ENIRONMENTAL STUDY REPORT

HIGHWAY 410 EXTENSION

From Bovaird Drive to Highway 10 (Main Street)

City of Brampton and the Town of Caledon
Regional Municipality of Peel

Prepared for The Ministry of Transportation by:
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October, 1999

EXECUTIVE SUMMARY

The Ministry of Transportation as proponent and Cole, Sherman & Associates Ltd., consultant, have conducted a Class Environmental Assessment Study to assess the impacts associated with extending Highway 410 from Bovaird Drive to Highway 10.

An Environmental Assessment Report (EAR) for the extension of Highway 410 was completed in 1989. During the mid-1990's, MTO updated the EAR to meet current environmental standards and to assess whether such an update would impact the original recommended route. This update confirmed that the original route was the preferred alternative. The Environmental Assessment Report (dated August 1995) received approval from the Minister of the Environment on March 5th, 1997.

Following approval, MTO undertook a value engineering exercise. The purpose of this exercise was to analyze the functional requirements of the project to provide essential functions at the lowest life-cycle cost. This resulted in changes to the alternative approved under the Environmental Assessment Act. Changes included narrowing the right-of-way through the provision of a concrete centre median barrier and minor interchange reconfigurations.

The amendment process for dealing with changes to the approved design was outlined in the Environmental Assessment Report (1995). MTO is required to conduct further design of the affected components in accordance with the Provincial Highways Class Environmental Assessment (Class EA) process. To comply with the amendment procedure, this project is being planned to meet the requirements of a Group 'B' undertaking under the Class EA process.

Two alternative methods of carrying out the undertaking were considered. These alternatives include the approved route identified in the 1995 Environmental Assessment (EA) Report (Alternative 1) and the refined alternative based on the Value Engineering Study (Alternative 2).

The alternatives were evaluated based on impacts to the natural, social, economic and cultural environments, agriculture, land use and transportation. Alternative 1 and Alternative 2 maintain the same basic alignment and configuration. As such, the impacts associated with the alternatives were relatively similar. However, Alternative 2 is approximately 15% less expensive to construct than Alternative 1, and is approximately 10% less expensive with respect to property acquisition costs.

The Preferred Alternative (Alternative 2) for the Highway 410 Extension consists of:

- A 4-lane limited access freeway;
- Ultimate 6 lanes from Bovaird Drive to Mayfield Road;
- Full Interchanges at Bovaird Drive, Sandalwood Parkway, Mayfield Road and Valleywood Boulevard;
- An urban median;
- Mayfield Road shifted to the north;

- 4-lane crossing road structures at Sandalwood Parkway, Mayfield Road and Valleywood Boulevard, and 2-lane structures at Countryside Drive, Heart Lake Road and Kennedy Road;
- A 70 metre, two-span (2 x 35 metres) structure with centre pier at the Etobicoke Creek crossing.
- Full illumination (median high-mast) from Bovaird Drive to Mayfield Road, at the Valleywood interchange, and at the transition to Highway 10.

The following summarizes the environmental impacts associated with the proposed alignment for the Highway 410 Extension:

Socio-Economic Environment

- Displacement of 4 residences and 2 businesses;
- Removal of heritage resources including 1 farmstead and 1 barn shed (2 properties impacted);
- Property impacts to 5 residences;
- A noise level increase of 5.0 to 9.9 dBA for 73 to residences.

Natural Environment

- Loss of one small wetland;
- Low to moderate impacts to vegetation, wetlands, wildlife, fish and aquatic habitat soils and environmentally sensitive areas (ESA's).

Agriculture

- One land-locked severance;
- Two internal access routes affected;
- Property impacts to 13 agricultural properties and inter-farm movement;

Transportation

- Improved transportation network;
- Flexible for construction staging and future expansion.

Land Use

- Minor impacts to approved development and proposed land use changes.

Cost

- Overall cost (construction and property acquisition costs) of approximately $58 million.

During the planning process, issues and concerns were raised by TRCA, the Town of Caledon, City of Brampton and local residents. The following chart summarizes the concerns of members of the public, government agencies and ratepayer groups and how they are affected or mitigated by the preferred alternative.

CONCERN	STAKEHOLDER	RESPONSE/MITIGATION
Configuration of the Highway 410 / Highway 10 / Valleywood interchange. Would like to see a north / south movement on Highway 10 given priority.	Town of Caledon, City of Brampton, Local Residents	Based on meetings with municipal representatives it was agreed that the design approved in the original EA could be improved by making the channelized right turn into a lane-away. An additional lane may be added in the future if necessary (as). The City of Brampton and Town of Caledon would like MTO to construct this additional lane during initial construction of the interchange. MTO has protected for this future improvement however it will not be constructed as part of this project because traffic volumes do not warrant it at this time.
Concerned about a possible extension of Highway 410 to the west of Highway 10, swinging south to connect to Mayfield Road.	Town of Caledon	This is a long-term land use issue and not appropriate for this study. There are no plans to further extend Highway 410 beyond the present proposal.
Highway 410 / Sandalwood Parkway interchange ramp from Highway 410 southbound should connect to Sandalwood Parkway rather than Heart Lake Road.	City of Brampton, Local Residents	This would place the ramp terminal too close to the intersection between Heart Lake Road and Sandalwood Parkway (thereby precluding future traffic signals at this terminal).
Potential for future widening (if necessary) of Sandalwood Parkway, Countryside Drive, Heart Lake Road, and Kennedy Road.	Town of Caledon	Future expansion of roadways can be accommodated within the design of the structures over Highway 410.
Impacts to floodlines associated with the structure crossing the Etobicoke Creek.	TRCA, MNR	There is a slight increase in water levels. The flood elevation returns to existing levels approximately 400 metres upstream of the bridge. To reduce the impacts to floodlines a 70 metre twin span bridge (2 X 35 metre with centre pier) has been incorporated into the design to satisfy requests forwarded by TRCA and MNR. Proposed floodlines are contained well within the existing valley and within TRCA property.
Effect on wildlife crossing in the vicinity of the Etobicoke Creek Valley.	TRCA, MNR, Local Residents	Provide a 70 metre twin span bridge (2 x 35) with a vertical clearance of 4 metres to mitigate the barrier effect of the highway to wildlife movement.
Possible impact to fish habitat resulting from bridge construction over the Etobicoke Creek.	TRCA, MNR, Local Residents	Utilize careful construction practice, particularly on the west bank (delineate a construction setback) to minimize impacts during construction. Design bank stabilization as required to replace fish habitat. Consult with MNR and DFO during construction to develop a compensation strategy.

CONCERN	STAKEHOLDER	RESPONSE/MITIGATION
Lowering the Grade of Highway 10.	Local Residents	Lowering the grade of Highway 10 has not been recommended due to its impacts to residential and commercial property, construction and property acquisition costs, existing utilities and drainage.
Concern with having only a single access to the Valleywood subdivision.	Local Residents	The recommended configuration and alignment of the Highway 410 extension does not remove any existing accesses to the Valleywood subdivision. Although this access will be modified, the availability of access/egress for Valleywood is unchanged. Plans for a secondary access to the subdivision are the responsibility of the Town of Caledon.
Noise in the vicinity of the Valleywood subdivision.	Local Residents	The preferred alignment was identified in 1988 and endorsed by the Town of Caledon. The Secondary Plan for the area identifies the Highway 410 alignment. As part of the conditions of approval for development, the developer has accepted the responsibility of noise mitigation for the development (for existing Highway 10 and the proposed Highway 410). Construction noise will be addressed in adherence to MTO / MOE Noise Protocol.

Any changes to the commitments in this ESR will be documented in an ESR addendum and will be subject to a 10 day public review period and opportunity for "bump-up" following newspaper notification of the same. Depending upon relative timing of the 45 day ESR review period and the 10 day addendum review period, the review periods may be either concurrent or consecutive.

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APPENDICES

EXHIBITS

TABLES

THE PUBLIC RECORD

Copies of this document have been sent to the following locations:

Ontario Ministry of Environment
Halton Peel District Office.
1182 North Shore Boulevard East, 1st Floor
Burlington, Ontario
L7R 3Z9

Ontario Ministry of Transportation
Central Region
Planning and Environmental Section
Atrium Tower, 3rd Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Office of the Clerk
The Regional Municipality of Peel
10 Peel Centre Drive
Brampton, Ontario
L6T 4B9

Brampton Public Library
4 Corners Brampton
65 Queen E.
Brampton, Ontario
L6W 3L6

Caledon East Branch Public Library
6500 Old Church Road
Box 286
Caledon East, Ontario
L0N 1E9

Cole, Sherman & Associates Ltd.
75 Commerce Valley Drive East
Thornhill, Ontario
L3T- 7N9

Office of the Clerk
The Town of Caledon
P.O. Box 1000, 6311 Old Church Rd.
Caledon East, Ontario
L0N 1E0

Office of the Clerk
City of Brampton
2 Wellington Street West
Brampton, Ontario
L6Y 4R2

Brampton Public Library
Chinguacousy Resource Branch
150 Central Park Drive
Brampton, Ontario
L6T 2T9

1.0 The Environmental Study Report

This Environmental Study Report (ESR) is prepared in compliance with the requirements of the Provincial Highway Class Environmental Assessment (1992) which has been accepted and approved under the Environmental Assessment Act.

The ESR documents the environmentally significant aspects of the planning, design, and operation of a specific Group "B" project which falls within the definition of the Class. It includes a description of the project and its purpose, specific environmental effects and mitigation measures, and committed monitoring procedures associated with the implementation of the project.

This ESR has been prepared to amend the approved Environmental Assessment Report (EAR) which received approval from the Ministry of the Environment on March 5th, 1997. The amendment process for dealing with changes to the approved design was outlined in the EAR. MTO is required to conduct further design of the affected components in accordance with the Provincial Highways Class Environmental Assessment (Class EA) process. To comply with the amendment procedure, this project is being planned to meet the requirements of a Group 'B' undertaking under the Class EA process.

Other aspects of this class of undertaking, such as the environmental assessment process, are contained in the Provincial Highways Class Environmental Assessment (1992). Readers interested in these matters are encouraged to refer to that document.

The information contained in this report describes the design of the selected alternative. Upon approval of this report and the conditions outlined in it, the project may proceed to construction pending the availability of funds.

In addition, detailed background information is contained in the environmental study file. The Project Manager or Environmental Planner is available to discuss this information and can be contacted as follows:

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You may also contact the following Ministry of Transportation representatives:

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Fax (416) 235-4940

2.0 Project Summary

2.1 DESCRIPTION OF THE PROJECT

An Environmental Assessment Report (EAR) for the extension of Highway 410 was completed in 1989. During the mid-1990's, MTO updated the EAR to meet current environmental standards and to assess whether such an update would impact the original recommended route. This update confirmed that the original route was the preferred alternative. The Environmental Assessment Report received approval from the Minister of the Environment on March 5th, 1997.

Following approval, MTO undertook a value engineering exercise. The purpose of this exercise was to analyze the functional requirements of the project to provide essential functions at the lowest life-cycle cost. This resulted in proposed changes to the alternative approved under the Environmental Assessment Act. Changes included narrowing the right-of-way through the provision of a concrete centre median barrier and minor interchange reconfigurations.

The amendment process for dealing with changes to the approved design was outlined in the Environmental Assessment Report (1995). MTO is required to conduct further design of the affected components in accordance with the Provincial Highways Class Environmental Assessment (Class EA) process. To comply with the amendment procedure, this project is being planned to meet the requirements of a Group 'B' undertaking under the Class EA process.

This project involves the extension of Highway 410 from Bovaird Drive to Highway 10.

2.1.1 Location

This project is located in the City of Brampton and Town of Caledon within the Regional Municipality of Peel. The study area is bounded on the west by the Canadian Pacific Railway, on the north by the property line between Lots 25 and 26, on the east by mid-concession of Concession 3 E.H.S. (East of Hurontario Street), and on the south by Bovaird Drive.

2.1.2 Engineering and Design Features of the Proposed Extension

The proposed undertaking is an 8.5 kilometre long four-lane limited access freeway (ultimately to be widened to 6 lanes from Bovaird Drive to Mayfield Road), which includes the following major features:

- Full interchanges at Bovaird Drive, Sandalwood Parkway, Mayfield Road and Valleywood Boulevard;
- Mayfield Road shifted to the north;

- An urban median;
- Four-lane crossing road structures at Sandalwood Parkway, Mayfield Road and Valleywood Boulevard, and two-lane structures at Countryside Drive, Heart Lake Road and Kennedy Road;
- A 70 metre (2 X 35 twin span) structure at the Etobicoke Creek Valley crossing;
- Provision for full illumination (median high-mast) from Bovaird Drive to Mayfield Road, at the Valleywood interchange, and at the transition to Highway 10;
- Ultimate six-lane freeway (from Bovaird Drive to Mayfield Road).

The roadway facility will result in the completion of a continuous highway link through the central area of the Regional Municipality of Peel. Between Bovaird Drive and Mayfield Road in the City of Brampton, the facility will be located to the east of Heart Lake Road. North of Mayfield Road in the Town of Caledon, the facility will be located in the general vicinity of the property line between Lots 18 and 19. It will connect existing Highway 410 at Bovaird Drive to existing Highway 10 north of Snelgrove. The Proposed Design is illustrated on **Exhibit 2.1A and B.**

Chapter 3 summarizes the environmental effects associated with the preferred alternative and proposed mitigation measures.

2.2 PROJECT JUSTIFICATION AND PURPOSE

Brampton is currently one of the fastest growing municipalities in the Greater Toronto Area. Existing traffic volumes to the north of the present terminus of Highway 410 at Bovaird Drive result in significant congestion to the existing roadway network. Future growth in Brampton will result in as much as a threefold increase in traffic volumes (By 2011). This growth, coupled with the existing problems, necessitates major improvements to the existing roadway network.

As a part of the 1995 Environmental Assessment, numerous alternatives were considered (see Section 2.4). The alternatives were evaluated based on impacts to the natural, social, economic and cultural environments. An extension of Highway 410 was identified as the preferred alternative based on this evaluation.

The purpose of this study is:

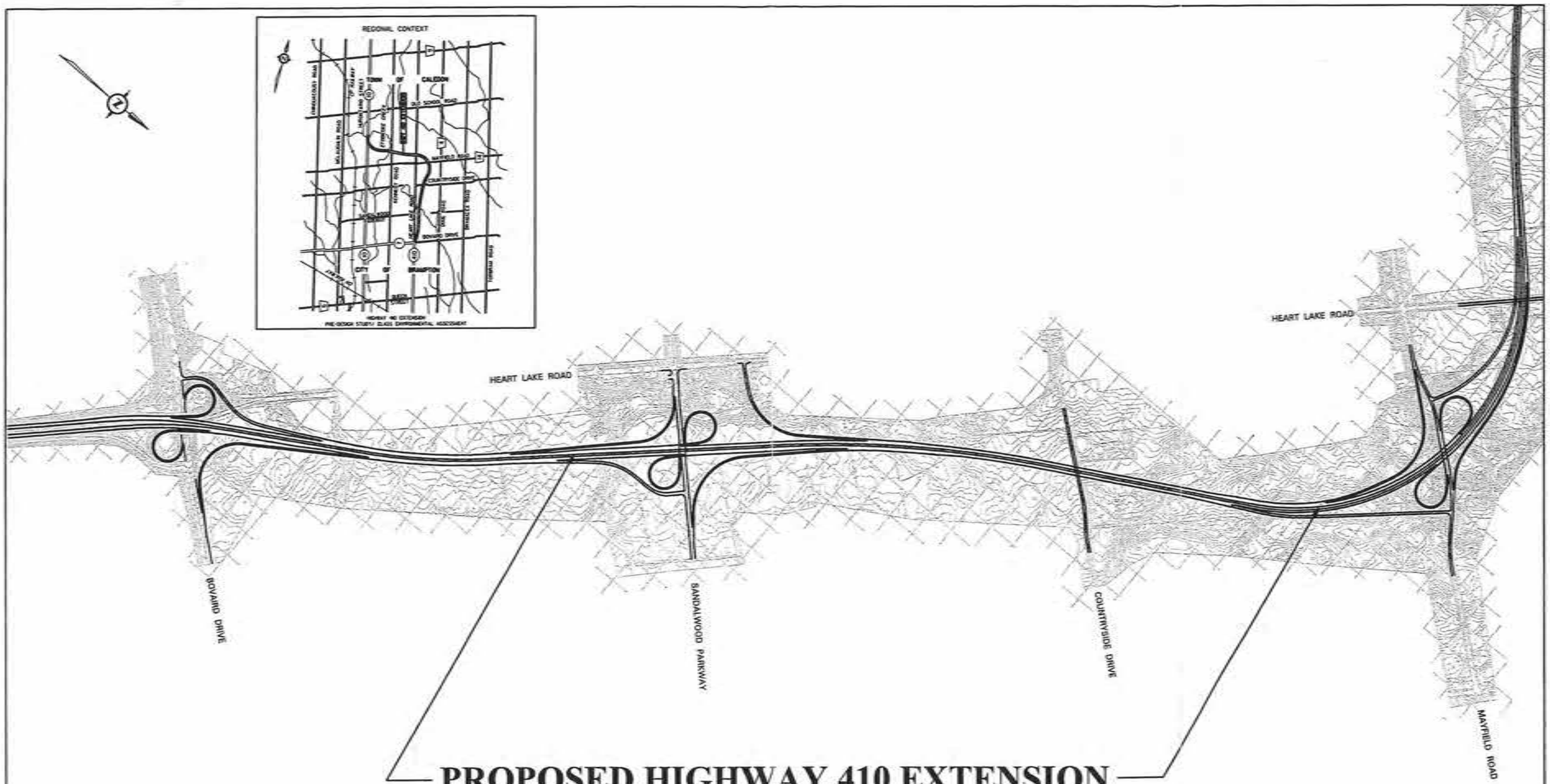
- To document the measures taken to meet the conditions of EA approval including the following:
  1.) Review the design of the Etobicoke Creek crossing;
  2.) Undertake further assessment of noise impacts and potential for mitigation;
  3.) Follow the Provincial Highways Class Environmental Assessment process for significant new concerns.
- To accommodate minor changes to the highway design as approved in the Environmental Assessment Report (August 1995); and
- To seek Environmental Assessment (EA) approval for those changes.

2.3 SIGNIFICANT ENVIRONMENTAL FEATURES

The project area is both urban and rural in character and consists of residential, commercial, industrial and agricultural uses as well as some significant natural features.

2.3.1 Natural Environment

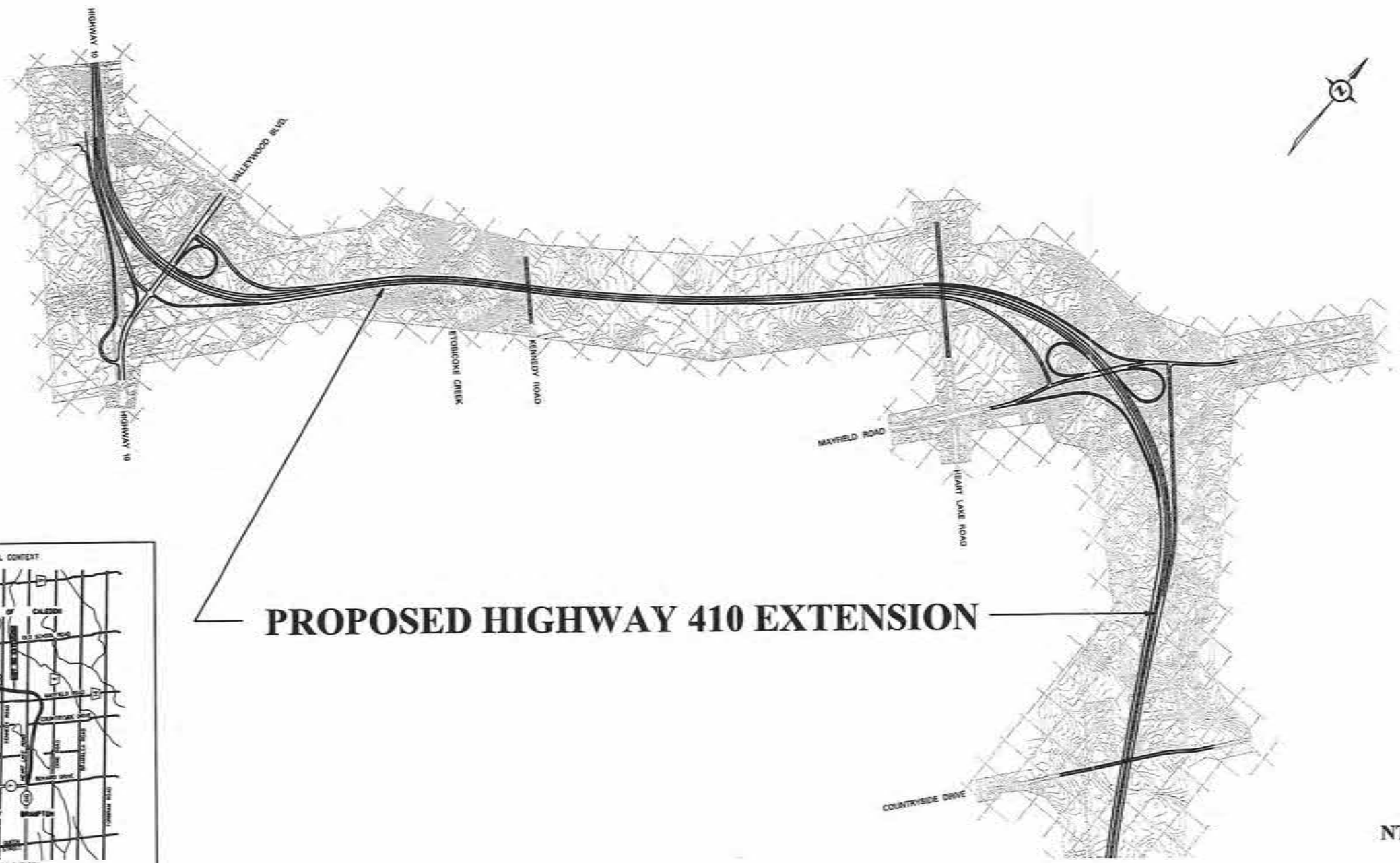
The study area was assessed for features of natural environmental significance through previous environmental assessment work, site investigation, aerial photography and correspondence with the MNR, TRCA, Region of Peel, City of Brampton and the Town of Caledon.

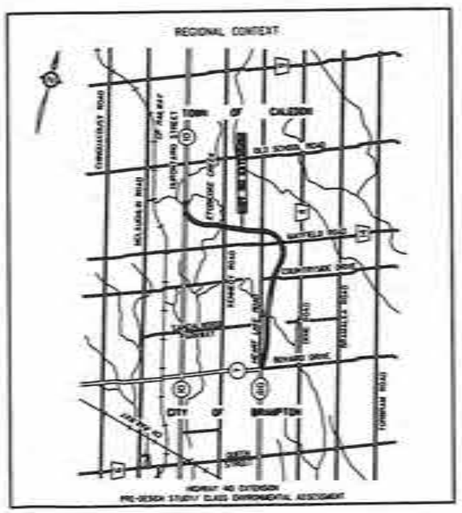


PROPOSED HIGHWAY 410 EXTENSION

NTS

Ontario COLE, SHERMAN	**HIGHWAY 410 EXTENSION** **PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT** **FROM BOVAIRD DRIVE TO HIGHWAY 10** **W.P. 22-79-00**	**Proposed Design**	EXHIBIT NUMBER **2.1 A**





NTS

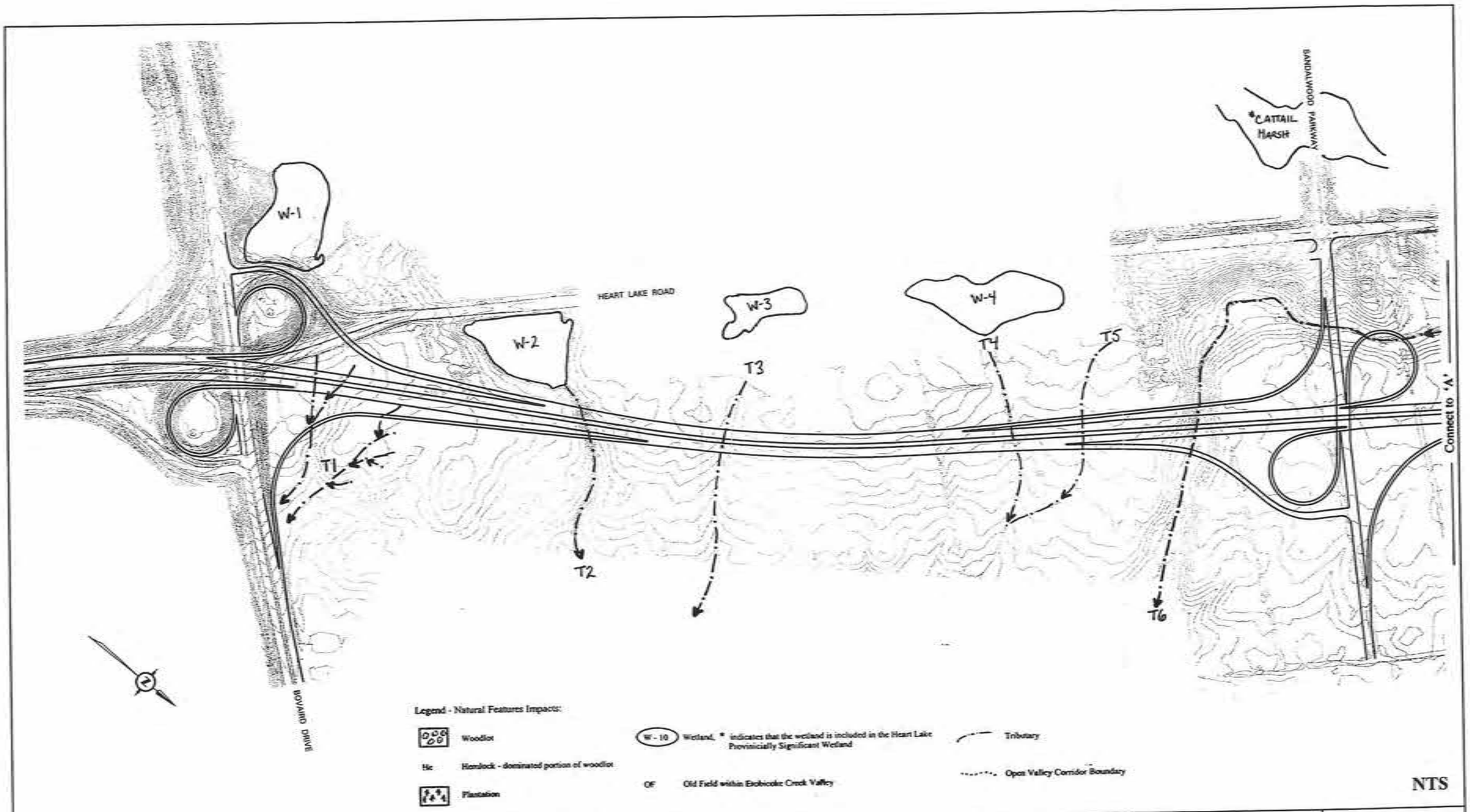
Ontario

COLE, SHERMAN

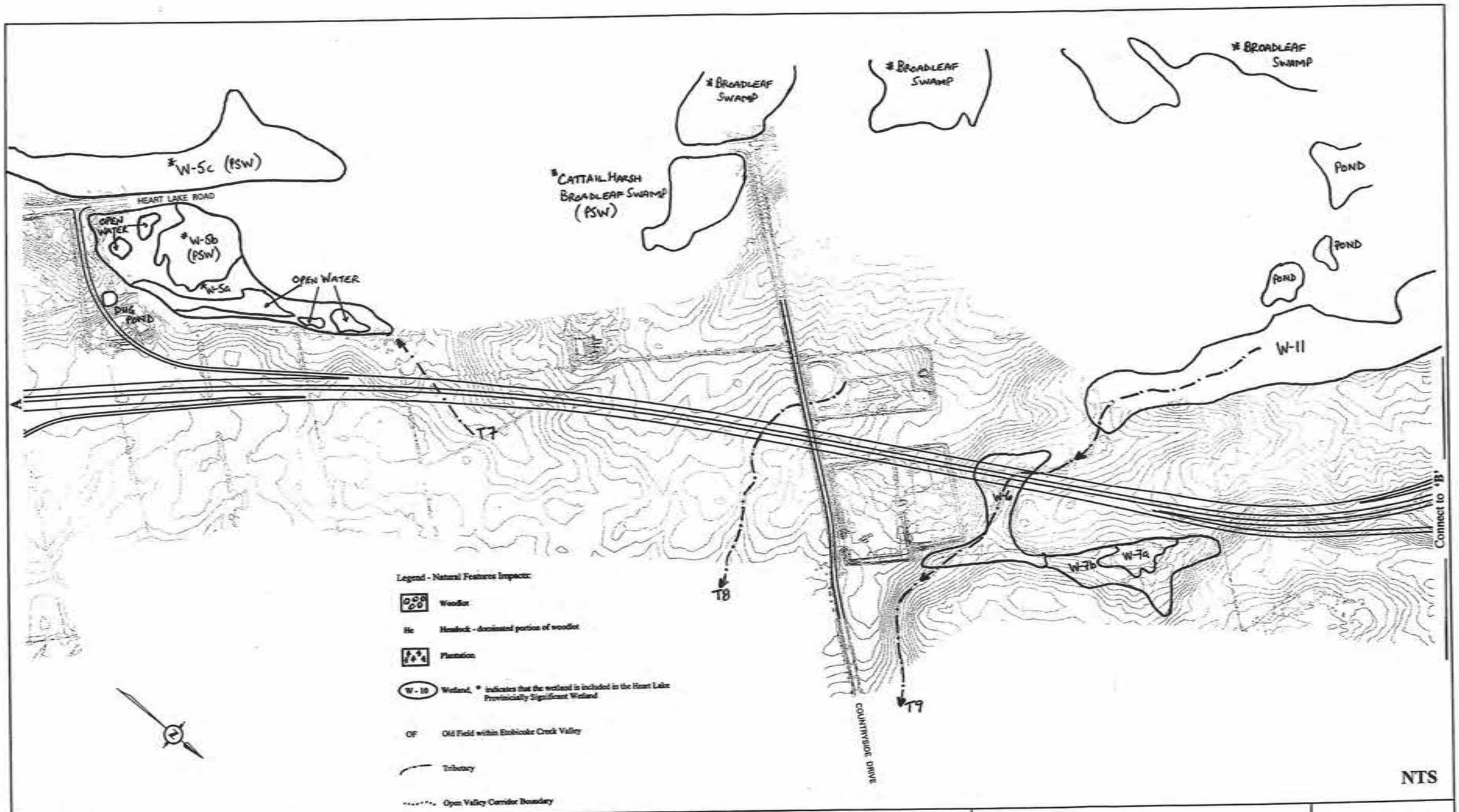
HIGHWAY 410 EXTENSION
PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT
FROM BOVAIRD DRIVE TO HIGHWAY 10
W.P. 22-79-00

Proposed Design

EXHIBIT NUMBER
2.1 B



Ontario COLE SHERMAN	**HIGHWAY 410 EXTENSION** **PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT** **FROM BOVAIRD DRIVE TO HIGHWAY 10** **W.P. 22-79-00**	**Natural Environment**	EXHIBIT NUMBER **2.2 A**



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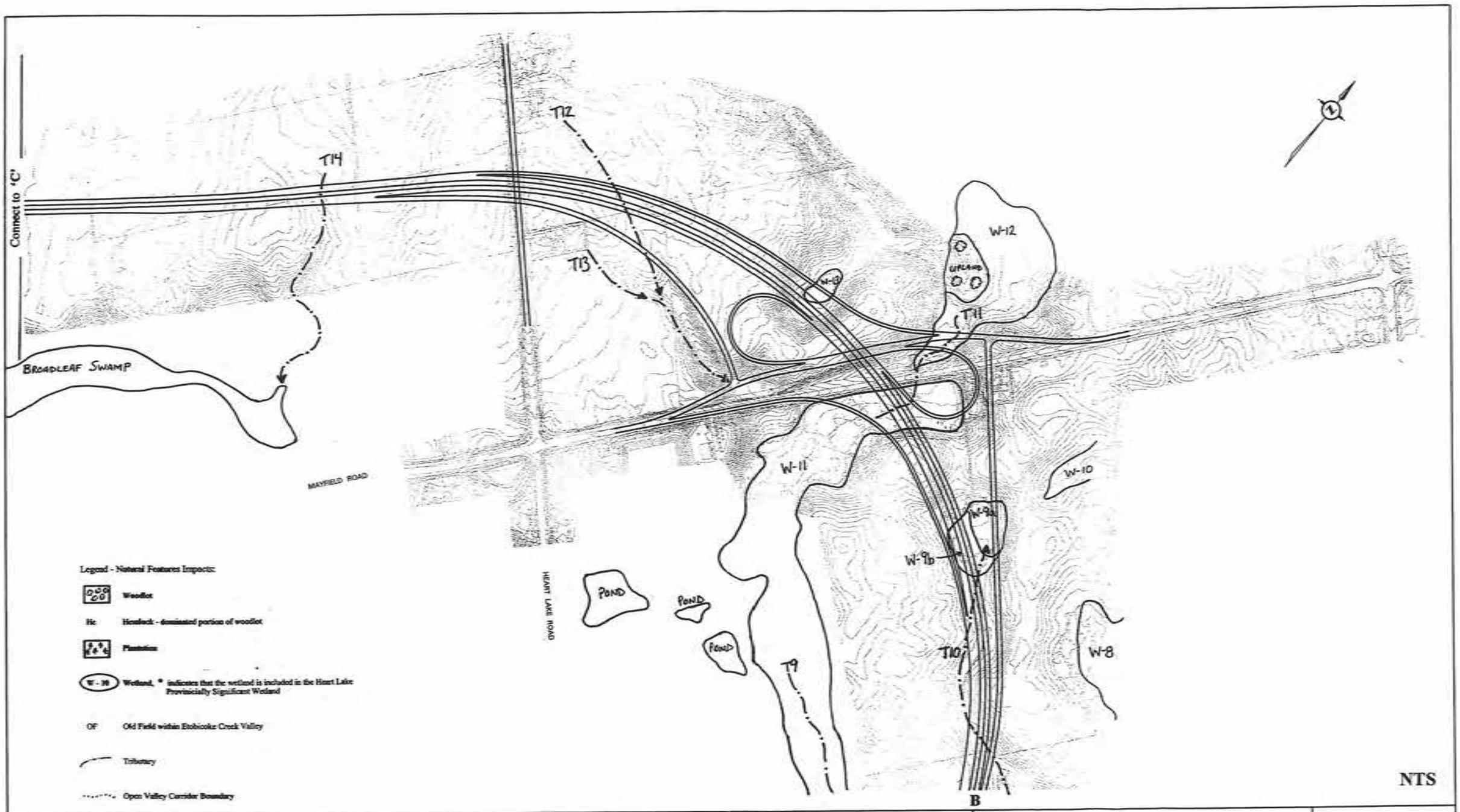


NTS

Ontario

COLE, SHERMAN

HIGHWAY 410 EXTENSION

PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT

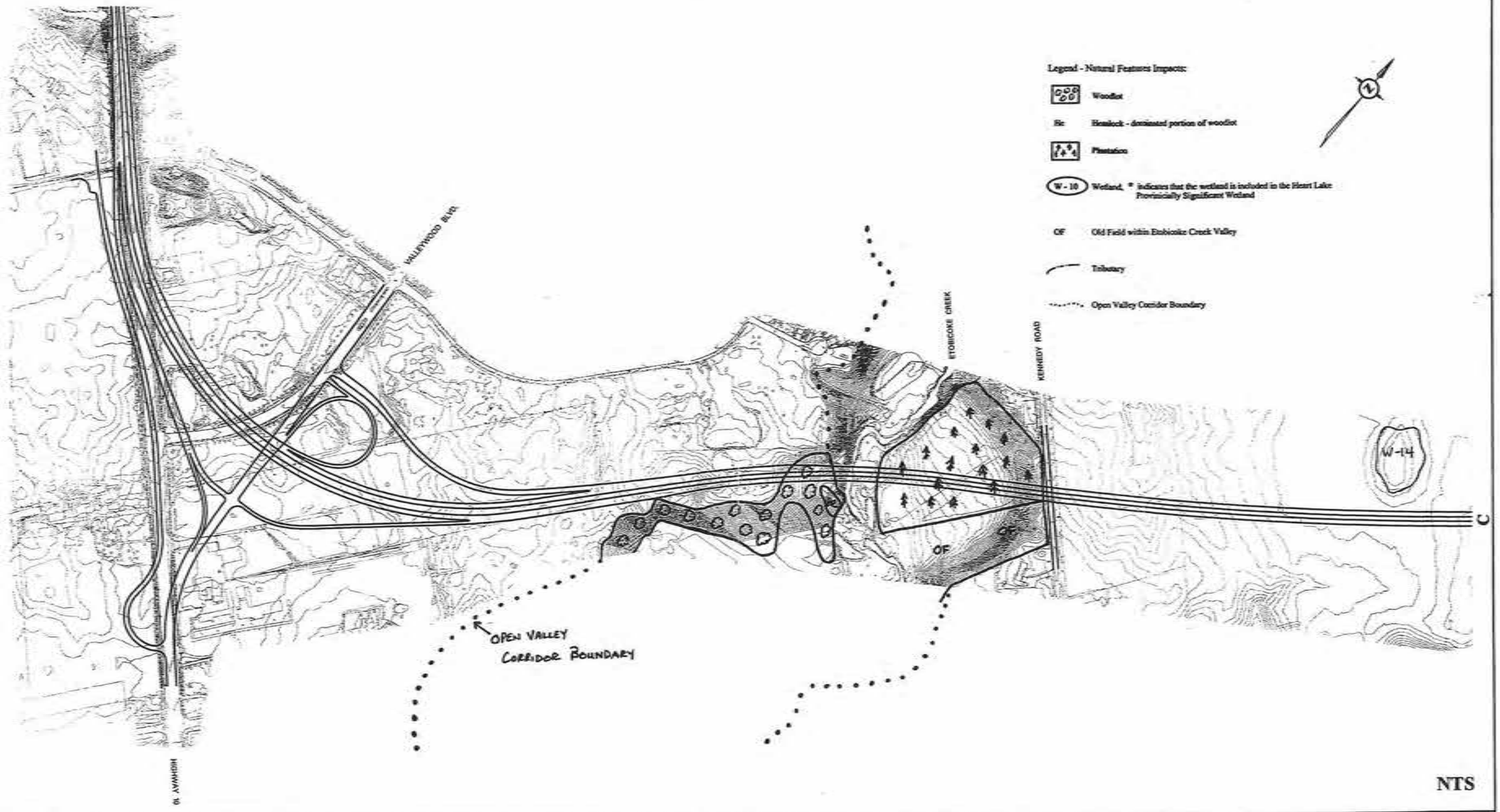
FROM BOVAIRD DRIVE TO HIGHWAY 10

W.P. 22-79-00

Natural Environment

EXHIBIT NUMBER

2.2 C



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Ontario COLE SHERMAN	**HIGHWAY 410 EXTENSION** **PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT** **FROM BOVAIRD DRIVE TO HIGHWAY 10** **W.P. 22-79-00**	**Natural Environment**	EXHIBIT NUMBER **2.2 D**

2.3.1.1 Physiographic Setting

To complete the hydrogeological analysis of the undertaking, existing information was reviewed and reconnaissance level field investigations of the proposed route alignments were undertaken. The purpose of the field investigations was to confirm existing land uses and to identify properties likely to have private wells. The existing information reviewed includes air photos, well records, geologic maps and reports and background reports prepared for the 1995 EA. In addition, the Regional Municipality of Peel was contacted to obtain the future sewage and water services planned for the area and the approximate timing for the implementation of these services.

