required.

### **5.3.2 Archaeological Resources**

#### **5.3.2.1 Displacement of Existing Features**

The Stage 1-2 Archaeological Assessment carried out in 2012 by New Directions Archaeology (**Appendix G**) found that the majority of the study corridor lies within the existing right-of-way and is generally disturbed due to roadway construction and surrounding residential and commercial land uses and utilities. During field investigations the Study Area was visually determined to be disturbed by roadway, parking lot, building, and railroad track construction and subsequent berming and was therefore not subject to test pit survey.

#### **Mitigation Measures**

No mitigation measures are proposed as no cultural material was recovered during the assessment. As a result, the Stage 1-2 Archaeological Assessment Report recommended that no further archaeological assessment is required.

Should the boundaries of the Study Area change to include lands outside the current plan, further Stage 2 archaeological assessment is will be completed as warranted.



The Stage 1-2 Archaeological Assessment Report has been submitted to the Ministry of Tourism, Culture and Sport in compliance with Section 65 (1) of the *Ontario Heritage Act* and has been entered into the Ontario Public Register of Archaeological Reports.

### **5.3.2.2 Construction Impacts**

#### **Mitigation Measures**

Consultation with relevant stakeholders, including any applicable Aboriginal communities, will be initiated in the event that archaeological resources or human remains are discovered.

If cultural heritage resources (such as archaeological sites, artefacts, building and structural remains, and/or human burials) are discovered during excavation, the following procedures will apply<sup>6</sup>:

1. Work shall be suspended until an assessment has been completed by the Ministry of Tourism, Culture, and Sport; and
2. YRRTC / TTC shall perform required measures to mitigate negative impacts on found resources as required by the Ministry of Tourism, Culture, and Sport.

In addition, if human burials are encountered, the Registrar/Deputy Registrar of the Cemeteries Regulation Unit, Ministry of Government and Consumer Services will also be notified.

### **5.3.2.3 Operations and Maintenance Impacts**

No cultural material was recovered during the Stage 1-2 Archaeological Assessment and no further archaeological assessment is required. Therefore, no impacts are anticipated during operation and maintenance of the TSF.

## **5.4 Transportation Network**

### **5.4.1 Transit Network**

#### **5.4.1.1 Displacement of Existing Features**

There are no permanent displacement impacts associated with the Transit Project. The extension of the underground facility will provide better functionality to the operation of the subway system due to the TSF.

#### **5.4.1.2 Construction Impacts**

The potential to impact YRT, Viva or GO Transit bus operations during construction is limited as none of their current routes pass through the roadways that will be affected by the construction of the TSF.

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<sup>6</sup> Toronto Transit Commission Master Specification 05-06-28 - Section 02230, subsection 1.2.2

Construction of the underground TSF will require a protection system for the deep excavation. The protection system will encroach within the CN railway corridor in which GO Transit operates, but will allow for the continued operation of all rail activity. In addition, encroachment will be required for utility relocation work which may involve jack and bore/tunneling work and/or directional drilling.

### **Mitigation Measures**

Encroachment into railway corridor will require CN and Metrolinx approval and supervision to ensure construction is conducted safely and does not impact railway operations.

In accordance with CN requirements for facilities to be constructed over or adjacent to CN railways, an agreement with CN Rail will be established prior to initiating construction.

#### **5.4.1.3 Operations and Maintenance Impacts**

The TSF will enhance the operations of the YSE to Richmond Hill Centre Station and hence will provide an overall positive impact to the local transit network. As the operation of the TSF will not impact above ground operations, there are no negative impacts to the above ground transit operations.

#### **5.4.2 Pedestrian and Cycling Network**

##### **5.4.2.1 Displacement of Existing Features**

There are no permanent displacement impacts associated with the Transit Project. The proposed access road and staff utility building will not preclude future pedestrian connectivity to Richmond Hill Centre Station.

##### **5.4.2.2 Construction Impacts**

Proposed closure of Bantry Avenue for 12-16 months for the construction of the underground TSF will impact cyclists and pedestrians using the existing sidewalk and bike route.

Proposed construction adjacent to Beresford Drive and Coburg Crescent will require the temporary reduction of roadway traffic to one lane and potentially a shift of the existing boulevard and sidewalk closer to the existing residential properties.

### **Mitigation Measures**

At the Bantry Avenue road closure, detour signing will be provided to direct cyclists and pedestrians to use facilities along High Tech Road.

All construction work adjacent to Coburg Crescent and Beresford Drive will be carried out in a manner as to ensure the least interference with pedestrians and cyclists and shall include fencing and lighting as required to provide a safe environment.

### 5.4.2.3 Operations and Maintenance Impacts

As the operation of the TSF will not impact above ground operations, there are no potential impacts to the surrounding pedestrian and cycling network.

### 5.4.3 Existing Roadway Network

#### 5.4.3.1 Displacement of Existing Features

There are no permanent displacement impacts associated with the Transit Project.

At the northern end of the TSF, an above ground building with a cargo elevator and stairway down to the facility is required for staff access. A permanent access road to the building and parking lot will be constructed within the open space next to the railway corridor (adjacent to Coburg Crescent) which will connect to the existing road network at Beresford Drive. The boulevard between the local roadways and the access road shall include fencing, landscaping and lighting as required to provide a safe environment.

The implementation of the roadway will require minor modifications to Beresford Drive at the intersection with the proposed site access road. This intersection is expected to result in no significant impacts.

#### 5.4.3.2 Construction Impacts

Construction of the TSF by 'open cut' necessitates the removal and subsequent reconstruction of a significant portion of the existing Bantry Avenue between Red Maple Road and Ellesmere Road. At Bantry Avenue, the proposed construction conflicts with the existing west abutment/pier, therefore the roadway will have to be closed for 12-16 months and local traffic diverted.

This will result in the displacement of approximately 610/590 vehicles per hour in the AM/PM Peak Hours. A preliminary assessment of future traffic volumes indicates that there will be sufficient capacity on the parallel alternative roadways (16<sup>th</sup> Avenue and High Tech Road) to accommodate the traffic displaced by the temporary closure of Bantry Avenue.

It is expected that, per the YSE conceptual design study, access to the construction site for construction vehicles will be via Yonge Street, and either Bantry Avenue or Beresford Drive. On Yonge Street, the addition of trucks to remove the excavated material is considered a negligible increase in truck traffic.

In addition, the underground TSF is in close proximity to Beresford Drive and Coburg Crescent. In order to construct the required protection system to complete the required deep excavation, the roadways will be reduced to one lane of traffic. Access will be maintained to all residences in the area throughout the duration of construction. **Figures 3-5A-C** illustrate in plan and section, the proposed construction and its impact to these roadways.

In addition to these roadways, temporary property easements will be required during construction to establish work zones, material laydown areas, equipment maintenance/storage and to obtain access for construction activities. Construction for the TSF will be a very large earth moving exercise, with an overall length of approximately 830 m and a depth of approximately 22 m. In order to facilitate the removal of this material, construction vehicle access will be required from several locations along the existing road network. The conceptual construction access plan (prepared as part of the YSE Conceptual Design Study) proposed construction access points at:

- High Tech Drive, east and west of proposed work zone required for construction of Richmond Hill Centre Station and beyond;
- 16th Avenue at Town of Richmond Hill right-of-way limit;
- Bantry Avenue Bridge (over railway corridor) is expected to be removed and reinstated; however alternative modes of construction may be possible;
- Beresford Drive (south leg) in the vicinity of the proposed new access road.

