



CONSULTING ENGINEERS  
& SCIENTISTS

# FINAL REPORT

## FLAMBOROUGH QUARRY HAUL ROUTE STUDY AIR QUALITY AND HEALTH IMPACTS REPORT

Project Number: #W08-5107A

September 29, 2008

**SUBMITTED TO:** Tara Erwin  
iTRANS Consulting Inc  
100 York Boulevard  
Richmond Hill, Ontario  
L4B 1J8

**SUBMITTED BY:** RWDI AIR Inc.  
Consulting Engineers & Scientists  
650 Woodlawn Road West  
Guelph, Ontario N1K 1B8

P: (519) 823-1311  
F: (519) 823-1316

**Project Scientist:** Terri-Lyn Pearson, B.Sc. (Agr.)  
**Senior Specialist:** Ron Haley, M.Sc., M.B.A, QP<sub>RA</sub>  
**Project Manager:** Nigel Taylor, M.Sc., CCEP  
**Project Director:** R. L. Scott Penton, P.Eng.

**Companion studies:** Air Quality Existing Conditions Report For Flamborough  
Quarry Haul Route Study

## TABLE OF CONTENTS

|     |   |    |
|-----|---|----|
| 1.  | INTRODUCTION .....                                      | 1  |
| 2.  | DESCRIPTION OF THE CONSULTANT TEAM.....                 | 1  |
| 3.  | DESCRIPTION OF ALTERNATIVE HAUL ROUTES .....            | 3  |
| 3.1 | Roadway Cross-Sections .....                            | 7  |
| 4.  | DESCRIPTION OF THE ENVIRONMENT .....                    | 8  |
| 4.1 | Methodology.....  | 8  |
| 4.2 | Results and Conclusions for Background Air Quality..... | 10 |
| 5.  | ANALYSIS CRITERIA AND INDICATORS .....                  | 11 |
| 6.  | ANALYSIS.....   | 13 |
| 6.1 | Data Sources .....                                      | 13 |
| 6.2 | Assumptions.....  | 13 |
| 6.3 | Methodology.....  | 14 |
| 6.4 | Results.....  | 14 |
| 7.  | RECOMMENDATIONS.....                                    | 14 |
| 8.  | REFERENCES .....  | 15 |

## LIST OF TABLES

|          |   |
|----------|---|
| TABLE 1: | Representative Rural 50 <sup>th</sup> Percentile Volatile Organic Compound Concentrations and AAQC Values |
| TABLE 2: | Summary of AAQC Exceedances of Representative Ambient Pollution Concentration                             |
| TABLE 3: | 2006 AQI Summary Readings for Selected Areas  |
| TABLE 4: | Qualitative Rating System   |
| TABLE 5: | Number of Receptors Based on Distance from Roadway for Each Haul Route Alternative                        |
| TABLE 6: | Quantitative Ranking Calculations for Haul Routes   |
| TABLE 7: | Ranking of Alternatives   |

## LIST OF FIGURES

|           |   |
|-----------|---|
| FIGURE 1: | Location of the Proposed St. Mary's Flamborough Quarry and Proposed Haul Routes |
| FIGURE 2: | Ministry of the Environment Monitoring Station Locations                        |

## LIST OF APPENDICES

|             |                                  |
|-------------|----------------------------------|
| APPENDIX A: | CART Comments and RWDI Responses |
| APPENDIX B: | Roadway Cross-sections           |

## 1. INTRODUCTION

St. Marys Cement (Canada) Inc. has proposed to develop a Dolostone Quarry on Part of Lots 1, 2 and 3, Concession 11, Geographic Township of East Flamborough, in the City of Hamilton. The property is located on the north side of 11th Concession, just west of Milborough Line (see Figure 1).

In April 2006 Dillon Consulting Limited prepared Terms of Reference for the Quarry Haul Route Evaluation on behalf of the City of Hamilton. Components of the Terms of Reference require that Alternative Haul Routes are identified, the existing baseline conditions of each alternative route are described, and a comparative analysis and evaluation is carried out. iTRANS Consulting Inc. has identified five Alternative Haul Routes that are described and analyzed in the following report in the context of Air Quality and Health Impact Assessment.

RWDI AIR Inc. (RWDI) was retained by St. Marys Cement and iTRANS Consulting Inc. to evaluate the baseline ambient air quality conditions and prioritizes the five different haul routes alternatives for the proposed quarry based on potential air quality impacts and human exposure to vehicle exhaust. This report documents the consultant team, describes the environment, defines the analysis criteria and indicators, reports the analysis and results, and offers recommendations and mitigating measures.

## 2. DESCRIPTION OF THE CONSULTANT TEAM

RWDI is a leading consultant for assessing air quality and noise impacts on highway improvement and other major roadway enhancement projects across the province. The company is known for providing superior technical expertise and professionalism. For this assignment, an experienced team of air quality and health risk specialists undertook the Air Quality and Health Impact assessment and evaluation of route alternatives, as summarized below:

- **Scott Penton, Project Director** – Scott joined RWDI in 1996 and became a Project Director of the firm in 2005. Scott has an undergraduate degree in Systems Design Engineering from the University of Waterloo, and has published several papers on environmental noise impact assessments. Scott is the head of the Environmental noise

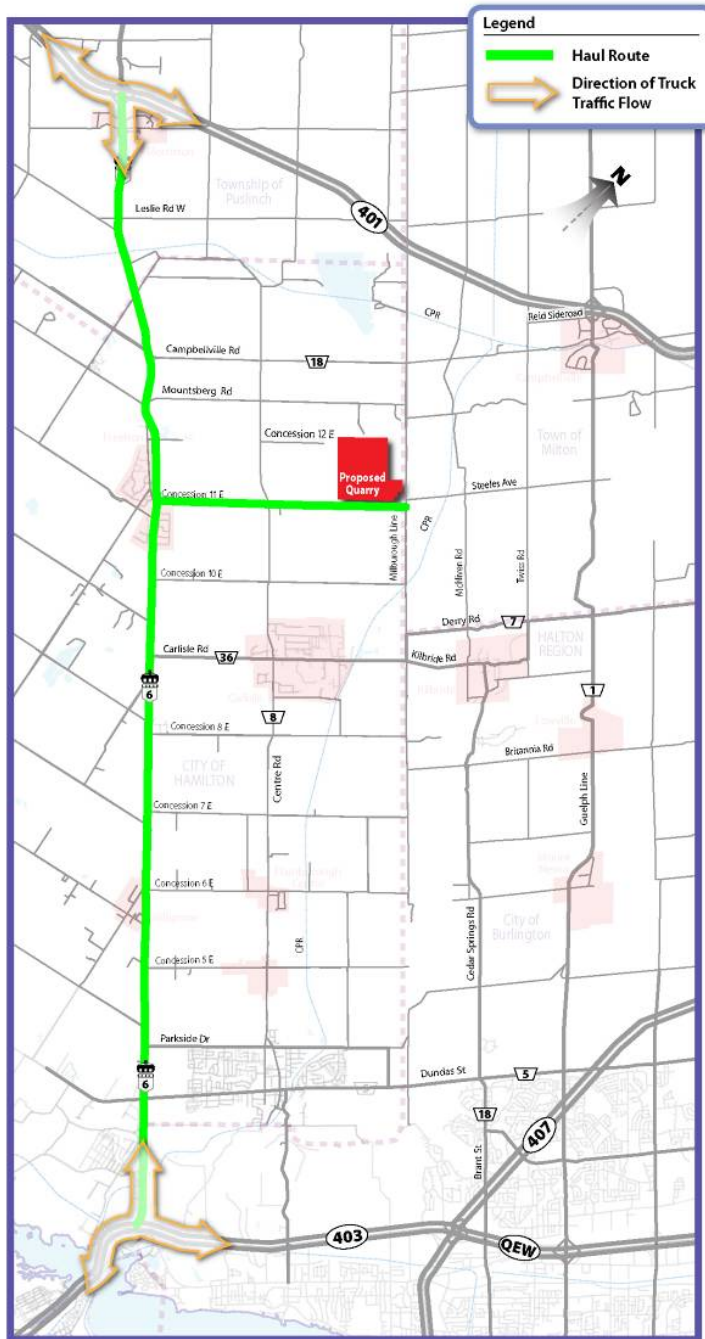
and vibration group at RWDI, overseeing a team of 10 people located in Guelph, Calgary and Vancouver. During his time at RWDI, Scott has worked on hundreds of environmental noise impact assessments, covering everything from new subdivisions to major power plants, for projects in Canada and around the world, and provided expert witness testimony. As a Project Director, Scott is responsible for providing overall direction and leadership on noise and vibration projects, ensuring that a high level of service is provided. Scott supervised all technical aspects of the study and was responsible for ensuring that all work conformed to RWDI's standards for quality assurance.

- **Nigel Taylor, Project Manager** - Nigel Taylor joined RWDI in 2004, as a Project Manager and Specialist. He came to us with ten years of experience in the energy sector, and has been responsible for providing managerial and technical support for over 100 assessment projects providing air quality, acoustic, and environmental risk services. Nigel provided technical direction and was responsible for the day-to-day communication with the Flamborough Quarry Haul Route Study Project Team.
- **Ron Haley, Senior Risk Assessment Specialist** - Ron brings over 18 years of consulting experience in human toxicology, risk assessment, risk-based decision-making and risk communication. Ron provides senior technical support and direction on air quality issues requiring toxicology, risk assessment, and regulatory criteria assessment support and has participated in a number of air quality projects for transportation studies. Ron conducted the health assessment work for the study.
- **Terri-Lyn Pearson, Project Coordinator** – Terri-Lyn Pearson joined RWDI in 2004. She has experience in data collection and analysis, emission inventories, and numerical modelling. Terri-Lyn conducted the air quality technical work under the direction of the Project Manager and Project Director.

### 3. DESCRIPTION OF ALTERNATIVE HAUL ROUTES

This section provides a description and figure for each of the preferred five alternative haul routes identified by iTRANS. Potential air quality impacts and potential human exposure to vehicle exhaust associated with each of these haul routes was evaluated.

#### Alternative Haul Route 1:



In the case of Alternative Haul Route 1, truck traffic destined for Highway 401 east would travel west on Concession 11 E, and then north on Highway 6 to the Highway 401 eastbound on-ramp.