An updated well record summary was obtained from the Ministry of the Environment (MOE).

The methodology and approach used is consistent with the original approved Environmental Assessment. Wells within 100 m of the centerline of the proposed alternatives were plotted from the well record summary information provided by the MOE. The reconnaissance field investigations confirmed the land uses within this area. It was assumed that each property with residences and/or buildings within 100 m of the highway centerline was serviced by a private well. The same assumption was made for both Alternatives for purposes of comparison and represents a worst case scenario. It is recognized that some of the properties, especially the ones with more recently completed buildings, are serviced by municipal water.

The evaluation of soil conditions with respect to susceptibility to erosion was conducted from existing soils information provided in the previous Environmental Study Report. No field checking was undertaken for this assignment.

The proposed highway alignment alternatives cross a glacial till plain, known as the Halton Till, which is underlain by fine grained silt to clayey silt (Karrow and Easton, 1990; White 1975). Directly to the west of the proposed alignment alternatives, on the west side of Heart Lake Road, is the Brampton Esker, a geologic feature consisting of sands and gravels. Eskers are formed from glacial meltwater channels beneath melting glaciers and are typically long, linear features. The surface of the Brampton Esker has been modified by the readvance of the glacier, which buried the esker beneath glacial till. In addition, blocks of ice were trapped in the esker and tills, which melted after the retreat of the glacier, creating isolated topographic depressions or kettle holes. These topographic depressions have been filled with fine grained silt and clay, as well as organic soil. Disturbance to the kettle lakes has been identified as a significant issue.

Sands and gravels of the Brampton Esker occur beneath the Halton Till. Well record information indicates that the extent of buried sands and gravels associated with the esker are confined mostly to the area on the west side of Heart Lake Road, although they may extend laterally towards the alignments.

These deposits have historically been exploited as a source of aggregate for construction purposes and some areas have been excavated to below the water table resulting in the creation of ponds.

The silt till does not readily transmit groundwater, consequently the area is considered to have relatively low susceptibility to contamination. The silt till soil beneath the proposed alignments acts as a protective layer to the underlying sands and gravels which provide groundwater to local wells.

The main soil type within the proposed alignments is the Oneida soil series. These soils are considered to have a medium erosion potential. The alignments do not cross soils having high erosion potential (i.e., Fox and Brookton soil series).

2.3.1.2 Fisheries and Aquatic Habitat

The study corridor crosses three subwatersheds of Etobicoke Creek. Tributaries to the east and south of Mayfield Road drain toward Spring Creek, which converges with Etobicoke Creek approximately 10 km south in the Lester B. Pearson Airport Lands. One small tributary enters the Heart Lake Drainage which appears to have no surface connection to Etobicoke Creek but is within the catchment and may be connected by groundwater. The third subwatershed is the Etobicoke Creek proper. A total of 14 ephemeral tributaries and one permanent stream, the Etobicoke Creek, are crossed by the Highway 410 Corridor (**Exhibit 2.2**). A summary of their characteristics is contained in Table 1 as exerpted from the 1995 Environmental Assessment Report and verified in the fall of 1998 by a review of 1997 air photographs and field visits. With the exception of Etobicoke Creek, all of the tributaries were found to be dry or with features that would suggest seasonally dry conditions (e.g. vegetated bed of the watercourse). Tributaries T1 and T2 had been altered in 1998 for pending land development. All of the tributaries to the east and south of Countryside Drive (8) are also intended to be altered for the urban drainage system to be implemented with planned development. Only one major overland flow route through the Springdale Secondary Plan Area (Rand, 1991) will be retained, roughly coincident with Tributary T6.

The fish community associated with the tributaries in the study corridor were assessed from the following sources: MNR District Fisheries Management Plan (1988), MNR Resource Mapping 1:50,000 (1985), MTRCA Snelgrove Tract Report (1984), Smith-Hoffman (1989), Steedman (1987) and Ecoplans (1994). No further fishing was conducted as part of this assessment as the previous data were sufficient to characterize the community and its sensitivity to the highway.

Of the 14 ephemeral tributaries, eight were considered to have no fish habitat as the channel was ill defined, there was no water at any time during field observations, and they were typically farmed through. The remaining six tributaries were considered (Ecoplans 1994) to have no permanent fish habitat

(T2, T4, T6, T8, T9, T10, and T11, refer to Table 1), although some were observed to be wet in the fall of both 1993 and in 1998. The Ministry of Natural Resources (MNR) has classified all of the ephemeral watercourses as not supporting fish or fish habitat. The quality of the channels, lack of connection with downstream reaches and water flow, and poor refuge characteristics, support this designation. The characteristics of each tributary are described in Tables 1 and 2.

Only Etobicoke Creek was determined to have fish habitat based on channel characteristics, permanence of flow and fish community observations. The crossing location is characterized as having a riffle-pool morphology with well vegetated banks, although some minor erosion was occurring. Substrates are generally gravel and cobble. Stream width varied from 1 m to 7 m with observed water depths of 20 to 80 cm.

Measurements of the meander belt width of the Etobicoke Creek were made from the 1998 photos according to the definition of meander belt "the greatest distance perpendicular to the valley trend that the channel migrates within". Depending on the point that is taken to start and stop the measurement, the results can vary. However, on eight measurements, upstream, downstream and through the crossing area, the meander belt width ranged from 50 m to 200 m (200, 150, 50, 100, 100, 80, 140, 120). Clearly, the bulk of the measurements hovered over 100 m (average 117 m). The width of the meander belt in the exact location of the Highway 410 crossing is 80 metres with the critical area approximately 50-60 metres in width where a potential meander cut could occur. Meander belt width is one criterion used when considering the necessary width of the crossing structure.

No additional fishing was conducted at Etobicoke Creek for this update. Steedman (1987) (reported in the 1995 EA Report) surveyed Etobicoke Creek just downstream of the bridge crossing at Mayfield Road and found a warmwater community dominated by creek chub (*Semotilus atromaculatus*), common shiner (*Luxilus cornutus*), bluntnose minnow (*Pimephales notatus*), white sucker (*Catostomus commersoni*), blacknose dace (*Rhinicthys atratulus*) and johnny darter (*Etheostoma nigrum*). A smaller representation of rock bass (*Ambloplites ruprestris*), brown bullhead (*Ameiurus nebulosus*), blacknose shiner (*Notropis heterolepis*), golden shiner (*Notemigonus crysoleucas*), fathead minnow (*Pimephales promelas*) and brook stickleback (*Culaea inconstans*) were also found. The community was considered to represent fair quality habitat based on the Index of Biotic Integrity (Steedman 1987) becoming poor quality with increasing distance downstream.

There were no species considered to be vulnerable, threatened or endangered (VTE). Although the blacknose shiner is not common in the area, one specimen was located during the 1984 and 1985 surveys. None have been recorded in the study area since.

The significance and sensitivity of each Tributary is summarized in Table 2.

2.3.1.3 Terrestrial

Extensive existing terrestrial inventory for the Study Area was available from background reports prepared as part of the 1995 Environmental Assessment Report (Landplan, 1984; Smith, Hoffman and Associates Limited, 1989; Ecoplans, 1993). These reports were prepared using aerial photography (1:10,000), topographic maps (1:50,000), Ontario Base Maps (1:10,000), reports and information on file with the City of Brampton, the Toronto and Region Conservation Authority, and the Town of Caledon, in addition to field investigations in 1993 and 1984. Gartner Lee Limited reviewed the latter two reports, and field checked that the reporting was accurate in the fall of 1998.

a Vegetation

Very little natural vegetation remains within the Study Area as it has been intensively farmed for some time, and with the preparation of plans of subdivision for residential development, large areas have been graded east of Heart Lake Road. The largest area of natural vegetation is contained within the Heart Lake Conservation Area located to the west of Heart Lake Road, together with the valleylands of the west branch of Etobicoke Creek. Both features are surrounded by existing residential subdivisions.

Within the Study Area, most of the vegetation is confined to the wetlands identified on **Exhibit 2.2**. In some cases, the wetlands include small portions of adjacent upland vegetation. The only portion of forest that was identified as a significant issue with respect to non-wetland vegetation is the forested area on the east side of the Etobicoke Creek Valley which includes a grove of mature Eastern Hemlock.

b Wetlands

The following data sources were reviewed in the previous environmental reports: Ontario Ministry of Natural Resources Wetland Evaluations, Peel County Soil Survey Report No. 18, Environmental Component for the Environmental Assessment Report One Stage Submission Extension of Highway 410, Stormwater Management Report (provided in the Environmental Assessment Report, August 1995), and City of Brampton Official Plan Review (1992). Gartner Lee confirmed the reports through interpretation of recent aerial photography and reconnaissance level field investigations in the fall of 1998.

Fourteen wetlands were identified within the Study Corridor (Table 3). Detailed descriptions are provided in the Environmental Assessment Report (1995). Since 1994, wetland W13, a disturbed livestock pond, has been filled as a result of earth moving activity unrelated to highway construction, and is not counted in this assessment.

Most of the wetlands are kettles; relics of glaciation that left depressions in the overburden which filled with fine silts, trapping groundwater resulting in the

development of wetland vegetation. The wetlands are a mixture of marshes and swamps, but several are drowned bogs or fens, with deep peat accumulations. Many of them are included in the provincially significant Heart Lake Wetland Complex. The largest unit of the complex is Heart Lake Bog, located west of the Study Area and will not be affected by the highway. Within the Study Area, wetlands W12 and part of W11 are similar features, with deep, organic (peat) soils (Golder, 1998). According to the 1995 Environmental Assessment Report, many trees in wetland W12 are dying from high water levels. The presence of deep peat soils indicates that this feature was once vegetated with peat-accumulating vegetation that has been killed by the excess water and/or enrichment from runoff. The hydrology of the site may have been altered during construction of Mayfield Road, or affected by a blocked culvert. Although care is being taken to avoid as many wetlands as possible, it is important to identify where drainage to a wetland is crossed, and to ensure that the hydrology is maintained post development.

Table 3: Highway 410 - Summary of Wetland Attributes (Ecoplans, 1994; GLL, 1999)

Wetland Type	Location	Special Features	Wetland Classification
Tall Shrub Thicket Swamp	W1	Isolated,	None
Cattail Marsh	W2	Highly disturbed, isolated, waterfowl and herpetofaunal habitat	Retained in Sandringham-Wellington Secondary Plan
Cattail Marsh	W3	Highly disturbed, isolated, waterfowl and herpetofaunal habitat	Retained in Sandringham-Wellington Secondary Plan
Cattail Marsh	W4	Isolated, waterfowl and herpetofaunal habitat	Retained in Sandringham-Wellington Secondary Plan
Cattail Marsh/Drowned Swamp	W5a	Waterfowl and herpetofaunal habitat, flow through from T7 to T6	Heart Lake Wetland PSW, retained in S-W Secondary Plan
Tall Shrub Thicket Swamp / Broadleaf Swamp	W5b	Waterfowl and herpetofaunal habitat, flow through from T7 to T6	Heart Lake Wetland PSW, retained in S-W Secondary Plan
Cattail/Sedge Marsh – Drowned Swamp	W5c	Waterfowl and herpetofaunal habitat, flow through from T7 to T6	Heart Lake Wetland PSW
Reed Canary Grass Swale / Meadow Marsh	W6	Floodplain marsh, low wildlife value, receives flow from W11 via T9 and from W7	None
Broadleaf Swamp / Cattail Marsh	W7	Floodplain marsh, outflows to W6, receives flow from W9	None
Broadleaf Swamp / Cattail Marsh	W8	Isolated	None
Broadleaf Swamp / Cattail Marsh	W9	Outflows via T10 to W7	None
Broadleaf Swamp / Cattail Marsh	W10	Isolated	None
Floodplain	W11	Largely floodplain marsh, pastured, groundwater discharge at edge, drains via T9 to W6	None

Wetland Type	Location	Special Features	Wetland Classification
Broadleaf Swamp – Drowned	W12	drains to W11, peat soils, includes forested upland hummock	None
Disturbed Pond	W13	reported as a livestock pond, removed from the landscape by grading activity	
Meadow Marsh	W14	floodplain marsh, isolated, seasonally dry	None

Note: Refer to Exhibit 2.2 for wetland locations

c Wildlife

Existing documentation was reviewed as documented in past environmental reports based on data contained in: Ontario Ministry of Natural Resources Wetland Evaluations, the Breeding Bird Atlas (Cadman *et al.*, 1989), the Ontario Herpetofaunal Summary (Oldham and Sutherland, 1986) and the Area of Natural and Scientific Interest report on Heart Lake (Hanna, 1984), in addition to a field survey undertaken by Landplan, April 20, 1988, and Gartner Lee Limited in the fall of 1998. The comments are based on observations and potential for wildlife use based on the presence of suitable habitat.

The breeding bird community reported for the study area is typical of fragmented and urban landscapes. No habitat is available for any of the significant species reported in the Breeding Bird Atlas for the 100 km^2 square within which the study area falls. The mammals that have been reported include muskrat, eastern cottontail, eastern chipmunk, woodchuck, striped skunk, gray squirrel (Landplan, 1984 *in* Smith, Hoffman Associates, 1989) which are all urban tolerant species and common on the landscape. Wood frog, spring peeper, chorus frog, american toad, and painted turtle were reported by Landplan (1984) *in* Smith, Hoffman (1989) and appear to be concentrated in wetlands W1 to W5. No observations for this Study Area were recorded by Gartner Lee due to the time of year of the field investigations.

Potential for wildlife habitat can be inferred from the size, shape and proximity of areas of natural vegetation. The wetland areas vary from one to nine hectares in size, which is minimal in terms of providing wildlife functions. The forested slopes in the valley are higher functioning, but remain very narrow. Therefore habitat for generalist species (i.e., those without narrow habitat tolerances) can be expected to occur.

On this landscape, the primary wildlife corridor occurs in the Etobicoke Creek valley, which is forested on the east and west slope, but otherwise consists mainly of old field and graminoid floodplain vegetation. A young plantation of white pine has been planted on the floodplain.

There is also a weak connection between wetlands W12 and W11 leading to a meadow marsh floodplain adjacent to tributary T9 which drains into the east

branch of Etobicoke Creek. However, this connection does provide a natural linkage for dispersal and aquatic conveyance.

d Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) include the Provincially Significant Heart Lake Wetland Complex, the Heart Lake Environmentally Significant Area and the Brampton Esker Environmentally Significant Area, as well as the Etobicoke Creek Valley. The highway corridor does not cross any of the ESAs, but it crosses the Etobicoke Creek Valley west of Heart Lake Road, and follows the west edge of the valley encroaching upon a small area of mature valley slope forest. The Town of Caledon identifies this valley as an Environmental Constraint Policy Area.

2.3.2 Socio-Economic Environment

The following sources were used to inventory the socio-economic environment:

- Official Plan for the Regional Municipality of Peel;
- The Town of Caledon Official Plan;
- The City of Brampton Official Plan;
- The Extension of Highway 410 Environmental Assessment Report, 1995;
- Site visits, and;
- Aerial Photography.

The study area is located within the City of Brampton and the Town of Caledon, in the Regional Municipality of Peel. The populations of these areas are based on 1997 enumeration statistics in the 1998 Ontario Municipal Directory and are provided below:

Town of Caledon	39,837
City of Brampton	260,498
Regional Municipality of Peel	829,495

The following sections describe the various existing land uses within the study area.

a Residential

Land use within the study area in Brampton is predominantly residential, and includes the communities of Heart Lake and Springdale (see **Exhibit 2.3**). Population within the City of Brampton is expected to grow to 489,300 persons by the year 2021. Approximately 77,000 of the future population will be within the 1620 hectare Springdale development (SPA 28 as designated in the local Official Plan).

Springdale is bounded by Bovaird Drive to the south, Heart Lake Road to the west, Countryside Drive to the north, and Airport Road on the east. Approximately 210 hectares of the Springdale community is situated within the study area.

A second major development area is located between Highway 10, Mayfield Road, the Etobicoke Valley Creek and the City of Brampton boundary. This development was approved in 1990 (OPA 170) and primarily consists of single detached residential units and includes a gas bar located on the northeast corner of Bovaird Drive and Mayfield Road.

In addition to planned communities, the historical community of Snelgrove is located within the study area (in the vicinity of Bovaird Drive and Highway 10 intersection). Rural communities are also represented by small groupings of houses along concession roads.

The predominant land use in the Town of Caledon is urban and rural / agricultural. Population within the Town of Caledon is expected to increase to approximately 84,000 persons by the year 2026 (based on approved and conceptual residential development plans). This population increase is in part attributable to the approved Valleywood development (OPA 79) which is bounded by Highway 10 to the west, the Etobicoke Creek to the north and the east and the City of Brampton municipal boundary to the south.

In addition to the Valleywood development, a study was initiated in July of 1996 to determine the preferred land use designation alternative for the Mayfield West Community. This community is bounded by Old School Road, Chinguacousy Road, Dixie Road and the Caledon/Brampton municipal boundary.

The Mayfield West Community draft plan proposes a change in land use from agricultural to residential, comprising approximately 5,100 to 6,500 low-density single-family detached dwellings. Subsequently, the population of this community is projected to be approximately 16,200 to 20,700 persons. As of spring 1999, a final draft Community Development Plan had not been finalized and subsequently the plan has not been formally adopted by the Town in the form of an Official Plan Amendment.

North of Mayfield Road, rural residences exist along Dixie Road, Heart Lake Road, Kennedy Road and Highway 10 north of the Valleywood development.

b Recreational/Open Space

There are two prominent natural open space features within the study area, the Heart Lake Conservation Area and the Etobicoke Creek Valley lands. The wetlands within the Heart Lake Conservation Area and along Heart Lake Road are part of the provincial Class 2 wetlands. This area is located to the west of the proposed alignment. The portion of the Etobicoke Creek in the study area is located north of Bovaird Drive and east of Highway 10, abutting the Valleywood development to the east. TRCA is currently planning a pedestrian trail within the valley.

A Golf Course is situated within the study area, abutting Dixie Road to the west (north of Sandalwood Parkway). In addition, a major drainage facility under construction since the summer of 1998 is located at the northwest corner of Bovaird Drive and Dixie Road. This facility functions primarily as a storm water detention facility with secondary open space uses and will eventually connect to the Heart Lake wetlands complex.

A major east-west pedestrian/bicycle route/path is proposed in the Sandringham Wellington (Springdale) Secondary Plan. This path is to be located in the vicinity of the drainage basin (at the northwest corner of Dixie Road and Bovaird Drive) and will link to neighbourhood parks and schools sites, and connect to the Heart Lake Conservation Area.

c Commercial/Industrial

Existing commercial uses are generally situated within the study area along the east side of Highway 10 between Mayfield Road and the Valleywood subdivision. Businesses along this section of Highway 10 include a Petro Canada Gas Bar, the Snelgrove Country Market / Reinhart Auction, and a Laidlaw Transit Ltd. bus depot.

With respect to industrial uses within the study area, a concrete/asphalt storage and recycling yard is located on the north side of Countryside Drive (mid concession) east of Heart lake Road (Lot 16 Concession 3, City of Brampton). The Region of Peel uses a portion of this site as a recycling/composting depot.

A garden centre exists on the east side of Heart Lake Road adjacent to the Heart lake Conservation Area, and a veterinary clinic exists at the northwest corner of Bovaird Drive and Dixie Road.

The Sandringham – Wellington Secondary Plan (Springdale development) designates commercial uses within the study area. A 56,000 m^2 Regional Commercial Centre is planned for the northeast corner of Bovaird Drive and Heart Lake Road (east of the proposed Highway 410 alignment). In addition to this Commercial Centre, a Regional Commercial Reserve designation abutting the north side of the Commercial Centre allows the expansion to 84,000 m^2. Highway commercial uses are designated throughout the study area, including 3.6 hectares adjacent to the Regional Commercial Centre and along the east side of Heart Lake Road.

d Institutional

The Coptic Orthodox Patriarchate of Alexandria Church is located on the east side of Highway 10 north of Mayfield Road. KRT Christian School is located on the west side of Highway 10 north of Valeywood Boulevard. Town of Caledon fire station number 7 is also located within the study area along Valleywood Boulevard just east of Highway 10.

Six schools and 2 churches are proposed in the Springdale Secondary Plan to be located within the study area.

e Agricultural

Agricultural land use is most prominent north of Mayfield Road. However, there are interruptions to the agricultural landscape, which are attributed to urbanization (Valleywood and Springdale developments) along existing built areas and woodlots along valley systems. Agricultural lands within the study area are used for common field crops such as corn, wheat, oats, barley, soybeans and forage.

2.3.3 Cultural Environment

2.3.3.1 Archaeological Resources

An archaeological assessment (Stages 1 and 2) was previously conducted for the original Environmental Assessment Study (1988). As a result of this study, two mid-19th Century Euro-Canadian sites were identified, and the recommendation was made that they be subject to additional Stage 3 assessment.

A Stage 3 archaeological assessment was conducted in September 1999 for the *Shell Canada Site* (AkGw-11) and the *Chinguacousy Farm site* (AkGw-12).

This assessment involved the controlled collection of surface artifacts followed by hand excavation of fourteen one-metre test pits to test the nature of the deposits at each of the two sites. In addition, a title search and examination of the 1851 census was conducted in order to provide a more detailed historical context for the archeological data.

Numerous artifacts dating from 1830 to 1860 were recovered from each of the sites. Given that the occupation at each location was limited to the middle portion of the Nineteenth Century, and the deposits are isolated from the later occupation of these lots, a Stage 4 archaeological assessment for both the *Shell Canada site* and the *Chinguacousy Farm site* will be conducted prior to highway construction.

2.3.3.2 Heritage Resources

The study area was assessed for heritage features through previous environmental assessment work, site investigation, aerial photography and correspondence with the Ministry of Citizenship, Culture and Recreation. Identified built heritage features include individual residences, farmsteads, churches, and cemeteries (refer to **Exhibit 2.3** for location of existing heritage resources).

Since the assessment of heritage resources documented in the 1995 Environmental Assessment Report, 5 features have been removed/demolished (including 1 residence, 2 farmsteads, 1 barn and a tree-lined drive). Existing

heritage features and their relative level of significance are listed as follows in Table 4.

Table 4: Inventory of Historical Resources

Type of Feature	Level of Significance				
	Exceptional	*Moderate*	*Ordinary*	*Minimal*	**Total**
Residence (only)	3	7	37	4	51
Farmstead (including residence, barns, and outbuildings)	4	8	14	1	27
Barns (only)	-	-	4	-	4
Ruins	-	-	1	1	2
Church (only)	1	-	-	-	1
Church & Cemetery	2	-	-	-	2
Cemetery (only)	3	-	-	-	3
Commercial	-	-	-	1	1
Other	-	-	-	1	1
Total	***13***	***15***	***57***	***7***	***92***

Specific features in close proximity to the highway alignment are shown on Exhibit 2.3.

2.4 DESCRIPTION OF ALTERNATIVES

2.4.1 Alternative Solutions to the Undertaking

Consistent with the requirements of the Environmental Assessment Act, several alternatives to the undertaking were considered as part of the original Environmental Assessment.

Three modal (non-roadway) alternatives as well as the "Do Nothing" alternative were considered. An examination of Air Travel, Bus Transit and Rail Transit identified that these were not reasonable alternatives.

Alternative methods of carrying out the undertaking considered during the original Environmental Assessment were based on roadway alternatives. Four sets of roadway alternatives were considered including:

- Existing Arterial Alternatives;
- New Route Freeway Alternatives;

- New Route Freeway (south of Mayfield Road)/New Route Arterial (north of Mayfield Road) Alternatives; and
- Combined New Route Freeway (south of Mayfield Road) / Existing Arterial) north of Mayfield Road.

The evaluation was carried out in three stages. The first stage of the evaluation consisted of a comparison of the alternatives within each set. It was determined that the alternatives which utilize arterial roads would result in a severe restriction in the ability to handle future traffic volumes at a reasonable level of service. Arterial alternatives would result in high level of pedestrian conflicts and accident potential (due to the many intersections that would be created). In addition, a link to Highway 10 (needed to alleviate traffic congestion in the local transportation network) did not exist with this set of alternatives.

The best alternatives were selected from each set and carried forward to the second stage and comparatively evaluated. As a result, the evaluation was narrowed down to two basic route alternatives.

The evaluation of these two routes resulted in the selection of the preferred alternative, which was later refined as a part of the third stage of the evaluation. It was determined that the preferred alternative would minimize the effect on agriculture but would require a bridge crossing of the Etobicoke Creek.

The alternative not selected (an alignment located to the north of the preferred alternative) required the severance of 3 established farming operations, a greater area of soil with Class 1 capability, a greater area of residential land, and would consume more medium class woodlot.

The trade-offs between the two alternatives were such that the Etobicoke Creek crossing could be refined and impacts could be mitigated. For the northern route however, a severance of nearly 10 ha of medium class woodlot could not be mitigated. The severance of established farming operations was considered a severe unmitigable effect and the removal of 18 ha of Class 1 capability land was not warranted (on the basis that there were no distinguishable differences between the two alternatives with respect to transportation benefits).

With respect to the Valleywood subdivision (which was not an approved development at the time of the Highway 410 route planning study), it was determined that if the development was approved, it could be planned to conform to the Highway 410 right-of-way.

For the Value Engineering (VE) Study (conducted in the spring of 1998), alternatives were generated to satisfy the basic essential functions for the proposed route. The alternatives were evaluated against the following functional criteria:

- Safety
- Life Cycle Cost
- Environmental Impacts
- Capital Cost
- Level of Service
- Future Flexibility

- Network Continuity
- Standards/Policies/Conventions

The costs associated with the alternatives that satisfied the above criteria were tallied to express a total project cost which was compared to the original EA approved design. The VE design satisfied the functional criteria and resulted in a potential cost savings of over $20 million and was therefore the preferred alternative.

2.4.2 Alternative Designs

Design alternatives were compared based on the following factors:

Natural Environment

- Fisheries and Aquatic Habitat
- Wildlife
- Vegetation
- Wetlands
- Groundwater
- Surface Water
- Greenways and Open Space
- Soil

Socio-Economic Environment

- Community Effects
- Noise
- Historical Resources
- Property

Agriculture Environment

- Soil Capacity
- Agricultural Land Use
- Individual Farm Effects
- Property
- Farm Community

Transportation

- Network Effects
- Geometrics
- Staging Options

Based on the stated factors, two methods of carrying out the undertaking were considered. These alternatives include the approved route and design identified in the 1995 Environmental Assessment (EA) Report and the refined design (same

route) based on the Value Engineering Study. These alternatives are described as follows:

ALTERNATIVE 1 – The 1997 EA Approved Design

- 4-lane limited access freeway with a rural cross section (i.e. 30 metre grass centre median);
- Ultimate 6 lanes from Bovaird Drive to Mayfield Road;
- Full Interchanges and bridges at Bovaird Drive (existing), Sandalwood Parkway, Mayfield Road, Valleywood Boulevard and a partial interchange at Countryside Drive;
- A 35 metre, single span structure at the Etobicoke Creek crossing (subject to regulatory approval).

ALTERNATIVE 2 – Modifications to the EA Approved Design based on Value Engineering (VE) Recommendations

This alternative maintains the same basic alignment and configuration as Alternative 1 with the following modifications:

- Replacement of grass median with urban median (divided by concrete barrier) requiring less property (see **Exhibit 2.4** for typical Section);
- Elimination of the partial interchange at Countryside Drive (property is protected for future ramps if required);
- Mayfield Road shifted 50 metres to the north to avoid poor soils (**see Exhibit 2.5**);
- Refinements at the Highway 410 / Highway 10 / Valleywood Boulevard interchange including channelized right turn lane for southbound Highway 10 and minor geometric improvements (see **Exhibit 2.6**);
- A 70 metre, 2 X 35 metre twin-span structure at the Etobicoke Creek crossing to provide good pedestrian/wildlife passage and addresses the requirements of TRCA and MNR (see **Exhibit 2.7** for plan and **Exhibit 2.8** for profile);
- Sandalwood Parkway structure reduced from 6-lanes to 4-lanes and Mayfield Road structure reduced from 4-lanes to 2-lanes (based on projected traffic volumes);
- Adjustment to vertical profile to balance cut and fill quantities including:
  - 0.7 metre grade raise halfway between Bovaird Drive and Sandalwood Parkway
  - 1.0 increasing to 2.0 metre grade raise from just south of Countryside Drive to Mayfield Road

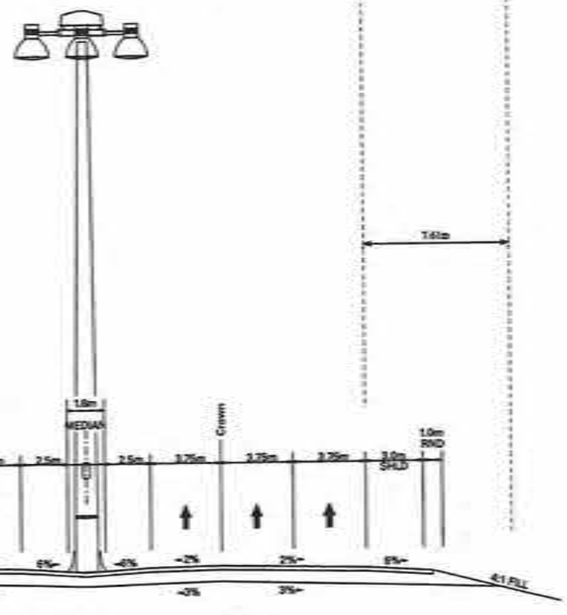
- 2.0 metre increasing to 5.0 metre grade raise from Mayfield Road to Heart Lake Road
- little change to profile from just west of Heart Lake Road to Etobicoke Creek
- 1.0 metre increasing to 6.0 metre grade raise from Etobicoke Creek crossing to just west of crossing
- little change to profile as Highway 410 Extension curves to meet existing Highway 10

- 11.0 metre mainline alignment shift (to the east) through Sandalwood Parkway to accommodate future development on Heart Lake Road – no change to property requirements required;

The overall design of Alternative 2 (the Technically Preferred Alternative) can be seen in **Exhibit 2.1**.

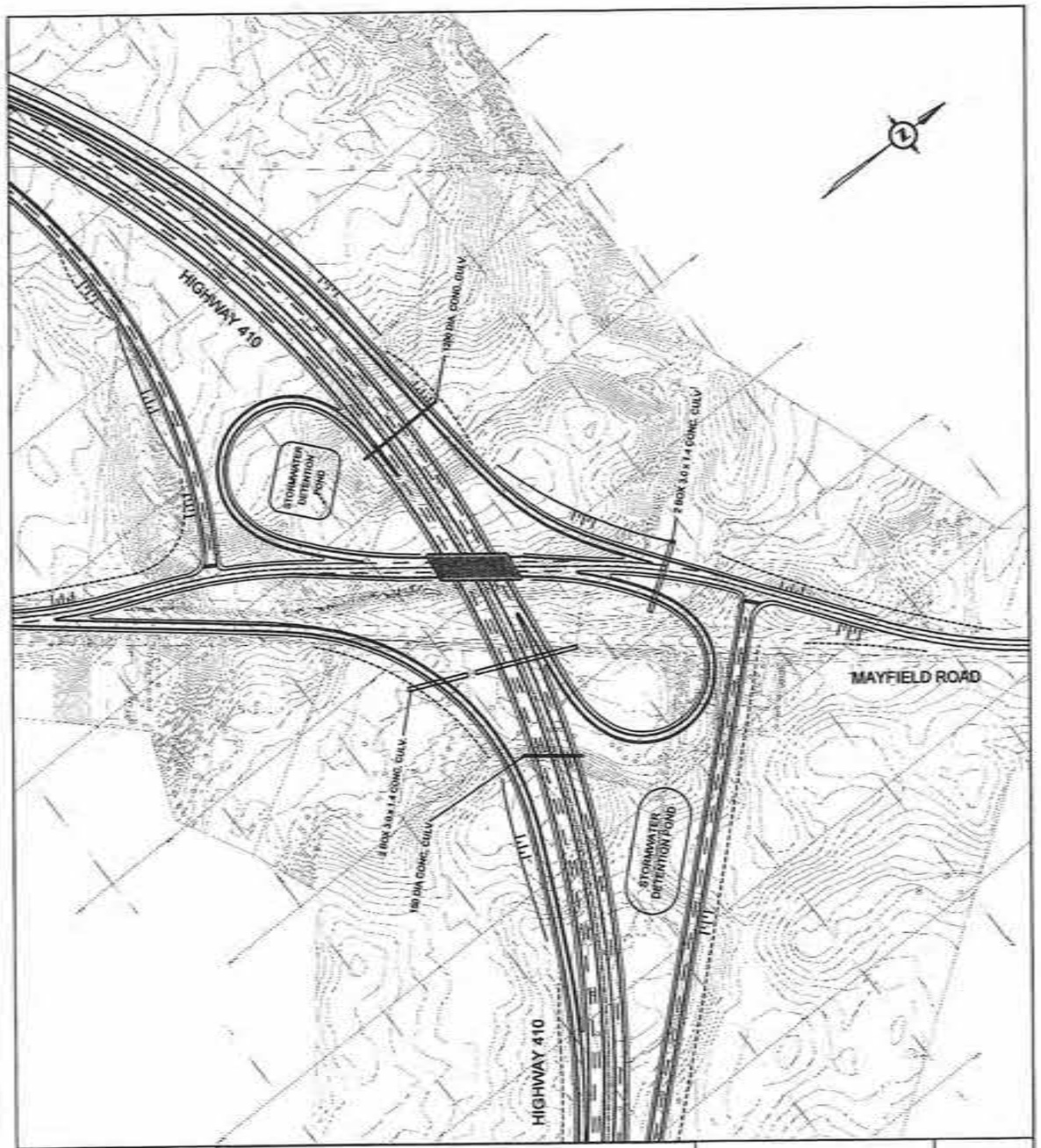
ORIGINAL EA DESIGN

PROPOSED DESIGN

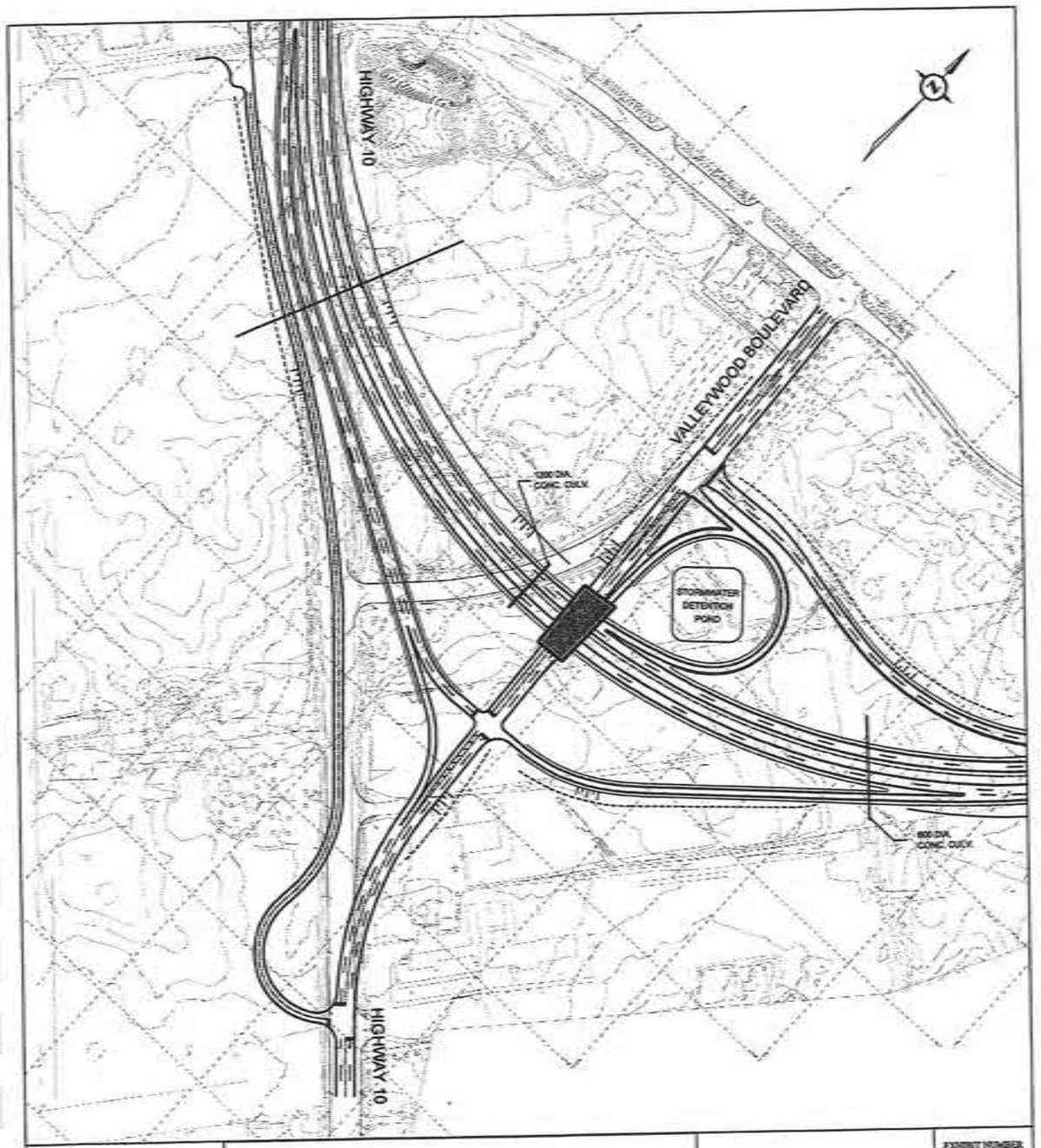


BOVAIRD DRIVE TO MAYFIELD ROAD

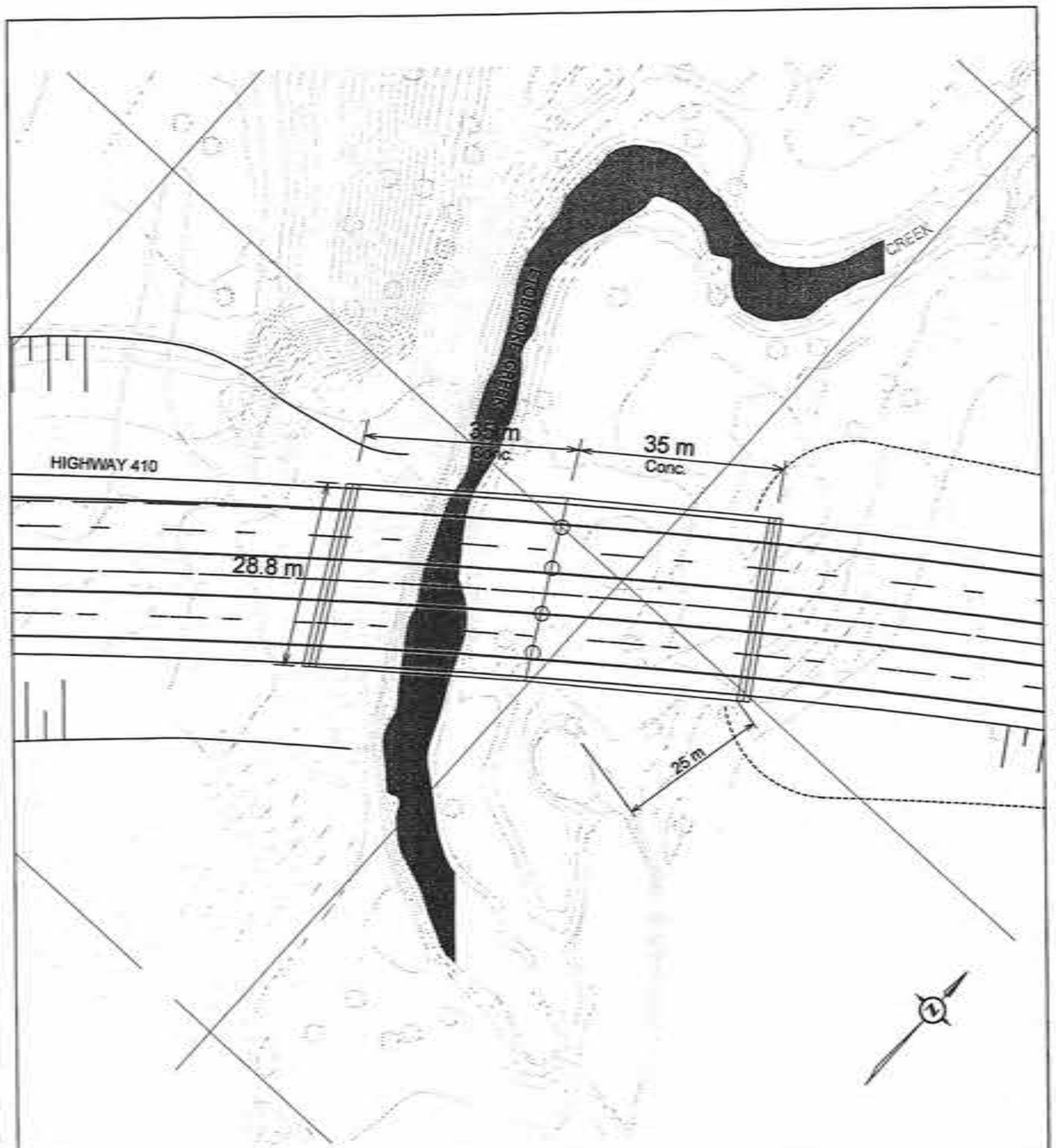
Ontario	**HIGHWAY 410 EXTENSION**	**Typical Section**	EXHIBIT NUMBER **2:4**
COLE SHERMAN	**PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT**		
	FROM BOVAIRD DRIVE TO HIGHWAY 10 **W.P. 22-79-00**		