### **Mitigation Measures**

During detailed design and implementation process, the Proponent and their consultants/contractors will work with York Region and the Town of Richmond Hill to develop an acceptable Traffic Management Plan (TMP) to be applied during construction. Truck haul routes will be identified during detail design as part of constructor's TMP. For the study area, trucks hauling materials associated with the YSE will be restricted from entering residential areas through contract provisions to the extent feasible.

A conceptual construction staging scheme was developed during the YSE Conceptual Design Study to confirm constructability, and was used as a basis for assessing the potential construction-related impacts. In the conceptual staging plan, it was proposed to split the work into two contract packages as detailed below.

1. Construction of the TSF from the north end of Richmond Hill Centre Station to 30m south of the Bantry Avenue Bridge Overpass
2. Construction of the TSF from 30m south of Bantry Avenue Bridge to the north end including associated facilities (EEBs, fan room, electrical services building, change facility and the removal and replacement of the Bantry Avenue Bridge.

Primary access for Contract 1 would be from High Tech Road and Beresford Drive. Access for Contract 2 would be from 16th Avenue and Bantry Avenue.

The Proponent will ensure that the contractor is following the approved Traffic Management Plan (TMP). In the event that the contractor proposes a deviation from the Plan, the contractor will be required to submit a revised TMP for review by York Region and the Town of Richmond Hill.

### **5.4.3.3 Operations and Maintenance Impacts**

The TSF building located adjacent to the north-east corner of Coburg Crescent will be staffed 24/7 to carry out cleaning, preventative maintenance (including diagnostic checks) as well as provide a permanent presence (overnight security) at the facility. This will result in additional traffic along Beresford Drive (south portion) where the proposed site access road will connect to the 30-space employee parking lot. The magnitude of the traffic generated by the site, however, is marginal and is not expected to result in any significant impacts on the existing road network. The employee contingent present at the site is expected to be in the order of 12-14 employees per shift, and it is expected that the peak period for site-generated traffic will be offset from the peak period for background traffic due to the timing of employee shift changes.

No significant long-term operational impacts to existing roadways are expected, and therefore no associated mitigation measures are proposed.

All maintenance activities associated with the access road will be undertaken by the transit authority. Given the minor increase in traffic along Beresford Drive, no mitigation measures are required.

### **5.4.4 Utilities**

#### **5.4.4.1 Displacement of Existing Features**

Within the Study Area, utilities will be impacted along the east side of Coburg Crescent and Beresford Drive as well as the proposed crossing under Bantry Avenue. A thorough review of existing and proposed future utilities plans, as well as all necessary relocations or modifications will be undertaken during detailed design of this Transit Project to determine permanent relocation requirements.

The existing trunk storm sewer as described in **Section 4.5** will have to be relocated as it is in conflict with the proposed construction of the TSF.

#### **Mitigation Measures**

Per the 2009 EPR, utilities will be avoided to the extent possible. Minor utilities that are not in direct conflict with the TSF will be supported and protected during construction where possible. Any utilities that are in direct conflict with the TSF will require relocation. Services will be maintained to the extent possible during relocation and notice of planned service interruptions will be provided to service users prior to interruptions. The location of all plant, potential conflicts and the relocation strategy will be confirmed with service providers during design.

Any utilities requiring relocation within the CN railway corridor will be undertaken in accordance with York Region and CN's requirements.

#### **5.4.4.2 Construction Impacts**

The existing trunk storm sewer running parallel with (and directly on top of) the proposed underground TSF will require relocation prior to construction. All other

utilities described in **Section 4.5** can be relocated either prior to or during construction depending on the proposed relocation strategy. Utility impacts and relocation strategies will be confirmed during the detailed design phase of the project.

### **Mitigation Measures**

Due to the complexities of relocating the large trunk storm sewer system, it is recommended that the relocation be permanent. There are three potential options suggested for a relocation of the sewer system:

Option 1 involves completing an underground crossing of the existing CN Railway/GO Transit railway corridor at the north east corner of Beresford Drive. The sewer system would proceed south, roughly parallel to the railway corridor on the east side in what currently appears to be an open green-field. North of High Tech Drive the system would once again cross under the existing CN/GO Transit corridor and connect back into the existing system. Both crossings of the railway corridor would require deep excavation pits (approximately 10 meters down) and would need to be tunneled. In order to cross the proposed YSE corridor, sewer construction would have to be staged to occur after the underground maintenance and TSF subway box.

Option 2 involves re-routing the sewer system westerly along Beresford Drive and south through the existing commercial parking lots and across High Tech Road to the existing storm water management pond.

Option 3 involves temporarily relocating the existing sewer system adjacent to the proposed subway structure within the CN railway corridor (see **Figure 5-4**). This would require re-building the sewer in its existing location during backfill of the excavation for the subway box structure. The benefit of this option is that no crossing of the railway corridor will be required and no additional property owners will be affected.

Services to residential homes on Beresford Drive and Coburg Crescent will be maintained to the extent possible during construction and notice of planned service interruptions will be provided to service users prior to interruptions. The location of all plant, potential conflicts and the relocation strategy will be confirmed with service providers during detailed design.

For all utilities that will be relocated, relocation plans and construction activities will be undertaken in accordance with the Road Rights of Way Act and with the Town's requirements for the Installation of Services within the Town of Richmond Hill Road allowance.

The Proponent will pursue the necessary crossing permits required from any affected utilities during the detailed design phase of this study.