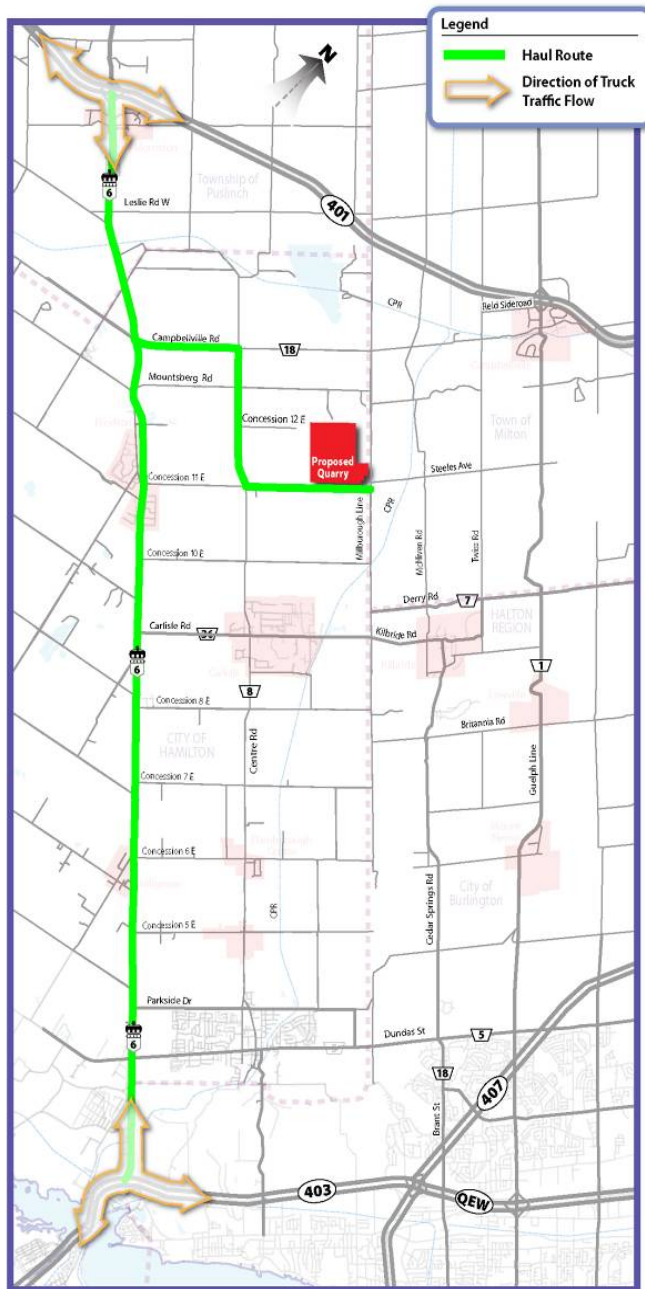
Truck traffic destined for Highway 401 west would travel west on Concession 11 E, and then north on Highway 6 to the Highway 401 westbound on-ramp.

Truck traffic destined for Highway 403 east would travel west on Concession 11 E, and then south on Highway 6 to the Highway 403/QEW eastbound on-ramp.

Finally, truck traffic destined for Highway 403 west would travel west on Concession 11 E, and then south on Highway 6 to the Highway 403/QEW westbound on-ramp.

Alternative Haul Route 1

## Alternative Haul Route 2:



In the case of Alternative Haul Route 2 truck traffic destined for Highway 401 east would travel west on Concession 11 E, then north on Centre Road, west on Campbellville, and north on Highway 6 to the Highway 401 eastbound on-ramp.

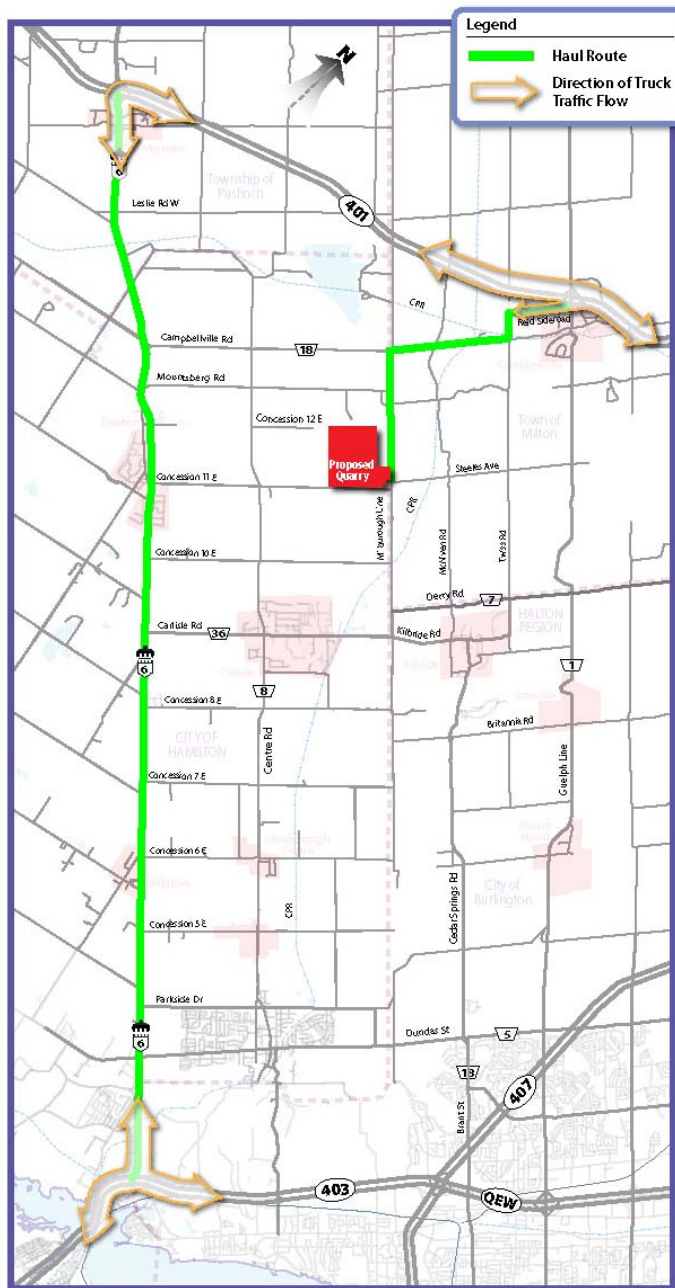
Truck traffic destined for Highway 401 west would travel west on Concession 11 E, then north on Centre Road, west on Campbellville, and north on Highway 6 to the Highway 401 westbound on-ramp.

Truck traffic destined for Highway 403 east would travel west on Concession 11 E, then north on Centre Road, west on Campbellville, and south on Highway 6 to the Highway 403/QEW eastbound on-ramp.

Finally, truck traffic destined for Highway 403 west would travel west on Concession 11 E, north on Centre Road, west on Campbellville, and south on Highway 6 to the Highway 403 /QEW westbound on-ramp.

**Alternative Haul Route 2**

### Alternative Haul Route 3:



In the case of Alternative Haul Route 3, truck traffic destined for Highway 401 east would travel north on Milburgh Line, then east on Campbellville Road, north on Twiss Road, and east on Reid Sideroad to the Highway 401 eastbound on-ramp.

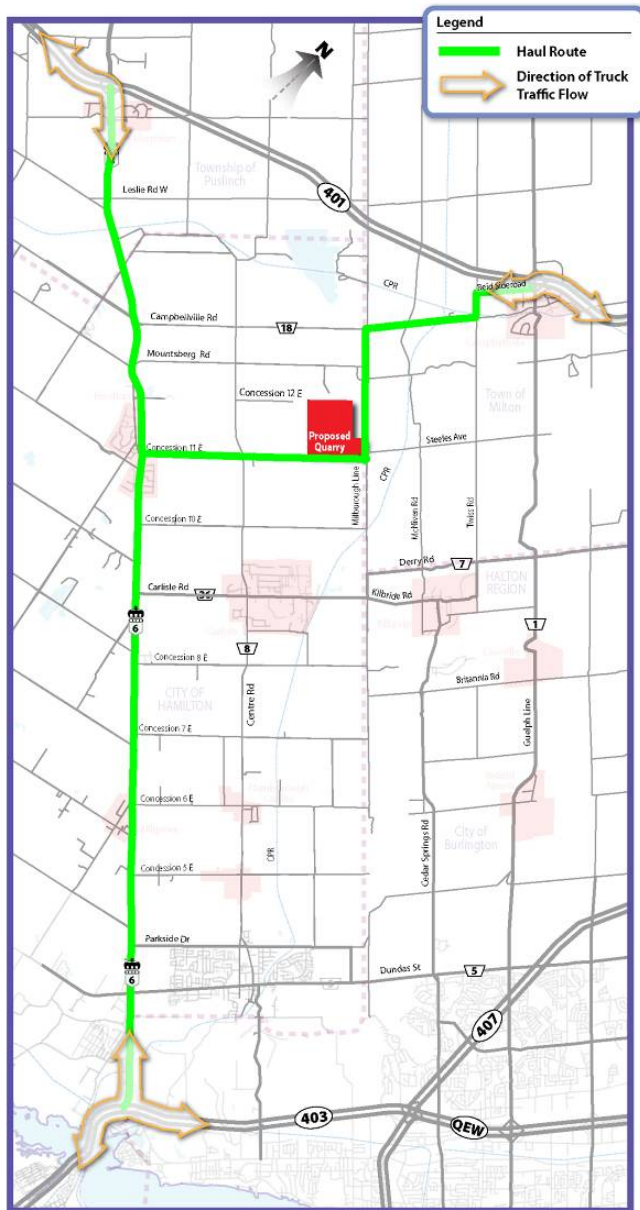
Truck traffic destined for Highway 401 west would travel north on Milburgh Line, then east on Campbellville Road, north on Twiss Road, east on Reid Sideroad and north on Guelph Line to the Highway 401 westbound on-ramp

Truck traffic destined for Highway 403/QEW east would travel north on Milburgh Line, then east on Campbellville Road, north on Twiss Road, and east on Reid Sideroad to the Highway 401 eastbound on-ramp. From here, there are several alternatives to reach the destination including taking the 407 ETR south to Highway 403.

Finally, truck traffic destined for Highway 403 west would travel north on Milburgh Line, east on Campbellville Road, north on Twiss Road, and east on Reid Sideroad to the Highway 401. From here, there are several alternatives to reach the destination including taking the 407 ETR southwest or Highway 6 south to the 403/QEW.

**Alternative Haul Route 3**

### Alternative Haul Route 4:



In the case of Alternative Haul Route 4, truck traffic destined for Highway 401 east would travel north on Milborough Line, then east on Campbellville Road, north on Twiss Road, and east on Reid Sideroad to the Highway 401 eastbound on-ramp.

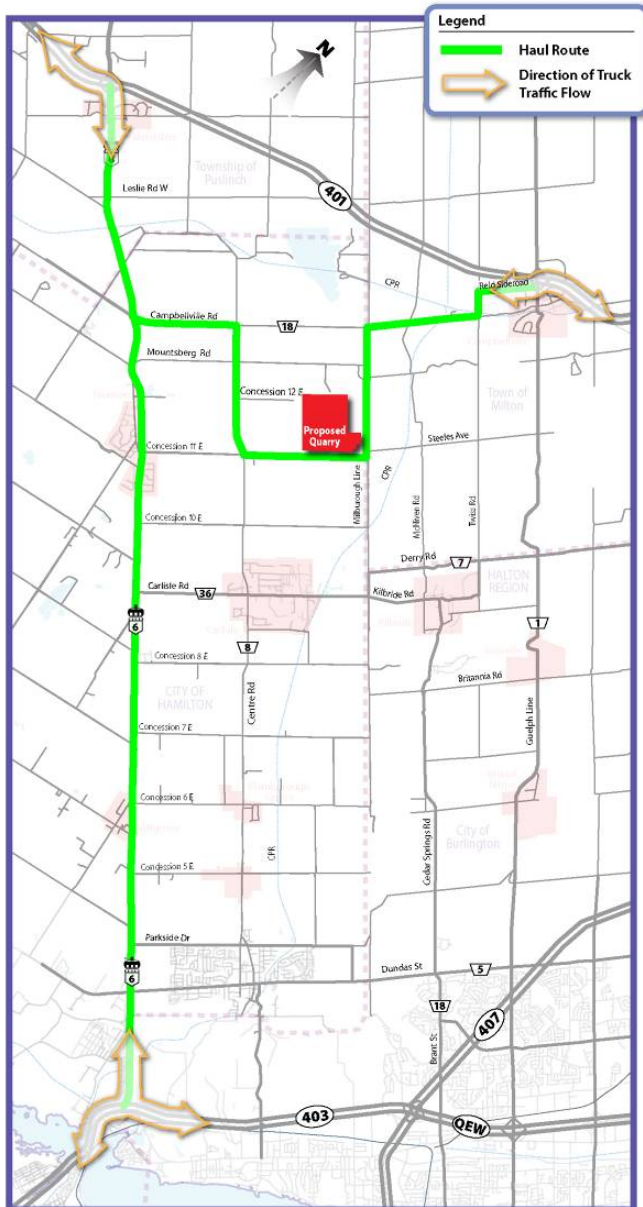
Truck traffic destined for Highway 401 west would travel west on Concession 11 E, and then north on Highway 6 to the Highway 401 westbound on-ramp.