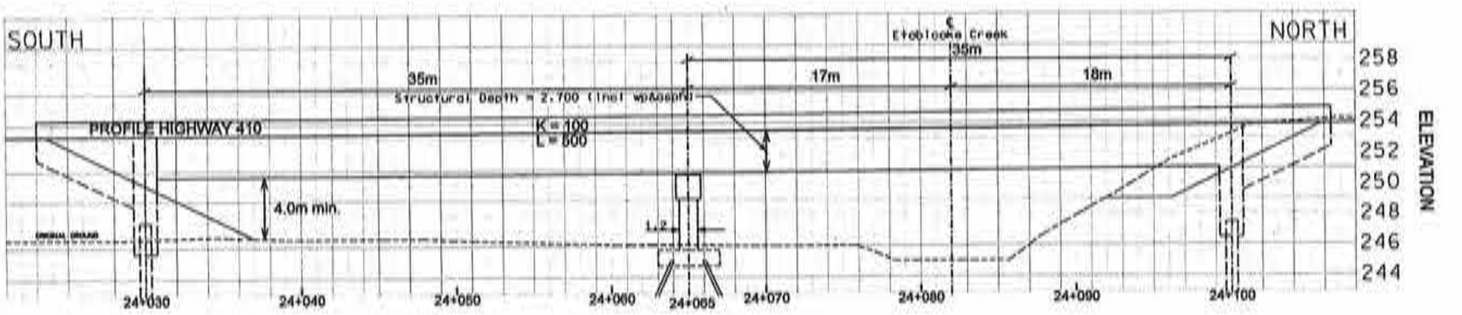
Ontario COLE SHERMAN	**HIGHWAY 410 EXTENSION** **PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT** **FROM BOVAIRD DRIVE TO HIGHWAY 10** **W.P. 22-79-00**	**Mayfield Road Interchange**	EXHIBIT NUMBER **2.5**



Ontario COLE SHERMAN	**HIGHWAY 410 EXTENSION** **PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT** **FROM BOVAIRD DRIVE TO HIGHWAY 10** **W.P. 22-79-00**	**Highway 410/ Valleywood Boulevard Interchange**	EXHIBIT NUMBER **2.6**



Ontario COLE SHERMAN	HIGHWAY 410 EXTENSION PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT FROM BOVAIRD DRIVE TO HIGHWAY 10 W.P. 22-79-00	Proposed Etobicoke Creek Crossing - Plan	EXHIBIT NUMBER 2.7



Ontario COLE SHERMAN	**HIGHWAY 410 EXTENSION** **PRE-DESIGN STUDY/CLASS ENVIRONMENTAL ASSESSMENT** **FROM BOVAIRD DRIVE TO HIGHWAY 10** **W.P. 22-79-00**	**Proposed Etobicoke Creek Crossing - Profile**	EXHIBIT NUMBER **2.8**

Stations	Type	Flow Character	Riparian Vegetations	Surrounding Land Use	Channel Characteristics	Potential Fish Habitat Impact/ Issues and Concerns	Summary
T1	group of shallow field swales	dry (October 6/93) dry (December 1998)[2]	none	abandoned agriculture cropland	ploughed over	none no fish habitat	altered for development proposed drainage alteration (Sandringham - Wellington Master Servicing Plan)
T2	ditched channel draining wetland pocket and stormwater channel from Heart Lake Road	shallow flow (October 6/93) originating from stormwater channel wet December 1998 dry July 1999[2]	herbaceous buffer 2 m banks on either side seeded with clover	abandoned agriculture cropland	defined 45° grade on both banks stormwater channel from Heart Lake Road has been incorporated below wetland heavy siltation, pooling behind installed gabion check dams scour occurring around check dams	no fish habitat (1999)[2] sediment transport during construction runoff water quality impacts downstream erosion control around check dams	altered for development proposed drainage alteration (Sandringham - Wellington Master Servicing Plan)
T3	shallow field swale	dry (October 6/93) dry December 1998	none	abandoned pasture	very shallow channel ploughed over	no fish habitat sediment and water quality concerns during construction future destination of drainage	same proposed drainage alteration (Sandringham - Wellington Master Servicing Plan)
T4	ditched channel outletting from marsh pocket at Heart Lake Road	dry (October 6/93) dry December 1998[2] dry July 1999[2]	5 m total herbaceous buffer 2 m buffer 1998	cropland (soybeans)	well defined 1 m deep channel	no fish habitat (1999)[2] sediment transport downstream water quality transport future destination of flow; defined channel should have culvert	same proposed drainage alteration (Sandringham - Wellington Master Servicing Plan)
T5	shallow field swale	dry (October 6/93) dry December 1998[2]	none	soybean field	ploughed over	no fish habitat none	same proposed drainage alteration (Sandringham - Wellington Master Servicing Plan)
T6	defined, ditched channel	dry (October 6/93) dry December 1998[2] dry July 1999[2]	5 m total herbaceous buffer dominated by sedge, reed canary grass, and cattail	soybean field	defined vegetated channel	no fish habitat water quality and sediment transport downstream during construction	same retained in Sandringham - Wellington Master Servicing Plan
T7	field swale	dry (October 6/93) dry December 1998[2]	none	abandoned agriculture	ploughed over	no fish habitat none	same proposed drainage alteration (Sandringham - Wellington Master Servicing Plan)
T8	grassed field swale	dry (October 6/93) dry December 1998[2]	reed canary grass dominated	abandoned agriculture	no definition, wide swath - likely sheetflow	fish habitat extremely limited due to flow nature (1993) downstream water quality during construction no fish habitat, 1998[2] drainage overflow from pond in compost area	ploughed through, no fish habitat (1998)[2] proposed drainage alteration (Sandringham - Wellington Master Servicing Plan)
T9	defined channel	dry (October 6/93) wet December 1998[2] dry July 1999[2]	reed canary grass, 10 m total herbaceous buffer	agriculture	defined 0.5 m deep channel with herbaceous buffer cattail choked channel 1998[2], 1999[2]	no permanent fish habitat downstream sediment transport and water quality impacts during construction	Same
T10	grassed field ditch	dry (October 6/93)	reed canary grass and herbaceous vegetation	agricultural	defined channel choked with vegetation 1998[2]	no permanent fish habitat minor sediment transport during construction	Same drainage to wetland W10
T11	poorly defined channel through broad floodplain	saturated (October 6/93) evidence of groundwater discharge wet December 1998[2] groundwater evidence	dominated by sedge and cattail, some trees and shrubs	agriculture to south	broad floodplain with no defined channel, soft organic soils sheet flow likely	fish habitat extremely limited due to flow character (1993), no fish habitat (1999)[2] loss of wetland area impacts to possible discharge reduction in stormwater flow attenuation and pretreatment	Same No fish habitat (1998)[2]
T12	minor shallow field swale, barely perceptible	dry dry December 1998[2]	none	agricultural (pasture)	grazed and trampled by cattle	no fish habitat none	same
T13	minor imperceptible field swale	dry dry December 1998[2]	none	agricultural (pasture)	trampled by cattle	no fish habitat none	same
T14	barely perceptible field swale	dry dry December 1998[2]	none	agricultural (pasture)	grazed and trampled	no fish habitat none	same
Etobicoke Creek	permanent flow creek system	permanent flow permanent December 1998	herbaceous (goldenrod, reed canary grass) with sparse wood vegetation (shrub willow, red osier dogwood)	old pasture juvenile white pine plantation	pools (0.5 to 1.5 m deep, 5 to 8 m wide) and narrows (0.15 m deep and < m wide) silt and gravel substrate eroded banks, siltation in pools	warmwater stream (MNR) permanent fish habitat high turbidity high nutrient input instream construction timing constrains	same

[1] As reproduced from Ecoplans, 1994 [2] Gartner Lee field observations

Note: Refer to **Exhibit 2.2** for water crossing locations

Ontario

COLE, SHERMAN

HIGHWAY 410 EXTENSION
PRE-DESIGN STUDY / CLASS ENVIRONMENTAL ASSESSMENT
FROM BOVAIRD DRIVE TO HIGHWAY 10
W.P. 22-79-00

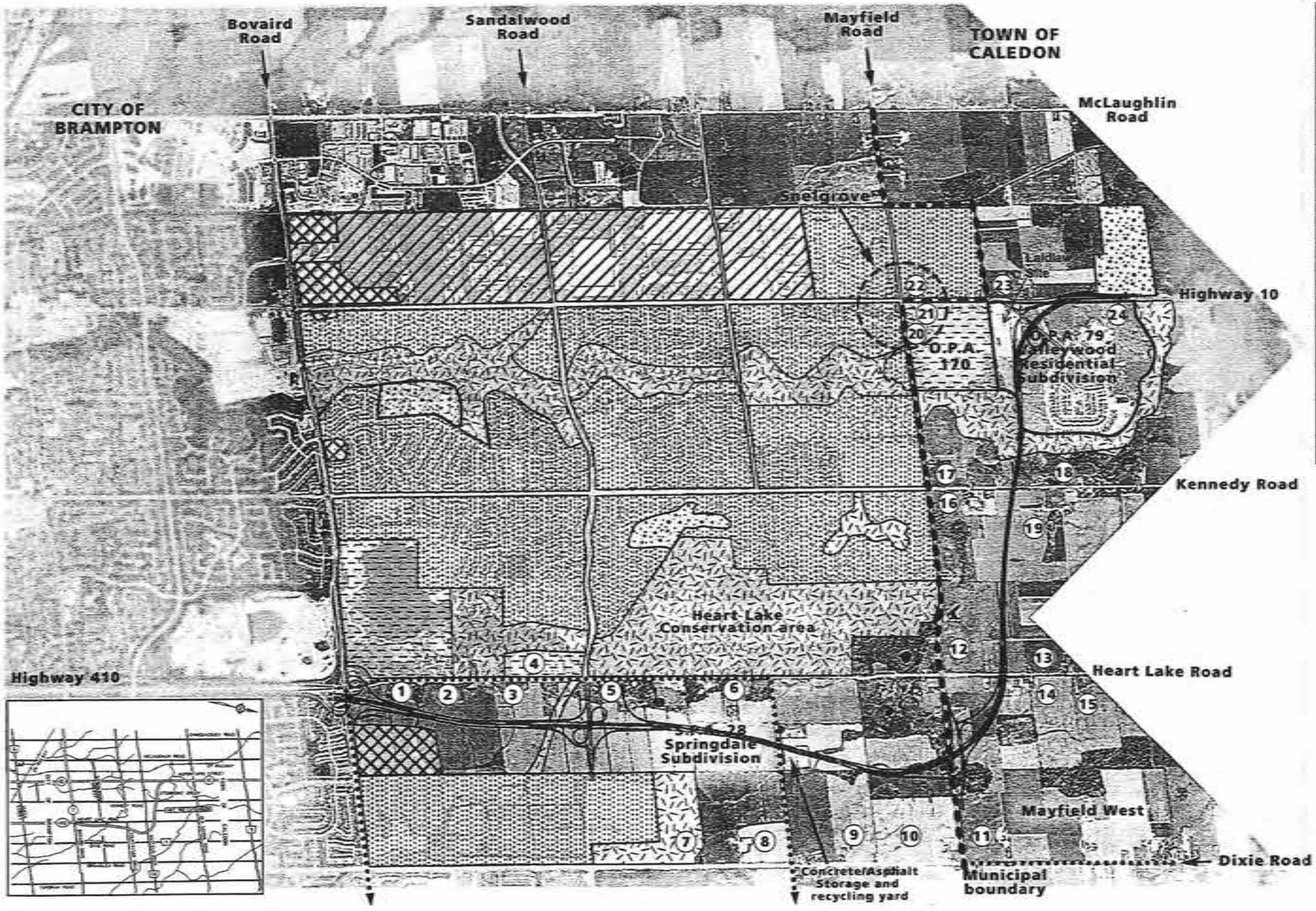
Summary of Water Crossings[1]

Table 1

Feature at Crossing	Proposed Structure Type & Dimensions	Location	Stream Class*	Stream Habitat Classification **	MNR Criteria Habitat Type***				MNR Habitat Sensitivity Level for Fish				System Sensitivity Downstream				***SWM Sensitivity at Crossing (water quality, quantity and erosion				Other Environmental Issues	Special Engineering and Design Constraints
					1	2	3	N H	H	M	L	Comments	H	M	L	Comments	1	2	3	Comments		
FIELD SWALES (DRY)		T1: 1+ 50 - 200	DS	no fish habitat				X			X	no fish			X						none	
DITCHED CHANNEL (WET)	culvert	T2: 1+ 560	IU	no fish habitat			X				X	no fish			X						none	
FIELD SWALE (DRY)		T3: 1+ 760	DS	no fish habitat				X			X	no fish			X						none	
DITCHED CHANNEL (DRY)		T4: 2+ 240	IA	no fish habitat			X				X	no fish			X						none	
FIELD SWALE (DRY)		T5: 2+ 340-350	DS	no fish habitat				X			X	no fish			X						within an ESA	
DITCHED CHANNEL (DRY)	double culvert	T6: 2+ 520	IA	no fish habitat			X				X	no fish			X						none	
FIELD SWALE (DRY)		T7: 3+ 550	DS	no fish habitat				X			X	no fish			X						none	
GRASSED FIELD SWALE (DRY)		T8: 4+ 090	DS	no fish habitat				X			X	no fish			X			X			none	
DEFINED CHANNEL (WET)	double culvert	T9: 4+ 475-525	IA	no fish habitat			X				X	no fish			X			X			none	
GRASSED FIELD DITCH (DRY)		T10: 4+ 800-890 and 5+ 000-150	IA	no fish habitat				X			X	no fish			X			X			none	
POOR DEFINED CHANNEL (WET)	culvert	T11: 5+ 440	IA	no fish habitat			X				X	no fish			X			X			groundwater	
SHALLOW FIELD SWALE (DRY)	culvert (Mayfield)	T12: 5+ 960	DS	no fish habitat				X			X	no fish			X			X			none	
MINOR FIELD SWALE (DRY)		T13:	DS	no fish habitat				X			X	no fish			X			X			none	
MINOR FIELD SWALE (DRY)		T14: 6+ 450	DS	no fish habitat				X			X	no fish			X			X			none	
ETOBICOKE CREEK (WET)	70 metre (2 x 35 twin span) Bridge	channel - 7+ 820, valley - 7+ 500-920	PN	predominant warmwater		X				X		silt and gravel with high turbidity		X		Sediment		X		no quantity controls or additional erosion control required	Valley corridor, Wildlife passage, future Trail Fisheries approval section 35 (2) of the Fisheries Act required.	bridge, instream construction timing constraints

Note: Refer to **Exhibit 2.2** for water crossing locations

*Stream Classification Codes:	** Habitat Classification	*** MNR Criteria
PU - PERMANENT URBAN	-predominant warmwater	Type 1: high level of protection (H)
DS - DRAINAGE SWALE	-predominant coldwater	Type 2: moderate protection (M)
IA - INTERMITTENT AGRICULTURE	-warmwater with minor coldwater habitat	Type 3: low protection (L)
IU - INTERMITTENT URBAN	-coldwater migratory	NH: no discernible fish habitat
IN - INTERMITTENT NATURAL	-intermittent coldwater	
PN - PERMANENT NATURAL	-intermittent warmwater	
	- no discernible fish habitat	



Heritage Resource Inventory		
Reference Number	Type of Feature	Level of Significance (as specified in the 1995 EAR)
1	Farmstead (removed since 1988)	Ordinary
2	Barn Only	Ordinary
3	Residence/site	Ordinary
4	Tree lined drive (removed since 1988)	Minimal
5	Residence and ruins	Minimal
6	Farmstead	Moderate
7	Residence	Moderate
8	Farmstead	Ordinary
9	Farmstead	Ordinary
10	Farmstead	Ordinary
11	Farmstead	Moderate
12	Barn (removed since 1988)	Ordinary
13	Farmstead	Ordinary
14	Barn	Ordinary
15	Residence	Ordinary
16	Residence	Moderate
17	Farmstead	Exceptional
18	Ruins	Ordinary
19	Farmstead	Ordinary
20	Residence (in the community of Snelgrove)	Ordinary
21	Church (in the community of Snelgrove)	Exceptional
22	Farmstead (removed since 1998 for Mayfield Park residential development)	Ordinary
23	Farmstead	Exceptional
24	Farmstead	Ordinary

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HIGHWAY 410 EXTENSION
PRE-DESIGN STUDY / CLASS ENVIRONMENTAL ASSESSMENT

FROM BOVAIRD DRIVE TO HIGHWAY 10
W.P. 22-79-00

Existing & Future Land Use

EXHIBIT NUMBER
2.3

Grouping	Factor		Indicator	Unit	Alternative 1	Alternative 2
SOCIO-ECONOMIC ENVIRONMENT	Community Effects	1.	Community facilities removed	No.	0	0
		2.	Community facilities adjacent to roadway (churches, libraries, etc.)	No.	1	1
		3.	Community severances	No.	0	0
		4.	Households displaced	No.	4	4
		5.	Businesses displaced	No.	2	2
		6.	Business viability	Subj.	can relocate	can relocate
		7.	Effect on recreational facilities	Descript	None	None
	Noise	8.	Houses subject to increase of > 10 dBA	No.	3	4
		9.	Houses subject to increase of 5-10 dBA	No.	71	73
		10.	Houses subject to increase of 0-5 dBA	No.	31	22
	Historical Resources	11.	Sites removed	No.	1	1
		12.	Sites within 100m of centreline	No.	3	3
		13.	Sites within 100 – 250m of centreline	No.	6	6
		14.	Cultural landscapes affected	Subj.	Min – Mod	Min – Mod
	Property	15.	Total residential area required	ha.	39.4	37.4
		16.	Total commercial area required	ha.	17.0	15.8
		17.	Total industrial area required	ha.	5.1	5.1
		18.	Residential properties affected	No.	5	6
NATURAL ENVIRONMENT	Vegetation	19.	Area of woodlots required – High	ha.	0	0
		20.	Area within 100m of centreline – High	ha.	0	0
		21.	Area of woodlots required – Medium	ha.	0.6	0.6
		22.	Area within 100m of centreline – Medium	ha.	3.2	3.2
		23.	Area of woodlots required – Low	ha.	0	0
		24.	Area within 100m of centreline – Low	ha.	0	0
		25.	Number of stands	No.	1	1
		26.	Number of significant hedgerows or ornamental plantings removed	No.	0	0
	Wetlands	27.	Effect on Heart Lake complex (Class 2)	Descript	Minor	Minor
		28.	Effect on other wetlands	Descript	Minor	Minor
		29.	Total wetland area removed	Ha	3.8	4.0
	Wildlife	30.	Effects on habitat	Descript	Minor	Minor
		31.	Effects on wildlife	Descript	Minor	Minor
		32.	Number of travel corridors crossed	No.	2	2
	Fisheries	33.	Effect on habitat and its potential	Descript	Minor	Minor
	Water	34.	Number of significant water crossings	No.	1	1
		35.	Number of properties / wells within 100m of O/L	No.	22	23
		36.	Effects on ground water movement	Descript	Minor	Minor
		37.	Effect on surface drainage patterns	descript	Minor	Minor
	Soils	38.	Area of lands with high erosion potential	ha.	0	0
		39.	Area of lands with medium erosion potential	ha.	32	30
	E.S.A.s	40.	Affect on environmentally sensitive areas (as identified by others)	ha. & descript	4.0 minor	4.0 minor

Grouping	Factor		Indicator	Unit	Alternative 1	Alternative 2
AGRICULTURE	Soil Capability	41	Area of high capability speciality crop land required (included in indicator 43 & 44)	ha.	0	0
		42	Area of indicator 42 within 200m of C/L.	ha.	0	0
		43	Area of class 1 & 2 common field crop capability land required	ha.	23.5	23.1
		44	Area of class 3 & 4 common field crop capability land required	ha.	12.7	12.5
	Agricultural Land Use	45	Area of owned common field crop land required	ha.	8.8	8.2
		46	Area of worked common field crop land required	ha.	27.4	27.4
		47	Area of speciality crop land required	ha.	0	0
		48	Area of existing tree fruit crops within 200m of centreline	ha.	0	0
	Individual Farm Effects	49	Number of land locked severances less than 10 ha. Created	No.	1	1
		50	Number of internal access routes affected	No.	2	2
		51	Number of farms where buildings are separated from land holdings	No.	1	1
	Property	52	Number of farm properties greater / equal to 38 ha. from which more than 10% of holdings required	No.	0	0
		53	Number of farm properties less / equal to 38 ha. from which more than 10% of holdings required	No.	7	7
		54	Number of farm properties greater / equal to 38 ha. from which less than 10% of holdings required	No.	1	1
		55	Number of farm properties less / equal to 38 ha. from which less than 10% of holdings required	No.	5	5
	Farm Community	56	Potential for farm community disruption	Subj.	Minor	Minor
		57	Interference with interfarm movement	Subj.	Minor	Minor
TRANSPORTATION	Network Effects	58	Level of service	L.O.S.	B,D	B,D
		59	Intersections/accesses	No.	0/0	0/0
		60	Accident potential	Subj.	Minor	Minor
		61	Highway continuity	Subj.	Good	Good
		62	Pedestrian conflicts	Subj.	None	None
		63	Conflicts with slow moving equipment	Subj.	None	None
		64	Network Flexibility	Subj.	Good	Good*
	Geometrics	65	Radius of limiting curve	m	525	525
		66	Visibility to decision points	m	-	-
	Staging Options	67	Ability to stage construction	Subj.	Good	Good
		68	Flexibility for future expansion	Subj.	Good	Good
LAND USE	Planning Policies	69	Effects on approved developed	Subj.	Minor	Minor
		70	Effects on proposed land use changes	Subj.	Minor	Minor
		71	Number of closed landfill sites	No.	0	0
COST	Cost	72	Construction costs	$ M	47.2	40
	Property	73	Property costs	$ M	20.3	18.3

* Ramps at Countryside Drive have been eliminated because there is no immediate need. Ramps can be provided in the future if required.

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W.P. 22-79-00

Analysis of Alternatives

EXHIBIT NUMBER
2.9

CATEGORY – SOCIO-ECONOMIC ENVIRONMENT			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 COMMUNITY EFFECTS	●	●	Alternative 1 and Alternative 2 displace the same 3 households and 2 businesses. In addition, the impacts to community and recreational facilities associated with Alternatives 1 and 2 are the same.
2 NOISE	●	●	Alternative 2 results in a slight increase in noise levels (2-5dBA) in the vicinity of the Valleywood subdivision as a result of changes in grade.
3 EFFECT ON HISTORICAL RESOURCES	●	●	Both Alternative 1 and Alternative 2 remove 1 farmstead on the west half of Lot 14 and part of a site on Lot 13. Alternative 1 and Alternative 2 impact the same 3 sites within 100 metres and 6 sites within 200 metres of centreline, and result in minor impacts to cultural landscapes.
4 PROPERTY EFFECTS	●	●	Alternative 1 requires slightly more residential and commercial property than Alternative 2. Alternative 2 results in a greater property taking to 12109 and 12181 Heart Lake Road. Both alternatives require the same industrial property area and impact the same 5 residences.
CATEGORY SUMMARY	●	●	

Summary of Socio-Economic Effects:
Alternative 1 and Alternative 2 result in generally the same impacts to the socio-economic environment with respect to community effects, and impacts to historical resources. Although Alternative 2 results in slightly greater noise impacts (2-5 dBA increase) in the vicinity of the Valleywood subdivision, impacts to property are reduced.

THEREFORE, FROM A SOCIO-ECONOMIC PERSPECTIVE, ALTERNATIVES 1 IS PREFERRED

CATEGORY – AGRICULTURE			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 SOIL CAPACITY	●	●	Neither alternative impacts high capability - specialty crop land. Alternatives 1 and 2 result in the same impacts to Class 1 -4 common field crop capability land.
2 AGRICULTURAL LAND USE	●	●	Alternative 1 results in slightly greater property impacts than Alternative 2 with respect to owner field crop land and worked field crop land. Neither alternative impacts specialty crop land or existing tree fruit crops.
3 INDIVIDUAL FARMS EFFECTS	●	●	Alternative 1 and Alternative 2 result in 1 land locked severance, impact the same two internal access routes and separate 1 farm building from its land.
4 PROPERTY EFFECTS	●	●	Alternative 1 and Alternative 2 result in the same impacts to 13 farm properties.
5 EFFECTS ON FARM COMMUNITY	●	●	Alternative 1 and Alternative 2 result in the same minor impacts to farm properties and inter-farm movement.
CATEGORY SUMMARY	●	●	

Summary of Effects on Agriculture:
Alternatives 1 and 2 result in the same impacts to 13 farm properties with respect to soil capacity, land use, land severance's, access routes, property impacts and inter-farm movement.

THEREFORE, FROM AN AGRICULTURAL PERSPECTIVE, ALTERNATIVES 1 AND 2 ARE EQUALLY PREFERRED

CATEGORY – NATURAL ENVIRONMENT			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 VEGETATION	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to vegetation.
2 WETLANDS	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to wetlands.
3 WILDLIFE	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to wildlife. However, Alternative 2 provides a greater wildlife passageway in the vicinity of the Etobicoke Creek.
4 FISHERIES	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to fisheries.
5 WATER	●	●	Alternative 2 affects one additional well in comparison to Alternative 1.
6 SOILS	●	●	Alternative 2 results in a reduced impact to moderately erodible soils in comparison to Alternative 1.
7 ENVIRONMENTALLY SENSITIVE AREAS	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to E.S.A's.
CATEGORY SUMMARY	●	●	

Summary of Effects on the Natural Environment:
Alternatives 1 and 2 result in similar impacts, which are generally, minor. Both alternatives create low to moderate impacts to fisheries, vegetation, wetlands, and E.S.A.'s. Although Alternative 2 affects one additional well, it reduces the impact to moderately erodable soils.

THEREFORE, FROM A NATURAL ENVIRONMENT PERSPECTIVE, ALTERNATIVES 1 AND 2 ARE EQUALLY PREFERRED

CATEGORY – LAND USE			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 PLANNING POLICIES	●	●	Alternatives 1 and 2 result in minor effects on approved development and proposed land use changes. With respect to the effect on closed landfill sites, there are no impacts associated with either alternative.
CATEGORY SUMMARY	●	●	

Summary of Effects on Land Use
Alternatives 1 and 2 result in minor effects on approved development and proposed land use changes. With respect to the effect on closed landfill sites, there are no impacts associated with either alternative.

THEREFORE, FROM A LAND USE PERSPECTIVE, ALTERNATIVES 1 AND 2 ARE EQUALLY PREFERRED

Least Preferred ● *Most Preferred* ●

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HIGHWAY 410 EXTENSION
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FROM BOVAIRD DRIVE TO HIGHWAY 10
W.P. 22-79-00

Evaluation of Alternatives

EXHIBIT NUMBER

2.10A

CATEGORY – TRANSPORTATION			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 NETWORK EFFECTS	●	●	Alternatives 1 and 2 result in a level of service of B, D., the same minor potential for accidents, and good highway continuity. No intersections or accesses are impacted by either alternative and no pedestrian or slow moving vehicle conflicts are foreseen. Ramps at Countryside Drive have been eliminated for Alternative 2 because there is no immediate need. Ramps can be provided in the future if required.
2 GEOMETRICS	●	●	Alternatives 1 and 2 each have a limiting curve radius of 525 metres and result in similar sight distances.
3 STAGING OPTIONS	●	●	Alternative 1 and Alternative 2 are the same with respect to construction staging and are equally flexible for future expansion.
CATEGORY SUMMARY	●	●	

Summary of Effects on Transportation
Alternatives 1 and 2 result in a level of service of B, D., the same minor potential for accidents, and good highway continuity. No intersections or accesses are impacted by either alternative and no pedestrian or slow moving vehicle conflicts are foreseen. Alternatives 1 and 2 each have a limiting curve radius of 525 metres, result in similar sight distances, are the same with respect to construction staging and are equally flexible for future expansion.

THEREFORE, FROM A TRANSPORTATION PERSPECTIVE, ALTERNATIVES 1 AND 2 ARE EQUALLY PREFERRED

CATEGORY – COST			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 CONSTRUCTION COSTS	●	●	Alternative 2 is approximately 15% less expensive to construct than Alternative 1.
2 PROPERTY COSTS	●	●	Alternative 2 is approximately 10% less expensive with respect to property acquisition costs.
CATEGORY SUMMARY	●	●	

Summary of Costs
Alternative 2 is approximately 15% less expensive to construct than Alternative 1. In addition, Alternative 2 is approximately 10% less expensive with respect to property acquisition costs.

THEREFORE, FROM A COST PERSPECTIVE, ALTERNATIVE 2 IS PREFERRED

SUMMARY OF CATEGORIES			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 SOCIO-ECONOMIC ENVIRONMENT	●	●	Alternative 1 and Alternative 2 result in generally the same impacts to the socio-economic environment with respect to community effects, impacts to historical resources and property impacts. Although Alternative 2 impacts less property, it results in a slight noise level increase (2-5dBA) in the vicinity of the Valleywood subdivision.
2 NATURAL ENVIRONMENT	●	●	Alternatives 1 and 2 result in similar impacts, which are generally, minor. Both alternatives create low to moderate impacts to fisheries, vegetation, wetlands, and E.S.A.'s. Although Alternative 2 affects one additional well, it reduces the impact to moderately erodable soils.
3 AGRICULTURE	●	●	Alternatives 1 and 2 result in generally the same impacts to 13 farm properties with respect to soil capacity, land use, land severance's, access routes, property impacts and inter-farm movement.
4 TRANSPORTATION	●	●	Alternatives 1 and 2 result in a level of service of B, D., the same minor potential for accidents, and good highway continuity. No intersections or accesses are impacted by either alternative and no pedestrian or slow moving vehicle conflicts are foreseen. Alternatives 1 and 2 each have limiting curve radius of 525 metres, result in similar sight distances, are the same with respect to construction staging and are equally flexible for future expansion. Ramps at Countryside Drive have been eliminated for Alternative 2 because there is no immediate need. Ramps can be provided in the future if required.
5 LAND USE	●	●	Alternatives 1 and 2 result in minor effects on approved development and proposed land use changes. With respect to the effect on closed landfill sites, there are no impacts associated with either alternative.
6 COST	●	●	Alternative 2 is approximately 15% less expensive to construct than Alternative 1. In addition, Alternative 2 is approximately 10% less expensive with respect to property acquisition costs.
CATEGORY SUMMARY	●	●	

Summary of Categories:

Alternatives 1 and 2 result in the same minor impacts with respect to the natural environment, agriculture and land use. Although Alternative 2 results in slightly greater noise impacts, it is approximately 15% less expensive to construct than Alternative 1, and is approximately 10% less expensive with respect to property acquisition costs.

THEREFORE, ALTERNATIVE 2 IS THE PREFERRED ALTERNATIVE WHICH WILL BE CARRIED FORWARD TO DETAIL DESIGN

Least Preferred ● *Most Preferred* ●

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Evaluation of Alternatives

EXHIBIT NUMBER

2.10B

2.5 ANALYSIS OF ALTERNATIVES

The alternatives were evaluated based on impacts to the natural, social, economic and cultural environments, agriculture, land use and transportation. Refer to **Exhibit 2.9 and 2.10.**

2.5.1 Natural Environment

Alternatives 1 and 2 result in similar impacts, which are generally, minor. Both alternatives create low to moderate impacts to fisheries, vegetation, wetlands, and E.S.A's. Although Alternative 2 affects one additional well, it reduces the impact to moderately erodable soils.

2.5.2 Socio-Economic Environment

Alternative 1 and Alternative 2 displace the same 4 households and 2 businesses. However, Alternative 2 results in greater property impacts to the residents at 12109 and 12181 Heart Lake Road. In addition, the impacts to community and recreational facilities associated with Alternatives 1 and 2 are the same.

With respect to heritage resources, Alternative 1 and Alternative 2 remove 1 farmstead on the west half of Lot 14 and part of a site on Lot 13 (removal of barn shed due to location in or straddling of right-of-way). These sites have been identified as having a minimal degree of historical significance. Alternative 1 and Alternative 2 impact the same 3 sites within 100 metres and 6 sites within 200 metres of centreline, and result in minor impacts to cultural landscapes.

Alternative 1 requires slightly more residential and commercial property than Alternative 2. Both alternatives require the same industrial property area (displacing 2 businesses, one along Countryside on Lot 16, Concession 3 E.H.S. and part lot 19 on Concession 1 EHS) and impact the same 5 residences.

From a noise perspective, Alternative 2 results in a slight increase in noise levels (2-5 dBA) in the vicinity of the Valleywood subdivision as a result of the change in grade. However, as a part of the conditions of approval for development, the developer has accepted responsibility for noise mitigation for the development.

2.5.3 Agriculture

Neither alternative impacts high capability - specialty crop land or existing tree fruit crops. In addition, Alternatives 1 and 2 result in the same impacts to Class 1 - 4 common field - crop capability land.

Both alternatives result in 1 land locked severance, impact the same two internal access routes and separate 1 farm building from its land.

Alternative 1 results in slightly greater property impacts than Alternative 2 with respect to owner field crop land and worked field crop land.