### **Monitoring**

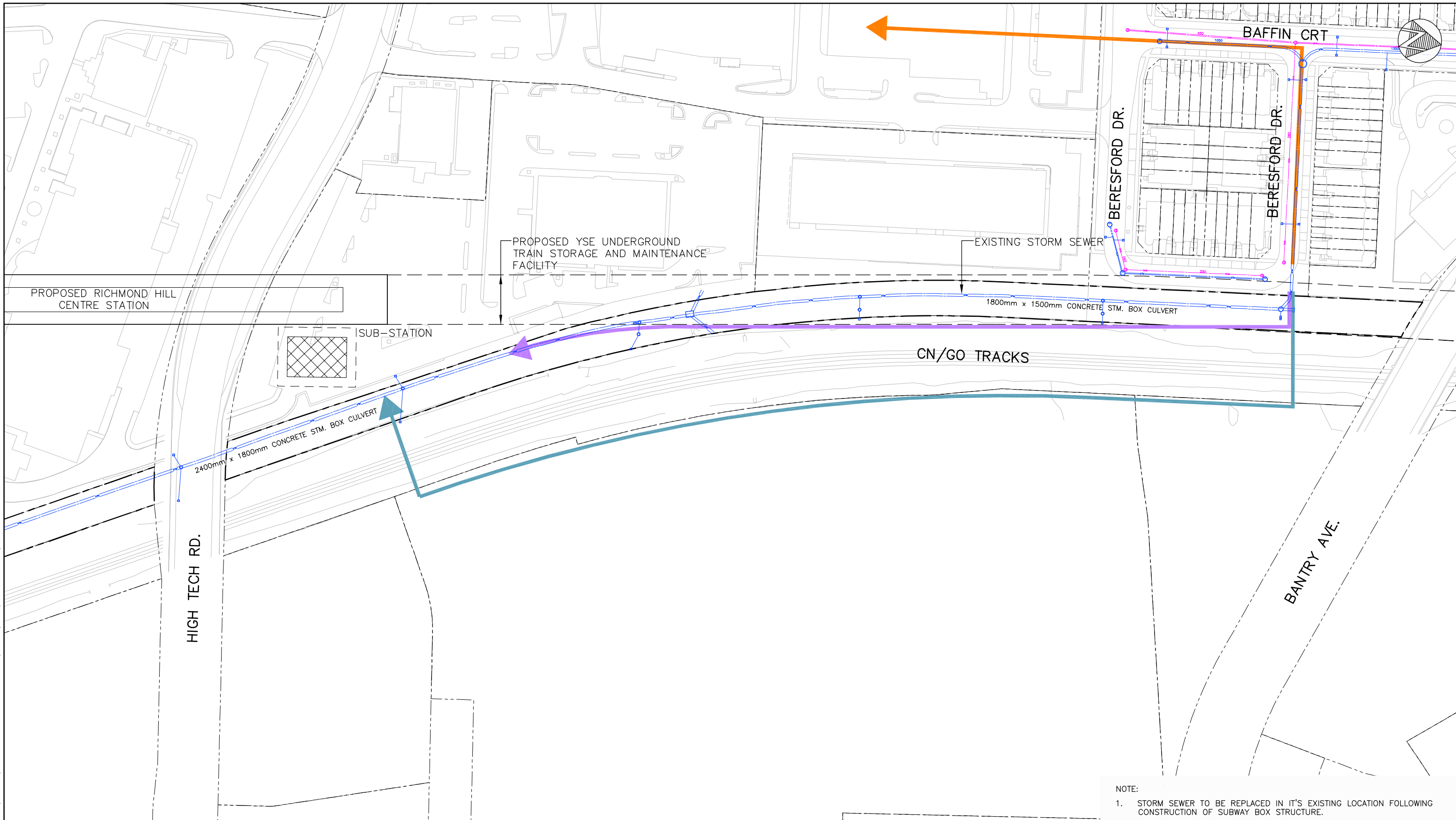
An appropriate monitoring plan will be developed during the detailed design phase of this project.

## **5.5 Summary of Potential Impacts, Proposed Mitigation Measures, Monitoring, and Future Work**

The following table summarizes the potential impacts, proposed mitigation measures and monitoring processes, and future work associated with the proposed changes to the YSE project.




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NOTE:  
 1. STORM SEWER TO BE REPLACED IN IT'S EXISTING LOCATION FOLLOWING CONSTRUCTION OF SUBWAY BOX STRUCTURE.



LEGEND:  
 PERMANENT RELOCATION OPTION #1  
 PERMANENT RELOCATION OPTION #2  
 TEMPORARY RELOCATION OPTION #3 (NOTE 1)

DATE:  
 JANUARY 2014  
 SCALE:  
 1:1500

**YONGE SUBWAY EXTENSION**  
**ENVIRONMENTAL PROJECT REPORT ADDENDUM**  
 EXISTING STORM SEWER / RELOCATION OPTIONS

FIGURE  
**5-4**

Table 5-3: Summary of Potential Impacts, Mitigation Measures, Future Work, and Contingencies

Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
Natural Environment				
Terrestrial Habitat	Direct and indirect impacts to terrestrial habitats during construction.	<p>Impacts to terrestrial habitat from construction of the TSF are expected to cause temporary disturbance that can be managed using best practice mitigation and restoration measures.</p> <p>If construction occurs during the bird breeding season, it may interrupt or curtail nesting efforts.</p> <p>No permanent impacts are anticipated to result from the operation and maintenance associated with the TSF.</p>	<ul style="list-style-type: none"> <li>Zones to be cleared of vegetation will be clearly delineated to minimize vegetation impacts and avoid incidental impacts from temporary stockpiling, debris disposal and site access.</li> <li>Vegetation clearing will be conducted outside the breeding bird season (May 1 to July 31) to avoid removal or destruction of active bird nests and remain consistent with the Migratory Birds Convention Act. An avian biologist will conduct a nest survey if vegetation removal is proposed during this period. Wildlife of any species incidentally encountered during construction will not be knowingly harmed.</li> <li>Where there is provincial or federal interest, all works will be completed in accordance with applicable legislation including, but not necessarily limited to, the <i>Migratory Birds Convention Act</i>, the <i>Endangered Species Act</i> and the <i>Species at Risk Act</i>.</li> </ul>	It is possible that additional mitigation measures, monitoring, and commitments may be identified in consultation with relevant provincial and federal agencies during the design/construction phase of the project. Any additional mitigation measures, monitoring, and commitments agreed to will be complied with.
Fish and Aquatic Habitat	Potential impacts to fish and fish habitat	<p>Permanent impacts to fish and aquatic habitat within the Study Area for the TSF are not anticipated.</p> <p>Impacts to fish and aquatic habitat from construction of the TSF are expected to cause temporary disturbances that can be managed using best practice mitigation and restoration measures to be refined based on the final design details.</p> <p>No permanent impacts are anticipated to result from the operation and maintenance associated with the TSF.</p>	<p>No specific mitigation measures for fish and aquatic habitat are required as a result of the TSF.</p> <p>To mitigate potential impacts to fish and aquatic habitat, erosion and sediment impacts from the TSF will be addressed as part of a comprehensive strategy for the entire YSE project developed during detailed design to meet the requirements, guidelines and design standards provided in TRCA's 2006 Erosion and Sediment Control Guidelines for Urban Construction.</p> <p>Where there is provincial or federal interest, all works will be completed in accordance with applicable legislation including, but not necessarily limited to, the Fisheries Act, the <i>Endangered Species Act</i> and the <i>Species at Risk Act</i>.</p>	It is possible that additional mitigation measures, monitoring, and commitments may be identified in consultation with relevant provincial and federal agencies during the design/construction phase of the project. Any additional mitigation measures, monitoring, and commitments agreed to will be complied with.
Species at Risk	Potential impacts to species at risk	<p>Locally or regionally rare species and Species at Risk are not expected in the Study Area, therefore there are no anticipated construction impacts to Species at Risk associated with the TSF.</p> <p>No permanent impacts are anticipated to result from the operation and maintenance associated with the TSF. Therefore, potential impacts should be limited to temporary disturbance-related impacts that can be addressed using standard mitigation measures.</p>	Vegetation clearing will be conducted outside the breeding bird season (May 1st to July 31st) to avoid removal or destruction of active bird nests and remain consistent with the <i>Migratory Birds Convention Act</i> . An avian biologist will conduct a nest survey if vegetation removal is proposed during this period. Wildlife of any species incidentally encountered during construction will not be knowingly harmed.	It is possible that additional mitigation measures, monitoring, and commitments may be identified in consultation with relevant provincial and federal agencies during the design/construction phase of the project. Any additional mitigation measures, monitoring, and commitments agreed to will be complied with.
Soil and Groundwater	Impacts to soil and groundwater during construction and operation	There are no permanent displacement impacts expected to soils associated with the TSF. All soil impacts are transient and relate to	Dewatering and groundwater inflow measures and contingency plans will be developed through additional investigations, during detailed design and continued consultation with the TRCA and	Ground movement will be monitored by a qualified geotechnical specialist during construction to ensure that existing infrastructure (roads, structures, utilities, etc.) are

Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
		<p>the construction of the TSF</p> <p>Based on currently available information, groundwater impacts are anticipated to be transient and relate to dewatering required for construction of the TSF.</p> <p>Dewatering will likely be required to temporarily reduce the groundwater levels and pressure in the upper and lower aquifers for construction of the TSF structure.</p>	<p>MOECC regulatory agencies. It is anticipated that these measures will adequately mitigate groundwater impacts from the TSF construction.</p> <p>A Permit to Take Water (PTTW) will be obtained from the MOECC for dewatering purposes and groundwater control, prior to the TSF construction. The PTTW will specify the rates and duration of the dewatering program, a monitoring program, and mitigation and contingency measures to be used during dewatering.</p> <p>A Soil Management Strategy Plan will be developed for re-use or disposal of excavated soils (i.e. excess soils), consistent with past TTC practice. This plan will be part of the Excess Materials Management Plan and require that management of excess soils is conducted in accordance with the applicable MOE (now MOECC) recommendations outlined in the documents titled "Protocol for Analytical Methods Used in the Assessment of Properties" (MOE, March 2004, amended in July 2011) and "Management of Excess Soils – A Guide for Best Management Practices" (MOE, January 2014).</p> <p>Please refer to <i>Contaminated Properties</i> for mitigation measures related to contaminated property.</p>	<p>protected. Baseline readings and existing condition reports will be completed prior to any construction activities.</p> <p>All construction activities will be conducted in a manner that maintains ground movement/vibration within a specified limit (pre-approved).</p> <p>An environmental inspector will be responsible for ensuring that all environmental mitigation and design measures are properly installed/constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.</p> <p>A monitoring program will be completed by a dewatering contractor as per conditions of the PTTW. This program will include monitoring dewatering rates and drawdown in monitoring wells and implementing erosion control measures to comply with the conditions imposed by the MOECC in the PTTW.</p>
<p>Drainage and Stormwater Management</p>	<p>Impacts to drainage and stormwater systems</p>	<p>The introduction of the TSF access roadway and employee parking lot will result in a minor increase in impervious area (and therefore a minor increase in stormwater run-off) within the catchment area for the drainage system.</p> <p>Construction of the TSF will be completed by open-cut excavation. Runoff into this excavation zone will require a dewatering system that will pump flow into the local storm sewer system until the proposed box structure is complete. Management of the additional flow to be handled by the local drainage network shall be reviewed in further detail during the detailed design phase of the project.</p> <p>No permanent impacts are anticipated to result from the operation and maintenance associated with the TSF.</p>	<p>In the design of the roadway and parking facility for the TSF, consideration will be given to ensure that run-off is directed away from the residential properties and the rail corridor.</p> <p>General drainage and stormwater management mitigation measures were outlined in the 2009 EPR, including stormwater management design criteria and a conceptual stormwater management plan (to be further defined in the design phase of the project in consultation with the Town of Richmond Hill and TRCA). These same stormwater management design criteria will apply to the works proposed in this EPR Addendum as well, and the design of the stormwater management plan will incorporate the proposed TSF as presented in this EPR Addendum.</p> <p>In addition, subsequent to the approval of the 2009 EPR, the TRCA has developed a Stormwater Management Criteria document. Therefore, in the development of the stormwater management plan (to be completed in the design/construction phase of the project), consideration will be given to implementing recommendations from TRCA's Stormwater Management Criteria, as appropriate, for the works proposed in the EPR Addendum.</p> <p>The detailed design phase will include specifications for sediment and erosion control to be complied with during construction. These specifications will be prepared in accordance with the TRCA's Erosion and Sedimentation</p>	<p>An environmental inspector will be responsible for ensuring that all environmental mitigation and design measures are properly installed / constructed, implemented and maintained, and appropriate contingency, response plans and remedial measures are in place and implemented if required.</p>

Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
			Guidelines which are based on Provincial and Regional legislation, guidelines and by-laws on the matter.	
Air Quality	Impacts to air quality during construction.  Impacts on air quality due to implementation of the TSF.	As with any major construction project, dust concentrations are at times expected to be highly visible in the surrounding area.  There are no notable permanent air quality impacts associated with the TSF, and therefore no specific mitigation or monitoring measures have been proposed.	A mitigation plan will be developed during the design / construction phase of the project to reduce the dust emissions generated during construction processes with guidance from Environment Canada's "Best Practices for the Reduction of Air Emissions from Construction or Demolition Activities", 2005;	The 2009 EPR outlines monitoring requirements for air quality construction impacts to ensure that construction operations meet Regulation 419/05 requirements. There are no changes to air quality monitoring requirements as a result of the works proposed in this EPR Addendum.
Contaminated Properties	Impacts to areas of high, moderate and low potential for contamination present within the study area.	A number of broad Areas of Potential Environmental Concern (APECs) were identified in the Contaminant Overview Study Report, however, no APECs with high potential for contamination were identified within close proximity of the TSF.  Several areas with <i>moderate potential</i> for contamination were identified to be present within the Study Area; however, the only property/area likely to be impacted by construction of the TSF is a CN/GO railway line present to the east of the proposed TSF.  There is the potential for soil and/or groundwater contamination to occur as a result of the operation and maintenance of the TSF.	Where there are property acquisitions that will be directly impacted by construction of the TSF (i.e. impacted properties) footprint or in the areas immediately adjacent to the railway line, Phase I and/or Phase II Environmental Site Assessments (in accordance with O.Reg.153/04, as amended) will be completed for these properties  For <i>moderate</i> APECs where there are no property impacts, soil contaminant investigation will be completed in areas where excavation may be required, to assess soil quality and soil management options during construction. Some investigations have already been completed through the Contaminant Investigation ( <b>Appendix D</b> ).  Where works are required along existing road right-of-ways appropriate management of salt, metal and Petroleum Hydrocarbons impacted soils (and groundwater) may be required with regard to environmental regulations.  Soil and groundwater quality will be evaluated for the area where the Train Storage Facility is proposed to be constructed south of Bantry Avenue. This area was not evaluated as part of the Contaminant Investigation due to difficulties in locating a storm sewer.  Additional groundwater sampling will be completed in wells MW4 and MW5 and wells to be installed during future investigations in the area south of Bantry Avenue, to provide recommendations for groundwater discharge options during dewatering for the TSF construction.  An Excess Materials Management Plan will be implemented to provide a mitigation strategy to effectively manage any contaminated excess materials (both soil and groundwater) encountered during construction. This plan will develop a sampling program to collect soil confirmatory samples for evaluation of options for soil re-use, recycling or disposal, as recommended in the MOE (now MOECC) Guide for Best Management Practices for Soil Management (MOE, 2014) and according to applicable regulations.  In addition to managing contaminated materials generated during construction, it is equally important to ensure that off-site	Additional environmental investigations may be required to evaluate the impacts to soil and/or groundwater during operations and maintenance. A monitoring program and a contingency plan to deal with potential spills and releases of contaminants into soil and groundwater will be developed at the detail design stage of the project.  A monitoring program will be included in the Soil and Groundwater Management Strategy which will be developed prior to construction. A contingency plan will be developed prior to construction where appropriate.

Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
			contamination (i.e. contamination outside of the subway corridor excavation area) does not migrate back into the corridor. This may require engineered containment barriers/walls such as grout curtains and sheet piling; and/or hydraulic traps to contain, capture and treat contaminant plumes. These requirements will be integrated into the detailed design of the subway corridor.	
Socio-Economic Environment				
Property	Property impacts for the construction of the YSR.	<p>11 properties will be permanently impacted within the study area (see <b>Table 5-1</b>).</p> <p>Temporary property easements will be required at nine properties as noted in <b>Table 5-2</b>.</p> <p>Temporary property easements will be required during the construction phase to establish work zones, material laydown areas, equipment maintenance/storage (pocket) and to obtain access for construction activities.</p> <p>Construction activities (e.g. excavation and protection system) may result in potential for ground settlement, and impacts to existing buildings/structures adjacent to construction.</p> <p>No operations and maintenance-related impacts to property ownership are anticipated.</p>	<p>Per the 2009 EPR, if property acquisition is required for this project, it will be undertaken by the Proponent. The acquisition process emphasizes negotiation and the achievement of a mutually satisfactory agreement between the Proponent and the owner. If necessary, in order to protect the ability to proceed with the Project, expropriation may be required to acquire the necessary property. The total property acquisition process and resulting compensation is intended to leave the affected owner "whole" and thereby mitigating the negative impact.</p> <p>The Proponent will negotiate temporary construction easements with property owners on a case-by-case basis following the procedures described in <b>Section 5.2.1.1</b>. Following construction, the Proponent will reinstate lands to pre-construction conditions, if feasible.</p>	<p>Prior to the commencement of construction operations, a pre-condition survey will be undertaken to document existing ground elevations and building/structure conditions.</p> <p>During construction, surveys will be undertaken to monitor any movement to existing ground and buildings/structures within 50m of the work zone. Surveys will be undertaken on a weekly basis (minimum). This monitoring schedule is reduced to every three months for up to a year following backfilling.</p> <p>The monitoring program will include review and alert levels. If instrument readings exceed "review" levels, the Proponent and its Contractor will jointly assess the necessity of altering the method, rate or sequence of construction. At "alert" levels, the Proponent can order construction operations to cease until the necessary mitigation measures are undertaken.</p> <p>Following construction, the Proponent and its contractors will arrange for a joint post-construction inspection of buildings/structures and utilities with the respective Owners. The results of these surveys will be compared with the pre-construction surveys.</p> <p>The Proponent will monitor horizontal and vertical movements on a daily basis during active excavation or backfilling. In the event that instrument readings reach "alert" levels, (as to be defined on a structure-specific basis in the construction contract documents), the Proponent site supervisory staff will order construction operations to cease and take necessary actions to mitigate unacceptable movements, including, but not limited to alternative construction methods or construction equipment and/or additional support/protection measures.</p> <p>In the event that a property owner submits a claim for property damage, the Proponent will conduct further investigations and, if appropriate, will negotiate a settlement.</p>
Noise and Vibration	Temporary noise and vibration impacts during construction.	<p>Based on the TTC requirement for all ancillary equipment to meet 60 dBA at 1 m in all public spaces, no adverse impacts are expected from the HVAC equipment to be located at the surface electrical service building.</p> <p>Vibration levels due to operations are expected to be below the</p>	<p>Should noise emissions or operations vary significantly from those outlined in the Noise and Vibration Assessment (<b>Appendix C</b>), noise impacts will be reassessed to assure compliance with all relevant legislative requirements.</p> <p><i>Noise</i></p>	<p>The Proponent will conduct a noise and vibration study, in accordance with the MOECC protocols. Specifically, this will include additional base line noise and vibration surveys (as required), similar to those already undertaken as part of the Transit Project. Post construction measurement will be undertaken to confirm "no adverse impact" as predicted in the</p>

Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
		<p>MOECC/TTC guideline limit of 0.10 mm/s root mean square (RMS) at all locations. Therefore, no adverse vibration impacts from normal operations are anticipated.</p> <p><i>Noise</i></p> <p>Construction noise levels will vary over time as the activities at the site change. Worst-case sound levels from construction activity, at the closest noise-sensitive receptors, will range from:</p> <ul style="list-style-type: none"> <li>• 75 dBA to 104 dBA, for removal of original surface material (including a +10 dB annoyance penalty applied to the hoe ram / mounted impact hammer).</li> <li>• 73 dBA to 96 dBA, for pile driving.</li> <li>• 74 dBA to 85 dBA, for general excavation and removal of material.</li> </ul> <p>These worst-case impacts are expected to occur immediately to the west of the cut-and-cover construction. Noise sensitive areas to the east, across the CN / GO Richmond Hill rail line can expect worst-case sound levels at least 17 dB lower than those outlined above.</p> <p>Stationary noise sources have been assessed cumulatively. Cumulative noise impacts include ventilation noise and noise from HVAC in the mechanical rooms of the electrical and access buildings.</p> <p>Based on the generic sound power emission data and silencer insertion loss data used in this assessment the emergency fire ventilation fans are expected to meet the applicable MOECC NPC-205 guideline limits at all noise sensitive locations.</p> <p>Based on the TTC requirement for all ancillary equipment to meet 60 dBA at 1 m in all public spaces, no adverse impacts are expected from the HVAC equipment to be located at the surface electrical service building.</p> <p><i>Vibration</i></p> <p>Construction vibration within the City is controlled by By-law 514-2008, which provides limits on maximum allowable vibration levels for construction and demolition activities (Toronto, 2008).</p> <p>The by-law identifies requirements for:</p> <ul style="list-style-type: none"> <li>g) Preliminary studies of vibration impacts;</li> <li>h) The identification of a "vibration zone of influence", where such a zone will extend beyond the property line / legal boundary of the construction site;</li> <li>i) The existence within the zone of influence of any buildings that have been designated under the Ontario Heritage Act;</li> <li>j) Pre-construction consultation with property owners within the</li> </ul>	<p>Construction noise impacts are temporary in nature, and generally unavoidable. Although construction noise will be noticeable for some periods and types of work, with adequate controls impacts can be minimized. A Construction Code of Practice and the following provisions have been identified to mitigate the potential impacts from construction noise:</p> <ul style="list-style-type: none"> <li>• Construction should be limited to the time periods allowed by the locally applicable by-laws (0700h to 2300h, except in the case of emergencies). If construction activities are required outside of these hours, the Contractor must seek permits / exemptions directly from the Town of Richmond Hill.</li> <li>• There will be explicit indication that Contractors are expected to comply with all applicable requirements of the contract and local noise by-laws. Enforcement of noise control by-laws is the responsibility of the Municipality for all work done by Contractors.</li> <li>• All equipment will be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order.</li> <li>• The Contract documents will contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to, are in effect.</li> <li>• In the presence of persistent noise complaints, all construction equipment will be verified to comply with MOECC NPC-115 guidelines.</li> <li>• In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measures may be required where reasonably available. In selecting appropriate noise control and mitigation measures, consideration would be given to the technical, administrative and economic feasibility of the various alternatives.</li> <li>• Any blasting works will be designed to meet any applicable overpressure and vibration limits established by the MOECC in Publication NPC-119 and by the Ministry of Transportation Ontario in OPSS 120.</li> <li>• Since the sound levels from the construction activity are anticipated to be quite high during some periods, and the site is located adjacent to public space, construction hoarding/temporary fences are to be used where feasible.</li> </ul> <p><i>Vibration</i></p> <p>The Town of Richmond Hill does not have a by-law addressing construction vibration. Although not directly applicable within Richmond Hill, City of Toronto By-law 514-2008 provides limits on maximum allowable vibration levels for construction and demolition activities (Toronto, 2008). Under the terms of the City of Toronto Vibration By-law, a vibration control form should be</p>	<p>noise and vibration impact analysis undertaken as part of the Transit Project (see <b>Appendix C</b> for details).</p>

Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
		<p>zone of influence;</p> <p>k) Pre-construction measurements of ambient background vibration levels, and site inspections; and,</p> <p>l) Development of a monitoring plan and continuous measurements of construction vibration during activities which may affect off-site receptors.</p> <p>The vibration Zone of Influence is identified in the by-law as the area beyond the property line of the construction site where vibration levels may exceed 5 mm/s.</p> <p>Vibration from pile driving and other general construction activities at the TSF could affect buildings on Coburg Crescent.</p> <p>Throughout the Study Area, the track is planned to be approximately 20 m underground. Although train speeds operating through the TSF will be very slow, a future scenario where the subway is extended to 16<sup>th</sup> Avenue may bring higher speeds through along this section of track. With the conservative assumption of trains travelling of 60 km/h through the TSF, the guideline limit is not expected to be exceeded at any of the sensitive receptors. Therefore, mitigation investigation is not required.</p> <p>Vibration levels due to operations are expected to be below the MOECC/TTC guideline limit of 0.10 mm/s rms at all locations. Therefore, no adverse vibration impacts from normal operations are anticipated.</p> <p><i>Human Health and Safety</i></p> <p>Local employees and residents as well as TSF construction workers will be potentially affected by construction-related noise, vibration and dust. Another important issue is the health and safety of construction workers.</p>	<p>provided with the Building Permit or Demolition Permit application. Pre-construction consultation, vibration monitoring, and site inspections will likely be required. Care should be taken where structures are located within the zone of influence.</p> <p><i>Human Health and Safety</i></p> <p>As documented in the 2009 EPR, the Proponent and its contractors will monitor noise, vibration and dust effects during construction. In addition, the proponent will monitor contractor compliance with applicable legislation and regulations.</p>	
Electromagnetic Interference	Potential generation of electromagnetic interference	There are no additional Electromagnetic Interference (EMI) impacts as a result of the TSF beyond those identified in the 2009 EPR.	N/A	N/A
Stray Current	Potential impacts from stray current	There are no additional stray current impacts as a result of the TSF beyond those identified in the 2009 EPR.	N/A	N/A
Cultural Environment				
Built Heritage and Cultural Landscapes	<p>Potential for displacement and/or disruption of cultural heritage landscapes and built heritage resources during and after construction.</p> <p>Potential for indirect impacts by</p>	No known built heritage resources or cultural heritage landscapes will be displaced or permanently impacted by the proposed TSF, including those identified in the 2009 EPR.	No mitigation measures are proposed as known built heritage resources or cultural heritage landscapes will not be impacted during construction of the proposed TSF. Should additional property be required outside of the current plan, further cultural heritage assessment may be required.	N/A



Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
	the introduction of physical, visual, audible or atmospheric elements not in keeping with their existing character and, or setting.			
Archaeological Resources	Potential loss of archaeological resources	Based on findings of the Stage 1-2 Archaeological Assessment, no impacts are anticipated during construction, operation and maintenance of the TSF.	<p>Should the boundaries of the Study Area change to include lands outside the current plan, further Stage 2 archaeological assessment is will be completed as warranted.</p> <p>Consultation with relevant stakeholders, including any applicable Aboriginal communities, will be initiated in the event that archaeological resources or human remains are discovered.</p> <p>If cultural heritage resources (such as archaeological sites, artefacts, building and structural remains, and/or human burials) are discovered during excavation, the following procedures will apply<sup>7</sup>:</p> <ol style="list-style-type: none"> <li>1. Work shall be suspended until an assessment has been completed by the Ministry of Tourism, Culture, and Sport; and</li> <li>2. YRRTC / TTC shall perform required measures to mitigate negative impacts on found resources as required by the Ministry of Tourism, Culture, and Sport.</li> </ol> <p>In addition, if human burials are encountered, the Registrar/Deputy Registrar of the Cemeteries Regulation Unit, Ministry of Government and Consumer Services will also be notified.</p>	N/A
Transportation Network				
Transit Network	Potential impacts to the transit network	<p>There are no permanent displacement impacts associated with the Transit Project. The extension of the underground facility will provide better functionality to the operation of the subway system due to the TSF.</p> <p>The potential to impact YRT, Viva or GO Transit bus operations during construction is limited as none of their current routes pass through the roadways that will be affected by the construction of the TSF.</p> <p>Construction of the underground TSF will require a protection system for the deep excavation. The protection system will encroach within the CN railway corridor in which GO Transit operates, but will allow for the continued operation of all rail activity. In addition, encroachment will be required for utility relocation work which may involve jack and bore/tunneling work and/or directional</p>	<p>Encroachment into railway corridor will require CN and Metrolinx approval and supervision to ensure construction is conducted safely and does not impact railway operations.</p> <p>In accordance with CN requirements for facilities to be constructed over or adjacent to CN railways, an agreement with CN Rail will be established prior to initiating construction.</p>	N/A

<sup>7</sup> Toronto Transit Commission Master Specification 05-06-28 - Section 02230, subsection 1.2.2



Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
		drilling.		
Pedestrian and Cycling Network	Relocation of existing sidewalks in the study area.	<p>There are no permanent displacement impacts associated with the Transit Project.</p> <p>Proposed closure of Bantry Avenue for 12-16 months for the construction of the underground TSF will impact cyclists and pedestrians using the existing sidewalk and bike route.</p> <p>Proposed construction adjacent to Beresford Drive and Coburg Crescent will require the temporary reduction of roadway traffic to one lane and potentially a shift of the existing boulevard and sidewalk closer to the existing residential properties.</p>	<p>At the Bantry Avenue road closure, detour signing will be provided to direct cyclists and pedestrians to use facilities along High Tech Road.</p> <p>All construction work adjacent to Coburg Crescent and Beresford Drive will be carried out in a manner as to ensure the least interference with pedestrians and cyclists and shall include fencing and lighting as required to provide a safe environment.</p>	N/A
Existing Roadway Network	<p>Reduction in the road capacity available for automobile movements.</p> <p>Changes to traffic movements.</p>	<p>There are no permanent displacement impacts associated with the Transit Project.</p> <p>A permanent access road to the TSF building and parking lot will be constructed within the open space next to the railway corridor (adjacent to Coburg Crescent) which will connect to the existing road network at Beresford Drive. The implementation of the roadway will require minor modifications to Beresford Drive at the intersection with the proposed site access road. This intersection is expected to result in no significant impacts.</p> <p>Construction of the TSF by 'open cut' necessitates the removal and subsequent reconstruction of a significant portion of the existing Bantry Avenue between Red Maple Road and Ellesmere Road. At Bantry Avenue, the proposed construction conflicts with the existing west abutment/pier, therefore the roadway will have to be closed for 12-16 months and local traffic diverted.</p> <p>This will result in the displacement of approximately 610/590 vehicles per hour in the AM/PM Peak Hours. A preliminary assessment of future traffic volumes indicates that there will be sufficient capacity on the parallel alternative roadways (16<sup>th</sup> Avenue and High Tech Road) to accommodate the traffic displaced by the temporary closure of Bantry Avenue.</p> <p>It is expected that, per the YSE conceptual design study, access to the construction site for construction vehicles will be via Yonge Street, and either Bantry Avenue or Beresford Drive. On Yonge Street, the addition of trucks to remove the excavated material is considered a negligible increase in truck traffic.</p> <p>In addition, the underground TSF is in close proximity to Beresford Drive and Coburg Crescent. In order to construct the required protection system to complete the required deep excavation, the roadways will be reduced to one lane of traffic. Access will be maintained to all residences in the area throughout the duration of construction.</p> <p>In addition to these roadways, temporary property easements will</p>	<p>No significant long-term operational impacts to existing roadways are expected, and therefore no associated mitigation measures are proposed.</p> <p>During detailed design and implementation process, the Proponent and their consultants/contractors will work with York Region and the Town of Richmond Hill to develop an acceptable Traffic Management Plan (TMP) to be applied during construction. Truck haul routes will be identified during detail design as part of constructor's TMP. For the study area, trucks hauling materials associated with the YSE will be restricted from entering residential areas through contract provisions to the extent feasible.</p> <p>The Proponent will ensure that the contractor is following the approved Traffic Management Plan (TMP). In the event that the contractor proposes a deviation from the Plan, the contractor will be required to submit a revised TMP for review by York Region and the Town of Richmond Hill.</p>	N/A

Factor	Environmental Issue / Concern	Effect / Impact (During Construction; During Operations)	Mitigation Measures	Monitoring / Future Work / Contingency
		<p>be required during construction to establish work zones, material laydown areas, equipment maintenance/storage and to obtain access for construction activities. Construction for the TSF will be a very large earth moving exercise, with an overall length of approximately 830 m and a depth of approximately 22 m. In order to facilitate the removal of this material, construction vehicle access will be required from several locations along the existing road network.</p> <p>The magnitude of the traffic generated by the operation of the TSF, however, is marginal and is not expected to result in any significant impacts on the existing road network. All maintenance activities associated with the access road will be undertaken by the transit authority. Given the minor increase in traffic along Beresford Drive, no mitigation measures are required.</p>		
Utilities	Impacts to utilities in study area	<p>Within the Study Area, utilities will be impacted along the east side of Coburg Crescent and Beresford Drive as well as the proposed crossing under Bantry Avenue. A thorough review of existing and proposed future utilities plans, as well as all necessary relocations or modifications will be undertaken during detailed design of this Transit Project to determine permanent relocation requirements.</p> <p>The existing trunk storm sewer running parallel with (and directly on top of) the proposed underground TSF will require relocation prior to construction. All other utilities described in <b>Section 4.5</b> can be relocated either prior to or during construction depending on the proposed relocation strategy. Utility impacts and relocation strategies will be confirmed during the detailed design phase of the project.</p>	<p>Minor utilities that are not in direct conflict with the TSF will be supported and protected during construction where possible. Any utilities that are in direct conflict with the TSF will require relocation. Services will be maintained to the extent possible during relocation and notice of planned service interruptions will be provided to service users prior to interruptions. The location of all plant, potential conflicts and the relocation strategy will be confirmed with service providers during design.</p> <p>Any utilities requiring relocation within the CN railway corridor will be undertaken in accordance with York Region and CN's requirements.</p> <p>For all utilities that will be relocated, relocation plans and construction activities will be undertaken in accordance with the Road Rights of Way Act and with the Town's requirements for the Installation of Services within the Town of Richmond Hill Road allowance.</p> <p>The Proponent will pursue the necessary crossing permits required from any affected utilities during the detailed design phase of this study.</p>	An appropriate monitoring plan will be developed during the detailed design phase of this project.

## **6. COMMITMENTS TO FUTURE WORK**

In preparation of this EPR Addendum, YRRTC and TTC have worked closely with key stakeholder agencies to address and resolve any issues or concerns.

Additional consultation with key stakeholders was undertaken to review the design changes described in this EPR Addendum. However, not all issues can be addressed within the context of a Transit Project Assessment since the design of the YSE within the area affected by this TSF Addendum has been prepared at a conceptual level and further details are required to finalize property requirements, construction issues and permits/approvals. The subsections following this paragraph summarize the Proponent's commitments to future action during preliminary and detail design, of the Project in the areas affected by this Addendum.

Commitments identified in the 2009 EPR that pertain to sections of the Project not covered by this Addendum remain in effect (unless modified through other means).

### **6.1 Permits and Approvals**

The Proponent, in the 2009 EPR has committed to securing necessary permits for the implementation of the Transit Project, including, but not limited to:

- 1) Planning approvals (including Site Plan Approval) for above-grade structures and facilities (through York Region and Town of Richmond Hill);
- 2) Building permits for the stations, Emergency Exit Buildings or other ancillary features (Town of Richmond Hill);
- 3) Obtain a subsurface easement from CN Rail and associated agreement.
- 4) Permit to Take Water from the MOECC if dewatering exceeds 50,000 litres per day;
- 5) TRCA permits and approvals for work within a regulated area;
- 6) Stormwater management, in accordance with Town of Richmond Hill and TRCA requirements;
- 7) Sewer discharge approvals, in accordance with Town of Richmond Hill and York Region requirements;
- 8) Certificates of Approval for noise and air quality related impacts resulting from vent shafts, stations, and parking lots from MOECC.

These commitments remain in effect, and also apply to the works proposed in this Addendum.

## 6.2 Property Acquisition

The preliminary property impacts identified in **Section 5.2.1** will be reviewed and confirmed during the detailed design phase of the study. The Proponent will continue with the property acquisition activities identified in the 2009 EPR, and commits to incorporate the new impacted properties identified under this EPR Addendum. The property acquisition activities include:

- Proceed with a Property Protection Study during the early stages of the design of the Transit Project with the intention of ensuring that, regardless of the timing of the initiation of the Transit Project, developments in the corridor do not impact the feasibility of implementing the recommended concept;
- Continue negotiations with the owner of property required for the Richmond Hill Centre Station;
- For properties required within the Town of Richmond Hill (including temporary easements to facilitate construction), the Proponent will acquire property by negotiation or expropriation (as required).