Truck traffic destined for Highway 403 east would travel west on Concession 11 E, and then south on Highway 6 to the Highway 403 eastbound on-ramp.

Finally, truck traffic destined for Highway 403 west would travel west on Concession 11 E, and then south on Highway 6 to the Highway 403 westbound on-ramp.

**Alternative Haul Route 4**

## Alternative Haul Route 5:



In the case of Alternative Haul Route 5, truck traffic destined for Highway 401 east would travel north on Milborough Line, then east on Campbellville Road, north on Twiss Road, and east on Reid Sideroad to the Highway 401 eastbound on-ramp.

Truck traffic destined for Highway 401 west would travel west on Concession 11 E, then north on Centre Road, then west on Campbellville, and then north on Highway 6 to the Highway 401 westbound on-ramp.

Truck traffic destined for Highway 403 east would travel west on Concession 11 E, then north on Centre Road, west on Campbellville, and south on Highway 6 to the Highway 403/QEW eastbound on-ramp.

Finally, truck traffic destined for Highway 403 west would travel west on Concession 11 E, then north on Centre Road, west on Campbellville, and south on Highway 6 to the Highway 403 /QEW westbound on-ramp.

**Alternative Haul Route 5**

### 3.1 Roadway Cross-Sections

For many haul route links, the roadways will require upgrades. For this study two types of cross-sections are proposed: rural (requires property acquisition) and urban (within the existing right-of-way). The final haul route roadway design may be all rural cross-sections, all

urban, or some combination. Haul route cross-sections are discussed in **Appendix B**. As the roadway will generally be centered in the right-of-way regardless of the cross-section design, the potential air quality impacts will not be affected by whatever cross-section design(s) are selected. Cross-sections are not considered further in this analysis.

## **4. DESCRIPTION OF THE ENVIRONMENT**

This section summarizes the findings of the baseline air quality assessment and provides an overview of existing air quality within the study area.

### **4.1 Methodology**

There was no ambient air monitoring data for the Study Area that could be used to evaluate ambient air quality. For this reason, it was necessary to use data from ambient monitoring stations located in areas that are considered to provide air quality data representative of the Study Area. The Ontario Ministry of Environment (MOE) maintains a network of ambient air quality monitoring stations that provide ambient air pollutant concentration data across the province (Figure 2). These stations are located such that they provide ‘representative’ or ‘background’ data on ambient air quality.

MOE monitoring stations representative of the Study Area were selected based on their proximity to roads having traffic volumes similar to the road segments that comprise the 5 haul routes alternatives. This was accomplished by comparing Ontario Ministry of Transportation (MTO) traffic volumes for roadways and intersections near MOE monitoring stations with traffic volume data for the alternative haul routes. Additionally, stations were also selected based on surround land use and intensification that are similar to that within the Study Area. Using this approach, data from the following monitoring stations were found to be located in areas with similar traffic patterns and land use intensification to that of the Study Area:

- Simcoe (Hwy 3 and Blue Line Road),
- Dorset (Hwy 117 and Paint Lake Road),
- Grand Bend (Hwy 21 and County Road 83), and
- Stouffville (Hwy 47/East of Hwy 48).

For each station, concentration data for carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), respirable particulate matter (PM<sub>2.5</sub>), sulphur dioxide (SO<sub>2</sub>) and ozone (O<sub>3</sub>) were tabulated. For volatile organic compounds (VOCs) data from the Mount Brydges (Longwoods Conservation Area) ambient monitoring station was used because it is representative of a rural setting and is close to the intersection of Highway 401 and Highway 402. The other MOE monitoring stations that measure VOCs are located in large urbanized areas that are not representative of the Study Area. Data for fine particulate matter (PM<sub>10</sub>) were not available from published reports.

Ambient air quality data from these monitoring stations were considered to provide “representative” air quality data because they are located in southern Ontario in rural settings within zones of urban influence and have traffic volumes similar to those of the haul route alternatives. These data were then used for the air quality impact assessment.

To evaluate air quality, the concentrations for each pollutant were compared with the applicable Ambient Air Quality Criteria (AAQC). The AAQCs represent human health or environmental effects-based values, and are normally set at a level not expected to cause adverse effects based on continuous exposure (MOE, 2008). They can be used to evaluate general air quality within a community and whether the concentration of a substance in air has the potential to cause an adverse effect.

Potential health impacts associated with existing air quality within the study area were also evaluated based on MOE Air Quality Index (AQI) readings. The AQI is used to relate pollutant concentrations in ambient air with potential to cause adverse human health impacts. Since the AQI is reported for the pollutant that generates the highest AQI reading, it is possible to evaluate air quality associated with this pollutant. The AQI is intended to provide a general indicator of air quality and the potential for adverse health impacts.

The Air Quality Health Index (AQHI), which is similar to the AQI, was not adopted for this study because the AQHI is calculated for multiple air pollutants, including those unrelated to truck emissions (i.e., ozone) rather than a single pollutant. The AQHI provides a better indication of potential health impacts associated with multiple air pollutants, including those not associated with vehicle emissions like ozone. It is not intended to be used to evaluate air quality impacts associated with individual pollutants or those associated primarily with vehicle emissions. This is important in southern Ontario where poor air quality (and elevated AQHI readings) is often the result of elevated ozone and particulate matter levels associated with transboundary air pollution and photochemical smog more so than impacts related to vehicle emissions. This is especially true for rural areas.

Because the objective of this study was to rank the various haul routes based on their potential to cause adverse air quality and health impacts rather than to quantify the nature and extent of impacts associated with each haul route alternative, a detailed health impact analysis was not conducted.

#### **4.2 Results and Conclusions for Background Air Quality**

Table 1 summarizes a variety of Volatile Organic Compound (VOC) concentrations considered as representative existing air quality concentrations within the Study Area. Ambient air concentrations for pollutants associated with vehicle exhaust emissions that are considered to be representative of the Study Area are provided in Table 2. The data were summarized from the MOE (2003) report entitled “Air Quality in Ontario – 2003 Report” and represent air quality conditions measured across the province in 2003. Year 2003 coincides with the most recent annual average daily traffic (AADT) volumes provided by the Ontario Ministry of Transportation (MTO) for King’s Highways, secondary highways and tertiary roads, which are also presented in Table 2.

The 50<sup>th</sup> percentile values are considered representative of typical long-term ambient background conditions and are appropriate for evaluating potential health impacts associated with long-term exposure to substances in air. The 90<sup>th</sup> percentile values are representative of air

quality conditions that exist infrequently and are appropriate for evaluating potential impacts associated with short-term exposure to elevated concentrations such as those which may exist for short periods of time during episodic events associated with regional smog or regional trans-boundary air pollution. The data presented in Tables 1 and 2 indicate that the concentrations for all substances were less than the applicable AAQCs. This indicates that exposure to these concentrations of substances in air is not expected to cause adverse health impacts.

The data presented in Table 3 indicate that based on AQI readings from representative monitoring stations, air quality in the study area may be characterized as good to very good approximately 90 percent of the time. This is consistent with the finding that pollutant levels at the stations were less than the applicable AAQCs, as summarized above. On days during which air quality was considered moderate or poor, the MOE monitoring data indicated that the elevated AQI readings were due primarily to elevated levels of ozone, and to a lesser extent PM<sub>2.5</sub>. Elevated levels of these substances are often associated with regional photochemical smog events and trans-boundary pollution (MOE, 2005).

Data from MOE monitoring stations considered to be representative of air quality within the Study Area indicate that air quality within the Study Area is expected to be good. This is based on the fact that pollutant concentrations were all less than the applicable AAQCs and the measured AQI levels were good to very good approximately 90 percent of the time. It is unlikely that any significant changes in overall air quality within the Study Area will result from selecting one haul route over another.

In order to prioritize the haul route alternatives based on air quality and potential human health impacts, it was necessary to adopt different analysis criteria and indicators and compare results. The approach used for this analysis and results are described in the following section.

## **5. ANALYSIS CRITERIA AND INDICATORS**

This section describes the analysis criteria and indicators that were used to evaluate air quality and potential health impacts for determining the preferred haul route. These indicators were adopted in order to evaluate and prioritize the various haul routes based on potential impacts to human health. They are not intended to represent a quantitative measure of impact

per se, but rather to identify and rank potential health impacts associated with the haul routes alternatives.

### **Number of Receptors:**

The number of receptors that would be affected by air quality impacts as a result of tail pipe emissions was identified as a key indicator of potential health impacts. In general, a haul route with fewer residences, businesses and other receptors has a comparatively lower potential to cause adverse health impacts than other haul routes since it would tend to have fewer individuals potentially exposed to pollutants released from truck exhaust.

### **Proximity of Receptors:**

Residences and other receptors located closer to the haul routes were given a higher weighting factor than receptors located farther away because they are more likely to have higher concentrations of traffic-related pollutants. Residences and other receptors located within 500m of the roadway was used as a cut-off since measurable air quality impacts attributable to the increased truck traffic would not likely be measurable beyond 500 m based on data collected along Highway 402 (MOE, 2005b).

Likewise, receptors located in along road segments with higher predicted percentage increases in traffic volumes and higher speed postings were also given a higher weighting factor to account for potentially higher emission rates. The same is true for homes located along roadways with no paved shoulder, which increases the potential for fugitive dust generation.

### **Receptor Types:**

The type of receptor is also an important consideration when evaluating potential health impacts. Children, the elderly, and individuals with pre-existing medical conditions (e.g., asthma) are more susceptible to air pollutants and poor air quality in general. Therefore, schools, daycares, nursing homes, etc. were given a higher weighting factor compared with other homes

and businesses. Churches were also given a higher weighting factor because they can often be used for community events that involve children and other susceptible individuals.

### **Ranking and Weighting Criteria:**

Table 4 provides a summary of the ranking and weighting criteria used to evaluate air quality and health impacts associated with the various haul route alternatives. Table 4 also provides an explanation on how the ranking and weighting criteria were developed.

## **6. ANALYSIS**

Based on the methodology and ranking criteria and indices, potential air quality impacts and human exposure were evaluated, as described in the following sections.

### **6.1 Data Sources**

Information related to traffic and haul route traffic has been provided by iTRANS. Base maps were provided on a CD by iTRANS. AutoCAD drawings dated December 12, 2007 and jpeg images dated December 6, 2007 were used as a base map.

### **6.2 Assumptions**

The air quality data from the MOE monitoring stations were considered representative of air quality within the Study Area. These data are believed to be representative because the stations were selected based on proximity to roadways with traffic levels similar to what is expected along the various haul route alternatives. However, it is possible that air quality may differ somewhat between the Study Area and that measured at the MOE monitoring stations.

For the health impact study, it was assumed that human exposure potential is an appropriate indicator to evaluate potential health impacts associated with the various alternatives. Specifically, the number, proximity and sensitivity of receptor locations (e.g., daycare or school) along each haul route were used to prioritize the various alternatives with respect to potential

health impacts. This is a reasonable approach for prioritization of haul route alternatives, which is the purpose of this study. However, such an approach can not be used to quantify health risks associated with an individual haul route or receptors.