2.5.4 Transportation

Alternative 1 and Alternative 2 are relatively the same with respect to network effects. The major difference between the alternatives is the elimination of ramps at Countryside Drive for Alternative 2. This is attributed to the fact that there is no immediate need for ramps at this location. However, ramps for the Countryside Drive interchange can be provided in the future if required.

In addition to network effects, the alternatives have the same radius of limiting curve and visibility to decision points. The ability to stage construction and flexibility for future expansion for the alternatives is the same for Alternative 1 and Alternative 2.

2.5.5 Land Use

Alternatives 1 and 2 result in minor effects on approved development and proposed land use changes. With respect to the effect on closed landfill sites, there are no impacts associated with either alternative.

2.5.6 Cost

Alternative 2 is approximately 15% less expensive to construct than Alternative 1. In addition, Alternative 2 is approximately 10% less expensive with respect to property acquisition costs.

2.6 Etobicoke Creek Structural Alternatives

As a result of concerns raised by TRCA and MNR, consideration was given to alternative structures for the crossing of the Etobicoke Creek. The following table summarizes the details of the structural alternatives considered:

Table 5: Etobicoke Creek Structural Alternatives

Alternatives	Upstream Floodlines	Minimum Clearance	Eastside Floodplain Width	Wildlife Passage+	Impact to Creek Bank – Fisheries	Construction Cost **
50 metre steel girder bridge – simple span *	- Regional Water Level > 1.2 m, 100 yr. Water Level > 0.6 m	4.0 metres	28 metres clear – main creek channel to abutment	13.0 metres	In-water work will be required to stabilize slopes. Fisheries Act approval will be required.	$1.97 million
2 x 35 metre pre-cast concrete girder – two span *	- Regional Water Level > 0.9 m, 100 yr. Water Level >	4.0 metres	10 metres main creek channel to pier and then 30 metres clear	23.0 metres	In-water work will be required to stabilize slopes. Fisheries Act	$2.27 million

Alternatives	Upstream Floodlines	Minimum Clearance	Eastside Floodplain Width	Wildlife Passage+	Impact to Creek Bank – Fisheries	Construction Cost **
	0.4 m				approval will be required.	
33 – 33 - 33 metre pre-cast concrete girder – three span *	- Regional Water Level > 0.5 m, 100 yr. Water Level > 0.2 m	4.0 metres	10 metres main creek channel to pier – then 60 m clear (divided by pier)	40.0 metres	In-water work will be required to stabilize slopes. Fisheries Act approval will be required.	$3.70 million
3 x 40 metre pre-cast concrete girder – three span *	- Regional Water Level > 0.2 m, 100 yr. Water Level > 0.1 m	6.0 metres	13 metres main creek channel to pier, 38 metres, and then 29 metres clear	60.0 metres	In-water work will be required to stabilize slopes. Fisheries Act approval will be required.	$4.50 million
Summary Comment	*Upstream impacts as a result of changes to floodlines are minimal for all alternatives*	*All alternative exceed minimum clearance*	*All alternatives meet requirements of EA (13.0 metres minimum clear zone) and allow for good wildlife passage. All alternatives span the minimum effective meander belt (50 metres).*		*All alternatives require minor bank stabilization work under structure*	

* - Spans measured from centreline of abutments

** - Construction costs include savings on fill and road structure

\+ - Measured on east side of creek from edge of backwater to abutment or fill limit

Based on meetings with TRCA and MNR it was agreed that a larger span is preferred over a clear span. The larger span was considered to offset the impacts of a pier in the floodplain. Although the 3 x 40 metre three span structure provides the largest span, at a cost of $4.5 million the marginal advantage of this structure can not be justified. Based on the evaluation criteria outlined in Table 5, the 2 X 35 metre structure is preferred as it provides a significant increase in overall span for a reasonable cost (refer to **Exhibit 2.7 and 2.8** for plan and profile of the preferred structure).

2.7 SELECTION OF THE PREFERRED ALTERNATIVE DESIGN

Alternatives 1 and 2 result in relatively the same minor impacts with respect to the natural environment, agriculture and land use. Although Alternative 2 results in slightly greater noise impacts, it is approximately 15% less expensive to construct than Alternative 1, and is approximately 10% less expensive with respect to property acquisition costs.

Therefore, Alternative 2 is the Preferred Alternative, which will be carried forward to detail design.

2.8 EXTERNAL, AGENCY AND PUBLIC INVOLVEMENT

The public and government agencies were provided the opportunity to review and comment on the alternatives, identify concerns and comment on proposed mitigation measures. The following section outlines the consultation process implemented for this undertaking.

External and public consultation took place as follows:

- Initial Notification letters, dated November 16th, 1998 (to those on the external agency list including adjacent property owners and tenants agencies, ministries and municipalities).
- "Permission to Enter" property forms dated November 12th, 1998 were sent to potentially affected property owners. Follow up letters and forms were sent out the week of January 11th, to those who had not responded.
- "Notice of Study Commencement" dated November 16th, 1998 was placed in the Toronto Star, Brampton Guardian, Orangeville Banner and the Caledon Citizen.
- Meetings with staff of the Region of Peel, City of Brampton and Town of Caledon on April 29th and June 2nd.
- External Team Meeting (those on the external agency list including agencies, ministries and municipalities) on June 16th, 1999.
- External Team Meeting (with MNR and TRCA) on January 7th April 26th, and July 9th.
- Field visit with MNR on July 19th, 1999.
- "Notice of Public Information Centre" dated the week of June 7th, 1999 was placed in the Toronto Star, Brampton Guardian, Orangeville Banner and the Caledon Citizen.
- Public Meeting and Information Centre held on June 16th, 1999 from 5:00 p.m. to 9:00 p.m. at the Snelgrove Community Centre.

2.8.1 External / Agency Participation

Several provincial ministries and agencies were involved in the planning process for this project. They included the Toronto and Region Conservation Authority (TRCA), Ministry of Municipal Affairs (MMA), Ministry of the Environment (MOE) and the Ministry of Natural Resources (MNR). A detailed list of contacts and letters received is included in Appendix B.

Extensive consultation with MNR and TRCA included discussions regarding stormwater management, flood line control and fisheries impacts. These discussions concentrated on the Etobicoke Creek crossing: the meander allowance of the channel, erosion control, wildlife and pedestrian passage, impacts to flood elevation associated with different bridge spans and overall water levels. It was agreed that the structure across the Etobicoke Creek should have a 4 metre vertical clearance to allow for good pedestrian and wildlife passage. Four structural

alternatives were considered including a 50 metre steel girder bridge – single span, a 2 x 35 metre pre-cast concrete girder - two span, a 33 – 33 - 33 metre pre-cast concrete girder – three span, and a 3 x 40 metre pre-cast concrete girder - three span.

It was agreed that a larger span was preferred over a clear span and offsets the impacts of a pier in the floodplain. As a result, the 2 X 35 metre twin span structure was preferred as it provides a significant increase in overall span for a reasonable cost (refer to section 2.6 for details). MNR determined that approval from the Department of Fisheries and Oceans would be necessary under Section 35 of the Fisheries Act due to the potential loss of vegetation along the west bank of the Etobicoke Creek. Fisheries Act approvals will be obtained prior to construction.

In addition, MNR expressed that during the original Environmental Assessment process, as many kettle wetlands were avoided as possible and there was no further accommodation that could be made.

An additional field review was also held with MNR for the purpose of reviewing all natural features within the study area and proposed mitigation measures.

Concerns were also raised by MNR regarding the proposed culvert passing under the Mayfield interchange. The Project Team reviewed the drainage within the interchange and agreed that it was possible to break the culvert to allow for better wildlife passage. Concrete headwalls will be constructed at either end of the culvert break. The proposed size of this culvert is 3.0 metres by 1.4 metres (see **Exhibit 2.5**).

The City of Brampton, Town of Caledon and the Regional Municipality of Peel were also involved in the project. Representatives from these municipalities were contacted early in the project to address the scope, purpose and study limits.

During discussions with municipal representative, issues relating to the Highway 410/Highway 10/Valleywood Boulevard Interchange, the Sandalwood Parkway Interchange and the allowance for future expansion were raised. It was agreed that the design of the Highway 410/Highway 10/Valleywood Boulevard Interchange could be improved by making the N-N/S ramp a channelized right turn lane with a lane-away along Valleywood Boulevard. This ramp modification was integrated into the interchange design.

The City of Brampton and the Town of Caledon also noted their preference for two southbound lanes on Highway 10 at the Highway 410/Valleywood Boulevard interchange. MTO has protected property for this future improvement but it will not be constructed as part of this project because it is not warranted by traffic volumes at this time.

Municipal representatives and Project Team staff also discussed the ramp (N-N/S ramp) from southbound Highway 410 to Heart Lake Road at the Sandalwood Parkway interchange and in particular the idea of connecting this ramp to Sandalwood Parkway. It was decided that the ramp as shown in the original EA provides for the best overall traffic operations and future flexibility. If the ramp

were to be connected to Sandalwood Parkway, the terminal would be too close to Heart Lake Road precluding future signals and hindering operations.

The municipalities also noted that Sandalwood Parkway, Countryside Drive, Heart Lake Road and Kennedy Road may require widening in the future. It was agreed that this future expansion could be accommodated within the design of the structures over Highway 410 and that additional bridge works would be at the expense of the municipality.

2.8.2 Public Involvement

Public Information Centre

A Public Information Centre (PIC) was held on June 16th, 1999 at Snelgrove Community Centre in Brampton, Ontario. The PIC provided the public an opportunity to review and discuss the proposed work with Project Team representatives. To publicize this meeting, newspaper advertisements were placed in the Toronto Star, the Brampton Guardian, the Caledon Citizen and the Orangeville Banner during the week of June 7th. In addition, letters were sent to area property owners, as well as individuals and businesses on the Project Team's mailing list and brochures were delivered to area residences.

The overall purpose of this Information Centre was to present:

1. Need for the Extension
2. The Alternatives Considered
3. The Evaluation of the Alternative Designs
4. The Preferred Alternative
5. What's Next

A total of 145 people attended the PIC.

In addition to verbal comments, Project Team members encouraged visitors to express in writing, any concerns or comments they had regarding the information presented (refer to Table 6). Of the 145 people who signed the register, 51 comment sheets (35% of attendees) were received.

Table 6: Concerns Raised in Public Consultation

CONCERN	RESPONSE/MITIGATION
Noise in the Valleywood subdivision	It was recognized (during the planning for the project) by both the Town and MTO that the area in the vicinity of the Highway 410 / Highway 10 interchange was anticipated to be redeveloped and that future development would recognize and incorporate the future highway alignment. The development of the Valleywood subdivision was designed to provide adequate buffering between the future use and the proposed highway alignment. It was approved by the Town with full knowledge of the future alignment of Highway 410. As a condition of approval, the Town imposed the requirement for the developer to assume the responsibility for noise mitigation.
Configuration of Highway410 / Highway 10 / Valleywood Boulevard interchange.	The design approved in the original EA is the preferred interchange design. The proposed Valleywood Boulevard Structure over Highway 410 will be designed to minimize safety concerns. The grade approaching the structure from either side will be gentle and the bridge will be well maintained (plowing, sanding, salting etc.) to ensure good access to the Valleywood subdivision at all times.
Single access/egress at the Valleywood subdivision.	The recommended configuration and alignment of the Highway 410 extension does not remove any existing accesses to the Valleywood subdivision. Although this access will be modified, the availability of access/egress for Valleywood is unchanged. Plans for a secondary access to the subdivision are the responsibility of the Town of Caledon.
Configuration of the Sandalwood Parkway / Highway 410 interchange.	This would place the ramp terminal too close to the intersection between Heart Lake Road and Sandalwood Parkway (thereby precluding future traffic signals at this terminal).
Wildlife Passage in the vicinity of the Etobicoke Creek crossing	Provide maximum bridge span and structure height to mitigate the barrier effect of the highway to wildlife movement.
Change highway alignment to connect to Highway 10 north of the Valleywood subdivision	Alternative route alignments were considered in the original Environmental Assessment (1998). It was determined that the preferred alignment resulted in fewer impacts than northern routes.
Location of Highway in proximity to Valleywood subdivision.	The Valleywood development was not an approved development at the time of the Highway 410 route planning study. It was determined that if the development was approved, it could be planned to conform to the Highway 410 right-of way.
Impacts to ground water	Pre-construction monitoring of selected wells will occur where significant excavations are required. If impacts occur, mitigation will include well deepening or replacement, or temporary water supply.
Reconstruction of Heart Lake Road.	Arterial alternatives were considered during the original Environmental Assessment. Impacts associated with the displacement of wetlands along Heart Lake were considered unacceptable. Further improvements to Heart Lake Road are the responsibility of the municipality.
Highway capacity.	The proposed Highway 410 extension is planned to be opened as a 4 lane limited access freeway (2 lanes in each direction). However, the highway has been designed to easily accommodate 6 lanes (3 lanes in each direction) from Bovaird Drive to Mayfield Road. Based on current and projected traffic volumes (to the year 2011) for the area, a 4-lane highway will operate well for 10-15 years. Constructing additional lanes beyond those required for efficient and safe highway operations is not cost effective.
Impacts to property values	The determination of property value was not a component of this study. A market value assessment will be undertaken for those properties from which property will be required.

3.1 Environmental Effects and Mitigating Measures

This chapter identifies the impacts produced by the preferred alternative on the environmental features and the proposed measures for mitigation. This chapter documents the impacts associated with the Highway 410 Extension as described in the approved EAR of August 1995 and as revised by the Value Engineering study of 1998, not just those impacts associated with the Value Engineering revisions.

3.1.1 Natural Environment

a. Groundwater and Soils

The soils in the area are relatively flat, and consist of a fine-grained Halton Till. Normal concerns for erosion and soil stability are expected to occur here. Fine-grained soils are more difficult to control with conventional sediment control measures and greater reliance should be placed on temporary sediment basins to enhance settling times of the fine particle soils. Soils should be stabilized as soon as possible after construction to reduce the potential for sediment delivery.

There are a total of 23 properties that are likely to have wells that could be affected by the proposed highway construction and ongoing highway maintenance (i.e. road salting activities) for Alternative 2. Baseline water levels and water quality is recommended for the wells at each of these residences/properties prior to the commencement of construction. This will be obtained as part of a well and water use survey to be completed prior to commencement of construction. This information will be used to measure changes in the ground water conditions of the wells to establish the extent of impact from the proposed highway construction and operations.

Periodic monitoring of wells within 100m of the Right of Way in areas that are to undergo significant regrading with excavations will be required during the construction period. If this monitoring determines that significant interference has occurred in nearby wells as a result of construction activities, mitigative measures could include providing a temporary water supply, deepening the well and/or relocating the well.

Wells that are to be removed will be properly decommissioned by plugging the well in accordance with Regulation 903. This is necessary to prevent future contamination of the underlying aquifer(s).

The impact of the proposed highway alignment on ground water movement will be minor. It is anticipated that there will be relatively little grading changes that involve excavations due to the relatively flat topography. Grading changes, for the

most part, will involve the creation of overpasses at road crossings that will require the addition of soil to the ground surface. Covering of the native soil with fill and the creation of impervious road surfaces could potentially reduce the amount of ground water recharge. However, within the ROW, the underlying soils are fine grained and soils of this nature typically have low infiltration rates and therefore the potential loss of groundwater recharge is small. Surface runoff will be directed away from nearby wells to reduce the potential for contamination from road salt.

During construction, refueling areas for construction vehicles will be kept as far away from private wells/residences as possible to reduce the potential for contamination. Spill containment and cleanup response measures will be in place for the refueling areas and any areas of chemical storage required for the construction activities.

b. Vegetation and Wetlands

The proposed highway extension will result in the loss of one small wetland (W9), loss of wetland area in five others (W1, W6, W7, W11 and W12) (Table 3) and encroachment within 100 m of six others (W2, W5a, W5b, W8, W10 and W14). Wetlands W3 and W4 are beyond 100 m from the highway. It will be important to maintain the water balance in all wetlands in order to mitigate effects to the existing vegetation. The possible exception would be W12, where a change to a slightly drier regime may be considered. Any grading adjacent to the wetlands will be stabilized as soon as possible with erosion cloth and/or vegetation (native species), depending on the slope.

It will be important to prevent the deposition of excess sediment in the wetlands during construction and therefore sediment and erosion control measures will be implemented and maintained. Post construction, storm drainage from the highway will be treated through the use of stormwater management facilities prior to being directed to the wetlands.

Site specific recommendations for the wetlands are contained below:

Table 7: Impacts to Wetlands & Mitigation

Location	Rationale	Suggested Mitigation
W1	Swamp thicket vegetation	swale planted with wetland tolerant herbaceous species, planted with wetland shrubs adjacent to wetland
W2	10m encroachment, shallow marsh	Provide vegetated screening (shrubs and trees)
W5a and b	20m encroachment, shallow marsh	Provide vegetated screening (shrubs and trees), appropriate sized culverts required to maintain hydrology
W6	Meadow marsh community	swale planted with wetland tolerant herbaceous species, maintain drainage

Location	Rationale	Suggested Mitigation
W7	Shallow marsh and swamp thicket	swale planted with wetland tolerant herbaceous species, planted with wetland shrubs adjacent to wetland, maintain drainage
W8	70 m encroachment	Provide vegetated screening (shrubs and trees)
W10	15 m encroachment	Provide vegetated screening (shrubs and trees)
W11	Meadow marsh	swale planted with wetland tolerant herbaceous species, planted with wetland shrubs adjacent to wetland, maintain drainage
W12	Treed swamp	swale planted with wetland tolerant herbaceous species, planted with wetland shrubs adjacent to wetland, maintain drainage to minimize backwater effects on the swamp
W14	5 m encroachment, meadow marsh	swale planted with wetland tolerant herbaceous species, planted with wetland shrubs adjacent to wetland

The crossing of the Etobicoke Creek valley results in the loss of 0.6 ha of forest at the top of slope, 0.05 ha of which is mature forest. Mitigation measures will be undertaken to prestress the trees, and to provide for some mitigation for disturbance to the forest microclimate.

A detailed evaluation of the health of the trees within 30 m of and within the Right-of-way will be undertaken. Prior to construction, the forest edge will be thinned by 25% focusing on removal of the least healthy or those trees most susceptible to wind-throw. Fast-growing tree species such as Black Cherry (*Prunus serotina*), Choke Cherry (*Prunus virginiana*), Trembling Aspen (*Populus tremuloides*), Gray Dogwood (*Cornus foemina*) and Ninebark (*Physocarpus opulifolius*) will be planted inside the edge of the proposed right-of-way. The following year, a further 25% thinning will occur, together with a dense planting of white spruce (*Picea glauca*) to provide a screen for the forest to reduce sun scald and desiccation effects. Prior to construction, the remaining trees within the right-of-way will be removed. All tree removal will occur outside of the breeding period for birds (April 15 to July 15).

Stormwater will be collected in swales and directed away from the valley slope to minimize effects of salt water on the trees. The limit of trees to be protected will be fenced off prior to construction with snow fencing or comparable barrier. Heavy vehicle construction traffic over the root zone (within 10 m of the dripline) will be prohibited. No storage of materials or stockpiling will be permitted within the root zone or within areas to remain vegetated. Graded surfaces adjacent to the forest shall be stabilized with erosion cloth or vegetation immediately in order to prevent accumulation of sediment within the forest, and requirements for silt fencing and maintenance will apply.

c. Wildlife

The loss of upland forest and wetland vegetation will create impacts to wildlife, however minor. The losses are not only to wildlife habitat, but also in restriction of opportunities for wildlife, especially small mammals and herptiles, to move about the landscape. In addition, it can be expected that the highway will increase the mortality to wildlife populations due to road kill (e.g. racoons, skunks, and frogs).

No provincially or regionally significant wildlife was reported in the study area. However, maintenance of the commonly occurring species is an issue. The best opportunity to mitigate for the loss of habitat is to ensure that opportunities for movement are facilitated to the extent possible when faced with a barrier as formidable as a highway. The bridge span over the Etobicoke Creek was designed to maintain opportunities for wildlife movement because of its height and span. The area below the bridge will be landscaped with vegetation (to the extent possible given light and moisture restrictions) and stone, to provide cover for wildlife movement.

The other minor crossing that will be maintained occurs at Mayfield Road. The crossing between wetlands W12 and W11 will be facilitated through an oversized box culvert, which will permit terrestrial as well, as aquatic movement. This will also help to re-establish former hydrological regimes in the wetland, and set the parameters for a possible recovery. Alterations to hydrology will not be undertaken in the late fall after the herptiles have hibernated, therefore these works must occur in the summer and early fall.

d. Aquatic Habitat and Surface Water

There are 15 drainage crossings along the preferred alignment, of which 14 are considered minor drainage's without permanent flow and one is a permanently flowing stream contained within the Etobicoke Creek Valley.

For the 14 drainages, maintaining conveyance function is important and can be accommodated with suitable culverts. Although there is not deemed to be any fish habitat potential in these tributaries, maintaining opportunity in tributaries T6 and T9-14 will be ensured through culverts that are placed flush or countersunk in the bed of the channel. Tributaries T1-T8 (except T6) will be removed from the landscape in the future and therefore maintaining opportunity is not necessary. However, appropriate flow conveyance will be required for all drainages.

Etobicoke Creek remains as the only significant water crossing which will be spanned by a bridge with a 70 metre (2 X 35 twin span) structure. This width will accommodate wildlife corridor function as well as a pedestrian footpath and maintains desirable setbacks (25 m) from the stream edge. Although a bridge is the most desirable crossing method, there will still be effects on the valley as it does not span the entire distance. From a fisheries perspective, bank stabilization will be required due to shading and a lack of moisture under the new structure. Further, MNR has determined that this bank work will result in a harmful, alteration, disruption or destruction of fish habitat. As such, the crossing of the Etobicoke

Creek has been referred to the Department of Fisheries and Oceans (DFO) for authorization pursuant to Section 35(2) of the Fisheries Act. Fisheries approval for the Etobicoke Creek crossing will be obtained prior to construction. Appropriate mitigation will be provided.

An evaluation of the effects on the meander belt width was made to assess whether the channel would have the ability to meander through the crossing as may naturally occur. There is evidence from the air photos, in the form of oxbows, both at the crossing and elsewhere in the valley, that the channel has moved and therefore giving it room to move will be potentially important. The average meander belt width of 117 m will not be accommodated by the 2 X 35 metre twin span. The meander belt measurement right at the bridge crossing is approximately 80 m in width, with the critical area about 50 m to 60 m wide where a potential meander cut could occur, based on existing morphology of the river. Thus, the minimum proposed bridge span of 70 m would be adequate to allow for the river to move. The movement would likely be to the east and therefore it is also preferable to maintain the bulk of the opening to this side.

Bridge construction will result in some sedimentation to the watercourse, as well as alteration of the riparian edge, particularly on the west bank. The re-establishment potential of riparian edge under the bridge is poor given the shade and interception of moisture. However, with careful construction practice and design to direct moisture from the bridge surface to the valley floor under the bridge, some level of vegetation can be retained, particularly along the banks where river moisture is available.

The west bank of Etobicoke Creek relies on vegetation to protect against erosion. The vegetation will be removed with the bridge construction and limitations of light and moisture will restrict the ability to re-establish any significant growth. Clearing activities on either side of the river should not remove stumps, instead leaving them in place for erosion control purposes. Any bank erosion control measures should be carried out with fish habitat needs in mind, reflecting a combination of river run cobble and vegetation.

Storm drainage from the highway will be treated through the use stormwater management facilities. Storm ponds will be designed to Level 2 treatment standards.

Timing windows for construction would restrict construction to the period between July 1 and April 1 based on warmwater species spawning periods. However, the duration of bridge construction may be expected to take longer than this period. No significant instream works are proposed except for works related to bank stabilization measures which can be completed quickly and with the benefit of only a silt curtain to protect the main channel from construction related sediment. Therefore, only instream work will be restricted to this window. Efforts will be made to limit the works to the summer and early fall to ensure that adequate vegetative cover can be established prior to the onset of winter. Temporary

crossings for construction purposes will not be installed in this valley. Access should be restricted to tableland entry points on either side of the river.

Areas for refueling of machinery will be located well away from any watercourse or drainage ditch.

Sediment and erosion controls will be implemented throughout the construction area, maintained frequently and in response to storm events. These controls will include measures such as sediment fences, check dams in swales and restoration of exposed soils with vegetative cover. On steeper slopes, geotextiles will be used to enhance slope stability and the growth of the vegetation. An environmental inspector will be employed to monitor the success of the sediment and erosion control methods used and to provide guidance on maintenance requirements. Sediment and erosion controls shall remain in place and maintained until such time as the vegetation has taken sufficiently to provide adequate protection for the watercourses.

Restoration will take place within 45 days of the start of grading and disruption of soil, as weather conditions permit. The schedule for the completion of construction will coincide with a seasonally appropriate time to allow for the successful growth of vegetation. Native species, tolerant of highway conditions will be used throughout the right-of-way to complement the natural conditions in the valleys.

All construction debris and litter will be removed frequently. Stockpiles will be located away from watercourses, and, where required, shall be separated with a sediment fence. All stockpiles will be removed upon completion of the works and the site restored under the location, as appropriate.

Sediment laden water in the working area will be first pumped to a temporary sediment control basin or through a filter bag prior to outletting to the floodplain or road side ditches. Additional measures such as straw bales or check dams may be required depending on the site specific conditions and as determined in the field by the Environmental Inspector. Dissipaters should be available to spread the pumped water out through the discharge zone.

Flow through the watercourses where instream works are taking place will be maintained and without sedimentation or erosion. Flows may be diverted by piping or damming and pumping for short duration. Construction of the culverts for the 14 drainage's will be primarily undertaken in the winter or summer when flows are expected to be minimal or non-existent.

e. Environmentally Significant Areas

The only feature affected is the Etobicoke Creek Valley itself. Mitigation measures for this feature are already detailed in the sections on vegetation, aquatic habitat and wildlife.

f. Groundwater

The soils were determined to be fine grained and therefore not overly susceptible to contamination or alteration of water supply potential with the development of the highway. Urban servicing in the near future is expected to change the reliance from ground water supply to municipal supply in the Brampton study corridor. Wells in the area will be assessed prior to construction, where remaining.

3.1.2 Socio-Economic Environment

a. Aesthetics

The proposed extension (as approved in the original EA) results in changes to the existing aesthetic quality of the area. The aesthetic qualities of the highway through this area will be maintained/enhanced by keeping the vegetation removals to a minimum and by undertaking post-construction landscape planting and berming.

The aesthetics of the proposed design will be slightly less desirable than those of the original EA design due to the raise in grade as described in Section 2.4.2. This raise in grade brings the highway out of a cut condition and places it closer to the existing ground elevation.

b Highway and Construction Noise

A detailed noise analysis was carried out for the Preferred Alternative in the spring of 1999.

Mitigation for noise receivers could include the combination of noise barriers, vertical and horizontal alignment shifts, and pavement types. Noise barriers can be a cost-effective form of noise mitigation when rows of houses are being considered.

It is Ministry of Transportation policy to erect noise barriers, where warranted, to achieve a minimum attenuation of 5 dBA. Noise attenuation of individual noise sensitive areas (houses) is technically feasible, however the benefit of providing one house with a noise barrier to reduce noise levels by a minimum of 5 dBA is considered to be minimal when compared to cost.

During detail design, noise sensitive locations will be re-assessed to determine if any additional sites would be subject to noise increases greater than 5 dBA. Additional mitigation will be considered at that time.

As a part of the conditions of approval for the Valleywood development, the developer has accepted responsibility for noise mitigation for the development

With respect to construction noise, future construction activities will have the potential to result in temporary noise level increase (particularly in areas previously described as noise sensitive) and vibration. Control measures, if required, will be applied to reduce the noise and vibration generated by blasting and pile driving operations. The general control measures can include pre-blast surveys; advising the contractor of safe limits for blast induced sound and vibration levels; monitoring

of blasting operations; and restrictions on times of operation. At the detail design stage, the Ministry of Transportation (MTO) will carry out the following commitments:

- Noise and vibration sensitive areas will be identified;
- Applicable municipal noise control by-laws will be identified and obeyed. Where timing constraints, or any other municipal by-law may cause hardship to MTO, an explanation of this will be outlined, and an exemption from such by-law will be sought directly from the municipality in question;
- General noise and vibration control measures (not sound level criteria) will be referred to, or placed in MTO contract documents;
- Any initial complaint from the public will require verification by MTO that the general noise and vibration control measured agreed to are in effect; MTO will investigate any noise or vibration concerns, warn the contractor of any problems, and enforce its contract;
- Notwithstanding compliance with the "general noise and vibration control measures", a persistent complaint will require a contractor to comply with MOE sound level criteria for construction equipment contained in the MOE Model Municipal Noise Control By-Law. Subject to the results of field investigation, alternative noise and vibration control measures will be required, where these are reasonably available;
- In the selection of the appropriate construction noise and vibration control and mitigation measures, MTO will give consideration to the technical, administrative, and economic feasibility of the various alternatives; and
- Monitoring where pile driving or blasting may be necessary in noise and vibration sensitive areas will be determined (in consultation with MOE) and adopted by MTO policy pursuant provincial legislation at the time of construction.

c Community and Recreation

The Preferred Alternative avoids existing residential areas. The proposed highway passes through areas north of Countryside Drive which are used primarily for agricultural purposes. South of Countryside Drive, lands are dedicated for residential/commercial development under SPA 28 (the Springdale development) in the City of Brampton. There are some rural residences scattered throughout the study area, which are a result of agricultural severance over time.

An east-west pedestrian/bike path is proposed under SPA 28 in the vicinity of the proposed Highway 410/Sandalwood Parkway interchange. The implementation of this path and associated costs will be addressed during detail design in coordination with the City of Brampton.

A complete property purchase of 4 residences will be required for the Preferred Alternative. Two properties are required on the south side of Mayfield Road within

the limits of the proposed interchange with Highway 410. Of the remaining two properties, one is located on the east side of Highway 10 at the junction with Highway 410 and the other on the east side of Heart Lake Road just north of Mayfield Road. Residential property taking will also be required at 12109 and 12181 Heart Lake Road (Part Lot 18, Concession 3 in the Town of Caledon). A small amount of commercial land will be required from a property (Auction barn and flea market) on Highway 10 and a concrete disposal and recycling plant on the north side of Countryside Drive (mid-concession) will be displaced.

The method of estimating property values and the potential impact of the proposed freeway on property is a general concern of local property owners. In situations where a property is required in its entirety, compensation is based on the market value of the property (market value being defined as the amount the land might be expected to realize if sold on the open market by a willing seller to a willing buyer). In those cases where only part of the property is required, the effect this may have on the balance of the property has to be taken into consideration. If the property is further reduced in value due to changes in shape, size, potential use or effect on buildings, the market value of the land may be revised to reflect these items in the total offer of compensation.

In any event, Ministry and / or private appraisers, and Ministry policy is guided by the Expropriations Act to carry out all property appraisals. There is also provision for payment of other reasonable allowances, such as legal and survey costs, relocation costs and inconvenience. Appraisal costs are also considered under most circumstances. Should property owners disagree with the amount of compensation offered, they have the provisions of the Expropriations Act and ultimately the Land Compensation Board.

3.1.3 Economic Environment

a Agriculture

The Preferred Alternative passes through the south limit of an active farming area. Approximately 23 ha. of Class 1 soil capability will be required for the proposed highway. Class 2 soil is not present in the proposed right-of-way. Approximately 12.5 hectares of Class 3 soil will be required.

Of the agricultural land required for the Preferred Alternative, only 8 ha is owner-operated field crop, the other 27 ha is tenant worked land. Specialty crop land is not affected by the proposed highway.

A total of 13 farm holdings will require severance. Two of the thirteen will be from owner operated farms. Twelve of the holdings are smaller than 38 ha from which seven will require more than 10 % of the holdings and 6 will require less than 10% of the holding.

Class 1 and 3 soil capability lands will be required. The acquisition of lands will be limited to that required for the right-of-way. Compensation for loss of land will be

at fair market value as per the Ministry of Transportation's guidelines. Topsoil will be stripped and stock piled for future use.

The majority of the agricultural community is situated north of the Preferred Alternative. The proposed alignment will have a minimal impact on the agricultural community.

b Commercial / Industrial

Existing commercial uses are generally situated within the study area along the east side of Highway 10 between Mayfield Road and the Valleywood development. Businesses along this section of Highway 10 include a Petro Canada Gas Bar, the Snelgrove Country Market / Reinhart Auction, and a Laidlaw Transit Ltd. school bus depot.

With respect to industrial uses within the study area, a concrete/asphalt storage and recycling yard is located on the north side of Countryside Drive (mid concession) east of Heart Lake Road (Lot 16, Concession 3, City of Brampton). The Region of Peel uses a portion of this site as a recycling/composting depot.

The proposed extension of Highway 410 will result in the displacement of 2 businesses including a compost and concrete/asphalt storage facility at 1756 Countryside Drive (Part Lot 16, Concession 3, Brampton) and a Laidlaw Transit facility at 12267 Hurontario Street (Part Lot 19 Concession 1, Brampton).

c Special Land Use Strategies

The Preferred Alternative passes through or in close proximity to 3 Official Plan Amendments (OPA's). These areas are described as follows:

The Sprindale subdivision (SPA 28) includes an area of approximately 1620 ha bounded by Heart Lake Road, Countryside Drive, Airport Road and Bovaird Drive.

OPA 170 within the City of Brampton was approved in 1990. This residential development is bounded by Highway 10, Mayfield Road and the City of Brampton boundary.

The Valleywood subdivision (OPA 79) located within the Town of Caledon is bounded by Highway 10, the Etobicoke Creek, the City of Brampton boundary and lands owned by TRCA. Completion of the Valleywood development will concur with the preferred alignment for Highway 410.

The Mayfield West Community draft plan initiated in July of 1996 proposes a change in land use from agricultural to residential, comprising approximately 5,100 to 6,500 low-density single-family detached dwellings. Old School Road, Chinguacousy Road, Dixie Road and the Caledon/Brampton municipal boundary bound this community. As of spring 1999, a Community Development Plan had not been finalized and subsequently, the plan has not been formally adopted by the Town in the form of an Official Plan Amendment.

The Preferred Alternative conforms to municipal objectives. Secondary Plan Area 28 (Springdale) in the City of Brampton and the conceptual plans for the Mayfield West Community in the Town of Caledon show a future Highway 410 alignment. The proposed alignment is conceptually the same.

d Property Contamination and Waste Deposition

An Environmental Site Assessment was conducted by Golder Associates on November 27, 1998 to identify areas of potential environmental concern.

As part of this assessment, two issues were identified. The presence of a compost transfer facility and a concrete/asphalt recycling yard on the north side of Countryside Drive (lot 16, Concession 3 E.H.S) and registered underground storage tanks (USTs) at the Laidlaw Transit property located at 12267 Hurontario Street ((Lot 19, Concession, 1 E.H.S) were noted.

The compost facility and concrete/asphalt storage yard (with a MOE provisional certificate of approval for a compost site is registered against the property) represent a low probability of subsurface impact. However, some localized shallow soil impacts may have occurred. Therefore, if surficial soil materials in these areas are to be disturbed during construction, the excavated materials will be stockpiled and tested as necessary to determine appropriate options for reuse or disposal.

The presence of underground fuel storage tanks can represent a moderate to high probability of at least some localized subsurface impact. During detail design, a Phase 2 Environmental Site Assessment will be conducted as necessary to investigate the possible presence and/or extent of hydrocarbon impact. Where the presence of impacted material or groundwater in the vicinity of the USTs is discovered, a strategy for managing contamination in accordance with the MOE "*Guidelines for use at Contaminated Sites in Ontario*" will be implemented.

e Aggregates / Mines

A quarry is located to the west of Heart Lake Road and north of Bovaird Drive. The proposed extension of Highway 410 does not impact this area.

The concrete/asphalt-recycling yard uses the site for crushing concrete and storage of bulk aggregates. A strategy for managing these materials will be incorporated into the detail design.

3.1.4 Cultural Environment

a Archaeology

An archaeological assessment (Stages 1 and 2) was previously conducted for the original Environmental Assessment Study (1988). As a result of this study, two mid-19th Century Euro-Canadian sites were identified, and the recommendation was made that they be subject to additional Stage 3 assessment.

A Stage 3 archaeological assessment was conducted in September 1999 for the *Shell Canada Site* (AkGw-11) and the *Chinguacousy Farm site* (AkGw-12).

Numerous artifacts dating from 1830 to 1860 were recovered from each of the sites. Given that the occupation at each location was limited to the middle portion of the Nineteenth Century, and the deposits are isolated from the later occupation of these lots, a Stage 4 archaeological assessment for both the *Shell Canada site* and the *Chinguacousy Farm site* will be conducted prior to highway construction.

b Heritage Resources

Heritage resources include both the built environment and cultural landscapes. The proposed highway will remove one farmstead and partially impact one residence/site. In addition, the proposed highway passes through three distinct cultural landscapes.

The farmstead that has been identified is located on the west half of Lot 14, Concession 3 E.H.S. (east side of Heart Lake Road between Bovaird Drive and Countryside Drive). This site is a residence with remains of out-buildings dating from circa 1840 and has been identified as having a minimal degree of significance or interest. The Preferred Alternative will also result in impacts to a residence/site on Lot 13, Concession 3 E.H.S (on the east side of Heart Lake Road). The removal of a barn shed will result due to the location in or straddling of the right of-way for the preferred alternative. The impact to this site is minimal.

Proposed mitigation directly related to the heritage qualities of features, which are affected, will need further investigation during detailed design, to determine the appropriate level of effort required. This would include consideration of whether specific site inspection, documentation (both in historic background and photographic/graphic inventory terms), salvage or other mitigation efforts are warranted; the responsibility for arranging and conducting these efforts; and the appropriate timing and reporting requirements for any efforts. This would require consultation with such concerned parties as the Ministry Citizenship, Culture and Recreation's Heritage Branch, and representatives of the relevant LACACs and local or other heritage organizations with interest in the area (e.g. Ontario Historical Society, Architectural Conservancy of Ontario, Inc.)