## 6.3 Construction Issues

In addition to the various construction issues identified in the 2009 EPR and within this report, the Proponent will conduct further research and analysis related to the construction of the Transit Project. The 2009 EPR identified a number of additional studies to be undertaken during the design/construction phase of the project, and these also apply to the works proposed under this EPR Addendum. Specific tasks include, but are not limited to the following activities:

- Developing traffic, transit and pedestrian management strategies to be included in construction contract documents;
- Undertaking an existing building condition survey prior to, during and post construction;
- Preparing and implementing tree and streetscape protection and restoration plans;
- Developing procedures for disposal of excavated materials, including contaminated soils as part of a Soil Management Strategy Plan;
- Preparing mitigation, monitoring and contingency plans for groundwater protection and dewatering discharges for the protection of surface water in consultation with and accordance with TRCA's Guidelines for Dewatering Needs Assessment and Environmental Management Plan; and
- Preparing an erosion and sediment control plan, which complies with prevailing TRCA, York Region and Town of Richmond Hill water guidelines and requirements.

The following additional activities were identified as part of the EPR Addendum, and apply to the works presented herein.

- Developing Bantry Avenue Bridge temporary closure/staging plan;
- Developing construction access plan for multiple construction contracts within a confined urban area;
- Where there are property acquisitions that will be directly impacted by construction of the TSF (i.e. impacted properties) footprint or in the areas immediately adjacent to the railway line, Phase I and/or Phase II Environmental Site Assessments (in accordance with O.Reg.153/04, as amended) will be completed for these properties. These studies will support both property acquisition and construction activities.
- For moderate APECs where there are no property impacts, soil contaminant investigation will be completed in areas where excavation may be required, to assess soil quality and soil management options during construction. Some investigations have already been completed through the Contaminant Investigation (**Appendix D**).
- Along existing road right-of-ways there is the potential for residual salt impacts, metals and Petroleum Hydrocarbons to be present in the shallow soil and groundwater resulting from winter road salting operations, vehicular exhausts, transportation accidents and spills. Where works are required along existing road right-of-ways appropriate management of salt, metal and Petroleum Hydrocarbons impacted soils (and groundwater) may be required with regard to environmental regulations.
- Soil and groundwater quality will be evaluated for the area where the Train Storage Facility is proposed to be constructed south of Bantry Avenue. This area was not evaluated as part of the Contaminant Investigation due to difficulties in locating a storm sewer.
- Additional groundwater sampling will be completed in wells MW4 and MW5 and wells to be installed during future investigations in the area south of Bantry Avenue, to provide recommendations for groundwater discharge options during dewatering for the TSF construction.
- Development of an Excess Materials Management Plan (includes the Soil Management Strategy Plan) to provide a mitigation strategy to effectively manage any contaminated excess materials (both soil and groundwater) encountered during construction;
- Ensure that off-site contamination (i.e. contamination outside of the subway corridor excavation area) does not migrate back into the corridor. This may require engineered containment barriers/walls such as grout curtains and sheet piling; and/or hydraulic traps to contain, capture and treat contaminant plumes. These requirements will be integrated into the detailed design of the subway corridor.
- Protection of railway corridor immediately adjacent to work zone to allow for continued railway operations;

- Development of a staged large storm sewer relocation plan including two potential crossings over the YSE and two crossings under the railway corridor;
- Prepare a mitigation plan to reduce the dust emissions generated during construction processes with guidance from Environment Canada's *"Best Practices for the Reduction of Air Emissions from Construction or Demolition Activities"*, 2005;
- A Construction Noise mitigation plan should be prepared based on the measures included in **Appendix C**. Although for some periods and types of temporary construction noise will be noticeable, with adequate controls impacts can be minimized;
- Pre-construction consultation, vibration monitoring, and site inspections will likely be required. Monitoring will be required during construction; and
- Post construction Noise and Vibration measurement will be undertaken to confirm "no adverse impact" as predicted in the noise and vibration impact analysis undertaken as part of this process (see **Appendix C**).

#### **6.4 Consultation**

Section 6.12 of the 2009 EPR includes a commitment for continued consultation between the Proponent and the public, property owners and stakeholder agencies (including Town of Richmond Hill, York Region Police, Fire and other emergency service providers) during the detailed design of the Transit Project, including the TSF and ancillary facilities proposed in this EPR Addendum.

#### **6.5 Sustainable Development**

As part of a separate environmental initiative, TTC has developed an Environmental Plan which will guide all TTC projects in terms of sustainable development.

York Region has also developed a Sustainability Strategy which will influence the detailed design phase of this project.

#### **6.6 Canadian Environmental Assessment Act (CEAA) Monitoring**

The 2009 EPR included a commitment to monitor the YSE project for potential *Canadian Environmental Assessment Act* triggers, as was appropriate given the legislative framework at the time. On July 6, 2012 an updated *Canadian Environmental Assessment Act* (CEAA) came into effect. With the revisions in 2012 CEAA has undergone significant changes and is no longer "trigger" based and instead focuses on assessment of "designated projects" as defined by the *Regulations Designating Physical Activities*.

After reviewing the *Regulations Designating Physical Activities*, it is understood that the proposed works are not considered to be a "designated project". Therefore, a formal assessment under the *Canadian Environmental Assessment*

*Act* (2012) is not required. CEAA 2012 also outlines requirements for determination of the likelihood of significant environmental effects for a physical activity that is carried out on federal lands, or outside Canada, in relation to a physical work and that is not a designated project<sup>8</sup>. As the proposed works outlined in this EPR Addendum will not be carried out on federal land the associated federal significance determination is not required.

Readers interested in obtaining additional information about the CEAA (2012) are encouraged to refer to: [www.ceaa-acee.gc.ca](http://www.ceaa-acee.gc.ca).

YRRTC and TTC will continue to monitor the Transit Project for potential CEAA requirements, and, in the event that the CEAA applies to the Transit Project, YRRTC and TTC will consult with the appropriate federal agencies during design.

## **6.7 Mechanism for Changes to the Approved Plan**

The Project presented in this EPR Addendum is not a static plan, nor is the context in which it is being assessed, reviewed, approved, constructed, and used. Given the potential for changes to the Project resulting from the approvals, detailed design, and construction processes, it is prudent to include in the EPR Addendum a comment on the responsibilities of the proponent should changes be required in the Project. The following sections outline how such changes will be addressed.

### **6.7.1 Design Refinements**

This EPR Addendum identifies the impacts associated with the Project presented herein, and the property envelope within which the Project can feasibly be constructed. The actual layout of project elements are subject to detailed design and any variation from that shown in this EPR Addendum, unless it results in an environmental impact which cannot be accommodated within the committed mitigation measures, do not require additional approval under O. Reg 231/08.

### **6.7.2 TPAP Addendum Process**

If a significant change is made to the project that is inconsistent with the approved Project documented in the 2009 EPR or this EPR, an Addendum must be prepared that follows the process outlined in O. Reg. 231/08, Section 15.

If the proposed change is significant, a Notice of Environmental Project Report Addendum will be issued in accordance with O. Reg. 231/08, including publication in the local newspaper(s) and posting the notice online. The notice must also be provided to the Ministry of the Environment and Climate Change (Regional Director and Director of the Environmental Assessment and Approvals Branch), every property owner within 30 metres of the site of the change,

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<sup>8</sup> For additional information see the Canadian Environmental Assessment Agency Operational Policy Statement: Projects on Federal Lands and Outside Canada under the *Canadian Environmental Assessment Act, 2012* (available online at: <https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=816DD520-1>)

Aboriginal communities that were given a Notice of Commencement, and any other person who the proponent thinks may be interested in the change to the transit project.

If the proposed change is not significant the Addendum will be documented and placed in the proponent's file.