No segments outside of the study area were accounted for in this analysis. Notably, Highway 401 was not modelled.

### **6.3 Methodology**

For each haul route alternative the number and types of receptors located at varying distance from the roadway were determined from base maps of the study area. The results of this assessment are provided in Table 5. These data were used to calculate the relative ranking scores based on the ranking and weighting criteria as previously discussed and shown in Table 4. Table 6 summarizes the quantitative ranking calculation for the haul route alternatives.

### **6.4 Results**

The results of the haul route alternative ranking based on potential impacts to air quality and human health are given in Tables 6 and 7. The data indicate that Haul Route #3 results in the lowest ranking and, as such, is expected to have least impact on air quality and human health. For this reason, Haul Route 3 was identified as the preferred alternative.

## **7. RECOMMENDATIONS**

The results of the ranking assessment indicate that Haul Route 3 is expected to have the least impact on air quality and human health. Therefore, it is recommended that Haul Route 3 be identified as the preferred alternative. If Haul Route 3 is not adopted, then the following haul routes should be selected in order of preference (i.e., lowest impact) is: Haul Route 4, Haul Route 1, Haul Route 2 and finally Haul Route 5.

Based on the qualitative nature of this assessment, there are no mitigation measures that can be recommended at this time because there are no data to indicate that mitigation is required and if so, to what extent. However, any measures to reduce vehicle emission would be beneficial such as using trucks with properly maintained engines and emission control technologies.

## 8. REFERENCES

CCME (2005). Canadian Council of Ministers of the Environment: Canada-Wide Standards of Particulate Matter and Ozone. Endorsed by CCME Council of Ministers, June 5-6, 2000, Quebec City.

Health Canada. (2004). Federal Contaminated Site Risk Assessment in Canada Part II: Health Canada Toxicological Reference Values (TRVs)

iTRANS Consulting Inc. (2008). St. Marys Cement Base Plan.

MOE (2003). Ontario Ministry of the Environment: Air Quality in Ontario – 2003 Report.

MOE (2005). Ontario Ministry of the Environment: Transboundary Air Quality in Ontario – 2005 Report.

MOE (2005b). Ontario Ministry of the Environment: Air Quality Assessment Related to Traffic Congestion at Sarnia's Blue Water Bridge. December 2005.

MOE (2006). Ontario Ministry of the Environment: Air Quality in Ontario – 2006 Report.

MOE (2008). Ontario Ministry of the Environment: Ontario's Ambient Air Quality Criteria (Sorted by Chemical Name), February 2008.

---

## **TABLES**

---

**Table 1:** Representative Rural 50<sup>th</sup> Percentile Volatile Organic Compound Concentrations and AAQC Values

| Substance     | 50 <sup>th</sup> Percentile (µg/m <sup>3</sup> ) | Current AAQC(µg/m <sup>3</sup> ) |
|---------------|--|----------------------------------|
| Formaldehyde  | N/A  | 65                               |
| 1,3-Butadiene | 0.050  | N/A                              |
| Acetylene     | 0.410  | 56,000                           |
| Benzene       | 0.357  | N/A                              |
| Propane       | 1.484  | N/A                              |

**Notes:** N/A stands for “not available”.

**Table 2:** Summary of AAQC Exceedences of Representative Ambient Pollutant Concentrations

| Substance              | MOE Monitoring Station   | Average Traffic Volume (AADT) | 50 <sup>th</sup> Percentile (µg/m <sup>3</sup> ) | 90 <sup>th</sup> Percentile (µg/m <sup>3</sup> ) | Ambient Air Quality Criteria (AAQC) (µg/m <sup>3</sup> ) |         | 50 <sup>th</sup> Percentile Above/Below AAQC |         | 90 <sup>th</sup> Percentile Above/Below AAQC |         |
|------------------------|--|-------------------------------|--|--|--|---------|--|---------|--|---------|
|                        |  |                               |  |  | 1 hour   | 24 hour | 1 hour                                       | 24 hour | 1 hour                                       | 24 hour |
| CO                     | Ontario Average <sup>[1]</sup>                                 | NA                            | 506  | 906  | 36,200   | N/A     | Below  | N/A     | Below  | N/A     |
| NO <sub>2</sub>        | Hwy 3 and Blue Line Road, Simcoe (# 22071) <sup>[2]</sup>      | 9,950                         | 14   | 34   | 400  | 200     | Below  | Below   | Below  | Below   |
| PM <sub>2.5</sub> TEOM | Hwy 3 and Blue Line Road, Simcoe (# 22071)                     | 9,950                         | 6  | 15   | N/A  | 30      | N/A  | Below   | N/A  | Below   |
|                        | Hwy 117 and Paint Lake Road, Dorset (# 49010) <sup>[2]</sup>   | 1,850                         | 5  | 11   |  |         | N/A  | Below   | N/A  | Below   |
|                        | Hwy 21 and County Road 83, Grand Bend (# 15020) <sup>[2]</sup> | 3,800                         | 7  | 17   |  |         | N/A  | Below   | N/A  | Below   |
| SO <sub>2</sub>        | Ontario Average <sup>[1]</sup>                                 | N/A                           | 3  | 15   | 690  | 275     | Below  | Below   | Below  | Below   |
| O <sub>3</sub>         | Hwy 3 and Blue Line Road, Simcoe (# 22071)                     | 9,950                         | 66   | 114  | 165  | N/A     | Below  | N/A     | Below  | N/A     |
|                        | Hwy 117 and Paint Lake Road, Dorset (# 49010)                  | 1,850                         | 64   | 97   |  |         | Below  | N/A     | Below  | N/A     |
|                        | Hwy 21 and County Road 83, Grand Bend (# 15020)                | 3,800                         | 62   | 95   |  |         | Below  | N/A     | Below  | N/A     |
|                        | Hwy 47/ East of Hwy 48, Stouffville (# 48002)                  | 8,950                         | 60   | 97   |  |         | Below  | N/A     | Below  | N/A     |

**Notes:** [1] Concentrations do not include monitoring stations in the GTA, Hamilton and Windsor areas

[2] INS indicated that there was an insufficient amount of data to calculate a valid annual mean. An adequate annual mean requires at least 75% valid data per quarter.

**Table 3: 2006 AQI Summary Readings for Selected Areas**

| City/Town  | Percentage of Valid Hours in AQI Range |         |          |         |           | Days with at Least 1 Hour > 49 |
|------------|--|---------|----------|---------|-----------|--------------------------------|
|            | Very Good                              | Good    | Moderate | Poor    | Very Poor |                                |
|            | 0 - 15                                 | 16 - 31 | 32 - 49  | 50 - 99 | 100+      |                                |
| Grand Bend | 33.1                                   | 57.3    | 9.2      | 0.4     | 0         | 10                             |
| Dorset     | 34.6                                   | 58.6    | 6.7      | 0       | 0         | 1                              |
| Guelph     | 36.5                                   | 53.6    | 9.7      | 0.2     | 0         | 4                              |
| Burlington | 44.5                                   | 46.1    | 9.1      | 0.3     | 0         | 7                              |

Adapted from Air Quality in Ontario - 2006 Report (MOE, 2006)

**Table 4: Quantitative Ranking System**

| Feature Description   | Weighting Factor | Explanation   |
|---|------------------|---|
| Number of receptors located <500m downwind of roadway with respect to prevailing winds              | 1                | As a worst-case analysis it was assumed that all receptors within 500m from the roadway are potentially impacted. Receptors located downwind may be more susceptible to higher pollutant concentrations.  |
| Number of receptors located <10m from roadway   | 4                | At close distances to the roadway, concentrations of pollutants are much higher. As distance from the roadway increases, concentrations of pollutants decrease (exponential decay).   |
| Number of receptors located between 10 and 20m from roadway   | 2                |   |
| Number of receptors located between 20 and 500m from roadway  | 1                |   |
| Number of receptors where speed limit is >80km/hour   | 2                | Tailpipe emissions increase with increased speed. Receptors located in areas where the speed limit is greater than 80km/hour may have higher pollutant concentrations.  |
| Number of receptors where shoulder is unpaved   | 2                | There is a greater chance for fugitive dust emissions when shoulders are unpaved.   |
| Number of receptors where traffic increase due to hauling increases average traffic counts by >200% | 5                | Doubling traffic volumes doubles the potential concentration of pollutants. These criteria also account for increased emissions due to an increased percentage of heavy truck traffic. <ul style="list-style-type: none"> <li>• &gt; 200% increase is a &gt; 3 x increase in traffic volume</li> <li>• &gt; 100% increase is a &gt; 2 x increase in traffic volume</li> <li>• &gt; 50% increase is a &gt; 1.5 x increase in traffic volume</li> </ul> |
| Number of receptors where traffic increase due to hauling increases average traffic counts by >100% | 3                |   |
| Number of receptors where traffic increase due to hauling increases average traffic counts by >50%  | 1                |   |
| Number of schools, daycares, and senior housings within 500 m of roadway                            | 100              | These receptors may be more sensitive to air quality impacts related to vehicle emissions.  |
| Number of places of worship within 500 m of roadway   | 50               |   |

**Table 5:** Number of Residences Based on Distance from Roadway for Each Haul Route Alternative

| Alternative   | Number of Receptors |                     |                     |                      |                       |                       |                       |                       |
|---------------|---------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|               | <10m from Roadway   | 10-20m from Roadway | 20-50m from Roadway | 50-100m from Roadway | 100-200m from Roadway | 200-300m from Roadway | 300-400m from Roadway | 400-500m from Roadway |
| Alternative 1 | 10                  | 13                  | 221                 | 263                  | 327                   | 212                   | 127                   | 36                    |
| Alternative 2 | 10                  | 12                  | 228                 | 272                  | 335                   | 218                   | 112                   | 19                    |
| Alternative 3 | 0                   | 0                   | 14                  | 18                   | 34                    | 25                    | 34                    | 13                    |
| Alternative 4 | 10                  | 13                  | 235                 | 281                  | 361                   | 237                   | 161                   | 49                    |
| Alternative 5 | 10                  | 12                  | 242                 | 290                  | 369                   | 243                   | 146                   | 32                    |

**Table 6:** Quantitative Ranking Calculations for Alternative Haul Route 1 through 5

| Feature Description  | Weighting Factor | Alternative Haul Route 1 |       | Alternative Haul Route 2 |       | Alternative Haul Route 3 |       | Alternative Haul Route 4 |       | Alternative Haul Route 5 |       |
|--|------------------|--------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|-------|
|  |                  | Number of Receptors      | Score | Number of Receptors      | Score | Number of Receptors      | Score | Number of Receptors      | Score | Number of Receptors      | Score |
| Feature located <500m downwind of roadway with respect to prevailing winds     | 1                | 1209                     | 1209  | 1206                     | 1206  | 138                      | 138   | 1347                     | 1347  | 1344                     | 1344  |
| Located <10m from Roadway  | 4                | 10                       | 40    | 10                       | 40    | 0                        | 0     | 10                       | 40    | 10                       | 40    |
| Located between 10 and 20m from roadway  | 2                | 13                       | 26    | 12                       | 24    | 0                        | 0     | 13                       | 26    | 12                       | 24    |
| Located between 20 and 50m from roadway  | 1                | 221                      | 221   | 228                      | 228   | 14                       | 14    | 235                      | 235   | 242                      | 242   |
| Speed Limit is >80km/hour  | 2                | 962                      | 1924  | 1020                     | 2040  | 5                        | 10    | 967                      | 1934  | 1025                     | 2050  |
| Shoulder is unpaved  | 2                | 0                        | 0     | 0                        | 0     | 0                        | 0     | 0                        | 0     | 0                        | 0     |
| If traffic increase due to hauling increases average traffic counts by >200% * | 5                | 0                        | 0     | 0                        | 0     | 0                        | 0     | 0                        | 0     | 0                        | 0     |