The Preferred Alternative will also pass in close proximity to a homestead located on the west half of Lot 15, Concession 3, E.H.S. The site is a residence with a barn and other small outbuildings dating from circa 1870. The site has been identified as having a moderate degree of significance or interest in this study. However, the homestead has been included under the Class 'A' category in the Brampton Inventory of Heritage Resources since 1993. Heritage resources in the Class 'A' category are significant and worthy of designation. It is noted that this heritage resource is located on lands approved for the Springdale development. Any mitigation, if warranted, will be investigated during detailed design as discussed in the preceding paragraph.

There are three landscapes in the vicinity of the Preferred Alternative. The Etobicoke Creek Valley landscape is crossed almost perpendicularly and provides the driver with an aesthetic view of the landscape. The majority of the landscape pattern will remain both to the north and to the south. The majority of the rural Caledon agricultural pattern would also not be affected by the Preferred Alternative. In addition, the clustered community of Snelgrove is not affected. The Springdale development will completely remove the existing cultural landscape as new houses, commercial developments and new roads are built.

3.1.5 Applied Environmental Factors

a Erosion and Sedimentation Control

To minimize the potential for erosion of newly exposed cut and fill slopes, a 45-day limit shall be adopted from the time slopes are exposed to the stabilization of grading. Standard sediment and erosion control measures (erosion blankets, sediment fences, temporary sediment basins and check dams) will be installed and maintained during construction as appropriate to prevent any exposed surfaces from contributing sediment to the Etobicoke Creek and other tributaries and wetlands in the vicinity of the proposed highway.

b Management of Excess Materials

During detail design a management plan for the disposal of excess material will be developed in accordance with current MTO practice. Disposal of excess material should not occur within any natural areas.

An assessment of potential property contamination (as indicated in section 3.1.3d) will be undertaken during detail design.

c Landscape Architecture

The aesthetic qualities of the highway will be maintained/enhanced by keeping the vegetation removals to a minimum and by undertaking post-construction landscape planting and berming. A detailed landscape plan will be incorporated into detail design requirements.

3.2 Concerns and Mitigating Measures

During the planning process, issues and concerns were raised by the Ministry of Transportation, Ministry of Natural Resources, Ministry of Agriculture and Food, Toronto and Region Conservation Authority, Ministry of Citizenship, Culture and Recreation, the Department of Fisheries and Oceans, and local residents/property owners.

Commitments for mitigation to address specific concerns with the selected alternative are listed in Table 8.

TABLE 8 SUMMARY REPORT OF ENVIRONMENTAL CONCERNS AND COMMITMENTS

I.D. #	Environmental Element/Concern and Potential Impact	Concerned Agencies (includes MTO)	I.D. #	Details/Mitigation
1.0	Erosion Control To minimize the potential for erosion of newly exposed cut and fill slopes.	TRCA/MNR/MTO	101	Limit the time, slopes are exposed prior to stabilization to 45 days from commencement of grading. Use erosion blankets on steeper slopes to enhance slope stability.
			102	Employ sediment fences, temporary sediment basins and check dams where appropriate.
			103	All stockpiling and refuelling activities will be conducted away from the channel.
2.0	Watercourse and Fisheries Protection	DFO, MNR, MTO, TRCA	201	Maintain water conveyance function throughout short term construction using piping, or damning and pumping, and in the long term through the installation of appropriate culverts. Culvert construction should be undertaken in the winter or summer when flows are at a minimum (often dry).
			202	Leave stumps within the Etobicoke Creek valley in areas to be cleared and re-establish bank stability with river run cobble and vegetation at the earliest opportunity. Direct moisture from the bridge surface to the valley floor under the bridge.
			203	Any proposed in-stream work at Etobicoke Creek will be restricted to the period between July 1 and April 30. A silt curtain shall be installed to protect the main channel from construction related sediment.
			204	Locate refueling areas well away from any watercourses and separated with a sediment fence.
			205	Fisheries approval under Section 35 (2) of the Fisheries Act for the Etobicoke Creek crossing will be obtained prior to construction. Appropriate mitigation and compensation will be exercised as necessary.
			206	Restoration will take place within 45 days of start of grading and exposure of soil, and with sufficient time to allow for successful establishment of vegetation prior to winter.
			207	Sediment and erosion controls shall be maintained until vegetation is established.
			208	Sediment laden water shall be pumped to a temporary sediment control basin and through a filter bag prior to the outletting (using dissipaters if necessary) to the floodplain or road side ditches. Straw bales or check dams may be required as determined by the Environmental Inspector.
			209	Access to the floodplain should be restricted to tableland entry points on either side of the river, and temporary crossings of the creek will not occur.

TABLE 8 SUMMARY REPORT OF ENVIRONMENTAL CONCERNS AND COMMITMENTS

I.D. #	Environmental Element/Concern and Potential Impact	Concerned Agencies (includes MTO)	I.D. #	Details/Mitigation
3.0	Vegetation Protection and Restoration To minimize impact to vegetation communities, wetlands and to maintain slope stability.	MTO, TRCA	301	Prestress forest edge of Etobicoke Creek Valley (see section 3.1.1b for details)
			302	Provide vegetated screenings between the wetlands and highway to protect from the effects of salt spray, encourage flyovers above the traffic stream to minimize avian road kill and to provide shelter from the noise, light and emission effects from the highway (see section 3.1.1b for details).
			303	Direct stormwater runoff away from valley slopes and pretreat before drainage into wetlands.
			304	Retain existing trees and shrubs where possible.
4.0	Wildlife	TRCA, MTO, MNR	401	Provide maximum feasible bridge span to mitigate for barrier effect of highway to wildlife movement.
			402	Provide oversized box culvert to provide terrestrial and aquatic linkage at Mayfield Road (wetlands W12 and W11).
			403	Tree removal in the EtobicokeValley will not occur during breeding season (April 15 to July 15). Disturbance to wetlands should also respect this time frame, in addition to avoidance of construction initiation in late fall when herptiles are in hibernation.
5.0	Stormwater Management	TRCA, MTO	501	Treatment ponds to be designed to Level 2 treatment standards.
			502	Treat in vegetated areas or stormwater management facilities.
6.0	Air Quality	MTO	601	Open burning will not be permitted.
			602	Application of calcium chloride flakes and/or water to reduce dust.
7.0	Construction Noise	MTO	701	Control construction noise (e.g. no unnecessary idling, well maintained equipment). If night work is required a noise bylaw exemption will be requested from the Municipalities.
			702	Monitor complaints on construction noise and investigate.
	Noise Increase to the Valleywood Subdivision	MOE / Local Residents	703	As a part of the conditions of approval for the subdivision, the developer has accepted responsibility for noise mitigation for the development.

TABLE 8 SUMMARY REPORT OF ENVIRONMENTAL CONCERNS AND COMMITMENTS

I.D. #	Environmental Element/Concern and Potential Impact	Concerned Agencies (includes MTO)	I.D. #	Details/Mitigation
8.0	Management of Excess Material	MTO	801	Excess material shall be managed in accordance with OPSS 180.
9.0	Archaeological Resources	MCzCR/MTO	901	A Stage 4 Archaeological Assessment will be undertaken prior to construction.
10.0	Heritage Resources	MTO, MCzCR, Caledon LACAC	1001	Develop a strategy to document sites prior to removal in association with the Ministry of Citizenship, Culture and Recreation.
11.0	Property	Local Residents	1101	Compensation is based on the market value of the property.
12.0	Property Contamination and Waste Deposition	MTO, TRCA / Local Residents	1201	Further site investigation will be conducted as necessary during detail design (i.e. the concrete recycling facility and compost lands, Lot 16, Concession 3 E.H.S and the Laidlaw Transit Facility, Lot 19 Concession 1 E.H.S.). Where soil contamination is identified, decommissioning will be conducted in accordance with the MOE "*Guidelines for Use at Contaminated Sites in Ontario*".
13.0	Agricultural Soil Capability and Land Use	OMAF, MTO	1301	Acquisition of lands to be limited to that required for the right-of-way. Topsoil will be stripped and stockpiled for future use.
14.0	Individual Farm Effects/Property	MTO, Property Owners	1401	Compensation is based on the market value of the property.
15.0	Disruptions to Traffic During Construction	Ontario Provincial Police (OPP)	1501	Liaisons with the Peel Regional Police or the Ontario Provincial Police as appropriate.
16.0	Aesthetics	MTO	1601	Post-construction landscaping to be carried out.
17.0	Groundwater	MTO, MOE	1701	Pre-construction monitoring of selected wells where significant excavations required.
			1702	Mitigation includes well deepening or replacement or temporary water supply.
			1703	Wells that are to be removed will be properly decommissioned in accordance with Regulation 903
18.0	Implementation of a Pedestrian/Bike Path in the vicinity of the Highway 410/Sandalwood Parkway Interchange	MTO, City of Brampton	1801	Implementation of a path and associated costs will be addressed during detail design in coordination with the City of Brampton.

4.0 Monitoring

4.1 PROJECT SPECIFIC TECHNICAL MONITORING

During construction, MTO ensures that the implementation of the mitigating measures and key design features are consistent with the contract. In addition, MTO will assess the effectiveness of its environmental mitigating measures to ensure the following:

1. individual mitigating measures are providing the expected control and/or protection;
2. composite control and/or protection provided by mitigating measure is adequate;
3. additional mitigating measures are provided as required for any unanticipated environmental conditions which may develop during construction;
4. information is available for the overview assessment of mitigating measures.

Environmental monitoring after a project is completed may involve follow-up monitoring of significant measures and /or significant concerns.

4.2 PROJECT SPECIFIC CLASS EA PROCESS MONITORING

During the planning and design, MTO ensures compliance with the Class EA process before MTO issues "environmental clearance" for project implementation.

During construction, MTO ensures that external notification and consultations are consistent with any commitments that may have been made earlier. Following construction, monitoring will ensure that any follow-up information is provided to external agencies as per any outstanding environmental commitments.

4.3 IMPLEMENTATION OF ENVIRONMENTAL MONITORING FRAMEWORK

4.3.1 Inspection by Construction Staff

Construction is subject daily to general on-site inspection to ensure the execution of the environmental component of the work and to deal with environmental problems that develop during construction. This is the primary method for compliance monitoring.

4.3.2 Site Visits by Environmental Staff

Construction projects with significant mitigating measures/concerns are subject to periodic site visits by consultant environmental staff. The timing and frequency of such site visits are determined by the schedule of construction operations, the sensitivity of environmental concerns and the development of any unforeseen environmental problems during construction. MTO staff will be available if difficulties arise.

APPENDIX 'A'

NOTIFICATION & PIC SUMMARY REPORT

COLE, SHERMAN CONSULTING ENGINEERS

November 25, 1998
Our Ref.: 98224

Mr. David Tilson, PC
Dufferin – Peel MPP
244 Broadway Avenue
Orangeville, Ontario
l9W 1K5

Dear Mr. Tilson:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bovaird Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

Cole, Sherman & Associates Ltd. has been retained by MTO to undertake the full scope of this study.

An Environmental Assessment Report (EAR) for the extension of Highway 410 was completed in 1989. During the mid-1990's, MTO updated the EAR to meet current environmental standards and to assess whether such an update would impact the original recommended route. This update confirmed that the original route was the preferred alternative. The Environmental Assessment Report received approval from the Minister of the Environment on March 5, 1997.

In early 1998, MTO undertook a value engineering exercise to analyze the functional requirements of the project and how to provide them at their lowest life-cycle cost. This resulted in changes to the MOE approved design, including narrowing the right-of-way through the provision of a concrete centre median barrier and minor interchange reconfigurations.

The EAR outlined a process for amending the approved undertaking. The process involves following the requirements of the Provincial Highway Class Environmental Assessment. An Environmental Study Report (ESR) documenting the anticipated effects of the project and the corresponding mitigation measures will be prepared to amend the approved Environmental Assessment Report and will be submitted to the Ministry of the Environment (MOE) for public review.

When the details of the proposed works have been developed to a sufficient level of detail, a Public Information Centre will be held. You will be informed of the date and time of the Public Information Centre and notices will be published in local newspapers.

The purpose of this letter is to notify you of project start-up. Should you require further information regarding this project, please feel free to contact the undersigned or Paul Hudspith (Project Manager).

Thank you for your cooperation and assistance.

Yours truly,
COLE, SHERMAN & ASSOCIATES LTD.

Michael Bricks
Environmental Planner

cc: D. Kemper - MTO
G. Ivanoff - MTO
P. Hudspith - CSA

COLE, SHERMAN & ASSOCIATES LTD.
75 Commerce Valley Drive East, Thornhill, Ontario L3T 7N9 ▲ Tel: (905) 882-4401 ▲ Fax: (905) 882-4399
e-mail: csa@wcc.com
Internet: www.colesherman.com

COLE, SHERMAN

CONSULTING ENGINEERS

November 25, 1998
Our Ref.: 98224

Mr. Joe Spina, PC
Brampton North MPP
2nd Floor, Suite 104 Conestoga Square
380 Bovaird Drive
Brampton, Ontario
L6Z 2S8

Dear Mr. Spina:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bovaird Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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Environmental Planner

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. John Nott
Director of Engineering
The Town of Caledon
P.O. Box 1000, 6311 Old Church Rd.
Caledon East, Ontario
L0N 1E0

Dear Mr. Nott:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bovaird Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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The purpose of this letter is to notify your office of project start-up.

In light of this, would you please indicate whether your organization wishes to participate, and who will act as our contact.

In order to assist us in our planning process, would you please indicate if the above project would affect the delivery of your organization's programs or services.

A reply by December 7, 1998 would be appreciated. Should you require further information regarding this request, please feel free to contact the undersigned or Paul Rudolphi (Project Manager).

Thank you for your cooperation and assistance.

Yours truly,
COLE, SHERMAN & ASSOCIATES LTD.

Michael Brooks
Environmental Planner

cc: D. Kenyon - MTO
G. Inwood - MTO
P. Rudolphi - CSA

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email: csa@csa.com
Internet: www.colesherman.com

COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. Bryce Manning
Director of Planning
The Town of Caledon
P.O. Box 2000, 6311 Old Church Rd.
Caledon East, Ontario
L0N 1E0

Dear Mr. Manning:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

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Michael Brooks
Environmental Planner

cc: D. Kenyon - MTO
G. Inwood - MTO
P. Rudolphi - CSA

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email: csa@csa.com
Internet: www.colesherman.com

COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. Sean Farrell
Environmental Co-ordinator
Rail Liaison Branch - GTA
Transport Canada Somerset
777 Bay Street, 15th Floor
Toronto, Ontario
M5G 2E5

Dear Mr. Farrell:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bovaird Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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COLE, SHERMAN & ASSOCIATES LTD.

Michael Brooks
Environmental Planner

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. Peter Carruthers
Environmental Assessment Co-ordinator
Cultural Operations Branch
Ministry of Culture, Tourism and Recreation
77 Bloor Street West, 2nd Floor
Toronto, Ontario
M7A 2R9

Dear Mr. Carruthers:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bovaird Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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Thank you for your cooperation and assistance.

Yours truly,
COLE, SHERMAN & ASSOCIATES LTD.

Michael Brooks
Environmental Planner

cc: D. Kenyon - MTO
G. Inwood - MTO
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Internet: www.colesherman.com

COLE, SHERMAN — CONSULTING ENGINEERS

November 18, 1998
Our Ref.: 98224

Mr. George Segovic
Director
Environmental Assessment Branch
Ministry of the Environment and Energy
250 Davisville Avenue, 5th Floor
Toronto, Ontario
M4S 1H2

Dear Mr. Segovic:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bovaird Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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Thank you for your cooperation and assistance.

Yours truly,
COLE, SHERMAN & ASSOCIATES LTD

Mildred Bricks
Environmental Planner

cc: D. Kemper - MTO
G. Inacoff - MTO
P. Rudolphi - CSA

COLE, SHERMAN — CONSULTING ENGINEERS

November 18, 1998
Our Ref.: 98224

Mr. James Clifford
Supervisor, Land Use Planning Unit
Environmental Assessment Branch
Ministry of the Environment and Energy
250 Davisville Avenue, 5th Floor
Toronto, Ontario
M4S 1H2

Dear Mr. Clifford:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bovaird Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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Environmental Planner

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75 Commerce Valley Drive East, Thornhill, Ontario L3T 7N6 • Tel (905) 882-4401 • Fax (905) 882-4399
email: csa@csa.com
Internet: www.csa@csa.com

COLE, SHERMAN — CONSULTING ENGINEERS

November 18, 1998
Our Ref.: 98224

Ms. Meredith Bonsdorf
Ministry of Municipal Affairs
777 Bay Street, 24th Floor
Toronto, Ontario
M5G 2E5

Dear Ms. Bonsdorf:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

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COLE, SHERMAN — CONSULTING ENGINEERS

November 18, 1998
Our Ref.: 98224

Mr. Jon Barker, District Manager
Greater Toronto Area District
Ministry of Natural Resources
P.O. Box 7400
12140 Dufferin Street
Maple, Ontario
L6A 1S9

Dear Mr. Barker:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Dr. Peter Cole
Commissioner and Medical Officer of Health
Peel Regional Health Department
10 Peel Centre Drive
Brampton, Ontario
L6T 4B9

Dear Dr. Cole:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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Richard Brooks
Environmental Planner

cc: D. Kreuger - MTO
C. Brandt - MTO
P. Rudajcik - CSA

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mrs. G. Grace
Sheridan College of Applied Arts
& Technology, Study Services
Trafalgar Road, P.O. Box 7500
Brampton, Ontario
L6T 5G6

Dear Mrs. Grace:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. R.A. Brown, Director
Design & Development Division
Transportation
Ontario Hydro
700 Bloorstreet Avenue
Toronto, Ontario
M3G 1X6

Dear Mr. Brown:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Ms. Heather Darroch
Peelland Transfer Branch
Ministry of Agriculture and Food
8th Floor, 801 Bay Street
Toronto, Ontario
M7A 2A5

Dear Ms. Darroch:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 9822A

Mr. Tim Eger
Director, Corporate Policy and Planning
Ontario Native Affairs Secretariat
700 Bay Street, Suite 1000
Toronto, Ontario
M5G 2K2

Dear Mr. Eger:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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Michael Bricks
Environmental Planner

cc:D. Kemper - MTO
G. Inwood - MTO
P. Rudolphi - CSA

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: MB24

C.W. Wyatt, Director Superintendent
Operational Policy & Planning Branch
Ontario Provincial Police
Ministry of the Solicitor General
& Correctional Services
90 Harbour Street, 3rd Floor
Toronto, Ontario
M7A 2X1

Dear C.W. Wyatt:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 9802H

Ms. Mary Bull
Planning Officer
Ontario Provincial Police
777 Memorial Avenue
Orillia, Ontario
L3V 7V3

Dear Ms. Bull:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 9822K

Mrs. Alyson Deans
Manager, Planning & Analysis
5 Sheffield Drive
Dunnville, Ontario
N3H 1X4

Dear Mrs. Deans:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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A reply by December 7, 1998 would be appreciated. Should you require further information regarding this request, please feel free to contact the undersigned or Paul Rudolphi (Project Manager).

Thank you for your cooperation and assistance.

Yours truly,
COLE, SHERMAN & ASSOCIATES LTD.

Michael Bricks
Environmental Planner

cc:D. Kemper - MTO
G. Inwood - MTO
P. Rudolphi - CSA

COLE, SHERMAN & ASSOCIATES LTD.
70 Commerce Valley Drive East, Thornhill, Ontario L3T 7N8 • Tel (905) 882-4401 • Fax (905) 882-4399
email: csa@csa.com
Internet: www.colesherman.com

COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. D.A. Reynolds, Manager
Engineering / Environmental Services
CH Hill
Suite 503
377 Rivers Street West
Thornton, Ontario
M3V 2W7

Dear Mr. Reynolds:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bovaird Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

Cole, Sherman & Associates Ltd. has been retained by MTO to undertake the full scope of this study.

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Michael Brooks
Environmental Planner

cc: D. Kemper - MTO
C. Imeroff - MTO
P. Rudolphi - CSA

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email: csa@csa.com
internet: www.colesherman.com

COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. Brian McCormick, Senior Head
Environmental Studies & Approvals
Ontario Region
2nd Floor, 2nd Avenue 2110 B2
Toronto, Ontario
M3G 7S6

Dear Mr. McCormick:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

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Michael Brooks
Environmental Planner

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C. Imeroff - MTO
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internet: www.colesherman.com

COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Ms. Eve Wyatt
Manager - Corporate Planning, Project Development
GO Transit
20 Bay Street, Suite 6900
Toronto, Ontario
M5J 2W3

Dear Ms. Wyatt:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

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Michael Brooks
Environmental Planner

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C. Imeroff - MTO
P. Rudolphi - CSA

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COLE, SHERMAN — CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mrs. Sonnie J. Jones, Regional Clerk
The Regional Municipality of Peel
10 Peel Centre Dr.
Brampton, Ontario
L6T 4B9

Dear Mrs. Jones:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

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COLE, SHERMAN & ASSOCIATES LTD.

Michael Brooks
Environmental Planner

cc: D. Kemper - MTO
C. Imeroff - MTO
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COLE, SHERMAN

CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. Mitch Dalwyk
Commissioner of Public Works
The Regional Municipality of Peel
10 Peel Centre Dr.
Brampton, Ontario
L6T 4B9

Dear Mr. Dalwyk:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bernard Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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Michael Brooks
Environmental Planner

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G. Imeroff - MTO
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e-mail: csa@csa.com
Internet: www.csa@sherman.com

COLE, SHERMAN

CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. Peter Allen
Commissioner of Planning
The Regional Municipality of Peel
10 Peel Centre Dr.
Brampton, Ontario
L6T 4B9

Dear Mr. Allen:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

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Michael Brooks
Environmental Planner

cc: D. Kemper - MTO
G. Imeroff - MTO
P. Rudolphi - CSA

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e-mail: csa@csa.com
Internet: www.csa@sherman.com

COLE, SHERMAN

CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. Leonard Mikolich
City Clerk
The City of Brampton
2 Wellington Street West
Brampton, Ontario
L6Y 4R2

Dear Mr. Mikolich:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bernard Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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Michael Brooks
Environmental Planner

cc: D. Kemper - MTO
G. Imeroff - MTO
P. Rudolphi - CSA

COLE, SHERMAN & ASSOCIATES LTD.

COLE, SHERMAN

CONSULTING ENGINEERS

November 16, 1998
Our Ref.: 98224

Mr. Larry Kiehle
Commissioner of Works and Transportation
The City of Brampton
2 Wellington Street West
Brampton, Ontario
L6Y 4R2

Dear Mr. Kiehle:

Re: Highway 410 Extension Pre-Design Study from Bernard Drive to Highway 10

The Ontario Ministry of Transportation (MTO) is starting up a pre-design study for the extension of Highway 410 from Bernard Drive to Highway 10. This extension of highway is located in the Regional Municipality of Peel and begins in the City of Brampton and proceeds on to the Town of Caledon (see key map attached).

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Yours truly,
COLE, SHERMAN & ASSOCIATES LTD.

Michael Brooks
Environmental Planner

cc: D. Kemper - MTO
G. Imeroff - MTO
P. Rudolphi - CSA

COLE, SHERMAN & ASSOCIATES LTD.

COLE, SHERMAN — CONSULTING ENGINEERS

November 15, 1996
Our Ref.: 96024

Mr. John Marshall
Commissioner of Planning and Building
The City of Brampton
2 Wellington Street West
Brampton, Ontario
L6Y 4R2

Dear Mr. Marshall:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

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Richard Brooks
Environmental Planner

cc: D. Kemper - MTO
G. Inwood - MTO
P. Rudolphi - CSA

COLE, SHERMAN — CONSULTING ENGINEERS

November 15, 1996
Our Ref.: 96024

Mrs. Marjory Blanchin, Town Clerk
The Town of Caledon
P.O. Box 1000, 6311 Old Church Rd.
Caledon East, Ontario
L0N 1E0

Dear Mrs. Blanchin:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

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Richard Brooks
Environmental Planner

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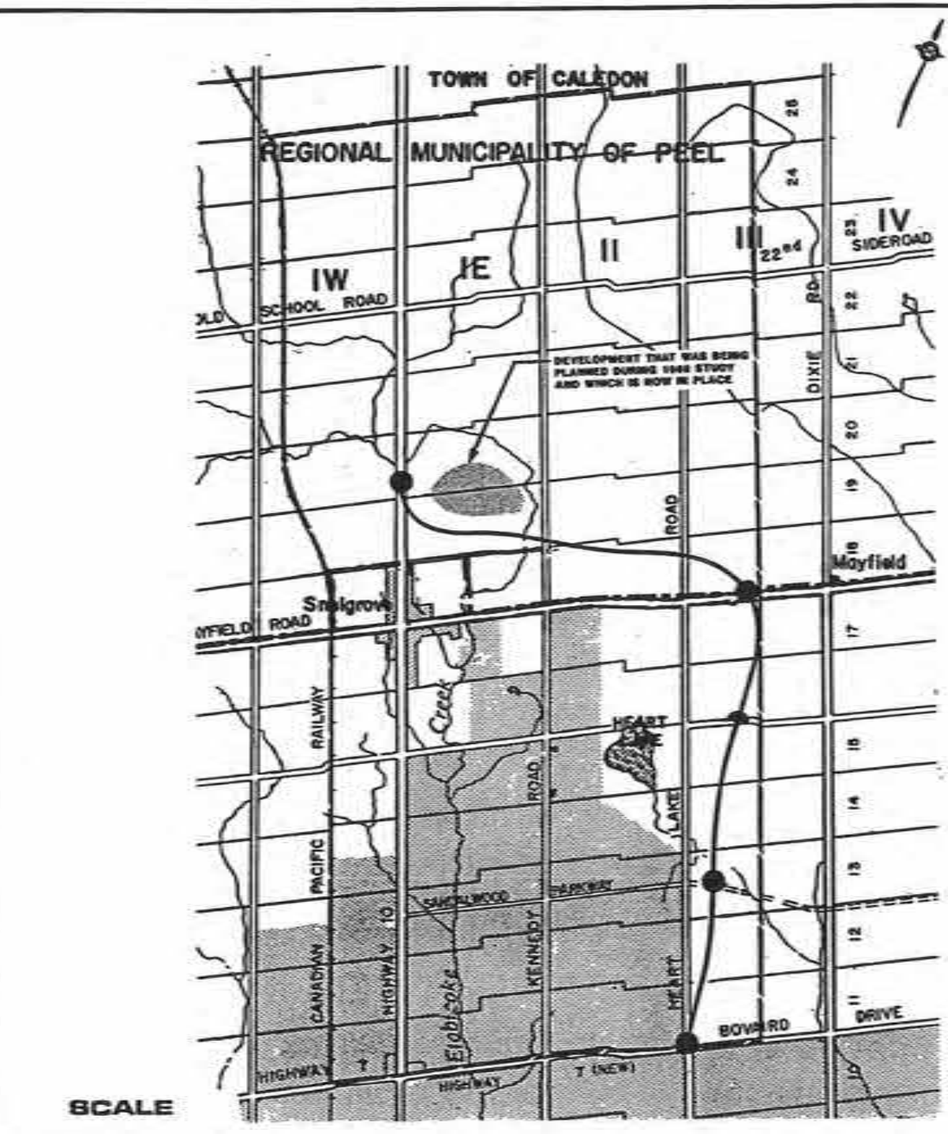
PROJECT STUDY AREA



HIGHWAY 410 EXTENSION FROM BOVAIRD DRIVE TO HIGHWAY 10
PRE-DESIGN STUDY W.P. 22-79-00

COLE, SHERMAN

Ontario
MINISTRY OF TRANSPORTATION

HIGHWAY 410 EXTENSION

FROM BOVAIRD DRIVE TO HIGHWAY 10 (HURONTARIO STREET)

PRE-DESIGN STUDY / CLASS ENVIRONMENTAL ASSESSMENT (GROUP 'B')

PUBLIC INFORMATION CENTRE SUMMARY REPORT

JUNE, 1999

Ontario

COLE, SHERMAN

1.0 INTRODUCTION

A Public Information Centre was held regarding the Highway 410 Extension Pre-Design Study. The Information Centre provided the public an opportunity to review and discuss the project with representatives of the Project Team.

The information centre were held on:

Wednesday June 16th
5:00 p.m. to 9:00 p.m.
Snelgrove Community Centre
BRAMPTON, ONTARIO
11692 HURONTARIO STREET

Representatives of Cole, Sherman & Associates and the Ministry of Transportation staffed the Public Information Centre.

2.0 PURPOSE

The purpose of this Information Centre was to introduce this study and provide the public with the opportunity to review and comment on:

1. The Need for the Extension
2. The Alternatives Considered
3. The Evaluation of Alternative Designs
4. The Preferred Alternative
5. What's Next

3.0 PUBLIC NOTIFICATION

Prior to the PIC, the following measures were carried out in order to make details of the information centre known to study area residents and interested members of the public:

1. Ontario Government Notices were placed in the Toronto Star, Brampton Guardian, Caledon Citizen and the Orangeville Banner during the week of June 7th 1999 (see Appendix A for notice).
2. Approximately 700 brochures detailing the project were hand delivered to area residents inviting them to attend the Information Centres.
3. Letters were directly sent to those people on the Project Team's mailing list, which includes external agencies and municipalities (see Appendix A for letters).

4.0 DISPLAY MATERIAL

The following display material was presented at the Public Information Centre (see Appendix B):

- Welcome to the PIC / Purpose of the PIC
- Study History / Background
- Purpose of the Study
- Need for the Extension
- Study Area
- Alternatives Considered
- Summary of Evaluation
- Evaluation
- What's Next

In addition to the display material, information packages detailing the information presented were made available for attendees of the PIC (see Appendix B).

5.0 ATTENDANCE/COMMENTS

A total of 145 members of the public chose to sign the visitor's register for the Public Information Centre.

In addition to verbal comments, Project Team members encouraged visitors to express in writing, any concerns or comments they had regarding the information presented. Of the 145 people who signed the register, 51 written comments (35. % of attendees) were received.

The following summarizes the issues raised at the PIC:

CONCERN	RESPONSE/MITIGATION
Noise in the Valleywood subdivision	
Configuration of Highway410 / Highway 10 / Valleywood Boulevard interchange.	The design approved in the original EA is the preferred interchange design. The proposed Valleywood Boulevard Structure over Highway 410 will be designed to minimize safety concerns. The grade approaching the structure from either side will be gentle and the bridge will be well maintained (plowing, sanding, salting etc.) to ensure good access to the Valleywood subdivision at all times.
Single access/egress at the Valleywood subdivision.	The recommended configuration and alignment of the Highway 410 extension does not remove any existing accesses to the Valleywood subdivision. Although this access will be modified, the availability of access/egress for Valleywood is unchanged. Plans for a secondary access to the subdivision are the responsibility of the Town of Caledon.
Configuration of the Sandalwood Parkway / Highway 410 interchange.	This would place the ramp terminal too close to the intersection between Heart Lake Road and Sandalwood Parkway (thereby precluding future traffic signals at this terminal).
Wildlife Passage in the vicinity of the Etobicoke Creek crossing.	Provide maximum bridge span and structure height to mitigate the barrier effect of the highway to wildlife movement.

CONCERN	RESPONSE/MITIGATION
Change highway alignment to connect to Highway 10 north of the Valleywood subdivision	Alternative route alignments were considered in the original Environmental Assessment (1998). It was determined that the preferred alignment resulted in fewer impacts than northern routes.
Location of Highway in proximity to Valleywood subdivision.	The Valleywood development was not an approved development at the time of the Highway 410 route planning study. It was determined that if the development were approved, it could be planned to conform to the Highway 410 right-of way.
Impacts to ground water.	Pre-construction monitoring of selected wells will occur where significant excavations are required. If impacts occur, mitigation will include well deepening or replacement, or temporary water supply.
Reconstruction of Heart Lake Road.	Arterial alternatives were considered during the original Environmental Assessment. Impacts associated with the displacement of wetlands along Heart Lake were considered unacceptable. Further improvements to Heart Lake Road are the responsibility of the municipality.
Highway capacity.	The proposed Highway 410 extension is planned to be opened as a 4 lane limited access freeway (2 lanes in each direction). However, the highway has been designed to easily accommodate 6 lanes (3 lanes in each direction) from Bovaird Drive to Mayfield Road. Based on current and projected traffic volumes (to the year 2011) for the area, a 4-lane highway will operate well for 10-15 years. Constructing additional lanes beyond those required for efficient and safe highway operations is not cost effective.
Impacts to property values.	The determination of property value was not a component of this study. A market value assessment will be undertaken for those properties from which property will be required.

APPENDIX A

News Ad / Brochure and Notice Letters

ONTARIO GOVERNMENT NOTICE

PUBLIC INFORMATION CENTRE
HIGHWAY 410 EXTENSION

from Bovaird Drive to Highway 10
Work Project 22-79-00

THE STUDY

Cole, Sherman & Associates Ltd. has been retained by the Ontario Ministry of Transportation (MTO) to undertake a pre-design study regarding the extension of Highway 410 from Bovaird Drive to Highway 10. This stretch of Highway 410 is located in the Regional Municipality of Peel. The extension begins in the City of Brampton and proceeds north to the Town of Caledon.

An Environmental Assessment Report (EAR) for the extension of Highway 410 was completed in 1989. During the mid-1990's, MTO updated the EAR to meet current environmental standards. This update confirmed the original route as the preferred alternative. The Environmental Assessment Report received approval from the Minister of the Environment on March 5th, 1997.

In 1998 MTO undertook a value engineering exercise. The purpose of this exercise was to analyze the functional requirements of the project to provide essential functions at the lowest life-cycle cost. This resulted in changes to the alternative approved under the Environmental Assessment Act. Changes included narrowing the right-of-way through the provision of a concrete centre median barrier and minor interchange reconfigurations.

THE PROCESS

The EAR outlined a process for amending the approved undertaking. The process involves following the requirements of the Provincial Highway Class Environmental Assessment. An Environmental Study Report (ESR) documenting the anticipated effects of the project and the corresponding mitigation measures will be prepared to amend the approved Environmental Assessment Report and will be submitted to the Ministry of the Environment (MOE) for public review.

If, however, after participating in the study, you have serious unresolved concerns, you have the right to request the Minister of the Environment (135 St. Clair Avenue West, Toronto, Ontario, M4V 1P5), to bump-up this project, thereby requiring an individual Environmental Assessment. A copy of this bump-up request should be forwarded to Cole, Sherman & Associates Ltd.

PUBLIC INFORMATION CENTRE

Public consultation is an essential part of the planning process, and a Public Information Centre (PIC) has been scheduled for this study. This PIC has been arranged to provide an opportunity for the public to provide input and discuss the project with representatives of the project team. You are encouraged to attend the Information Centre and to relay your views so that they can be addressed during the study.

The PIC will allow you the opportunity to review:

- The Study Process and Schedule;
- The Problem Statement;
- The Alternatives Considered;
- The Evaluation of the Alternative Designs; and
- The Preferred Alternative.

The Information Session will be held as follows:

Wednesday June 16, 1999
5:00 p.m. to 9:00 p.m.
Snelgrove Community Centre
11692 Hurontario Street
Brampton, Ontario

COMMENTS:

You are encouraged to contact Cole, Sherman & Associates project staff at any time if you have any questions or concern regarding the Highway 410 extension. All comments, with the exception of personal information, will become part of the public record for this project.

For further information, or to be added to the mailing list, please contact:

Mr. Paul Hudspith, PEng.
Project Manager
Cole, Sherman & Associates Ltd.
75 Commerce Valley Drive East,
Thornhill, Ontario, L3T 7N9
Fax: (905) 882-4399
Tel: (905) 882-4401
e-mail: paul_hudspith@urscorp.com

Mr. Michael Brickell
Environmental Planner
Cole, Sherman & Associates Ltd.
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Tel: (905) 882-4401
e-mail: mike_bricks@urscorp.com

Ontario

5. STUDY AREA

Ontario

HIGHWAY 410 EXTENSION

FROM BOVAIRD DRIVE TO HIGHWAY 10

PRE-DESIGN / CLASS ENVIRONMENTAL ASSESSMENT (GROUP 'B')

PUBLIC INFORMATION CENTRE

WEDNESDAY JUNE 16TH, 1999
5:00 P.M. TO 9:00 P.M.
SNELGROVE COMMUNITY CENTRE
11692 HURONTARIO STREET
BRAMPTON, ONTARIO

1. BACKGROUND AND PURPOSE

Cole, Sherman & Associates Ltd. has been retained by the Ontario Ministry of Transportation (MTO) to undertake a pre-design study regarding the extension of Highway 410 from Bovaird Drive to Highway10. This stretch of Highway 410 is located in the Regional Municipality of Peel. The extension begins in the City of Brampton and proceeds on to the Town of Caledon.

An Environmental Assessment Report (EAR) for the extension of Highway 410 was completed in 1989. During the mid-1990's, MTO updated the EAR to meet current environmental standards and to assess whether such an update would impact the original recommended route. This update confirmed that the original route was the preferred alternative. The Environmental Assessment Report received approval from the Minister of the Environment on March 5th, 1997.

Following approval, MTO undertook a value engineering exercise. The purpose of this exercise was to analyze the functional requirements of the project to provide essential functions at the lowest life-cycle cost. This resulted in changes to the alternative approved under the Environmental Assessment Act. Changes included narrowing the right-of-way through the provision of a concrete centre median barrier and minor interchange reconfigurations.

2. STUDY PROCESS

The EAR outlined a process for amending the approved undertaking. The process involves following the requirements of the Provincial Highway Class Environmental Assessment. An Environmental Study Report (ESR) documenting the anticipated effects of the project and the corresponding mitigation measures will be prepared to amend the approved Environmental Assessment Report and be submitted to the Ministry of the Environment (MOE) for public review.

If, however, after participating in the study, you have serious unresolved concerns, you have the right to request the Minister of the Environment (135 St. Clair Avenue West, Toronto, Ontario, M4V 1P5), to bump-up this project thereby requiring an Individual Environmental Assessment.

A copy of this bump-up request should be forwarded to Cole, Sherman & Associates Ltd.

3. PUBLIC INFORMATION CENTRES

Public consultation is an essential part of the planning process, and a Public Information Centre (PIC) has been scheduled for this study. This PIC has been arranged to provide an opportunity for the public to provide input and discuss the project with representatives of the project team. You are encouraged to attend the Information Centre and to relay your views so that they can be addressed during the study.