*Cont'd Next Page*

**Table 6: Quantitative Ranking Calculations for Alternative Haul Route 1 through 5**

| Feature Description  | Weighting Factor | Alternative Haul Route 1 |       | Alternative Haul Route 2 |       | Alternative Haul Route 3 |       | Alternative Haul Route 4 |       | Alternative Haul Route 5 |       |
|--|------------------|--------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|-------|--------------------------|-------|
|  |                  | Number of Receptors      | Score | Number of Receptors      | Score | Number of Receptors      | Score | Number of Receptors      | Score | Number of Receptors      | Score |
| If traffic increase due to hauling increases average traffic counts by >100% * | 3                | 131                      | 393   | 45                       | 135   | 58                       | 174   | 189                      | 567   | 103                      | 309   |
| If traffic increase due to hauling increases average traffic counts by >50% *  | 1                | 0                        | 0     | 56                       | 56    | 0                        | 0     | 0                        | 0     | 56                       | 56    |
| Number of schools, daycares, and senior housings                               | 100              | 0                        | 0     | 1                        | 100   | 0                        | 0     | 0                        | 0     | 1                        | 100   |
| Number of places of worship  | 50               | 1                        | 50    | 2                        | 100   | 1                        | 50    | 2                        | 100   | 3                        | 150   |
| <b>TOTAL SCORE</b>   |                  | <b>3863</b>              |       | <b>3929</b>              |       | <b>386</b>               |       | <b>4249</b>              |       | <b>4315</b>              |       |

Notes:

\* Based on existing average daily data volumes (cars and trucks). Compares background traffic versus background plus haul route traffic.

- 200% increase represents increase from 100% background traffic to 300% (> 3 x increase in volume)
- 100% increase represents increase from 100% background traffic to 200% (> 2 x increase in volume)
- 50% increase represents increase from 100% background traffic to 150% (> 1.5 x increase in volume)

Where applicable, counts include receptors within 500 m of either side of roadway link(s)

**Table 7: Ranking of Alternatives**

| Criteria  | Indicators   | Alternative Haul Route 1  | Alternative Haul Route 2  | Alternative Haul Route 3   | Alternative Haul Route 4  | Alternative Haul Route 5  |
|---|--|---|---|--|---|---|
| Air quality impacts on community  | Number of residences and that would experience potential air quality impacts as a result of tail pipe emissions (<500m from roadway).<br><br>[AQ1] | <ul style="list-style-type: none"> <li>• 1209 receptors from 10m to 500m from the edge of the roadway</li> <li>• 834 Receptors less than 200 m from edge of roadway</li> <li>• Quantitative Rating: 3863</li> </ul> | <ul style="list-style-type: none"> <li>• 1206 receptors from 10m to 500m from the edge of the roadway</li> <li>• 857 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 3929</li> </ul> | <ul style="list-style-type: none"> <li>• 138 receptors from 10m to 500m from the edge of the roadway</li> <li>• 66 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 386</li> </ul> | <ul style="list-style-type: none"> <li>• 1347 receptors from 10m to 500m from the edge of the roadway</li> <li>• 900 receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 4249</li> </ul> | <ul style="list-style-type: none"> <li>• 1344 receptors from 10m to 500m from the edge of the roadway</li> <li>• 923 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 4315</li> </ul> |
| <p><u>Note AQ1:</u> Quantitative Air Quality Evaluation score is calculated as follows (used for air quality, dust, and potential human health impacts):</p> <ul style="list-style-type: none"> <li>+ No of receptors within 500 m of roadway x 1</li> <li>+ No of receptors located &lt;10m from Roadway x 4</li> <li>+ No of receptors located between 10 and 20m from roadway x 2</li> <li>+ No of receptors located between 20 and 50m from roadway x 1</li> <li>+ No of receptors where the speed limit is &gt;80km/hour x 2</li> <li>+ No of receptors where the shoulder is unpaved x 2</li> <li>+ No of receptors where traffic increase due to hauling increases average traffic counts by &gt;200% x 5</li> <li>+ No of receptors where traffic increase due to hauling increases average traffic counts by &gt;100% x 3</li> <li>+ No of receptors where traffic increase due to hauling increases average traffic counts by &gt;50% x 1</li> <li>+ No. of Schools, Daycares, and Senior Housings x 100</li> <li>+ No. Places of Worship x 50</li> </ul> <hr/> <p style="text-align: center;">Evaluation Score</p> <p style="text-align: center;">For Alternative 3, does not include 60 truck movements per day along Highway 6, as this represents an negligible increase over existing conditions<br/>                     For Alternatives 1, 2, 4 and 5, does not include the United Church of Hamilton (1552 Hwy 6) as changes are insignificant in this area</p> <p><u>Note AQ2:</u> There is a minor change in the final Quantitative Rating for Alternative Haul Route 4 due to a miscalculation.</p> |  |   |   |  |   |   |

*Cont'd Next Page*

**Table 7: Ranking of Alternatives**

| Criteria  | Indicators   | Alternative Haul Route 1  | Alternative Haul Route 2  | Alternative Haul Route 3   | Alternative Haul Route 4  | Alternative Haul Route 5  |
|---|--|---|---|--|---|---|
| Dust impacts on community   | Number of residences likely to experience dust impacts as a result of additional truck traffic. [AQ1]  | <ul style="list-style-type: none"> <li>• 1209 receptors from 10m to 500m from the edge of the roadway</li> <li>• 834 Receptors less than 200 m from edge of roadway</li> <li>• Quantitative Rating: 3863</li> </ul> | <ul style="list-style-type: none"> <li>• 1206 receptors from 10m to 500m from the edge of the roadway</li> <li>• 857 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 3929</li> </ul> | <ul style="list-style-type: none"> <li>• 138 receptors from 10m to 500m from the edge of the roadway</li> <li>• 66 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 386</li> </ul> | <ul style="list-style-type: none"> <li>• 1347 receptors from 10m to 500m from the edge of the roadway</li> <li>• 900 receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 4249</li> </ul> | <ul style="list-style-type: none"> <li>• 1344 receptors from 10m to 500m from the edge of the roadway</li> <li>• 923 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 4315</li> </ul> |
| <p><u>Note AQ1:</u> See Notes portion of “Air quality impacts on community” section for note AQ1 and explanation of relative evaluation score</p> <p><u>Note AQ2:</u> See Notes portion of “Air quality impacts on community” section for note AQ2 and explanation of relative evaluation score</p>   |  |   |   |  |   |   |
| Potential for health impacts on community   | Number of residences (receptors) within 500m of the haul routes that would potentially be exposed to substances resulting from tail pipe emissions due to air quality impacts related to increased truck traffic. [AQ1][HH1] | <ul style="list-style-type: none"> <li>• 834 Receptors less than 200 m from edge of roadway</li> <li>• Quantitative Rating: 3863</li> </ul>   | <ul style="list-style-type: none"> <li>• 857 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 3929</li> </ul>   | <ul style="list-style-type: none"> <li>• 66 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 386</li> </ul>  | <ul style="list-style-type: none"> <li>• 900 receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 4249</li> </ul>   | <ul style="list-style-type: none"> <li>• 923 Receptors less than 200 m from roadway</li> <li>• Quantitative Rating: 4315</li> </ul>   |
| <p><u>Note AQ1:</u> See Notes portion of “Air quality impacts on community” section for note AQ1 and explanation of relative evaluation score</p> <p><u>Note AQ1:</u> See Notes portion of “Air quality impacts on community” section for note AQ2 and explanation of relative evaluation score</p> <p><u>Note HH1:</u> Potential health impacts due to additional haul route traffic are directly related to the emissions as a part of the air quality assessment. Alternative Route #3 has a relatively lower potential for air quality impacts and has less residences along the route. Therefore, from a human health perspective, this route represents the least predicted impact. Utilize the resident counts and rankings from the air quality section</p> |  |   |   |  |   |   |

Cont'd Next Page

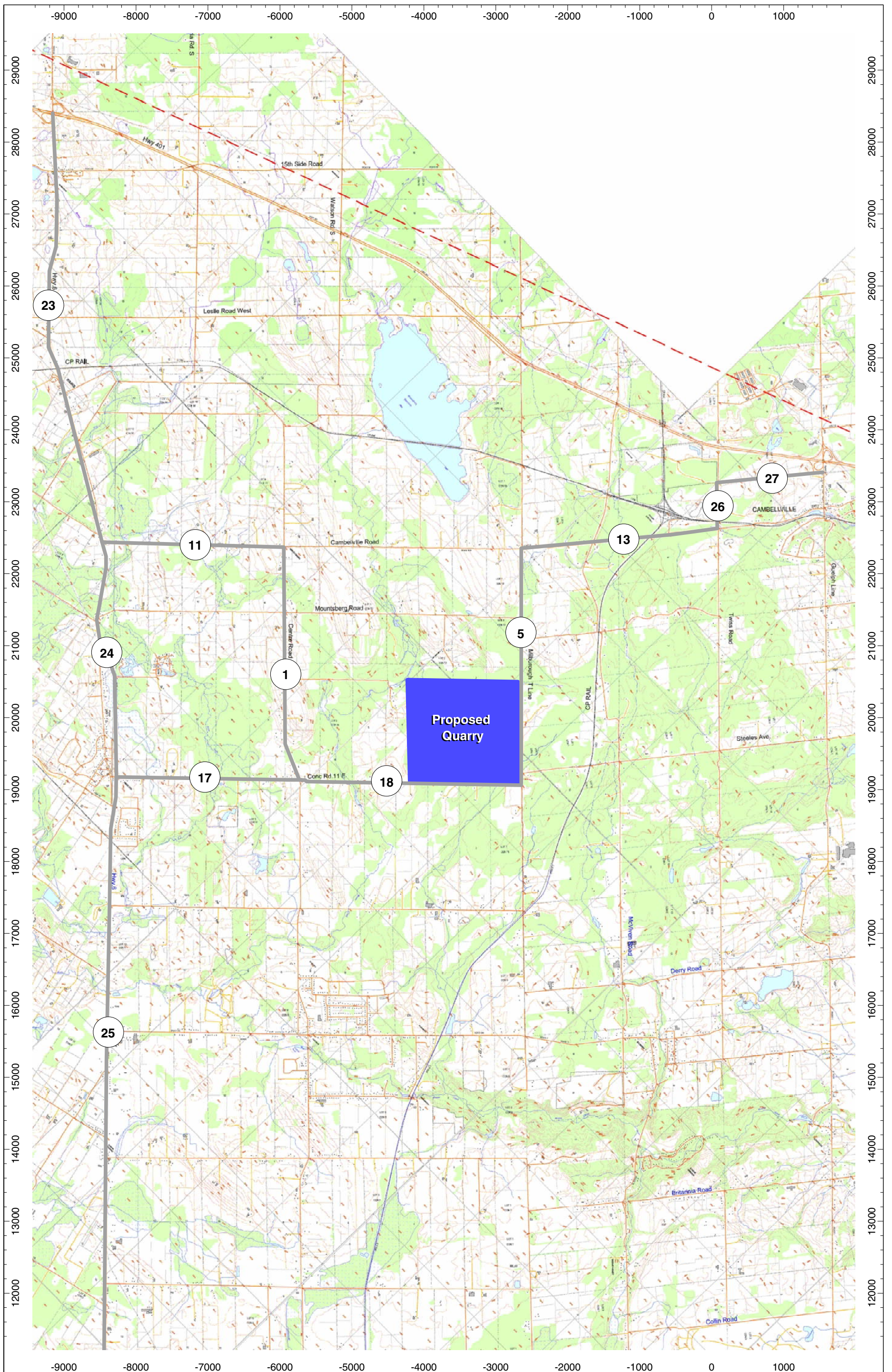
**Table 7: Ranking of Alternatives**

| <b>Criteria</b>                   | <b>Indicators</b>   | <b>Alternative Haul Route 1</b>  | <b>Alternative Haul Route 2</b> | <b>Alternative Haul Route 3</b> | <b>Alternative Haul Route 4</b> | <b>Alternative Haul Route 5</b> |
|-----------------------------------|---|--|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Air Quality impacts on businesses | Number of businesses along the proposed haul route(s) potentially affected by a change in air quality as a result of tailpipe emissions of additional truck traffic | 3  | 22                              | 8                               | 11                              | 30                              |
| Dust impacts on businesses        | Number of businesses along the proposed haul route(s) potentially affected by dust as a result of tailpipe emissions of additional truck traffic                    | Refer to the above unit counts – rating is assumed to be equal to the number of receptors since criteria used for community factors does not apply. Industrial and Agricultural uses not included. |                                 |                                 |                                 |                                 |