The PIC will allow you the opportunity to review:

- The Need for the Extension;
- The Alternatives Considered;
- The Evaluation of the Alternative Designs;
- The Preferred Alternative;
- What's Next

4. INFORMATION CENTRE ARRANGEMENTS

This Public Information Centre has been scheduled for:

Wednesday June 16th, 1999
5:00 p.m. to 9:00 p.m.
Snelgrove Community Centre
11692 Hurontario Street
Brampton, Ontario

Comments and information regarding this study are being collected to assist the Ministry of Transportation in meeting the requirements of the Environmental Assessment Act. This material will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments will become part of the public record.

For further information, or to be added to the mailing list, please contact:

Mr. Paul Hudspith, P.Eng.
Project Manager
Cole, Sherman & Associates Ltd.
75 Commerce Valley Drive East,
Thornhill, Ontario,
L3T 7N9
Tel: (905) 882-4401
Fax: (905) 882-4399

or

Mr. Michael Bricks
Environmental Planner
Cole, Sherman & Associates Ltd.
75 Commerce Valley Drive East,
Thornhill, Ontario,
L3T 7N9
Tel: (905) 882-4401
Fax: (905) 882-4399

COLE, SHERMAN

Ontario

Municipal / Agency Letter

June 7th, 1998
Our Ref.: 98224

«Address»

Dear «Name»

Re: Highway 410 Extension Pre-Design from Bovaird Drive to Highway 10 (W.P. 22-79-00)

As you are aware, Cole, Sherman & Associates Ltd. has been retained by the Ontario Ministry of Transportation (MTO) to undertake a pre-design study regarding the extension of Highway 410 from Bovaird Drive to Highway 10. This stretch of Highway 410 is located in the Regional Municipality of Peel. The extension begins in the City of Brampton and proceeds on to the Town of Caledon.

Public consultation is an essential part of the planning process, and a Public Information Centre (PIC) has been scheduled for this study. This PIC has been arranged to provide an opportunity for the public to provide input and discuss the project with representatives of the project team.

Prior to the PIC, an External Team Meeting will be held. You are encouraged to attend this meeting and to relay your views so that they can be addressed during the study.

This meeting will allow you the opportunity to review:

- The Need for the Extension;
- The Alternatives Considered;
- The Evaluation of the Alternative Designs; and
- The Preferred Alternative.

The External Team Meeting will be held on:

Wednesday June 16th, 1999
4:00 p.m. to 5:00 p.m.
Snelgrove Community Centre
11692 Hurontario Street
Brampton, Ontario

The purpose of this letter is to notify your office of the upcoming External Team Meeting. If you have any questions or require additional infoemation, please feel free to contact the undersigned.

Thank you for your cooperation.

Yours very truly,

COLE, SHERMAN & ASSOCIATES LTD.

Michael Bricks
Senior Environmental Planner

cc: D. Kemper - MTO
G. Ivanoff - MTO
P. Hudspith - CSA

Public Letter

June 7th, 1999
Our Ref.: 98224

«Address»

Dear «Name»:

Re: Highway 410 Extension Pre-Design from Bovaird Drive to Highway 10 (W.P. 22-79-00)

As you are aware, Cole, Sherman & Associates Ltd. has been retained by the Ontario Ministry of Transportation (MTO) to undertake a pre-design study regarding the extension of Highway 410 from Bovaird Drive to Highway 10. This stretch of Highway 410 is located in the Regional Municipality of Peel. The extension begins in the City of Brampton and proceeds on to the Town of Caledon (refer to the attached brochure).

Public consultation is an essential part of the planning process, and a Public Information Centre (PIC) has been scheduled for this study. This PIC has been arranged to provide an opportunity for the public to provide input and discuss the project with representatives of the project team. You are encouraged to attend the Information Centre and to relay your views so that they can be addressed during the study.

The PIC will allow you the opportunity to review:

- The Need for the Extension;
- The Alternatives Considered;
- The Evaluation of the Alternative Designs; and
- The Preferred Alternative.

The Information Session will be held as follows:

Wednesday June 16th
5:00 p.m. to 9:00 p.m.
Snelgrove Community Centre
11692 Hurontario Street
Brampton, Ontario

The purpose of this letter is to notify you of the upcoming Public Information Centre. If you have any questions or require additional information, please feel free to contact the undersigned.

Yours very truly,

COLE, SHERMAN & ASSOCIATES LTD.

Michael Bricks
Senior Environmental Planner

cc: D. Kemper - MTO
G. Ivanoff - MTO
P. Hudspith - CSA

Address	Name
"Mr. Ross Farewell Environmental Co-ordinator Real Estate Branch - GTA Management Board Secretariat 777 Bay Street, 15th Floor Toronto, Ontario M5G 2E5"	Mr. Farewell
"Mr. Peter Carruthers Environmental Assessment Co-ordinator Cultural Operations Branch Ministry of Culture, Tourism and Recreation 77 Bloor Street West, 2nd Floor Toronto, Ontario M7A 2R9"	Mr. Carruthers
"Mr. Michael Williams Director Environmental Assessment and Approvals Branch Ministry of the Environment and Energy 250 Davisville Avenue, 5th Floor Toronto, Ontario M4S 1H2"	Mr. Williams
"Mrs. Diana Jardine, Director Plans Administration Branch **Attn: Dianne McArthur Rogers** Ministry of Municipal Affairs 777 Bay Street, 14th Floor Toronto, Ontario M5G 2E5"	Ms. McArthur Rogers
"Mr. Chris Tschirhart – Senior Planner Strategic Planning and Operations Greater Toronto Area District Ministry of Natural Resources P.O. Box 7400 10401 Dufferin Street Maple, Ontario L6A 1S9"	Mr. Tschirhart
"Mr. Tim Eger Director, Corperate Policy and Planning Ontario Native Affairs Secretariat 595 Bay Street, Suite 1009 Toronto, Ontario M5G 2C2"	Mr. Eger
"C.M. Wyatt Director Superintendent Operational Policy & Planning Branch Ontario Provincial Police Ministry of the Solicitor General & Correctional Services	

90 Harbour Street, 3rd Floor
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M7A 2S1" C.M. Wyatt

"Mr. D. A. Reynolds, Manager
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M5V 2X7" Mr. Reynolds

"Mr. Brian McCormick, Section Head
Environmental Studies & Approvals
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"Ms. Eve Wyatt
Manager - Corporate Planning, Project Development
GO Transit
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M5J 2W2" Ms Wyatt

"Mr. Richard Vandezande
Planning Department
The Town of Caledon
P.O. Box 1000, 6311 Old Church Rd.
Caledon East, Ontario
L0N 1E0" Mr. Vandezande

"Mr. Craig Campbell
Asisstant Director of Public Woks
The Town of Caledon
P.O. Box 1000, 6311 Old Church Rd.
Caledon East, Ontario
L0N 1E0" Mr. Craig Campbell

"Ms. Heather Konefat
Acting Director of Planning & Development
The Town of Caledon
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"Mr. Richard Lloyd
Plan Analyst - Regulations
The Toronto and Region Conservation Authority
5 Shoreham Drive
Downsview, On.
M3N 1S4" Mr. Lloyd

"Mr. Don Haley
Plan Analyst - Regulations

The Toronto and Region Conservation Authority
5 Shoreham Drive
Downsview, On.
M3N 1S4" Mr. Haley

"Mr. Graham Birch
City of Brampton
2 Wellington Street
Brampton, ON
L6Y 4R2" Mr. Birch

"Mr. Bill Winterhalt
Director of Planning Policy and Research
City of Brampton
2 Wellington Street
Brampton, Ontario
L6Y 4R2" Mr. Winterhalt

"Mr. Jeffrey Smith
Appraiser/Negotiator
Property & Housing Department - Real Estate Team
Property Services Division
The Regional Municipality of Peel
10 Peel Centre Dr.,
Brampton, Ontario
L6T 4B9" Mr. Smith

"Mr. Doug Billet - Director
Planning Department
The Regional Municipality of Peel
10 Peel Centre Dr.,
Brampton, Ontario
L6T 4B9" Mr. Billet

"Mr. Peter Crockett - Director
Engineering Department
The Regional Municipality of Peel
10 Peel Centre Dr.,
Brampton, Ontario
L6T 4B9" Mr. Crockett

"Mr. Randy Wright
Manager of Transportation
Peel District School Board
5650 Hurontario Street
Mississauga, Ontario
L5R 1C6" Mr Wright

"Mr. Vince Nichilo
Superintendent of Planning
Peel Region Separate School Board
5685 Keaton Cres.
Mississauga, Ontario
L5R 3H5" Mr. Nichilo

"Mr. Verrall Clark

Fire Chief
The City of Brampton
2 Wellington Street West
Brampton, Ontario
L6Y 4R2" Mr. Clark

"Mr. Noel Cathey
Chief of Police
Peel Regional Police
7756 Hurontario Street
Brampton, Ontario
L6V 3W6" Mr. Cathey

"Mr. Boyd Finger
Fire Chief
Town of Caledon
P.O. Box 1000
6311 Old Church Road
Caledon East, Ontario
L0N 1E0" Mr. Finger

Hwy. 410 – Bovaird to Highway 10 ***Interest Group List***
(Ref No. 98224)

Address	Name
"Mr. James Johnston Prsident Peel County Federation of Agriculture 33 Parkview Place Brampton, Ontario L6W 2G2"	Mr. Johnston
"Mr. Douglas Geddes Halton Field Naturalists Box 115 Georgetown, Ontario L7G 4T1"	Mr. Geddes
"Mr. Elbert Van Donkersgoed Ontario Coalition to Preserve Foodland 25-795 Water Street Guelph, Ontario N1G 2Y5"	Mr. Donkersgoed
"South Peel Naturalists Club P.O. Box 91 Port Credit Postal Station Mississauga, Ontario L5G 4L5"	Madam/Sir
"Mr. Gordon Armstrong Mayfield Landowners Group R.R. #4 Caledon East, Ontario L0N 1E0"	Mr. Armstrong
"Mr. Bob Albracht – Manager Brampton Flying Club 13691 McLaughlin Road Brampton, Ontario L0P 1C0"	Mr. Albracht
"Ms. Garcia Janes P.A.L.S. Preservation of Agricultural Lands Society P.O. Box 1090 St. Catharines, Ontario L2R 7A3"	Ms. Janes
"Mrs. Heather Broadbent L.A.C.A.C Chair Caledon Heritage Committee c/o Town of Caledon Box 1000 Caledon East, Ontario L0N 1E0"	Ms. Broadbent
"Mr. Colin Campbell L.A.C.A.C Chair	

123 Elizabeth Street South Brampton, Ontario L6Y 1R6"	Mr. Campbell
"Mr. Rick Simms – Executive Director Federation of Ontario Naturalists 355 Lesmill Road Toronto, Ontario M3B 2W8"	Mr. Simms
"Mrs. Vern Flowers Association of Peel People Evaluating Agricultural Lands Box 532 Streetsville Postal Station Mississauga, Ontario L5M 2C1"	Mrs. Flowers
"Mr. David Armstrong Mayfield Ratepayers Organization R.R. #1 Inglewood, Ontario L0N 1K0"	Mr. Armstrong

PUBLIC INFORMATION CENTRE

INFORMATION PACKAGE

for the

Highway 410 EXTENSION
From Bovaird Drive to Highway 10 (Hurontario Street)

PRE-DESIGN STUDY
Class Environmental Assessment (Group 'B')

June 16th, 1999

Welcome to the Public Information Centre

for the

Highway 410 Extension Pre-Design Study

Please sign in here.

Members of the Project Team are available to discuss and answer any questions you may have.

Purpose of this Public Information Centre

The purpose of this Information Centre is to update you on the progress of the project and obtain comments so your input can be considered as this project is brought to completion. Major elements presented today include:

1. Need for the Extension
2. The Alternatives Considered
3. The Evaluation of the Alternative Designs
4. The Preferred Alternative
5. What's Next

The Project Team encourages you to fill out a comment sheet recording your comments and concerns.

Study History / Background

An Environmental Assessment Report (EAR) for the extension of Highway 410 was completed in 1989.

During the mid-1990's, the Ministry of Transportation (MTO) updated the EAR to meet current environmental standards and to assess whether such an update would impact the original recommended route. This update confirmed that the original route was the preferred alternative.

The Preferred Route for the extension of Highway 410 received approval from the Minister of the Environment on March 5th, 1997.

Following approval, MTO undertook a value engineering exercise. The purpose of this exercise was to analyze the functional requirements of the project and provide cost-effective refinements and improvements. This resulted in minor changes to the design approved under the Environmental Assessment Act.

Purpose of the Study

The purpose of this study is:

- To refine the highway design as approved in the Environmental Assessment Report (August 1995) incorporating the changes from the Value Engineering Exercise; and

- To seek Environmental Assessment (EA) approval for those changes and file an Environmental Study Report (ESR).

Need for the Extension

Brampton is currently one of the fastest growing municipalities in the Greater Toronto Area.

Existing traffic volumes to the north of the present terminus of Highway 410 at Bovaird Drive result in significant congestion to the existing roadway network.

Future growth in Brampton will result in as much as a threefold increase in traffic volumes. This growth, coupled with the existing problems, necessitates major improvements to the existing roadway network.

As a part of the 1995 Environmental Assessment, numerous alternatives were considered. The alternatives were evaluated based on impacts to the natural, social, economic and cultural environments. An extension of Highway 410 was identified as the preferred alternative based on this evaluation.

Study Area

Ontario

Highway 410 Extension
Pre-Design Study / Class Environmental Assessment
Public Information Centre – June 16th, 1999

COLE SHERMAN

Alternatives Considered

ALTERNATIVE 1 – The 1997 EA Approved Design

- 4-lane limited access freeway with a rural cross section (i.e. 30 metre grass centre median);
- Ultimate 6 lanes from Bovaird Drive to Mayfield Road;
- Full Interchanges and bridges at Bovaird Drive (existing), Sandalwood Parkway, Mayfield Road, Valleywood Parkway and a partial interchange at Countryside Drive;
- A 35 metre, single span structure at the Etobicoke Creek crossing (subject to regulatory approval);

ALTERNATIVE 2 – Modifications to the EA Approved Design based on Value Engineering (VE) Recommendations

This alternative maintains the same basic alignment and configuration as Alternative 1 with the following modifications:

- Replacement of grass median with urban median (divided by concrete barrier) requiring less property;
- Elimination of partial interchange at Countryside Drive;
- Mayfield Road shifted slightly to the north to avoid poor soils;
- A 50 metre, single-span structure at the Etobicoke Creek crossing;
- Sandalwood Parkway structure reduced from 6-lanes to 4-lanes and Mayfield Road structure reduced from 4-lanes to 2-lanes.
- Minor adjustment to vertical profile and alignment shift at Sandalwood Parkway.
- Change in recommended pavement surface from Open Friction Coarse Pavement (OFC) to Dense Friction Coarse (DFC) Pavement.

Summary of Evaluation

The alternatives were evaluated based on impacts to the natural, social, economic and cultural environments, agriculture, land use and transportation.

Alternative 1 and Alternative 2 generally maintain the same basic alignment and configuration. As such, the impacts associated with the alternatives were generally the same. However, Alternative 2 is approximately 15% less expensive to construct than Alternative 1, and is approximately 10% less expensive with respect to property acquisition costs.

Therefore, Alternative 2 is the Preferred Alternative, which will be recommended to carry forward to Detail Design.

The following outlines the evaluation of alternatives by factor:

Evaluation of Alternatives

CATEGORY – SOCIO-ECONOMIC ENVIRONMENT			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 COMMUNITY EFFECTS	●	●	Alternative 1 and Alternative 2 displace the same 3 households and 2 businesses. In addition, the impacts to community and recreational facilities associated with Alternatives 1 and 2 are the same.
2 NOISE	●	●	Alternative 2 results in a slight noise level increase (2-5 dBA) in the vicinity of the Valleywood subdivision as a result of changes in grade.
3 EFFECT ON HISTORICAL RESOURCES	●	●	Both Alternative 1 and Alternative 2 remove 1 farmstead on the west half of Lot 14 and part of a site on Lot 13. Alternative 1 and Alternative 2 impact the same 3 sites within 100 metres and 6 sites within 200 metres of centreline, and result in minor impacts to cultural landscapes.
4 PROPERTY EFFECTS	●	●	Alternative 1 requires slightly more residential and commercial property than Alternative 2. Both alternatives require the same industrial property area and impact the same 5 residences.
CATEGORY SUMMARY	●	●	

Summary of Socio-Economic Effects:
Alternative 1 and Alternative 2 result in generally the same impacts to the socio-economic environment with respect to community effects, and impacts to historical resources. Although Alternative 2 results in a 2-5dBA increase in the vicinity of the Valleywood subdivision, it results less property impacts.

THEREFORE, FROM A SOCIO-ECONOMIC PERSPECTIVE, ALTERNATIVE 1 IS PREFERRED

CATEGORY – NATURAL ENVIRONMENT			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 VEGETATION	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to vegetation.
2 WETLANDS	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to wetlands.
3 WILDLIFE	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to wildlife. However, Alternative 2 provides a greater wildlife passageway in the vicinity of the Etobicoke Creek.
4 FISHERIES	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to fisheries.
5 WATER	●	●	Alternative 2 affects one additional well in comparison to Alternative 1.
6 SOILS	●	●	Alternative 2 results in a reduced impact to moderately erodible soils in comparison to Alternative 1.
7 ENVIRONMENTALLY SENSITIVE AREAS	●	●	Alternatives 1 and 2 result in the same low to moderate impacts to E.S.A's.
CATEGORY SUMMARY	●	●	

Summary of Effects on the Natural Environment:
Alternatives 1 and 2 result in similar impacts, which are generally, minor. Both alternatives create low to moderate impacts to fisheries, vegetation, wetlands, and E.S.A's. Although Alternative 2 affects one additional well, it reduces the impact to moderately erodible soils. In addition, Alternative 2 provides a greater wildlife passageway in the vicinity of the Etobicoke Creek.

THEREFORE, FROM A NATURAL ENVIRONMENT PERSPECTIVE, ALTERNATIVE 2 IS PREFERRED

Least Preferred ● → ● *Most Preferred*

Evaluation of Alternatives

CATEGORY – AGRICULTURE			
FACTOR	**ALTERNATIVE 1 (1995 EA Approved Design)**	**ALTERNATIVE 2 (VE Recommendations)**	**Comments**
1 SOIL CAPACITY	●	●	Neither alternative impacts high capability - specialty crop land. Alternatives 1 and 2 result in the same impacts to Class 1 -4 common field crop capability land.
2 AGRICULTURAL LAND USE	●	●	Alternative 1 results in slightly greater property impacts than Alternative 2 with respect to owner field crop land and worked field crop land. Neither alternative impacts specialty crop land or existing tree fruit crops.
3 INDIVIDUAL FARMS EFFECTS	●	●	Alternative 1 and Alternative 2 result in 1 land locked severance, impact the same two internal access routes and separate 1 farm building from its land.
4 PROPERTY EFFECTS	●	●	Alternative 1 and Alternative 2 result in the same impacts to 13 farm properties.
5 EFFECTS ON FARM COMMUNITY	●	●	Alternative 1 and Alternative 2 result in the same minor impacts to farm properties and inter-farm movement.
CATEGORY SUMMARY	●	●	
Summary of Effects on Agriculture: Alternatives 1 and 2 result in the same impacts to 13 farm properties with respect to soil capacity, land use, land severance's, access routes, property impacts and inter-farm movement. **THEREFORE, FROM AN AGRICULTURAL PERSPECTIVE, ALTERNATIVES 1 AND 2 ARE EQUALLY PREFERRED**			

CATEGORY – TRANSPORTATION			
FACTOR	**ALTERNATIVE 1 (1995 EA Approved Design)**	**ALTERNATIVE 2 (VE Recommendations)**	**Comments**
1 NETWORK EFFECTS	●	●	Alternatives 1 and 2 result in a level of service of B, D., the same minor potential for accidents, and good highway continuity. No intersections or accesses are impacted by either alternative and no pedestrian or slow moving vehicle conflicts are foreseen. Ramps at Countryside Drive have been eliminated for Alternative 2 because there is no immediate need. Ramps can be provided in the future if required.
2 GEOMETRICS	●	●	Alternatives 1 and 2 each have a limiting curve radius of 525 metres and result in similar sight distances.
3 STAGING OPTIONS	●	●	Alternative 1 and Alternative 2 are the same with respect to construction staging and are equally flexible for future expansion.
CATEGORY SUMMARY	●	●	
Summary of Effects on Transportation Alternatives 1 and 2 result in a level of service of B, D., the same minor potential for accidents, and good highway continuity. No intersections or accesses are impacted by either alternative and no pedestrian or slow moving vehicle conflicts are foreseen. Alternatives 1 and 2 each have a limiting curve radius of 525 metres, result in similar sight distances, are the same with respect to construction staging and are equally flexible for future expansion. **THEREFORE, FROM A TRANSPORTATION PERSPECTIVE, ALTERNATIVES 1 AND 2 ARE EQUALLY PREFERRED**			

Least Preferred ● → ● *Most Preferred*

Evaluation of Alternatives

CATEGORY – LAND USE			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 PLANNING POLICIES	●	●	Alternatives 1 and 2 result in minor effects on approved development and proposed land use changes. With respect to the effect on closed landfill sites, there are no impacts associated with either alternative.
CATEGORY SUMMARY	●	●	

Summary of Effects on Land Use
Alternatives 1 and 2 result in minor effects on approved development and proposed land use changes. With respect to the effect on closed landfill sites, there are no impacts associated with either alternative.

THEREFORE, FROM A LAND USE PERSPECTIVE, ALTERNATIVES 1 AND 2 ARE EQUALLY PREFERRED

CATEGORY – COST			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 CONSTRUCTION COSTS	●	●	Alternative 2 is approximately 15% less expensive to construct than Alternative 1.
2 PROPERTY COSTS	●	●	Alternative 2 is approximately 10% less expensive with respect to property acquisition costs.
CATEGORY SUMMARY	●	●	

Summary of Costs
Alternative 2 is approximately 15% less expensive to construct than Alternative 1. In addition, Alternative 2 is approximately 10% less expensive with respect to property acquisition costs.

THEREFORE, FROM A COST PERSPECTIVE, ALTERNATIVE 2 IS PREFERRED

Least Preferred ● → ● *Most Preferred*

Evaluation of Alternatives

SUMMARY OF CATEGORIES			
FACTOR	ALTERNATIVE 1 (1995 EA Approved Design)	ALTERNATIVE 2 (VE Recommendations)	Comments
1 SOCIO-ECONOMIC ENVIRONMENT	●	•	Alternative 1 and Alternative 2 result in generally the same impacts to the socio-economic environment with respect to community effects, impacts to historical resources and property impacts. Although Alternative 2 results in a slight noise level increase (2-5dBA) in the vicinity of the Valleywood subdivision, it impacts less property.
2 NATURAL ENVIRONMENT	•	●	Alternatives 1 and 2 result in similar impacts, which are generally, minor. Both alternatives create low to moderate impacts to fisheries, vegetation, wetlands, and E.S.A.'s. Although Alternative 2 affects one additional well, it reduces the impact to moderately erodable soils. In addition, Alternative 2 provides a greater wildlife passageway in the vicinity of the Etobicoke Creek.
3 AGRICULTURE	●	●	Alternatives 1 and 2 result in generally the same impacts to 15 farm properties with respect to soil capacity, land use, land severance's, access routes, property impacts and inter-farm movement.
4 TRANSPORTATION	●	●	Alternatives 1 and 2 result in a level of service of B, D., the same minor potential for accidents, and good highway continuity. No intersections or accesses are impacted by either alternative and no pedestrian or slow moving vehicle conflicts are foreseen. Alternatives 1 and 2 each have limiting curve radius of 525 metres, result in similar sight distances, are the same with respect to construction staging and are equally flexible for future expansion. Ramps at Countryside Drive have been eliminated for Alternative 2 because there is no immediate need. Ramps can be provided in the future if required.
5 LAND USE	●	●	Alternatives 1 and 2 result in minor effects on approved development and proposed land use changes. With respect to the effect on closed landfill sites, there are no impacts associated with either alternative.
6 COST	•	●	Alternative 2 is approximately 15% less expensive to construct than Alternative 1. In addition, Alternative 2 is approximately 10% less expensive with respect to property acquisition costs.
CATEGORY SUMMARY	•	●	

Summary of Categories:

Alternatives 1 and 2 result in the same minor impacts with respect to agriculture and land use. Although Alternative 2 results in slightly greater noise impacts, it impacts less property than Alternative 1. From a natural environment perspective Alternative 2 results in greater benefits (with respect to wildlife passage). In addition, Alternative 2 is approximately 15% less expensive to construct than Alternative 1, and is approximately 10% less expensive with respect to property acquisition costs.

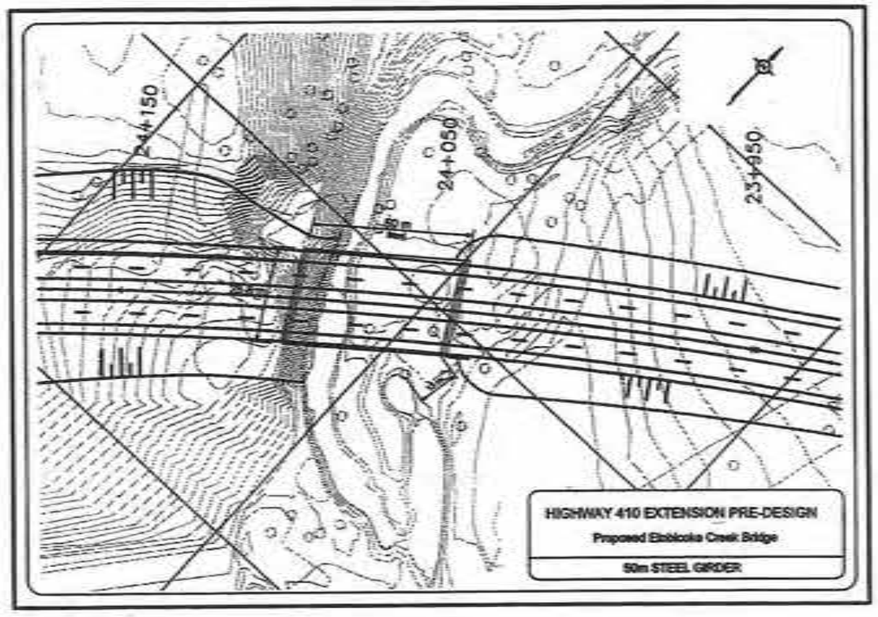
THEREFORE, ALTERNATIVE 2 IS THE PREFERRED ALTERNATIVE WHICH WILL BE CARRIED FORWARD TO DETAIL DESIGN

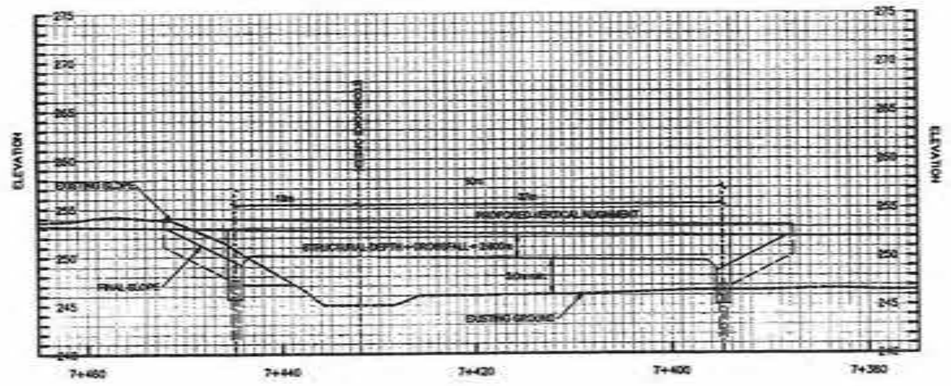
Least Preferred → *Most Preferred*

The Preferred Alternative

The Preferred Alternative for the Highway 410 Extension consists of:

- A 4-lane limited access freeway (initially);
- Ultimate 6 lanes from Bovaird Drive to Mayfield Road;
- Full Interchanges at Bovaird Drive, Sandalwood Parkway, Mayfield Road and Valleywood Boulevard;
- An urban median (paved shoulders with concrete barrier);
- Mayfield Road shifted to the north;
- 4-lane crossing road structures at Sandalwood Parkway, Mayfield Road and Valleywood Boulevard, and 2-lane structures at Countryside Drive, Heart Lake Road and Kennedy Road;
- A 50 metre, single-span structure at the Etobicoke Creek crossing;
- Full illumination (median high-mast) from Bovaird Drive to Mayfield Road, at the Valleywood interchange, and at the transition to Highway 10.


24+150
24+050
23+950
HIGHWAY 410 EXTENSION PRE-DESIGN
Proposed Etobicoke Creek Bridge
50m STEEL GIRDER


ELEVATION
EXISTING SLOPE
FINAL SLOPE
PROPOSED VERTICAL ALIGNMENT
EXISTING GROUND
7+460
7+440
7+420
7+400
7+380

Crossing of the Etobicoke Creek

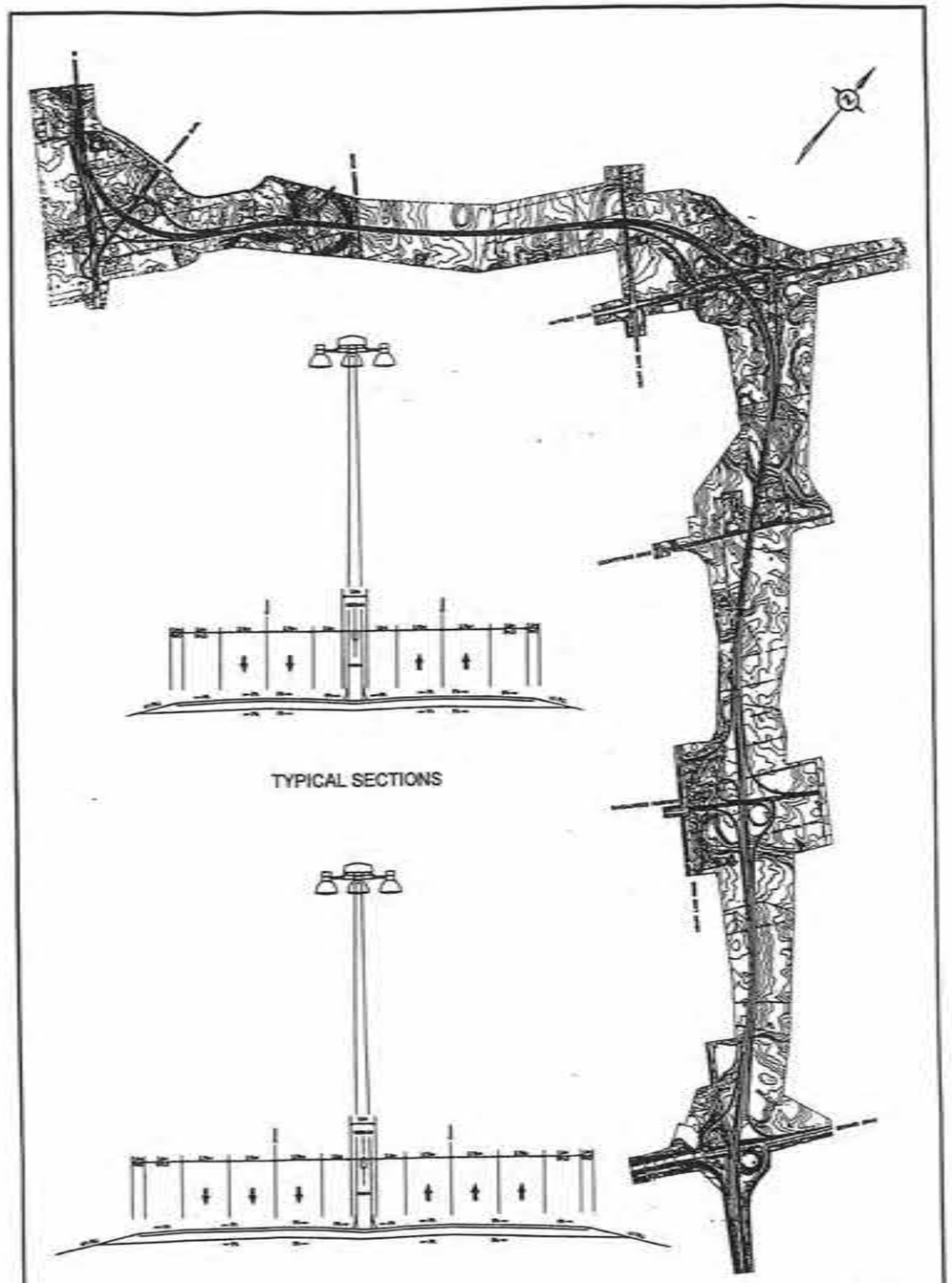
- The original EA suggested a 35 metre clear span bridge over the creek (with commitment to further review).
- The Preferred Alternative proposes a 50 metre clear span bridge over the creek (3 metre vertical clearance). This larger span:
  - Enhances wildlife and pedestrian passage;
  - Reduces upstream floodline impacts; and
  - Reduces fisheries concerns.

What's Next

Following this Public Information Centre the following tasks will be completed:

- Compile Public / Agency Comments;
- Refine the Preferred Alternative as appropriate,
- Prepare Environmental Study Report (ESR)
- File ESR with the Ministry of the Environment

An Environmental Study Report (ESR) will be prepared and placed on the Public Record for a 60-day review period in July 1999. Detailed design and property acquisition can commence following the 60-day review period provided that no bump-up requests have been received.



TYPICAL SECTIONS

NTS

Ontario

COLE, SHERMAN

TECHNICALLY PREFERRED ALTERNATIVE
Highway 410 Extension - Bovaird Drive to Highway 10
Pre-Design Study

APPENDIX 'B'

CORRESPONDENCE & MINUTES OF MEETINGS

COLE, SHERMAN CONSULTING ENGINEERS

August 27th, 1999
Our Ref: 98224

The Toronto and Region Conservation Authority
5 Shoreham Drive
Downsview, Ontario
M3N 1S4

Attention: Don Haley, Coordinator, Floodplain Management
Resource Science Section

Dear Mr. Haley:

RE: Highway 410 Pre Design (W.P. 22-79-00)
Bovaird Drive to Highway 10
Etobicoke Creek Crossing

Further to our meeting on July 9th, 1999 and your letter dated July 16th, 1999, we have reconsidered the alternatives for the Highway 410 bridge crossing of the Etobicoke Creek. As suggested in your letter we have considered a 100 metre structure (33-33-33 metre triple span) to span the possible meander belt and we have revised the remaining three alternatives to show a minimum clearance of 4.0 metres. The attached table summarizes the details of these alternatives. It can be seen in this table that the cost of the 100 metre structure is $3.7 million, significantly more than the 2 x 35 metre or the 50 metre alternative. This substantial increase in cost cannot be justified by the relatively small advantages of this bridge, and as such we do not recommend this structure as the preferred alternative.

At our meeting on April 26th, it was agreed that a pier in the floodplain is not desirable. At our recent meeting on July 9th, this issue was discussed again and it was suggested that a larger span is preferred over a clear span and offsets the impacts of a pier in the floodplain. Based on this new evaluation criterion, the 2 x 35 metre structure is preferred over the 50 metre clear span. It is approximately $300,000 more expensive than the 50 metre alternative; however, it does provide a significant increase in overall span for a reasonable price. For this reason we are recommending the 2 x 35 metre twin span as the preferred alternative for the Highway 410 crossing of the Etobicoke Creek. It should be noted that the location of the centre pier within the flood plain may limit future options regarding maintenance and rehabilitation of this structure.

At our meeting on April 26th, it was agreed that the required clearance under the bridge should be a minimum of 3.0 metres. However, at our recent meeting it was suggested that an increased clearance would provide for enhanced user comfort and improved aesthetics. In your letter of July 16th, you have suggested a minimum clearance of 3.5 metres. We have adjusted all of our alternatives to show a minimum clearance of 4.0 metres. A 4.0 metre clearance exceeds the 3.5 metre clearance suggested while maintaining the cut and fill balance, the noise levels in the Valleywood subdivision and the property requirements. The increase in cost to raise the grade is approximately $100,000.

COLE, SHERMAN & ASSOCIATES LTD.
75 Commerce Valley Drive East, Thornhill, Ontario L3T 7N9 ▲ Tel: (905) 882-4401 ▲ Fax: (905) 882-4399
e-mail: cse@wcc.com
Internet: www.colesherman.com

We have attached a revised plan and profile of our preferred alternative (2 x 35 metre twin span structure) for reference purposes (similar to the previously submitted 2 x 35 with a 4.0 metre minimum clearance under the structure).

In our opinion the 2 x 35 metre twin span structure meets the criteria set out in your letter dated July 16th, 1999. In particular we have addressed the pertinent points as follows:

B.2 Floodwaters will pass safely under the structure during both the 100 year and the Regional events (the proposed structure allows for a minimum of 4.0 metres freeboard from high water level during the Regional event to the design profile of the proposed Highway 410 Extension).

B.3 Due to the width of the valley, it is not possible to clear-span the regulatory flood plain (approximately 120 metres at this location). The proposed structure minimizes obstruction to water flow and has an insignificant impact to upstream floodlines during a storm.

B.4 Overtopping of the structure is not a concern as a minimum of 4.0 metres of freeboard is provided by the proposed structure (minimum 1.7 metres clear from flood elevation to underside of structure). For this reason it is not necessary to design the approach ramps as spillways.

B.5 There is no increase in flood risk to adjacent, upstream or downstream properties. A detailed hydraulic analysis has been provided.

B.6 The width of the meander belt for this section of the Etobicoke Creek varies from 50 metres to 200 metres. However, the width of the meander belt at the exact location of the proposed structure is 60 metres. There is the potential for some movement in the stream, however, our structure is oriented to accommodate stream movement to the east, which based on the air photos, is the direction that the creek will likely go. We have reviewed and overlaid available historic information (mapping and air photos back to 1976) to investigate the meander potential of the Etobicoke Creek in the immediate vicinity of the Highway 410 crossing and have confirmed very little movement in the past 22 years. Although this is a short period of time in geomorphologic terms, it does suggest that significant stream realignment within the life of the structure is unlikely. The proposed structural abutment and pier will be constructed on piles eliminating concerns about erosion and undercutting of the structure.