---

## **FIGURES**

---



**Study Area, Showing Potential Haul Route Links**

Flamborough Quarry Haul Route Study - Flamborough, Ontario

True North



Project #W08-5107

Drawn by: KAC

Figure: **1**

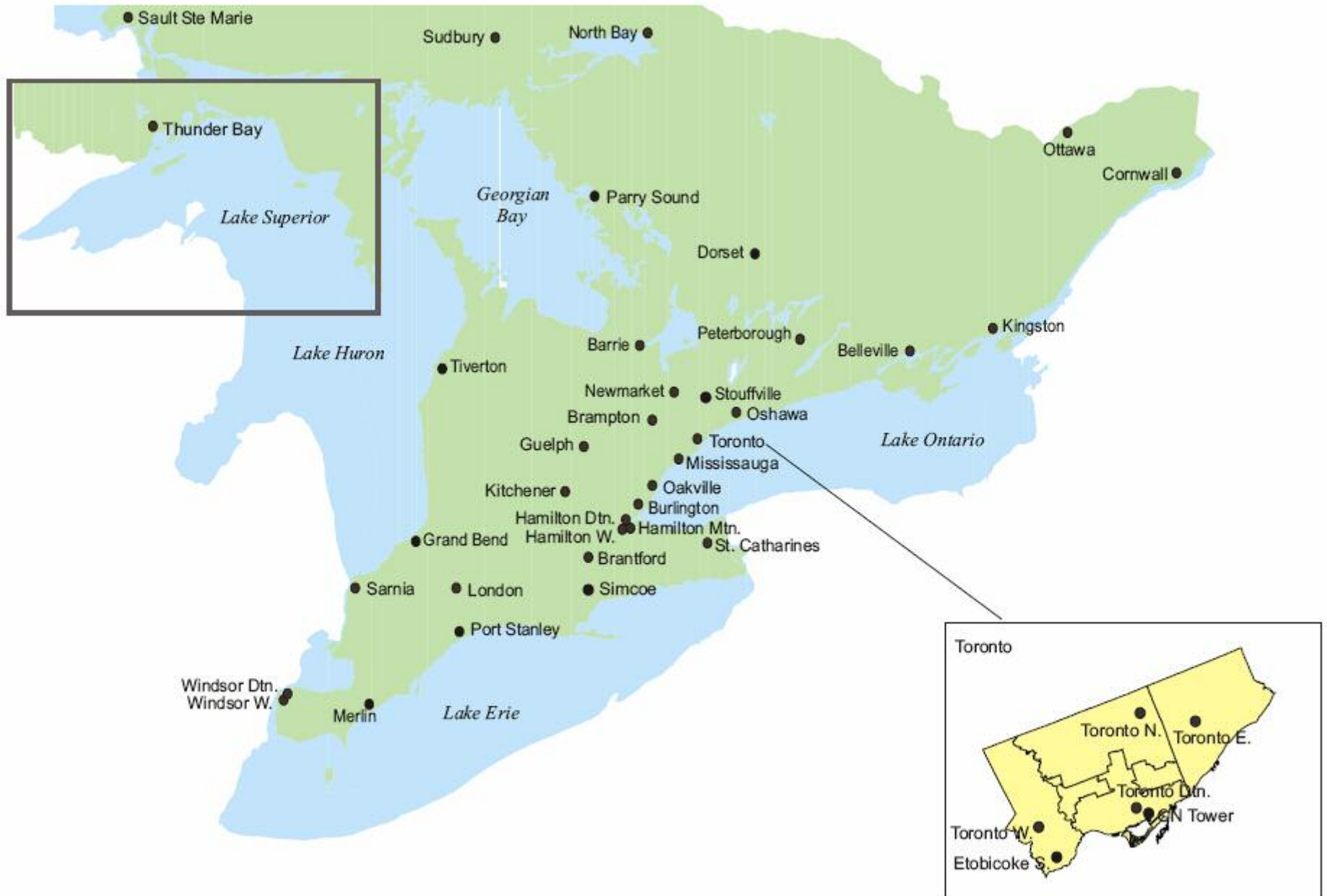
Scale:

1:50000

Date:

July 10, 2008





From the Ministry of the Environment website (<http://www.ene.gov.on.ca/envision/techdocs/4949e.pdf>)

**Ministry of the Environment Ambient Monitoring Stations**

|                |                  |             |
|----------------|------------------|-------------|
| Drawn by: TLP  | Figure: <b>2</b> | <b>RWDI</b> |
| Approx. Scale: | N/A              |             |
| Date Revised:  | Mar 14, 2008     |             |

---

## **APPENDIX A**

---

August 28, 2008

Tara Erwin  
iTRANS Consulting Inc.  
100 York Boulevard  
Richmond Hill, Ontario  
L4B 1J8

**Re: Responses to Region of Halton's Comments  
Air Quality Existing Conditions Report  
St. Mary's Flamborough Quarry  
RWDI # W08-5107A**



CONSULTING ENGINEERS  
& SCIENTISTS

**RWDI AIR Inc.**  
650 Woodlawn Road West  
Guelph, ON  
Canada N1K 1B8

A member of the  
RWDI Group of Companies

**Email:** [terwin@itransconsulting.com](mailto:terwin@itransconsulting.com)

Dear Ms. Erwin:

As requested, RWDI AIR Inc. (RWDI) has prepared the following responses to the comments provided by the Region of Halton dated April 29, 2008 on our Air Quality Existing Conditions Report.

**Overview:**

For clarity, the purpose of the existing conditions report was to provide a general assessment of ambient air quality within the study area for the purpose of ranking and prioritizing the various haul route alternatives based on potential health impacts. This requires an understanding of the differences in air quality and human exposure potential between the different haul routes rather than an absolute understanding of existing (and future) conditions. Once the preferred haul route is identified, then a more detailed assessment of the air quality and health impacts can be completed if necessary. As the Region correctly identified, this could include the use of air quality data from a nearby representative site (i.e., not influenced by a point source) or by installing air monitoring equipment in the local area would provide more reliable data that could be used to evaluate health impacts to local residents.

**Responses to Specific Comments:**

- 1) It was correctly identified that fine particulate matter (PM) is the major component of DPM, but PM10 was mistakenly inserted rather than PM2.5. Fine particles are PM2.5 and are defined as the respirable fraction whereas PM10 is known as the inhalable fraction.

- 2) Traffic corridor studies consider impacts due to all emissions regardless of the type of engine (diesel + gasoline). On a mass percent basis, data from the US EPA clearly show that the substances identified (SO<sub>2</sub>, VOC, PAHs) are emitted in much smaller amounts. Health impacts observed in traffic corridor studies related to exposure to all substances present in vehicle exhaust and do not necessarily support the notion that the substances identified as being minor constituents in diesel exhaust are important contributors to health risk.
- 3) See comment (2).
- 4) Acknowledged. As discussed above, the purpose of the existing conditions report was to provide information necessary for ranking and prioritizing the different haul route alternatives. A detailed air quality and health risk assessment will be conducted for the preferred haul route, if necessary.
- 5) See comment (4).
- 6) Acknowledged. PM data from MOE monitoring stations located near to the study area were considered and used for comparison to the provincial Ambient Air Quality Criteria (AAQC) and for the AQI assessment. It is important to emphasize that background PM levels are generally dominated by regional photochemical smog events and transboundary air pollution from the US rather than local sources.
- 7) No comment.
- 8) It is possible that some sensitive individuals may experience adverse health impacts due to exposure to pollutants present in air at a concentration below their AAQC. However, such effects are generally not expected for the general population. We believe this comment refers to studies involving overall urban air quality rather than individual pollutants and, as such, considers exposure to multiple chemicals.
- 9) It is agreed that the AQHI is intended to provide a better indicator of potential health impacts compared with the AQI. However, the AQHI is only a pilot project (Toronto) in Ontario at present and has not been adopted province-wide. Moreover, analysis of AQI exceedences was done to provide a general indicator of the potential for adverse health impacts. It is not intended to imply that adverse health impacts are not expected or are unlikely. A more detailed analysis using human health toxicological reference values would imply a degree of certainty beyond that afforded by the study objectives and design.
- 10) Valid comment, the wording will be rephrased for all subsequent reports. The reference value for benzene was derived using Health Canada's tolerable concentration value, assuming a 1 in 1,000,000 excess cancer risk as per MOE policy. This value is considered protective of human health.

- 11) 'Surrogate' data was used to provide a general indicator of air quality within the study area. Differences in PM levels between two different sites from outside the study area would not improve our understanding of air quality within the study area. The fact that average concentrations from two sites located near roadways with vastly different traffic patterns is likely related to the fact that PM levels in southern Ontario are largely influenced by regional photochemical processes and transboundary air pollution.
- 12) 'Surrogate' data was used to provide a general indicator of air quality within the study area. Differences in NO<sub>2</sub> levels between two different sites from outside the study area would not improve our understanding of air quality within the study area.

Should you have any questions regarding the above please do not hesitate to contact me or Scott Penton at (519) 823-1311.

Sincerely,  
RWDI AIR Inc.

Ron Haley, M.Sc., M.B.A.  
Senior Specialist, Toxicology and Risk Assessment

REH/klm



# The Regional Municipality of Halton

Planning & Public Works  
Planning and Transportation Services  
1151 Bronte Road  
Oakville ON L6M 3L1  
Fax: (905) 825-8822

April 29, 2008

Stan Holiday  
Senior Planner  
Planning Division  
Planning and Economic Development  
City of Hamilton  
City Centre, 77 James Street North, Suite 400  
Hamilton, Ontario  
L8R 2K8

RECEIVED  
MAY 6 2008

Dear Mr. Holiday:

RE: St. Mary's Flamborough Quarry Application  
Baseline Conditions for Flamborough Quarry Haul Route Study  
City of Hamilton

---

Further to your request for comments on the proposed St. Mary's Flamborough Quarry Haul Route Study, please find the following comments from the Region of Halton. For ease of understanding, these comments have been provided in the same order as the individual reports in the Haul Route Study binder.