B.9 Access to the valley corridor for construction and maintenance will be designed to minimize slope instability.

B.10 Storm sewer outfall headwalls will not be located within the meander belt.

B.11 The construction approach will be developed during detail design (the next phase of this project) to minimize ecological impacts.

B.12 On and off stream sediment controls will be specified during and after construction until such time as erodible areas have been vegetated/stabilized.

B.15 The proposed crossing will not restrict fish movement, increase water temperature, decrease baseflow characteristics, impair substrate characteristics or impair surface/ground water quality. There is the potential for a reduction of food sources due to shading under the bridge. This reduction can be mitigated by stream enhancements in the area.

B.16 The proposed structure provides ample space for wildlife passage. There will be no fragmentation or loss of bio-diversity. The natural areas under the proposed bridge approaches will be removed but this does not constitute a significant loss of vegetation or habitat.

B.17 The ecological integrity of the valley will be maintained.

B.18 Rehabilitation will be incorporated into the proposed works (during detail design).

B.19 The proposed structure adheres to corridor linkage objectives. Aquatic, terrestrial and human access has been maintained.

C We have completed and submitted a Stormwater Management Study based on the standard criteria set out during our previous meetings. We will revise this report based on your comments and resubmit a Final Stormwater Management Study. This report addresses all stormwater management concerns (SWMP's, siting, water quality, water quantity, erosion, etc.). No stormwater management facilities (i.e. ponds) are proposed within the meander belt, within the 100 year erosion limit or within the 100 year flood plain.

I trust the above points address all of your concerns.

We intend to move this project forward and file an ESR in the fall of 1999. The 2 x 35 metre alternative will be shown as the technically preferred alternative for the crossing of the Etobicoke Creek. As requested, we have issued to your office copies of the foundations and geotechnical reports and intend to issue a revised Stormwater Management Study in the near future. I trust with these final documents in place TRCA will endorse this project as we move through the EA process and into detail design.

Please call Dean Kemper of MTO (416) 235-4664 or myself if you wish to discuss any aspect of this project.

Yours very truly,

COLE, SHERMAN & ASSOCIATES LTD.

Paul Hudspith, P.Eng.
Project Manager

cc:

Richard Lloyd	TRCA
Chris Tschirhart	MNR
Ken Cornelisse	MNR
Dean Kemper	MTO
George Ivanoff	MTO
Cynthia Mitton-Wilkie	MTO

Highway 410 Extension - Bovaird Drive to Highway 10

Structural Alternatives at Etobicoke Creek

Alternatives	Upstream Floodlines	Minimum Clearance	Eastside Floodplain Width	Wildlife Passage+	Meander Belt	Impact to Creek Bank - Fisheries	Construction Cost **
50 metre steel girder bridge - simple span *	- Regional WL > 1.2 m, 100 yr WL > 0.6 m	4.0 metres	28 metres clear - main creek channel to abutment	13.0 metres	Spans meander belt	No in-water work required for "hard construction" (abutments/piers) - Bank stabilization may be required to mitigate loss of vegetation under structure	$1.97 million
2 x 35 metre pre-cast concrete girder - two span *	- Regional WL > 0.9 m, 100 yr WL > 0.4 m	4.0 metres	10 metres main creek channel to pier and then 30 metres clear	23.0 metres	Spans meander belt	No in-water work required for "hard construction" (abutments/piers) - Bank stabilization may be required to mitigate loss of vegetation under structure	$2.27 million
33 - 33 - 33 metre pre-cast concrete girder - three span *	- Regional WL > 0.5 m, 100 yr WL > 0.2 m	4.0 metres	10 metres main creek channel to pier - then 60 m clear (divided by pier)	40.0 metres	Spans meander belt	No in-water work required for "hard construction" (abutments/piers) - Bank stabilization may be required to mitigate loss of vegetation under structure	$3.70 million
3 x 40 metre pre-cast concrete girder - three span *	- Regional WL > 0.2 m, 100 yr WL > 0.1 m	6.0 metres	13 metres main creek channel to pier, 38 metres, and then 29 metres clear	60.0 metres	Spans meander belt	No in-water work required for "hard construction" (abutments/piers) - Bank stabilization may be required to mitigate loss of vegetation under structure	$4.50 million
Summary Comment	*Upstream impacts as a result of changes to floodlines are minimal for all alternatives*	*All alternative exceed minimum clearance*	*All alternatives meet requirements of EA (13.0 metres minimum clear span) and allow for good wildlife passage*		*All alternatives span meander belt*	*All alternatives require minor bank stabilization work under structure*	

* - Spans measured from centreline of abutments

** - Construction costs include saving on fill and road structure

\+ - Measured on east side of creek from edge of backwater to abutment or fill limit

COLE, SHERMAN

CONSULTING ENGINEERS

August 27th, 1999
Our Ref: 98224

Ministry of Natural Resources
Greater Toronto Area District
50 Bloomington Road West
Aurora, Ontario
L4G 3G8

Attention: Chris Tschirhart, MA, Senior Planner
Strategic Planning and Operations

Dear Mr. Tschirhart:

RE: **Highway 410 Pre Design (W.P. 22-79-00)**
Bovaird Drive to Highway 10
Etobicoke Creek Crossing

This letter is written in response to your letter dated July 27th, 1999 and a letter from Don Haley dated July 16th, 1999.

Our Project Team has reviewed the drainage within the Mayfield Road interchange and agrees that it is possible to break the very long culvert that passes under this interchange to allow for good wildlife passage. Concrete headwalls will be constructed at either end of the culvert break. The proposed size of this culvert is 3.0 metres by 1.4 metres.

Further to our meeting on July 9th, 1999 and TRCA's letter dated July 16th, 1999 (attached), we have reconsidered the alternatives for the Highway 410 bridge crossing of the Etobicoke Creek. As suggested in the letter we have considered a 100 metre structure (33-33-33 metre triple span) to span the possible meander belt and we have revised the remaining three alternatives to show a minimum clearance of 4.0 metres. The attached table summarizes the details of these alternatives. It can be seen in this table that the cost of the 100 metre structure is $3.7 million, significantly more than the 2 x 35 metre or the 50 metre alternative. This substantial increase in cost cannot be justified by the relatively small advantages of this bridge, and as such we do not recommend this structure as the preferred alternative.

At our meeting on April 26th, it was agreed that a pier in the floodplain is not desirable. At our recent meeting on July 9th, this issue was discussed again and it was suggested that a larger span is preferred over a clear span and offsets the impacts of a pier in the floodplain. Based on this new evaluation criterion, the 2 x 35 metre structure is preferred over the 50 metre clear span. It is approximately $300,000 more expensive than the 50 metre alternative; however, it does provide a significant increase in overall span for a reasonable price. For this reason we are recommending the 2 x 35 metre twin span as the preferred alternative for the Highway 410 crossing of the Etobicoke Creek. It should be noted that the location of the centre pier within the flood plain may limit future options regarding maintenance and rehabilitation of this structure.

COLE, SHERMAN & ASSOCIATES LTD.
75 Commerce Valley Drive East, Thornhill, Ontario L3T 7N9 ^ Tel: (905) 882-4401 ^ Fax: (905) 882-4399
e-mail: csa@wcc.com
Internet: www.colesherman.com

92

At our meeting on April 26th, it was agreed that the required clearance under the bridge should be a minimum of 3.0 metres. However, at our recent meeting it was suggested that an increased clearance would provide for enhanced user comfort and improved aesthetics. In the TRCA letter of July 16th, a minimum clearance of 3.5 metres is suggested. We have adjusted all of our alternatives to show a minimum clearance of 4.0 metres. A 4.0 metre clearance exceeds the 3.5 metre clearance suggested while maintaining the cut and fill balance, the noise levels in the Valleywood subdivision and the property requirements. The increase in cost to raise the grade is approximately $100,000.

We have attached a revised plan and profile of our preferred alternative (2 x 35 metre twin span structure) for reference purposes (similar to the previously submitted 2 x 35 with a 4.0 metre minimum clearance under the structure).

In our opinion the 2 x 35 metre twin span structure meets the criteria set out in the TRCA letter dated July 16th, 1999. In particular we have addressed the pertinent points as follows:

B.2 Floodwaters will pass safely under the structure during both the 100 year and the Regional events (the proposed structure allows for a minimum of 4.0 metres freeboard from high water level during the Regional event to the design profile of the proposed Highway 410 Extension).

B.3 Due to the width of the valley, it is not possible to clear-span the regulatory flood plain (approximately 120 metres at this location). The proposed structure minimizes obstruction to water flow and has an insignificant impact to upstream floodlines during a storm.

B.4 Overtopping of the structure is not a concern as a minimum of 4.0 metres of freeboard is provided by the proposed structure (minimum 1.7 metres clear from flood elevation to underside of structure). For this reason it is not necessary to design the approach ramps as spillways.

B.5 There is no increase in flood risk to adjacent, upstream or downstream properties. A detailed hydraulic analysis has been provided.

B.6 The width of the meander belt for this section of the Etobicoke Creek varies from 50 metres to 200 metres. However, the width of the meander belt at the exact location of the proposed structure is 60 metres. There is the potential for some movement in the stream, however, our structure is oriented to accommodate stream movement to the east, which based on the air photos, is the direction that the creek will likely go. We have reviewed and overlaid available historic information (mapping and air photos back to 1976) to investigate the meander potential of the Etobicoke Creek in the immediate vicinity of the Highway 410 crossing and have confirmed very little movement in the past 22 years. Although this is a short period of time in geomorphologic terms, it does suggest that significant stream realignment within the life of the structure is unlikely. The proposed structural abutment and pier will be constructed on piles eliminating concerns about erosion and undercutting of the structure.

B.9 Access to the valley corridor for construction and maintenance will be designed to minimize slope instability.

B.10 Storm sewer outfall headwalls will not be located within the meander belt.

B.11 The construction approach will be developed during detail design (the next phase of this project) to minimize ecological impacts.

B.12 On and off stream sediment controls will be specified during and after construction until such time as erodible areas have been vegetated/stabilized.

B.15 The proposed crossing will not restrict fish movement, increase water temperature, decrease baseflow characteristics, impair substrate characteristics or impair surface/ground water quality. There is the potential for a reduction of food sources due to shading under the bridge. This reduction can be mitigated by stream enhancements in the area.

B.16 The proposed structure provides ample space for wildlife passage. There will be no fragmentation or loss of bio-diversity. The natural areas under the proposed bridge approaches will be removed but this does not constitute a significant loss of vegetation or habitat.

B.17 The ecological integrity of the valley will be maintained.

B.18 Rehabilitation will be incorporated into the proposed works (during detail design).

B.19 The proposed structure adheres to corridor linkage objectives. Aquatic, terrestrial and human access has been maintained.

C We have completed and submitted a Stormwater Management Study based on the standard criteria set out during our previous meetings. We will revise this report based on your comments and resubmit a Final Stormwater Management Study. This report addresses all stormwater management concerns (SWMP's, siting, water quality, water quantity, erosion, etc.). No stormwater management facilities (i.e. ponds) are proposed within the meander belt, within the 100 year erosion limit or within the 100 year flood plain.

We intend to move this project forward and file an ESR in the fall of 1999. The 2 x 35 metre alternative will be shown as the technically preferred alternative for the crossing of the Etobicoke Creek. As requested, we have issued to your office copies of the foundations and geotechnical reports and intend to issue a revised Stormwater Management Study in the near future. I trust with these final documents in place MNR will endorse this project as we move through the EA process and into detail design.

Please call Dean Kemper of MTO (416) 235-4664 or myself if you wish to discuss any aspect of this project.

Yours very truly,

COLE SHERMAN & ASSOCIATES LTD.

Paul Hudspith, P.Eng.
Project Manager

cc:

Ken Cornelisse	MNR
Dean Kemper	MTO
Cynthia Mitton-Wilkie	MTO
George Ivanoff	MTO
Don Haley	TRCA
Richard Lloyd	TRCA

THE TORONTO AND REGION CONSERVATION AUTHORITY
5 Shoreham Drive, Downsview, Ontario M3N 1S4 (416) 661-6600 FAX 661-6898 http://www.trca.on.ca

July 16, 1999

Mr. Dean Kemper
Ministry of Transportation
4th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M1J8

Dear Sir:

Re: Extension of Highway 410, Crossing of Etobicoke Creek Valley

As follow up to the discussion held at our meeting of July 9, 1999 at your offices. I have reviewed the valley crossing of the Highway with our planning and environmental staff and we have put together the requirements for the crossing from the Authority's perspective. The Authority's Valley and Stream Corridor Management Program is one of the key tools we use to establish the technical requirements for sizing and deals with issues related to the alignment, fluvial geomorphologic and hydraulic in order to establish appropriate waterway/valley crossing designs.

Section 4.3 of the Program outlines the criteria to be used in sizing infrastructure including bridge crossings. I have included those sections pertinent to this discussion.

A. *The following type and extent of services may be permitted within valley and stream corridors:*

1) *New transportation corridors and above-ground utility corridors shall not be routed within valley and stream corridors; however, they may be permitted to cross valley and stream corridors.*

B. *Services should be carefully sited and designed to:*

- *prevent risk associated with flooding, erosion or slope instability;*
- *protect and rehabilitate existing landforms, features, and functions; and*
- *provide for aquatic, terrestrial and human access,*

such that:

2) *The safe passage of flood flows shall not be impeded.*

3) *Structural abutments or piers should be located outside of the regulatory flood plain to minimize obstruction to water flow.*

. . ./2

4) *Where abutments or piers are approved within the flood plain, the structure shall be designed so that overtopping or flanking can occur with a minimum of damage. Bridges or culverts with openings not designed for the Regional Flood should have their approach ramp(s) designed as spillways.*

5) *There shall be no increase in flood risk to adjacent, upstream or downstream properties. A detailed hydraulic analysis may be required to demonstrate compliance.*

6) *Bridge or structural abutments should be located outside the meander belt (as calculated from the existing meander amplitude) or the 100 year erosion limit of a watercourse, unless located beyond the valley or stream corridor boundary.*

9) *Access to valley corridors for construction or maintenance purposes shall not cause and/or aggravate slope instability.*

10) *Storm sewer outfall headwalls should not be located within the meander belt (as calculated from the existing meander amplitude) or within the 100 year erosion rate of a watercourse unless located beyond the valley or stream corridor boundary. Alterations to stream profiles may be permitted pursuant to Section 3 - Watercourses.*

11) *Innovative design and construction technologies should be used, such as tunnelling or corridor spanning, to reduce the risk and ecological impacts of corridor crossings.*

12) *On and off stream sediment control during construction shall be required until such time as erodible areas have been vegetated/stabilized.*

15) *Services should not:*

- i) *result in the restriction of fish movement or migration for spawning, nursery or feeding;*
- ii) *increase water temperatures by reducing shade, decreasing water depth, reducing groundwater flows, or permitting inputs from surface draw dams or stormwater management facilities;*
- iii) *decrease baseflow characteristics;*
- iv) *reduce food sources through the reduction of in-stream or terrestrial (riparian) vegetation;*
- v) *impair substrate characteristics; and/or*
- vi) *impair surface and/or ground water quality such as through the introduction of sediment or other contaminants or pollutants.*

16) *Services should not reduce/fragment wildlife habitat (including forage, water supply, shelter and living space), nor reduce wildlife diversity nor restrict wildlife movement.*

17) *Services shall ensure the ecological integrity of the valley or stream corridor s maintained.*

18) *Services shall ensure rehabilitation is incorporated into the proposed works.*

19) *Services shall safeguard corridor linkage objectives. Crossings in particular shall be designed to permit aquatic, terrestrial and human access.*

July 22, 1999

r management facilities, for the purposes of
r impairment and/or risks associated with

it alternative servicing design techniques (eg.
nt possible. Provincial guidelines for the
anagement practices are available.
e impacts related to public safety and other
ms within the corridor.

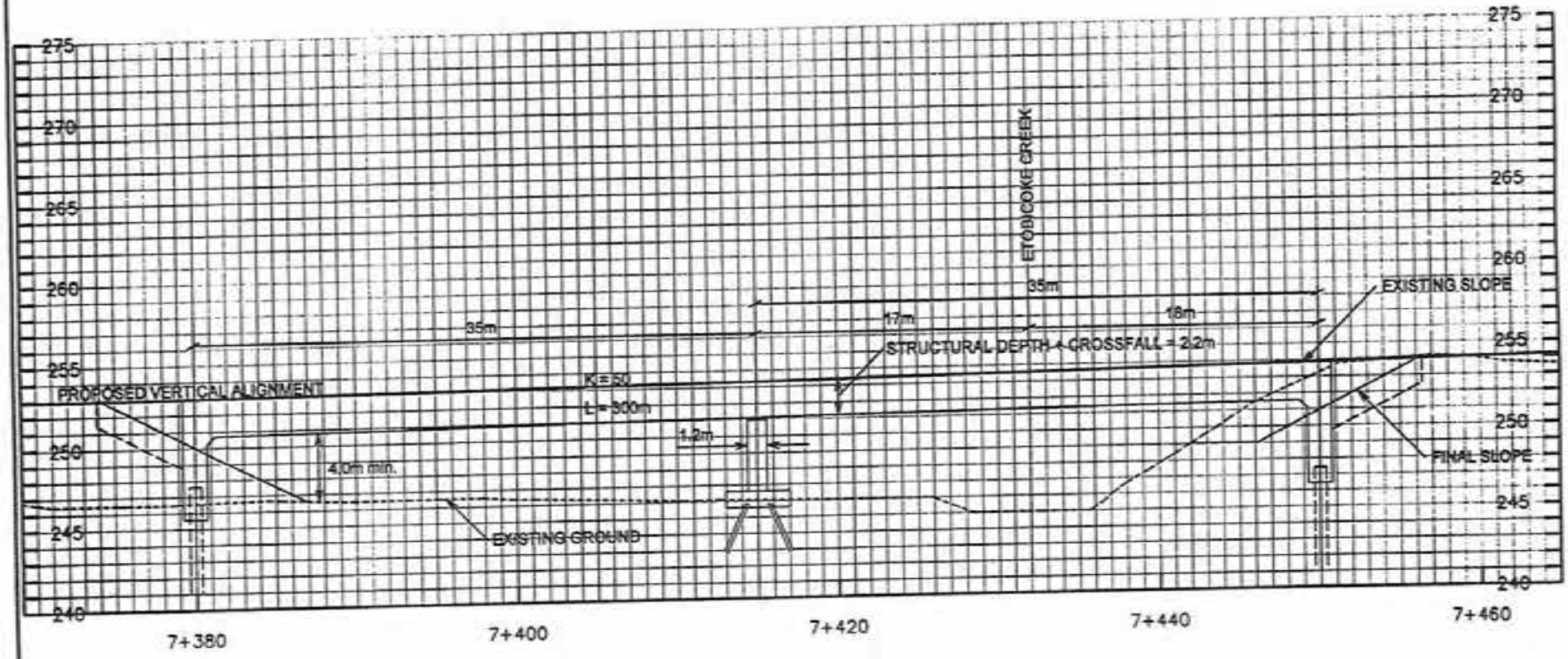
results in the greatest net public benefit.
social, economic, recreational, and other
ms.

it facilities shall not be located within the
ig meander amplitude) or within the 100 year
100 year flood plain, whichever is greater.

and design for the crossing of Etobicoke
l works carried out for the crossing noted
h, the width of the bottom of the opening(
criteria for establishing the width of the
kely meet the objective of flood passage.
or to meet the requirements for pedestrian
Development Guide which indicates a
bridge of 3.5 metres to accommodate both
e minimum height to be above the existing
uture pedestrian and wildlife passage

Highway 410 crossing of the Etobicoke

Ontario
Ministry of Transportation



HIGHWAY 410 EXTENSION PRE-DESIGN

Etobicoke Creek Bridge

PRE-CAST CONCRETE GIRDER - 2 x 35

COLE, SHERMAN

\\micro1\design2\creek.dgn Aug. 06, 1999 11:24:16

Ministry of Transportation

Ministère des Transports

Ontario

May 4th, 1999
Our Ref: 98224

City of Brampton
2 Wellington Street
Brampton, Ontario
L6Y 4R2

Attention: Leonard J. Mikulich, City Clerk

Dear Sir:

RE: Highway 410 Pre Design (W.P. 22-79-00)
Bovaird Drive to Highway 10
Council Endorsement

Further to our municipal staff briefing meeting held on April 29th, 1999, we formally request endorsement by your Council for the extension of Highway 410 from Bovaird Drive to Highway 10 as proposed by the Ministry of Transportation.

The details of the undertaking are described in the information package distributed at the above meeting. In addition, a 1:2,000 roll plan of the proposed highway extension will be distributed to municipal staff by courier on May 6th, 1999.

Please call anytime if you have any questions or concerns regarding this project.

Yours very truly,

COLE, SHERMAN & ASSOCIATES LTD.

Dean Kemper, P.Eng.
Senior Project Manager

cc: Paul Hudspith, Cole, Sherman

Ministry of Transportation

Ministère des Transports

Ontario

May 4th, 1999
Our Ref: 98224

Town of Caledon
6311 Old Church Road
Caledon East, Ontario
L0N 1E0

Attention: Marjory Morden, Clerk

Dear Marjory:

RE: Highway 410 Pre Design (W.P. 22-79-00)
Bovaird Drive to Highway 10
Council Endorsement

Further to our municipal staff briefing meeting held on April 29th, 1999, we formally request endorsement by your Council for the extension of Highway 410 from Bovaird Drive to Highway 10 as proposed by the Ministry of Transportation.

The details of the undertaking are described in the information package distributed at the above meeting. In addition, a 1:2,000 roll plan of the proposed highway extension will be distributed to municipal staff by courier on May 6th, 1999.

Please call anytime if you have any questions or concerns regarding this project.

Yours very truly,

COLE, SHERMAN & ASSOCIATES LTD.

Dean Kemper, P.Eng.
Senior Project Manager

cc: Paul Hudspith, Cole, Sherman

Ministry of Transportation

Ministère des Transports

Ontario

May 4th, 1999
Our Ref: 98224

Regional Municipality of Peel
10 Peel Centre Drive
Brampton, Ontario
L6T 4B9

Attention: Doug R. Billett, P. Eng., M.C.I.P.
Director, Development Review and Transportation Planning

Dear Sir:

RE: Highway 410 Pre Design (W.P. 22-79-00)
Bovaird Drive to Highway 10
Council Endorsement

Further to our municipal staff briefing meeting held on April 29th, 1999, we formally request endorsement by your Council for the extension of Highway 410 from Bovaird Drive to Highway 10 as proposed by the Ministry of Transportation.

The details of the undertaking are described in the information package distributed at the above meeting. In addition, a 1:2,000 roll plan of the proposed highway extension will be distributed to municipal staff by courier on May 6th, 1999.

Please call anytime if you have any questions or concerns regarding this project.

Yours very truly,

COLE, SHERMAN & ASSOCIATES LTD.

Dean Kemper, P.Eng.
Senior Project Manager

cc: Paul Hudspith, Cole, Sherman

Don Naylor + Associates

Environmental Planning
Landscape Architecture

February 3, 1999

Mr. Greg Roszler
MTO 1st. Floor Atrium Tower
1201 Wilson, Ave.
Downsview, Ont.
M3M 1J8

Dear Sir **Re:** ***Valleywood Pedestrian Trail Etobicoke Creek. Caledon 410 Extension Crossing***

Further to our discussion this morning please be advised that there is a current need to construct the subject walkway in the spring of 1999 to provide the public with recreational linkages. The proposed walkway will be constructed of granular material only and is at grade. Since we need to build the walkway in advance of the highway, we request your approval to proceed with what can be deemed a temporary connection.

The following points summarize the course of action agreed to today;

1.) We will obtain an encroachment agreement form from MTO's (Terry Raike) fill it out and submit it for approval with our current drawings.

2.) We will issue our current drawings to Cole Shaman's project rep. (Mr. Hudstith) so that he is aware of our proposed walkway location. Copies of all correspondence with Mr. Hudstith will be issued to yourself and Dean Kemper.

3.) We will copy you on MTRCA approval documents.

4.) Through coordination, every effort will be made to locate and construct the subject stretch of walkway without interference with future bridge construction. However, if for some reason in the future the design changes and the walkway requires relocation or repair, The Town of Caledon will assume responsibility for such repairs or reinstatement.

Please forward the encroachment agreement form by fax at your earliest convenience.
Thank you for your attention to this matter.

Yours truly,

Don Naylor OALA
c.c. Dave Turner: Town of Caledon.
Mr. Paul Hudstith Cole Sherman Engineering

Don Naylor + Associates Limited
245 Main Street North
Brampton, Ontario L6X 1N3
905.459.6570
905.455.2249

The Corporation of the City of Brampton
Works and Transportation Department
L.T. Koehle, P.Eng., Commissioner
Engineering and Development Services, Maintenance and Operations
Administrative Services, Transit

2 Wellington Street West
Brampton, ON L6Y 4R2

General Works 905/874-2500
Licensing 905/874-2580
Parking 905/874-2404
Fax 905/874-2599

1999 01 13

Cole Sherman & Associates Ltd.
75 Commerce Valley Drive East
Thornhill, Ontario
L3T 7N9

Attention: Michael Bricks

Dear Mr. Bricks:

Re: Hwy. #410 Extension
Bovaird Drive to Highway #10

Further to our recent conversation, we would point out that the City of Brampton's position is as follows:

- Sandalwood Parkway – full interchange with provision in abutment and pier widths to accommodate six lanes.
- Countryside Drive – two lane flyover, no on-off ramps.
- Highway #10 – southbound continuous through movement to Mayfield Road (no stop condition – channelized right turn movement).

Should you have any questions in this regard kindly contact the undersigned at (905) 874-2541.

Yours truly,

G.N.G. Birch, P. Eng.,
Manager - Engineering Services

GNGB/em

Cc: B. Hale

Canadian Coast Guard | Garde côtière canadienne

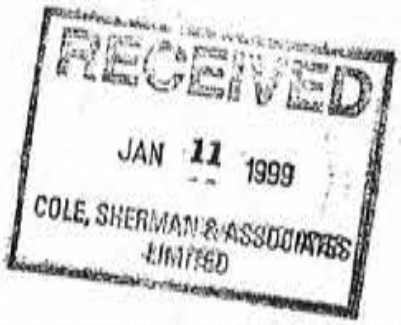
P.O. Box 1000
Prescott, Ontario
K0E 1T0

Your file / Votre référence
8200-98-7194

Our file / Notre référence

January 8, 1999

Ministry of Transportation
C/o Cole, Sherman Consulting Engineers
75 Commerce Valley Drive East
Thornhill, Ontario
L3T 7N9



Attn: Michael Bricks

Dear Sir:

Re: Navigability enquiry of the Etobicoke Creek, Highway 410 extension, Bovaird Drive to Highway 10, City of Brampton, Town of Caledon, Regional Municipality of Peel, Province of Ontario

We make reference to our Regional Office's letter of December 3, 1998 concerning the above project.

There is no requirement for an application pursuant to the Navigable Waters Protection Act for the project mentioned above.

I note that the Canada Fisheries Act may still be applicable and contact should be made with Department of Fisheries and Oceans – Fish Habitat Management in Burlington at (905) 336-6436.

If you have any questions, please contact me at your convenience.

Yours truly,

A. Robertson
Navigable Waters Protection Program Officer
Canadian Coast Guard
Prescott Base

cc. EWOAE

Ministry of Transportation

Ministère des Transports

Ontario

Highway Engineering
Central Region
Atrium Tower, 4th Floor
1201 Wilson Avenue
Downsview, Ontario M3M 1J8
Telephone (416) 235-4664
Facsimile (416) 325-8070

December 21, 1998

Ms. Heather Konefat
Acting Director of
Planning & Development
Town of Caledon
Box 1000
Caledon, Ontario
L0N 1E0

Dear Ms. Konefat:

Re: Highway 410 Value Engineering Exercise
Impact on the Mayfield West Community Concept Plan

I am responding to your letter dated August 4, 1998 to Mr. Roger Hanmer regarding the above subject. I apologize for the late response as my staff's recent discussions with Mr. Vandezande revealed that you had never received a response to your original letter.

The ministry has recently retained the services of Cole, Sherman & Associates Ltd. to carry out a Pre-Design and Environmental Study Report Submission Study for the Highway 410 Extension. Both the ministry and the consultant will work with local municipalities and interested parties in an attempt to address any concerns or issues related to the undertaking.

Since this study has just been initiated some of the points you have raised may require additional review, however, at this time I can offer the following:

1. The ministry carried out an extensive review of existing and future traffic demands in conjunction with the existing and proposed municipal road improvements impacting this corridor. The location of the interchanges on the Highway 410 Extension were agreed to by all stakeholders and are designed to provide the maximum benefit to both the provincial freeway system as well as the municipal roads. Although it is physically possible to construct an interchange between Heart Lake Road and Kennedy Road the ministry will not propose to do so in the present study. Every effort is being made to not jeopardize the

already approved Environmental Assessment. Such a change in scope would prompt a complete re-thinking of the original concept. Should the municipality ever wish to proceed with such an undertaking in the future then as the proponent they would be responsible for all engineering and construction costs. The ministry would be receptive as long as the need, justification and technical feasibility could be demonstrated.

The provision of interchanges at Mayfield Road and Highway 10 in combination with the north-south movement provided along Heart Lake Road and Kennedy Road should be sufficient to serve the proposed development.

2. Both structures at Heart Lake Road and Kennedy Road will most likely be initially constructed as two lane roadways based on anticipated traffic projections. However, in order to protect for future traffic demand the sub-structure and abutments could be designed and initially built to be able to accommodate a future structural expansion as needed. The differential cost for such an undertaking is in the order of $200,000 per structure and would be the responsibility of the municipality.

I trust this response is sufficient for your needs at this time and please feel free to contact me at any time should you require additional information.

Yours truly,

Peter Shaver, P.Eng.
Head, Highway Engineering
Peel, Halton & Hamilton

cc: R. Hanmer
P. Allen
B. Moore
J. Hook
T. Salter
D. Kemper
P. Hudspith - Cole Sherman

Ontario Native Affairs Secretariat

720 Bay Street
4th Floor
Toronto, ON M5G 2K1

Tel: (416) 326-4740
Fax: (416) 326-4017

Secrétariat des affaires autochtones de l'Ontario

720, rue Bay
4e étage
Toronto, ON M5G 2K1

Tel: (416) 326-4740
Fax: (416) 326-4017

Ontario

December 18, 1998

Mr. Michael Bricks
Environmental Planner
Cole, Sherman & Associates Ltd.
75 Commerce Valley Drive East
Thornhill, Ontario
L3T 7N9

Dear Mr. Bricks:

Re: Your Letter Dated November 16, 1998 - Your Reference 98224
Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

Thank you for your letter dated November 16, 1998 which I have forwarded to Ms. Marine Perran.

Please refer all correspondence regarding the above-noted subject to Ms. Marine Perran, Director, Negotiations Branch, Ontario Native Affairs Secretariat, 720 Bay Street, 4th Floor, Toronto, Ontario M5G 2K1. The Negotiations Branch now has responsibility in ONAS for environmental assessment matters.

We would appreciate it if you would adjust your records in this regard. Thanks again for your assistance.

Yours truly,

Tim Eger
Director
Corporate Aboriginal Policy and Management

cc: Marine Perran
Mr. Michael Williams, Director, Environmental Assessment & Approvals Branch

Michael Bricks.Cole, Sherman.doc
TEWORD7.EnvironmentalAssessmentCorrespondence

THE CORPORATION
OF THE
TOWN OF CALEDON

Box 1000, Caledon East, Ontario. L0N 1E0

Telephone:
905-584-2272
1-800-303-2546

December 8, 1998

Mr. Michael Bricks,
Environmental Planner,
Cole Sherman,
Consulting Engineers,
75 Commerce Valley Drive East,
Thornhill, Ontario,
L3T 7N9

Dear Mr. Bricks,

RE: Highway 410 Extension.

Council at its meeting held November 30, 1998 adopted resolution W-651-98 which reads as follows:

> **RESOLVED THAT** correspondence from Cole Sherman (Hwy. #410 Extension Pre-Design Study from Bovaird Dr. to Hwy. #10) be received;
>
> **AND THAT** Council confirm the Town of Caledon's interest to be notified and kept informed of the environmental assessment process;
>
> **AND THAT** the Town of Caledon expects the letter of August 4, 1998 from the Director of Planning, be addressed.
>
> Carried.

Mr. Richard Vandezande, Community Planner, has communicated in his correspondence to you dated December 1, 1998, that he will be the Town's representative. Please direct your written response to the Town's August 4, 1998 correspondence via Mr. Vandezande. Thank you.

Yours truly,

Marjory Morden, A.M.C.T.,
Town Clerk.

Hw

C: R. Vandezande

Fisheries and Oceans Canada
Pêches et Océans Canada

Coast Guard
Garde côtière

Central & Arctic Region
Région du Centre et de l'Arctique

201 N. Front Street, Suite 703
Sarnia, Ontario
N7T 8B1

Your file Votre référence
98224

Our file Notre référence
8200-98-7194

December 3, 1998

Ministry of Transportation
C/0 Cole, Sherman Consulting Engineers
75 Commerce Valley Drive East
Thornhill, ON L3T 7N9

Attention: Michael Bricks

Dear Sir/Madam:

Re: Enquiry of navigability status, Etobicoke Creek, Highway 410 extension, Bovaird Drive to Highway 10, City of Brampton/Town of Caledon, Regional Municipality of Peel, Province of Ontario

Receipt is acknowledged of your correspondence in connection with the above-noted enquiry.

Your enquiry has been referred to our base in Prescott for determination of navigability and review.

If you have any questions or wish further information, please contact this office at (519) 383-1864.

Yours truly,

R.A. McLean
Inspections Supervisor
Navigation Protection Program

RAM/nav
c.c. Prescott Base

Canada

THE CORPORATION
OF THE
TOWN OF CALEDON

Box 1000, Caledon East, Ontario. L0N 1E0

Telephone: 905-584-2272 Fax: 905-584-4325
Toll Free use:1-800-303-2546

December 1, 1998

Cole Sherman and Associates Limited
75 Commerce Valley Drive East
Thornhill, Ontario
L3T 7N9

Attention: Mr. Michael Bricks
Environmental Planner

Re: Highway 410 Pre-Design Study
Your File: 98224

Thank you for your letter regarding the proposed pre-design study regarding the extension of Highway 410 from Bovaird Drive to Highway 10. We understand your firm will be preparing an Environmental Study Report which will be documenting the anticipated effects of the project and the corresponding mitigation measures for submission to the Ministry of the Environment.

Please be advised that the Town of Caledon Planning Department would like to participate in the project and that Mr. Richard Vandezande of the Planning Department will be acting as the contact person. Please direct all future correspondence regarding the project to him.

Based on discussions with Mr. Craig Campbell, Assistant Director of Public Works for the Town of Caledon, it was requested that the Public Works Department also be circulated correspondence relating to the Study. Craig Campbell will be acting as the contact person.

Yours truly,

Heather Konefat
Director of Planning and Development

c.c. Craig Campbell - Public Works
John Hook - Engineering

rpv/

COLE, SHERMAN

CONSULTING ENGINEERS

November 27, 1998
Our Ref.: 98224

Mr. Rick McLean
Canadian Coast Guard
Supervisor of Inspection
NWPD
201 N. Front Street, Suite 703
Sarnia, Ontario
N7T 8B1

Dear Mr. McLean:

Re: Highway 410 Extension Pre-Design Study from Bovaird Drive to Highway 10

Cole, Sherman & Associates Ltd. has been retained by the Ministry of Transportation to undertake the pre-design for the extension of Highway 410 in the City of Brampton and Town of Caledon. An Environmental Assessment Report was approved by the Ontario Ministry of the Environment in 1997.

The extension of Highway 410 will include a crossing of the Etobicoke Creek (see attached maps). Please advise us if this section of the Etobicoke Creek is considered a navigable waterway. If so, please provide us with clearance requirements.

A reply before January 15, 1999 would be appreciated. If you require additional information, please feel free to contact us.

Yours truly,
COLE, SHERMAN & ASSOCIATES LTD.

Michael Bricks
Senior Environmental Planner

MB/lh

Att.

cc: D. Kemper - MTO
G. Ivanoff - MTO
P. Hudspith - CSA

COLE, SHERMAN & ASSOCIATES LTD.
75 Commerce Valley Drive East, Thornhill, Ontario L3T 7N9 ▲ Tel: (905) 882-4401 ▲ Fax: (905) 882-4399
e-mail: csa@wcc.com
Internet: www.colesherman.com

THE TORONTO AND REGION CONSERVATION AUTHORITY
5 Shoreham Drive, Downsview, Ontario M3N 1S4 (416) 661-6600 FAX 661-6898 http://www.trca.on.ca

November 27, 1998

CFN 0955

Mr. Michael Bricks
Cole, Sherman Consulting Engineers
75 Commerce Valley Drive East
Thornhill, Ontario
L3T 7N9

Dear Mr. Bricks,

Re: Highway 410 Extension Pre-Design Study from Bovarid Drive to Highway 10

Thank you for your letter of November 16, 1998. The Authority has been involved throughout the Environmental Assessment (EA) process and has provided comments on a number of occasions.

As we understand it, the EA has been approved subject to a number of conditions, three of which relate to the Authority. The conditions related to the programs and services of the Authority include:

- The design of the Etobicoke Creek crossing will be subject to review and comment by Authority staff at the detailed design stage. The Ministry of Transportation will consider the Authority's comments within the context of the approved environmental assessment and standard transportation and environmental assessment principles and practices;

- The location of the stormwater management facility which is proposed adjacent to the proposed Highway 410 right-of-way on the valleylands (Authority owned lands) will be subject to further siting evaluation and approval by Authority staff at the detailed design stage; and.

- The Design and Construction Reports will be provided to Authority staff for review and comment during detailed design. We note that the change in the design proposal eliminating the grassed centre median will result in a reduction in the possibility of providing stormwater quality treatment. Staff request information on how this lost storage will be replaced.

Please be advised that the undersigned will act as the staff contact for this project.