## **Draft Transportation Report**

The report prepared by iTRANS Consulting Inc. (Flamborough Quarry Haul Route – Draft Transportation Report); dated April 2008 was reviewed by Halton Region's Transportation Services and provides the following preliminary comments.

### General Comments:

1. Halton Region is anticipated to double its' population and employment by 2031. Please further clarify that with this growth, why is it stated in the report that no quarry trucks will be utilizing Guelph Line or Dundas Street, even though approximately 10% of aggregate demand will be coming within Halton Region?
2. The proposal to date does not indicate where the quarry entrance will be located (i.e. Milborough Line, etc.)?
3. What are the evaluation criteria to get from the Initial Long List of Routes, down to the Short List? Was there any weighting in the evaluation criteria?

### Specific Comments:

1. On page 10 – Halton's Transportation Mater Plan was updated in 2007. Change reference from 2004.

## Page 2

2. On page 16 – Guelph Line (2<sup>nd</sup> Paragraph). Make it clear that Guelph Line & Reid Side Road is under MTO's jurisdiction (not Halton Region).
3. On page 16 – Guelph Line (3<sup>rd</sup> Paragraph). Guelph Line and the **Westbound** 401 Ramp is unsignalized.
4. On page 21 – Dundas Street (2<sup>nd</sup> Paragraph). Posted speed along Dundas Street is 80km/h except in the vicinity of Guelph Line (60km/h).
5. On page 21 – Dundas Street (3<sup>rd</sup> Paragraph). Dundas Street is signalized . . . Brant Street/Cedar Springs Road.
6. On page 57/58 – How will St. Mary's quarry trucks deliver aggregate to Halton Region, which is estimated at 10%?
7. On page 134 – 10.4 Collision Analysis (4<sup>th</sup> Paragraph). Verify that no collisions were reported along Campbellville Road, Twiss Road or Reid Side Road (2002-2006). This would appear to be an error.
8. Both Appendix C1 & Appendix C2 should label 'Reid Side Road'.
9. Appendix C2 (Existing Volume with Seasonal Adjustment). Eastbound left-turn volumes are too low at Guelph Line & Reid Side Road. Halton Region's May 2005 TMC indicates higher volumes. This assessment should be re-evaluated.

## Natural Heritage Existing Conditions Report

Comments on this report will be provided under separate cover.

## Land Uses Report

The report prepared by Glen Schnarr and Associates and dated April 2008 was reviewed within the context of the policies of the Halton Region Official Plan [2006]. The following is a list of issues or concerns identified through this review:

1. The reports itself would benefit from an appendix dealing with the Halton Region Official Plan and an overlay of the proposed Haul Routes on this plan.
2. The page numbers as identified in the Table of Contents do not correspond with the sections or text of the report.
3. On page 6, at the end of Section 3.0, it states that the St. Mary's Quarry will be consistent with among other things public health and safety. How do we know this as being true in the absence of a full and complete review?
4. On page 15, Section 7.1.3, these lands are also designated Escarpment Rural Area in the Region of Halton Official Plan. This land use designation and the associated policies need to be examined and included in this assessment.
5. On page 17, Section 7.1.6.1, last paragraph, there are no lands designated Greenlands "B" along the stretch of road identified as a potential haul route. This section indicates that the assessment is in between Concession 11 and Campbellville Road. The lands designated as Greenlands "B" are substantially east of Milborough Line.
6. On page 18, Section 7.1.8, 2<sup>nd</sup> paragraph, within the C.3.1. Schedule of the Town of Milton Official Plan, no lands along Reid Side Road are designated "Hamlet Industrial" or "Institutional". Are these designations outside this land use schedule on lands located on the north side of the road and if so, the references need to be corrected and the appropriate schedule

identified. There are lands however designated Church or Cemetery in the Campbellville Hamlet land use schedule C.3.A that are along this stretch of road

7. On page 19, Section 7.1.9.2, 1<sup>st</sup> paragraph, on the lands located between the south side of Highway /401 and the Reid Side Road, there are no lands used for agricultural purpose. These lands are used in their entirety for the Highway 401 interchange.

### **Socio-Economic and Business Impact Existing Conditions Report**

The report prepared by Gartner Lee and dated March 2008 was reviewed within the context of the policies of the Halton Region Official Plan [2006] and also assessed through a site visit by staff. The following is a list of issues or concerns identified through this review:

1. On page 33, Table 17, the reference in the table to St. David's Presbyterian Church and Cemetery should also have an ``X`` on Criteria 1 and 3.
2. On page 30, Section 4.15.3, the report states that the Community of Campbellville businesses should be taken into consideration yet on page 34, Table 18, they are not included in the review.

### **Agriculture Existing Conditions Report**

The report prepared by Conna Consulting Inc. and dated March 31, 2008 was reviewed by Regional Staff. The Region of Halton has no comments on this report at this point in time. We do however reserve the right to comment as the study progresses.

### **Air Quality Existing Conditions Report**

The report prepared by RWDI and dated April 3, 2008 was reviewed by the Halton Region Health Department and the following are their comments:

RWDI Air Inc. was retained to evaluate ambient air quality baseline conditions and baseline health impacts along five alternative haul routes for a proposed quarry at 11<sup>th</sup> Concession Road East and Milborough Line, City of Hamilton. In the Introduction, the Final Report states "This Air Quality Existing Conditions report...documents baseline ambient air quality along proposed haul routes and discusses the potential impacts on human health associated with existing air quality." (p.1)

The Region is concerned about the potential haul routes which run through Halton Region, particularly Links 26 and 27 through Campbellville. Our comments are restricted to whether or not the 'existing conditions report' adequately assesses existing air quality and human health impacts in the vicinity of the five alternative haul routes as a basis for evaluating future impacts due to increased truck traffic along potential haul routes.

#### General Comments:

Overall the report is confusing and does not clearly explain the methods, the limitations of the methods, or the results. This study does not appear to indicate anything meaningful about air quality in the local community examined. Nor does it provide any basis for making an evaluation of health impacts. For a study such as this to properly assess existing air quality, two things are required.

First, an assessment of ambient air quality in the area of the proposed undertaking is required. This may be determined by selecting air quality data from a nearby representative site (i.e., not influenced by a point source) or by selecting several surrounding sites and averaging the results or by installing air monitoring equipment in the local area and collecting data for a period of time.

The second piece of information required is an assessment of air quality along the roadways as impacted by existing traffic emissions. The traffic volume counts provided need to be used with data (or defensible assumptions) about fleet composition and a vehicle emissions model to estimate the contribution from existing traffic to the air quality in the localized area. This would provide the baseline for comparison to increased traffic volumes resulting from the undertaking. Determining these baseline air levels would also provide information to assess potential impacts on human health – the stated purpose of the study.

A number of problems arise when examining air quality from monitoring stations near roads of similar traffic volume and then inferring air quality in the area of interest (as appears to have been done for this study). Traffic volume is just one variable influencing air quality in a region and traffic volume counts give no indication of the fleet composition, e.g., light duty gasoline vs. heavy duty diesel, which is crucial when evaluating vehicle impact on air quality. There is no indication for the 'representative' sites selected, how close the monitors at those sites are to the nearby roads – the influence on air quality of traffic emissions drops dramatically with distance from a roadway. Other influences on general air quality in an area can include water bodies (e.g., Lake Erie for the Simcoe site) and general topography (e.g., the area around Dorset).

#### Specific Comments:

1. On page 3, the report indicates that between 80 and 95% of DPM is fine particles (PM<sub>10</sub>) when in fact, between 80 and 95% of DPM is fine particulate matter (PM<sub>2.5</sub>), which is much more harmful to human health than "coarse" particulates, PM<sub>10</sub>. Terminology regarding particle size is confused. Fine particles are PM<sub>2.5</sub> (also known as respirable particulate) not PM<sub>10</sub> (also known as inhalable particulate). The terminology chosen should be clearly explained and then used consistently throughout the report.
2. On page 3 the report states "Since diesel exhaust is not a significant source of these substances [SO<sub>2</sub>, VOC, PAHs], the potential for adverse health effects due to exposure to these substances contributed by the additional truck traffic by local residents is considered minor."
3. There are many traffic corridor studies that dispute this premise; they all suggest that human health along traffic corridors can be negatively affected by vehicle-related exhaust, particularly from diesel-fuelled vehicles, because of the localized impact associated with emissions along busy traffic corridors.
4. Also, the statement is unsupported by projections of increased truck traffic and is premature – the report is supposed to be assessing existing air quality, not dismissing potential future impacts on air quality should the undertaking proceed. Presumably, that is the subject of a future, detailed study referred to in the previous paragraph, which the Health Department would like to review when it is completed.
5. On page 5, the methodology needs to be more clearly explained including limitations. More recent traffic count data may be available from municipalities for vehicle emissions modeling. It may be useful to examine multiple years to determine potential trends in direction of air quality prior to the undertaking.

6. To help determine ambient air quality in the area, monitoring data are available for both PM<sub>2.5</sub> and PM<sub>10</sub> for a number of years and locations in Ontario (see historical Air Quality in Ontario reports by MOE and results from the federal government's NAPS network).
7. On pages 6, 7, and 8 the report says that it is conducting a baseline health impact assessment and that it relies on the AAQC and the AQI, for that purpose.
8. The AAQC are the Ministry of the Environment's air standards for these air pollutants. However; the standards for CO, NO<sub>2</sub> and SO<sub>2</sub> are based on health studies that are decades old, and health impacts have been demonstrated at air levels well below the air standards for these air pollutants as demonstrated by the work of Toronto Public Health, McMaster University, the Ontario Medical Association, and Health Canada. So the report can indicate that the air levels are within the air standard but that is not a health impact assessment.
9. The AQI has been shown to be a poor indicator of human health impacts. A study conducted by Dr. David Pengelly for Toronto Public Health demonstrated that about 92% of the air pollution health impacts experienced by Toronto residents occur when air quality is rated as "good" or "very good". This is why the Federal and Provincial governments have worked to develop the new Air Quality Health Index (AQHI) which is being piloted in communities across the country.
10. On page 7, the statement is made "Except for benzene, these substances [in Table 4: formaldehyde, 1, 3-butadiene, acetylene, benzene, propane] are not considered overly toxic to humans." Formaldehyde and 1, 3-butadiene are listed in IARC under Group 1: Carcinogenic to humans. Although data may not be available for formaldehyde for 2003, data are available for at least 2001 and 2002 in appendices to the Air Quality in Ontario reports for those years. The inhalation unit risk presented for benzene comes from a Health Canada document intended to be used as guidance for risk assessment at federally owned contaminated sites. Depending upon assumptions, such as defining negligible risk as 1 in 100,000, this may not be applicable for comparison with ambient air levels of benzene.
11. In Table 2, some pollutants are compared to an Ontario average and some pollutants are compared to one or three of the four 'representative' sites listed on page 5. The only pollutant compared to all four representative sites is ozone which is a secondary pollutant not emitted by vehicles. There is no discussion of why the 50<sup>th</sup> percentile for PM<sub>2.5</sub> is virtually the same from a site near traffic volumes of less than 2,000 vehicles a day and a site near traffic volumes of almost 10,000 vehicles a day.
12. In Table 3, it appears that the 50<sup>th</sup> percentile for NO<sub>2</sub> from the Simcoe site (9,950 vehicles/day) is being used as representative for the Hwy 6 segment South of Parkside Drive (42,500 vehicles/day) and for Concession 11 between Milborough Townline and Centre Rd (516 vehicles/day) with no explanation or justification.