Yours truly,

Richard Lloyd
Plans Analyst - Regulations
Plan Review Section
Extension 281

/mh

Regional Municipality of Peel

FILE COPY

Paul Hudspeth

FAXED: (416)255-8355

September 21, 1998

Trinity Development Inc.
2275 Lakeshore Boulevard West
Toronto, Ontario M8V 3Y3

Attention: Mr. Art Welter

Dear Sir:

Re: Highway 410 Extension, - Bovaird Dr to Highway 10

Highway 410 is an essential part of the infrastructure required to support continued development in north Brampton.

For some time the Region of Peel has been engaged in discussions with the Minister of Transportation, the City of Brampton and the Town of Caledon with the objective of advancing the timing of constructing the Extension of Highway 410 between Bovaird Drive and Highway 10. At the present time this extension is not included in the Ministry's construction program and is probably 15 years or more away.

In meetings with the Minister he has indicated that the Ministry is prepared to consider a proposal from Peel, Brampton, Caledon and the Private sector that would share the cost of the project on a partnership basis. His initial proposal was for a 1/3 split for each of the Province, the Municipalities and the private Sector. This concept has been successful in the Region of York and in other locations.

The City of Brampton staff have suggested contributions that the City could make and Regional staff have identified situations where the Region could make contributions. Discussions are also continuing with the aggregate producers in Peel.

Preliminary discussions have also taken place with Sandringham Place Inc., one of the major developers in the Springdale Community, with respect to a 5 year interest free deferred payment for the land required for the extension of Highway 410 with payments spread over the following 3 years. Further discussion is required with other owners to determine an acceptable means of the development community contributing to the project.

In order to discuss this matter, your or your representative of your firm are invited to a meeting at 2:00 pm on October 2 1998 in the Planning Department boardroom on the 6th floor of the Region of Peel building at 10 Peel Centre Drive, Brampton.

The Ministry of Transportation has indicated that it must receive a firm proposal from the Region of Peel within the next two weeks in order that it can be considered with other projects in order to be allocated funding from the Governments capped budget for highway expansions. Time is of the essence and it is hoped that agreement can be reached at our meeting to ensure that this project receives government approval for early construction.

Yours truly,

Peter E. Allen
Commissioner of Planning

DRB:nb
C:\MSOFFICE\WINWORD\DAILY\hwy410pf.doc

cc: E. Kolb
R. Maloney
D. Billett
B. Hooshley, Metrus Development Inc.

COLE, SHERMAN

CONSULTING ENGINEERS

MINUTES OF MEETING

PROJECT NAME:	Highway 410 Pre-Design	**MEETING No.**	External Meeting #3
PROJECT No.	98224	**DATE:**	July 9, 1999
LOCATION:	MTO Atrium Tower, 4th Floor	**TIME:**	10:00 a.m.

PRESENT:

Don Haley	-	TRCA
Chris Tschirhart	-	MNR
Ken Cornelisse	-	MNR
Cindy Mitton-Wilkie	-	MTO
Joe Lai	-	MTO
Dean Kemper	-	MTO
Dale Leadbeater	-	GLL
Chris Doherty	-	EWRG
Paul Hudspith	-	CSA
Mike Bricks	-	CSA

PURPOSE: To discuss stormwater management and Etobicoke Creek crossing.

Items	Description	Action by:
1.	Review of Previous Minutes	
	Paul H. noted that the geotechnical reports are now finalized. Copies will be sent to MNR and TRCA.	CSA
2.	Review of Stormwater Management Report	
	Chris D. reviewed the recommendations of the Stormwater Management Report. The Strategy was designed for the ultimate Highway and ponds have been designed for a 25 mm storm event and oversized as much as possible. In general, all were satisified with the overall proposed Stormwater Management Strategy. This meeting was the opportunity for the agencies to provide comments prior to it being finalized. The following outlines the revisions suggested.	

COLE, SHERMAN & ASSOCIATES LTD.
75 Commerce Valley Drive East, Thornhill, Ontario L3T 7N9 ^ Tel: (905) 882-4401 ^ Fax: (905) 882-4399
e-mail: csa@wcc.com
Internet: www.colesherman.com

Items	Description	Action by:
	It was noted that the streams in the area should be identified as Type 2 habitat. This will be changed in Section 2.4 and the Summary.	EWRG
	TRCA suggested removing the reference to the capacity issue relating to the muncipal storm sewer on Bovaird Drive. It was suggested that we obtain sign-off and written clarification from the City of Brampton that the highway run-off can be accommodated in the municipal sewer.	EWRG
	The new pond in the vicinity of the Etobicoke Creek is outside of the floodplain. The highway will not result in additional flooding impacts to the existing pond. This existing pond is located in the floodplain and currently floods under the regional storm.	
	TRCA has concerns about the construction of a pond in the valley system. They wish to see the pond built in an aesthetically pleasing manner. The design should incorporate appropriate safety features (TRCA does not want fencing in the valley). A natural outflow to the Etobicoke Creek is desired over a pipe. It was noted that the landscaping details can be left until detail design but we should ensure we have adequate property identified.	
	MNR suggested that we consider moving the centre drainage to the shoulder ditches for the areas west of the Etobicoke Creek in order to provide some treatment before entering the Creek. It was also noted that the drop structure should not be located in the meander belt.	
3.	Fisheries	
	There was some confusion relating to fisheries concerns in the study area. At two previous meetings it was agreed that the only fishery in the study area was the Etobicoke Creek. An internal Draft ESR suggests the possibility of other fisheries. This is contrary to the understandings of all attendees and will be reviewed as a possible oversight. It was agreed that a field visit will be undertaken with MNR on July 19, 1999 to clarify.	
4.	Etobicoke Creek Crossing	
	TRCA noted that they had a concern with regards to the proposed 3 metre height of the structure. This concern was based on aesthetics and pedestrian movements and did not related to wildlife movement or flood line issues. TRCA noted that this opening provided the minimum, but in the case of a new structure, a greater clearance is desirable.	
	Dean Kempter noted that at previous meetings, MNR and TRCA requirements/criteria for the Etobicoke Creek crossing had been discussed,	

the design only allows for a distance of 95 metres between the bullnose of the left entrance and the access road to the school (just north of Collingwood Avenue). This is a very short distance for vehicles to weave across two lanes to access the school. This weaving condition may create operational and safety concerns and is not desirable.

It was agreed that the current design (as shown in the EA with the addition of a channelized right turn lane) could be improved by making the channelized right turn into a "lane-away". This modification will be made to the design and shown at the PIC (interchange design as modified is attached for reference purposes). It is also possible to add an additional lane to the channelized right, if future traffic volumes warrant the additional capacity. Peter Shaver noted that there is a long-term "vision" for this interchange, documented in the EA, which allows for two through lanes north and southbound from Highway 10 to Main Street.

It was agreed that the one lane channelized right turn lane would be carried forward to the public and into the ESR with the understanding that an additional lane can be added in the future if necessary and the further understanding that the "vision" will be protected through MTO corridor management. Cole, Sherman will modify the channelized right turn as discussed and develop the design for the two lane channelized right turn. Both of these designs will be e-mailed to Brampton on Thursday, June the 3rd. CSA

Craig Campbell stated that Caledon Council requested a possible extension of Highway 410 to the west of Highway 10, swinging south to connect with Mayfield Road. It was agreed that this is a long-term land use planning issue and not appropriate for the current study.

3) **Highway 410 and Sandalwood Parkway Interchange:**

Brampton questioned whether the ramp from southbound Highway 410 to Heartlake Road could be realigned to connect with Sandalwood Parkway. It was explained that this will place the ramp terminal too close to the intersection between Heart Lake Road and Sandalwood Parkway (thereby precluding future traffic signals at this terminal).

4) **What's Next:**

The Project Team will proceed to the public on June 16th, as planned. This will allow for the filing of the ESR at the end of June or early July.

MTO requested overall municipal staff and council endorsement for the project to aid in quick environmental approvals. These approvals will allow the project to proceed to design and into construction as soon as possible.

Craig Campbell agreed to present this project to Caledon Council on June 14th, 1999. Caledon

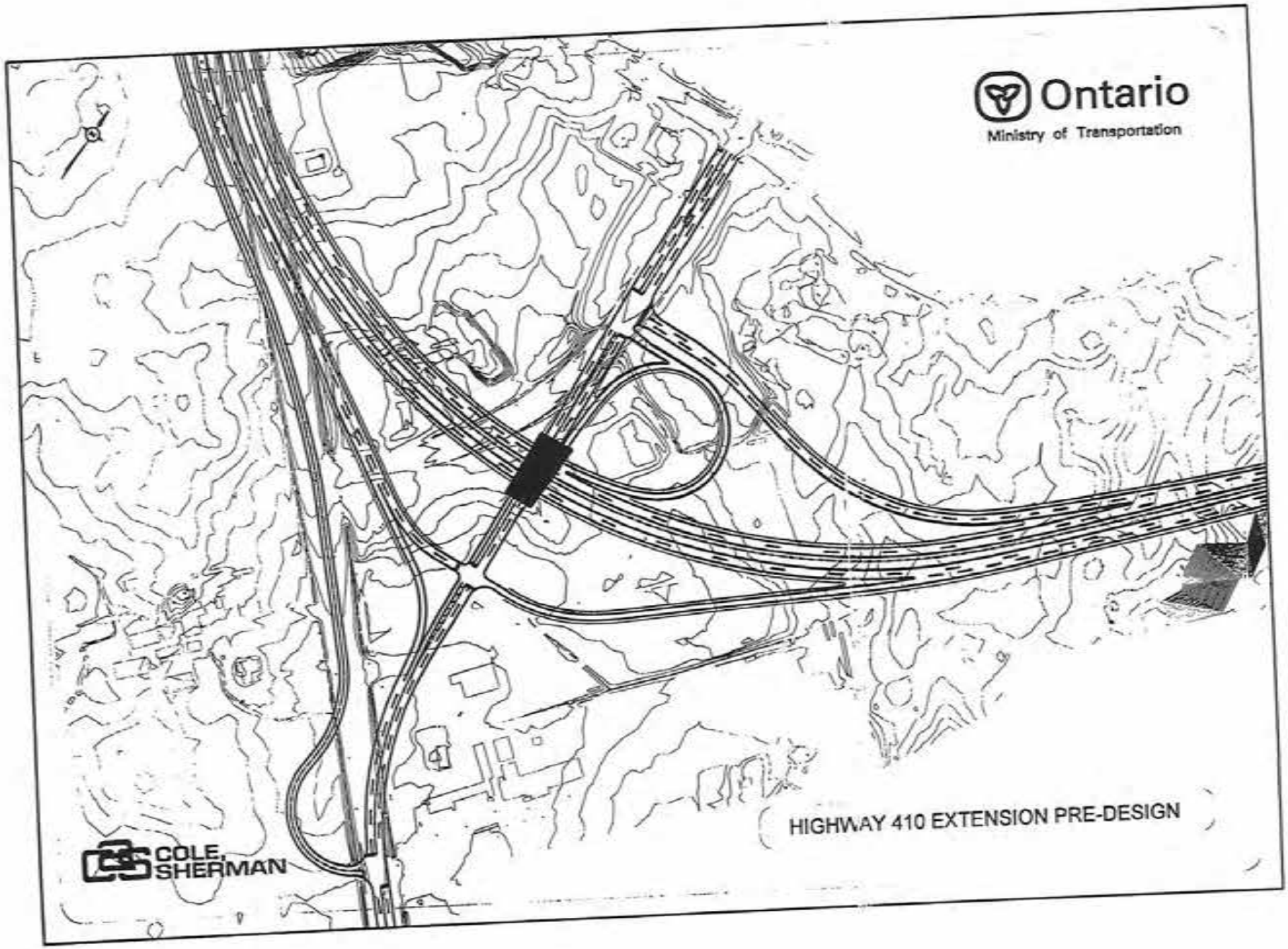
Grahame Birch will discuss the project with the Mayor in the near future (upon receipt of the revised plans for the Highway 410/Main interchange). Brampton

The Region of Peel Council has endorsed the project conditional on agreement from Caledon and Brampton.

Meeting Adjourned at 3:00 p.m.

Submitted By:

Paul Hudspith, P.Eng.


Ontario
Ministry of Transportation
HIGHWAY 410 EXTENSION PRE-DESIGN
COLE, SHERMAN

COLE, SHERMAN

CONSULTING ENGINEERS

MINUTES OF MEETING

DATE:	April 29th, 1999	1:30 p.m.
PROJECT:	Highway 410 Pre-Design Study – Bovaird Drive to Highway 10 W.P. 22-79-00	
LOCATION:	The Regional Municipality of Peel 10 Peel Centre Drive, Brampton The Caledon Room (1st Floor)	
OUR REF.:	98224	

PRESENT:

Dean Kemper	-	MTO Project Manager
Rick Kester	-	City of Brampton
Brad Hale	-	City of Brampton
Bill Winterhalt	-	City of Brampton
Grahame Birch	-	City of Brampton
Richard Vandezande	-	Town of Caledon
Craig Campbell	-	Town of Caledon
Jim Carrick	-	Region of Peel
Peter Crockett	-	Region of Peel
Doug Billett	-	Region of Peel
Paul Hudspith	-	Cole, Sherman
Mike Bricks	-	Cole, Sherman
Matthew Hum	-	Cole, Sherman

PURPOSE: Municipal Team Meeting

The purpose of this meeting was to present and discuss the Pre-Design Study for Highway 410 Extension and to request Council's endorsement for the project.

ACTION BY

1) **Presentation:**

Paul Hudspith presented overhead slides to the attendees that described the design process, requirements and recommendations. The slides summarized the following items:

- Study Area
- Project Background and History
- Value Engineering Recommendations
- Project Environmental Requirements
- Stormwater Management
- Traffic Review
- Preliminary Highway Design

PLEASE NOTE: If your records of this meeting do not agree with this document, or if there are any omissions, please advise the writer at once, otherwise the contents of this document shall be assumed accurate and correct.

COLE, SHERMAN & ASSOCIATES LTD.
75 Commerce Valley Drive East, Thornhill, Ontario L3T 7N9 ▲ Tel: (905) 882-4401 ▲ Fax: (905) 882-4399
e-mail: csa@wcc.com
Internet: www.colesherman.com

2) **Discussions:**

City of Brampton attendees expressed concerns with the geometric design and traffic operations of the N-N/S ramp at the Valleywood Boulevard interchange. It was agreed that Cole, Sherman will review the design of this interchange and provide recommendations in an attempt to improve the southbound traffic flow on Highway 10 through Valleywood Boulevard. Cole, Sherman will send the results of this review to Brampton on Tuesday, May 4th, 1999. CSA

The attendees discussed the N-N/S ramp at the Sandalwood Parkway interchange and in particular the idea of connecting this ramp to Sandalwood. It was agreed that this ramp, as shown in the EA (connected to Heart Lake Road), provides for the best overall traffic operations and future flexibility.

The municipalities noted that Sandalwood Parkway, Countryside Drive, Heart Lake Road and Kennedy Road may be widened in the future. It was agreed that this future expansion could be accommodated within the design of the structures over Highway 410, however; additional bridge works would be at the municipalities' expense. It was noted that the structure over Mayfield Road will accommodate four lanes.

3) **What's Next:**

Cole, Sherman agreed to provide a roll plan of the technically preferred design for the Highway 410 Extension (Scale 1:2000) to the City of Brampton, Town of Caledon and Region of Peel for their records. CSA

The staff from the three municipalities agreed to present this project to their respective councils and request endorsement for the undertaking as described in the presentation package and the roll plan. The only outstanding issue is the possible refinement of the southbound Highway 10 move through the Valleywood interchange. This issue will be resolved by mid next week, clearing the way for a Brampton and Peel council endorsement. The Caledon endorsement is expected in the near future.

It was noted that the PIC will be held in June of 1999 and the ESR will be filed in the summer of 1999. This will allow for the commencement of property acquisition in late summer of this year.

Meeting Adjourned at 3:00 p.m.

Submitted By: Matthew Hum, P.Eng.

Ontario

Ministry of Transportation

Highway 410 Extension: Pre-Design Study

Bovaird Drive to Highway 10 (W.P. 22-79-00)

Municipal Team Meeting

Region of Peel

April 29, 1999

COLE, SHERMAN

Ontario
Ministry of Transportation

COLE, SHERMAN

HIGHWAY 410 EXTENSION PRE-DESIGN

Purpose of the Study

- **To accommodate minor changes to the highway design shown in the approved Environmental Assessment Report (August 1995)**
- **To seek EA approval for those changes - File an Environmental Study Report**

COLE, SHERMAN

Background and History

- EA started in mid 1980's and delayed
- EA picked up in early 1990's and Filed in August of 1995
- EA approved by MOE on March 5, 1997
- Value Engineering (VE) study in July of 1998
  - Analyze functional requirements of the highway
  - Cost-effective refinements and improvements
- Current study commenced November of 1998

COLE, SHERMAN

Stormwater Management

- **Pond sizes and locations adjusted to accept increased runoff from closed median**
- **Ongoing consultation with TRCA *re:* Etobicoke Creek Bridge span and upstream flood lines**
- **All stormwater runoff anticipated to be treated within the highway R.O.W.**

COLE, SHERMAN

Traffic Review

- **Traffic review based on most recent Regional EMME/2 model - 2011 AM Peak Hour**
  - **Ultimate Stage: 6 lanes Bovaird to Mayfield - 4 lanes Mayfield to Highway 10**
- **Confirmed interchange locations and configurations**
- **Analysis for signal warrants, operations and level of service - facility operates well**

COLE, SHERMAN

Preliminary Highway Design

- **Proceeding with preliminary design of mainline highway (plan, profile, sections), ramps, structures, illumination, etc.**
- **Issue Property Request - commence property acquisition**
- **Complete Pre-Design Report**

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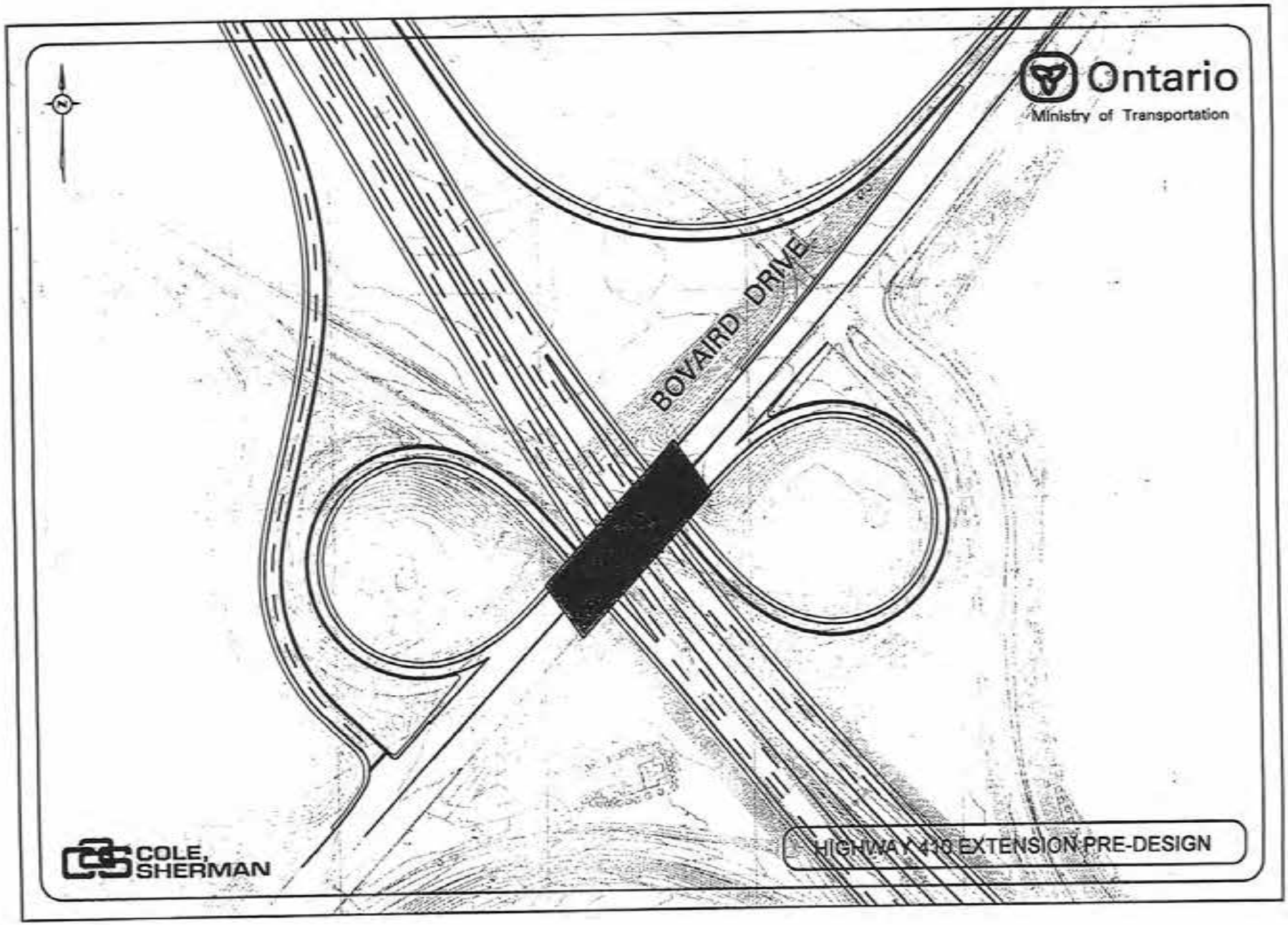
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BOVAIRD DRIVE
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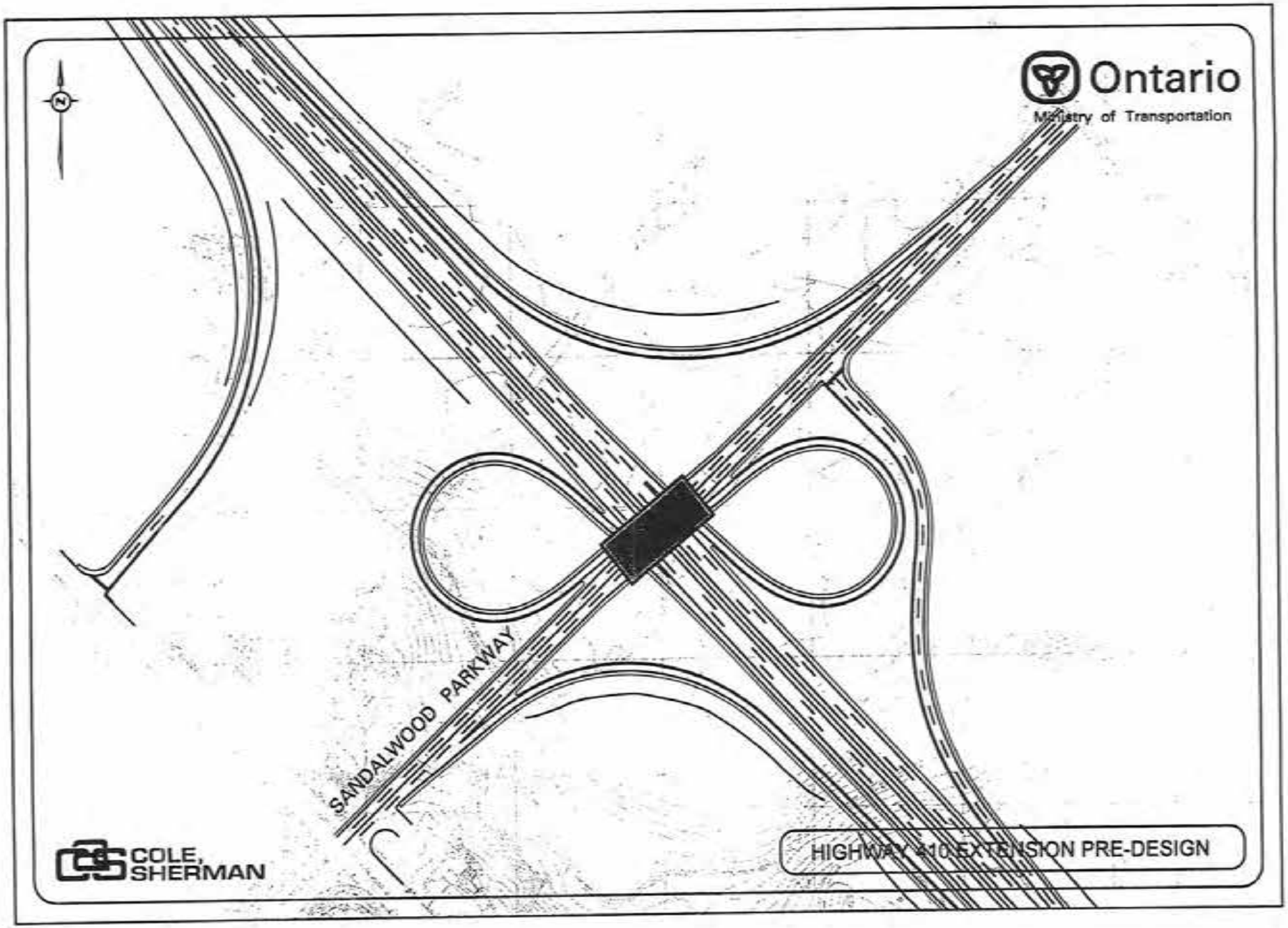
HIGHWAY 410 EXTENSION PRE-DESIGN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COUNTRYSIDE DRIVE
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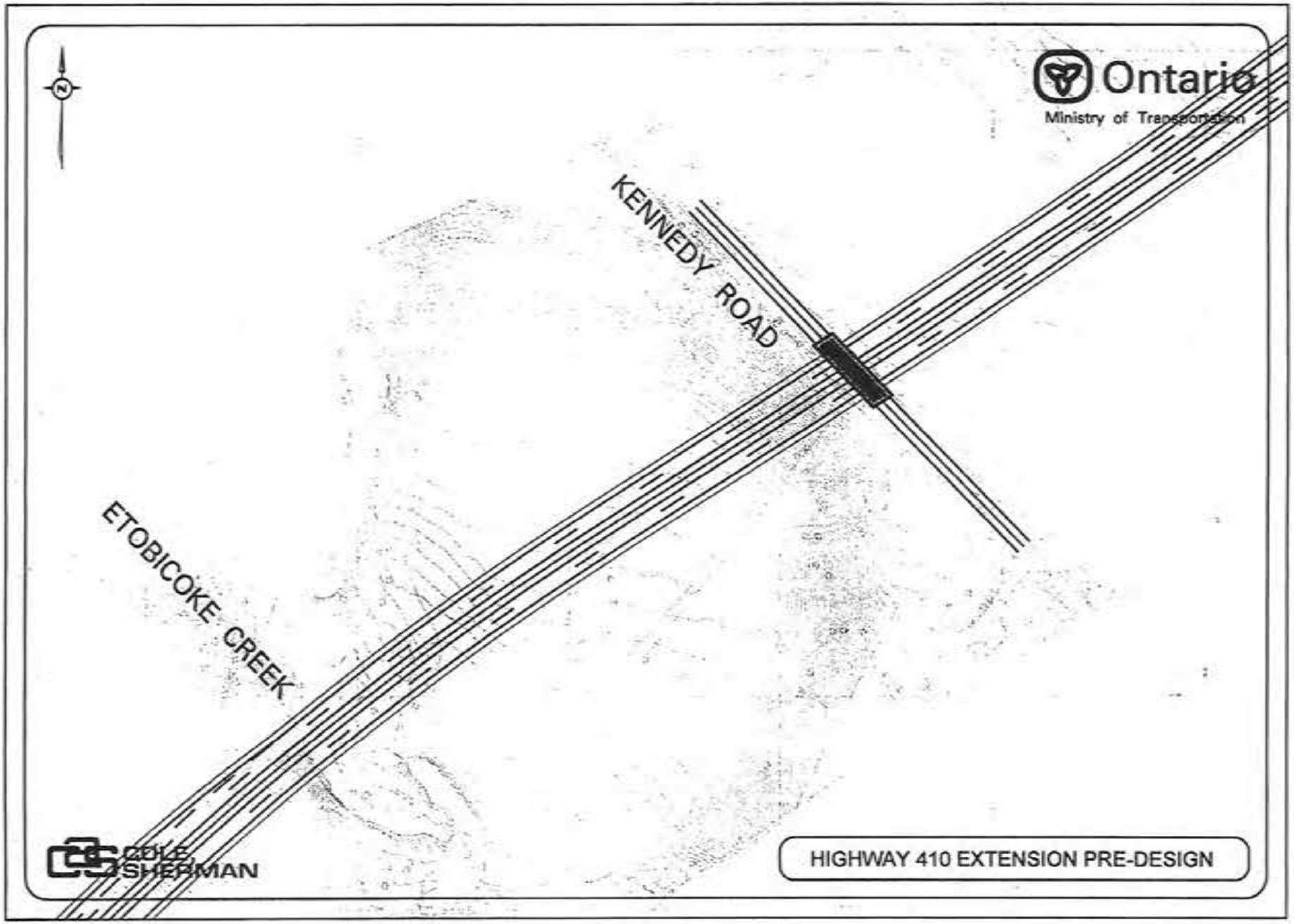
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KENNEDY ROAD
ETOBICOKE CREEK
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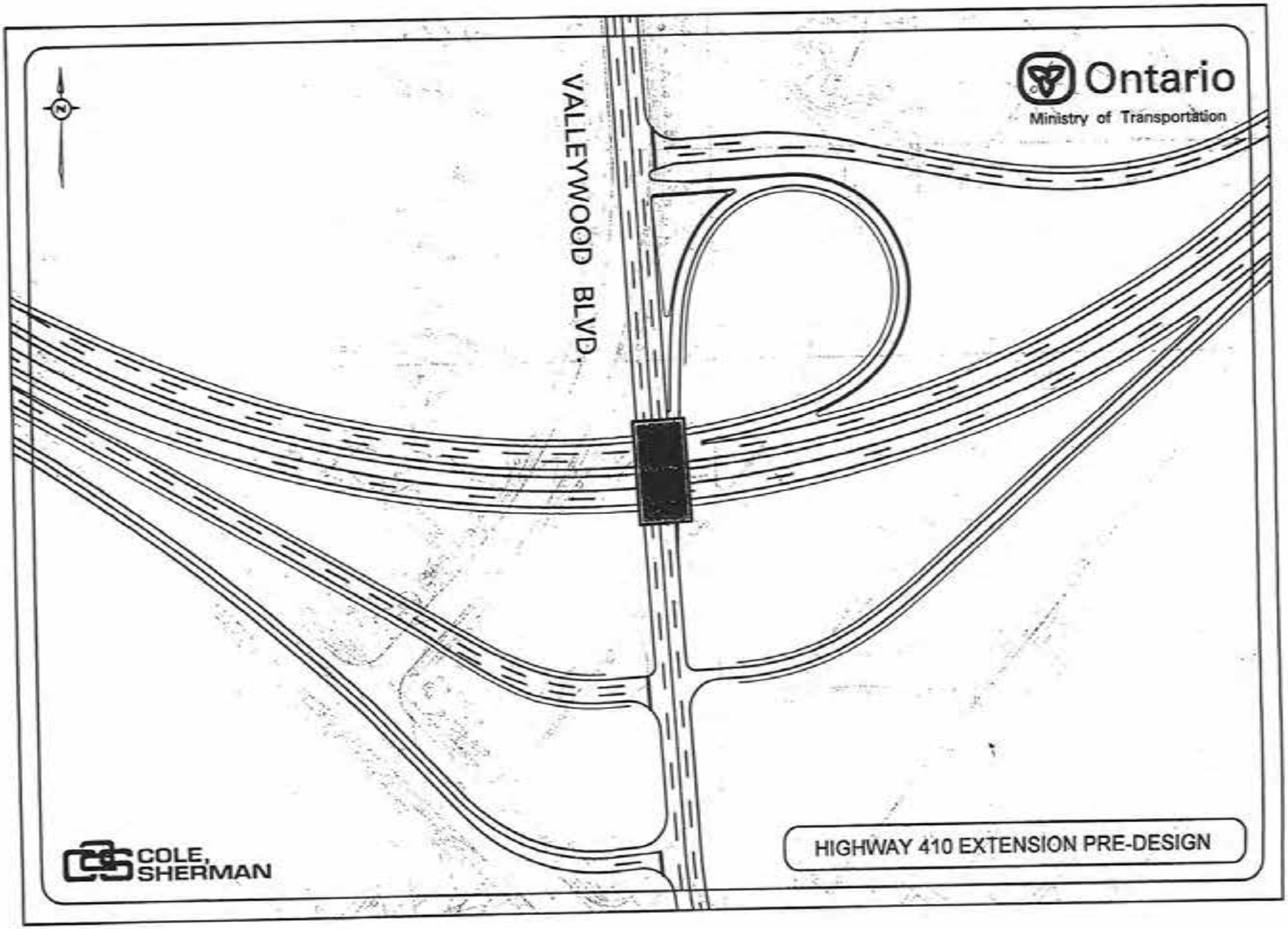
HIGHWAY 410 EXTENSION PRE-DESIGN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VALLEYWOOD BLVD.
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HIGHWAY 410 EXTENSION PRE-DESIGN

What's Next

- Council endorsement for project
- Proceed to Public Information Centre in spring 1999
- File ESR in spring 1999
- Pre-Design Report in fall 1999
- Commence Property Acquisition
- Commence Detail Design

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Meeting Summary

Highway 410 Extension, Bovaird to Highway 10
WP 22-79-00

April 26, 1999
9:30 to 11:00 a.m. Atrium Tower, Ministry of Transportation Central Region

Present:

Dean Kemper, MTO
Cindy Mitton-Wilkie, MTO
Don Haley, TRCA
Richard Lloyd, TRCA
Chris Doherty, WRG
Paul Hudspith, Cole Sherman
Dan Remollino, MTO
George Ivanoff, MTO
Nich Garland, MTO
Chris Tschirhart, MNR
Dale Leadbeater, Gartner Lee
Deborah Martin-Downs, Gartner Lee

Agenda Item	Action
1. Review of Minutes from Previous External Team Meeting (January 7, 1999) • Sandringham Wellington and Snells Hollow Plans have been obtained. GLL has reviewed the Sandringham proposals with TRCA staff who confirmed that the existing drainage pattern is to be altered to accommodate the new development. • TRCA confirmed criteria for the stormwater design - no quantity controls required, Level 2 quality control for first 25 mm, no additional requirement for erosion control to Etobicoke Creek. • GLL has made initial contact with Naylor but have not completed assessment of their works as they impact on the valley. • BMP options still being assessed. • Geotechnical work at Mayfield Road has now been completed and it appears that the new alignment proposed here virtually eliminates the impact on the peat soils. TRCA and MNR still interested in the results. Questioned whether piezometers were installed and what the readings indicated. • Archaeology requirements must be confirmed with TRCA prior to property transfer at detail design stage.	• GLL to continue to liaise with Naylor. • CSA send geotechnical report to TRCA and MNR, address groundwater conditions.
2. Etobicoke Creek Crossing • Cole Sherman provided a table, plan view and cross-sections of four alternatives evaluated for the bridge crossing. • Three of the alternatives are simple span and range from 35 to 50 m in	

Agenda Item	Action
geomorphology requirements. Suggested 42 m originally discussed. Need to review the opening for hydraulic capacity first then address remaining issues of trails, meander belt and wildlife passage. MNR felt that 35 m was sufficient width for wildlife in an urban setting but with urban influences in the valley this may require review. • Naylor and Associates is doing the pathway design for the Town of Caledon	• GLL to contact Naylor to discuss path plans
• TRCA would like an assessment of the river stability to ensure that there is sufficient room for the channel to meander. • MNR indicated that Fisheries Act approval would not be required if piers are not in the water. There could be some issues with reduction of the riparian zone but that will need to be assessed when the bridge opening is determined. Bridge height is likely in the order of 6 m. MTO would like a decision on the Fisheries Act implications as no formal signoff is on the file from the EA.	
• The ability to infiltrate road drainage was discussed. Soils will be assessed for this potential. The full range of BMP options should be addressed. • Loss of wetlands was discussed. MNR indicated that during the EA process, as many kettle wetlands were avoided as possible and there was no further accommodation that could be made. MNR has signed off on the treatment of these areas and the losses expected. No further action is required.	• CSA evaluate range of BMP options.
• MNR was interested in the soil results at the Mayfield Road wetland and would like to have the impacts of removal and the adjacent drainage systems addressed. • Preliminary design for culverts to convey drainage not an issue for MNR. Other crossings are not of major interest to MNR.	• GLL/CSA to address soils at Mayfield Road wetland
• TRCA inquired as to the status of archaeological investigations. They require one to transfer lands to MTO. CSA should contact Bob Burger at TRCA	• CSA to Contact Bob Burger at TRCA.
5. Other Items • Questions were raised as to the public process. MTO is holding 1 PIC to bring everyone up to date. Letters to the property owners have gone out. Government notices of the project will be published and letters to PIC attendees will be sent.	

Notes Prepared By: *Deborah Martin-Downs, Gartner Lee Limited*
Please forward any errors or omissions to her ASAP at Fax (905) 477-1456, Phone (905) 477-8400 ext. 225.

COLE, SHERMAN

CONSULTING ENGINEERS

MINUTES OF TELEPHONE CONVERSATION

DATE:	December 4, 1998	**OUR REF.:**	98224
PROJECT:	Highway 410 Pre-Design		
PARTICIPANTS:	Chris Tschirhart – MNR Mike Bricks – CSA		

Chris Tschirhart called to inquire about the scope of work. It was noted that, for the most part, the changes proposed are within the EA approved right-of-way.

Chris noted that if this was the case, MNR has no concerns and does not require to be involved. Mike noted that although there may not be any MNR concerns, MTO wishes to keep MNR informed and obtain a formal "sign-off".

An initial meeting will be arranged in early January 1999 to discuss the project jointly with MNR and TRCA. Chris noted that he would attend with an MNR biologist to review the project and determine future MNR involvement.

Chris further noted MNR's concerns in the EA related to adequate clearance for wildlife movement under the Etobicoke Creek Structure and potential impacts to Kettle Wetlands.

Submitted by:

Mike Bricks
Senior Environmental Planner

cc:
- C. Tschirhart - MNR
- D. Kemper - MTO
- G. Ivanoff - MTO
- P. Hudspith - CSA
- D. Martin-Downs - Gartner Lee

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