### **Noise Conditions Existing Conditions Report**

The report prepared by RWDI (Noise Conditions – Existing Conditions Report for Flamborough Quarry Haul Route Study), dated April 4, 2008 was reviewed by Halton Region's Transportation Services and provides the following preliminary comments.

None of the 'Short Listed' Haul Routes include Halton Regional roads, except for Guelph Line at the MTO ramps. At this point in time, we do not have any preliminary concerns/comments.

**Built Heritage and Cultural Landscape Assessment**

The report (Built Heritage and Cultural Landscape Assessment) prepared by Archaeologix Inc. and dated March 2008 was reviewed by Halton Region. Halton Region has no comments on this report at this point in time. We will rely on our municipal partners at the Town of Milton to identify any built heritage related issues related to the two houses identified to be located within the Region.

**Archaeological Assessment (Stage 1) – Existing Conditions Report**

The Region of Halton will rely on the expertise provided by the Ontario Ministry of Culture. This report should be provided to them for their review and comment.

**Road and Pavement Engineering – Existing Conditions Report**

The report prepared by Golder Associates (Road & Pavement Engineering – Existing Conditions Report for Flamborough Quarry Haul Route Study), dated April 2, 2008 was reviewed by Halton Region’s Transportation Services and provides the following preliminary comments.

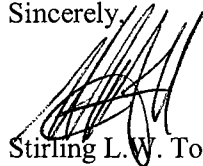
None of the ‘Short Listed’ Haul Routes include Halton Regional roads, except for Guelph Line at the MTO ramps. At this point in time, we do not have any preliminary concerns/comments on this report.

**Municipal Structures and Drainage Existing Conditions Report**

As none of the ‘Short Listed’ Haul Routes include Halton Region related infrastructure, except for Guelph Line at the MTO ramps, we do not have any comments or concerns on this report as this time.

Please let me know if you have any questions regarding these comments.

Sincerely,



Stirling L. W. Todd,  
Senior Planner - Long Range Planning

C: Anne Dawkins, Town of Milton  
Kathryn Pounder, Niagara Escarpment Commission  
Robin van de Lande, City of Burlington



Hamilton

Planning and Economic  
Development Department

## Memorandum

**To:** Members of the Combined Aggregate Review Team for the Proposed St. Marys Flamborough Quarry  
**From:** Christopher Bell, Senior Planner, City of Hamilton  
**Phone:** 905-546-2424, Ext. 1262 **Fax:** 905-546-4202  
**Date:** July 10, 2008  
**Subject:** **Consolidation of CART Comments on Baseline Conditions and Supporting Material for Haul Route Study PIC#4**

---

Between April and June 2008 the Flamborough Quarry proponent team provided members of the Agency Review Group for the proponent's transportation study with a series of documents intended to give background and generate consultation responses, prior to Public Information Centre #4 which was to be held on June 23 and has now been deferred. These documents were as follows:

- "Baseline Conditions for Flamborough Quarry Haul Route Study" comprising a binder containing several reports and a list of specialists and criteria, provided on April 8, 2008.
- PIC #4 draft poster boards and background material, May 20, 2008, including:
  - A memorandum discussing earlier comments provided re: aggregate supply and demand and the selection of the alternative routes;
  - A Summary of the Transportation Analysis;
  - An Assessment of the Effects of the Alternative Haul Routes (Analysis Matrix)
  - The Evaluation Approach and Results
  - A description of the Preliminary Preferred Haul Route and Potential Mitigation
- Additional draft poster boards for PIC #4, and a memorandum provided June 11, 2008.

The proponent team was provided with comments from the Agency Review Group on some of the Baseline Conditions material (Memorandum of April 15 and initial transportation comments) , and was provided with the general concerns of the Agency Review Group in relation to subsequent documentation at a CART/Proponent meeting of June 17. The proponent team has requested more details of the CART's concerns. With the assistance of Steven Rowe, the City's Aggregate Planning Advisor and Peer Review Coordinator, this memorandum has been prepared with the intent to provide a consolidation of CART's comments to date. As noted in the covering letter to this memorandum, CART intends to conduct more detailed review of some aspects of the materials over the summer of 2008, and the results of these reviews will be provided in due course.

The comments provided below are intended to address the structure and content of the materials as they affect the evaluation and selection of alternative and preferred haul routes, and not necessarily the details or format of each PIC display board, for example. They are all staff comments and do not comprise the formal positions of CART's constituent municipalities and agencies.

## **1. The Baseline Conditions Reports and Supporting Materials**

The following comprises the April 15 memo referred to above, with modifications to respond to subsequent materials and to add further comments from CART members.

### **Transportation Baseline Conditions Report**

The transportation materials submitted by St Marys are to be subjected to detailed review by IBI Group, CART's transportation peer reviewer. Therefore the following comments are provisional, pending that review. Other CART members may also provide comments as part of the process.

#### *Section 1. Introduction*

- Page 1: It would be helpful to set out the study criteria the transportation report is intended to address within the actual report (the same applies to all reports). The proposed criteria, provided separately, do not indicate the source of changes to the TOR comments (i.e. the St Marys consulting team, public submissions).
- Page 2: The description of the proposed quarry does not indicate the location of the quarry entrance. While CART has been told informally that the access would be on Milborough Line, this information does not appear on any of the background or poster board materials received to date.
- Page 4, para. 4: The report should explain the relationship of the study with potential requirements under the Municipal Class EA and the MTO Class EA.
- Page 4, para. 6: Highway 6, Guelph Line and Reid Sideroad are also Provincial highways. Hamilton-Wentworth is no longer a jurisdiction.

#### *Section 2. Existing Provincial, Regional and Municipal Policies and Initiatives*

- Page 6, Section 2.1.1: The Planning Act Regulations are not strictly part of the Act itself. The relationship between the Act and the PPS etc. should be more clearly explained.
- Page 6, Section 2.1.2: The Growth Plan has more to say about "where and how future growth should be accommodated" than the Greenbelt Plan. There are specific policies in the Greenbelt Plan (such as the objective that infrastructure should support resource use in Section 4.2.1) – or all of this could be deferred to Report C, Land Uses as it relates to general policies (not all alternative routes), where this is referenced.

- Page 7, Municipal Policies: The section should refer (at least generally) to the broader policy framework including objectives etc., following the principle of looking at the entire Plan and not just specific sections.
- Page 10: Halton's Transportation Master Plan was updated in 2007, and the reference to 2004 should be changed.

### *Section 3. Study Area*

- Page 14: Milborough Line is considered by Hamilton to be a cautionary un-signed bike route. The document describes it as an "on-street bike route" which implies an upgraded facility. (Bike routes, trails & parks map)
- Page 16: It should be made clear that that Guelph Line & Reid Side Road are under MTO's jurisdiction (not Halton Region). Also, Guelph Line and the **westbound** Highway 401 ramp is un-signalized.
- Page 18: Concession 11 E is considered a cautionary un-signed bike route and not an on-street bike route.
- Page 19: Carlisle Rd is considered a cautionary un-signed bike route and not an on-street bike route.
- Page 20: Concession 7E, Concession 6E and Parkside Drive are considered cautionary un-signed bike routes and not on-street bike routes.
- Page 21: Dundas Street, 2nd paragraph only mentions 5 signalized intersections...there are many more, they should all be listed for baseline conditions.
- Page 21: Re: Dundas Street (2<sup>nd</sup> Paragraph). The posted speed along Dundas Street is 80km/h except in the vicinity of Guelph Line (60km/h). Also (3<sup>rd</sup> Paragraph), Dundas Street is signalized.

### *Section 4. Project Description*

- Page 34: Re: proposed fleet: is there a "fleet" as such, or does the mix of vehicles depend on individual decisions of contractors and agents?
- The document proposes daily hours of operations but does not indicate seasonal hours – would the quarry be open all year long? Also, the vehicle configurations only consider single unit dump trucks. As the price of diesel fuel climbs, it may be more efficient for companies to use "pup trailers" in conjunction with the dump trucks (i.e. tri-axle dump trucks with tri-axle dump trailers and tandem dump trucks with tandem dump trailers). This will increase vehicle lengths, turning radii and may lower operating speeds.
- Also on page 34, why was an 85th percentile used to calculate daily trips? While the 85th percentile is used in other traffic engineering applications it is not

normally used to justify trip generation. While information on quarry operations is proprietary, reviewers such as CART need to be provided with more details about the data to better evaluate St Marys conclusions.

- Page 35: The document refers to peak hours...is this the street peak hour or the facility peak hour?

*Section 5. Aggregate Supply and Demand*

- Page 39, Section 5.2, Areas of Supply and Demand for Aggregates: There should be discussion of why this information is important, and how it is to be utilized in selecting a haul route(s).
- There may be a cost and environmental advantage to minimizing haul route distances, (as indicated in the MNR quote in Section 6.1, page 59) but this is not specifically reflected in the TOR/final comparison criteria or the screening criteria on page 75. It is also not clear how the TOR/final comparison criteria might be used to identify whether there should be one or more haul routes to link with Provincial highways, in terms of minimizing haul distances. The proponent team commented in the May 20, 2008 memorandum accompanying the first PIC #4 poster boards that that alternative haul routes are directly and indirectly sensitive to the length of the route (presumably in terms of impacts).
- This supply/demand analysis essentially reflects data available to the present day, and does not address the future development scenario as set out in the Growth Plan (notwithstanding the use of Growth Plan mapping in Exhibit 5-10), or with the proposed quarry in place. It also does not address the degree to which dolostone and other aggregate materials can be substituted for each other ("crushed stone" appears to be crushed dolostone and not unconsolidated gravel and rocks extracted in situ and then crushed). The analysis also appears to assume that the Greater Golden Horseshoe is a discrete entity in terms of aggregate supply and demand, when there is presumably importation from outside and export as well.

The proponent team responded in the May 20, 2008 memorandum accompanying the first PIC #4 poster boards that their:

---

*"supply and demand details also focused on the Greater Toronto Area and assumed there would be some importing and exporting of crushed stone from outside this area; to be conservative the majority of the local supply was distributed to the deficient markets within the GGH".*

It also indicates that:

*"Although our analysis suggests that one hundred percent of the future crushed stone deficiently is to the east in York Region and Toronto, we have adopted a more conservative distribution that accounts for distribution in all directions based on subsequent discussions with CART."*

There was no response to the comment on future as opposed to present demand, however, nor on the interchangeability of different types of stone.

- Halton Region has commented that it is anticipated to double its population and employment by 2031, and has requested clarification as to why, with this level of growth, the report states that no quarry trucks will be utilizing Guelph Line or Dundas Street, even though the proponents estimate that approximately 10% of aggregate demand will come from within Halton Region.
- Although the proponent has responded to CART's request for more information on the distribution of supply and demand, the Supply and Demand analysis does not provide a clear linkage between the analysis and the future "proposed" (or estimated?) distribution of truck trips to and from the proposed quarry on page 56, nor is it clear how this information is to be used.

#### *Section 6. Alternative Transportation Solutions*

- Page 59: The quote from the Ministry of Natural Resources is not sourced. The environmental assessment approach being used for this process requires that all aspects of the environment be considered. It is unclear how this Ministry approach would assist in the selection of preferred haulage route(s), unless it is to say that the directness of an alternative route to the area of highest demand should be considered in a route comparison. This has not been identified by the agencies or the proponent as an evaluation criterion for this study, however it is mentioned in the proponent's evaluation matrix provided in May 2008 with respect to greenbelt considerations.
- Also with regard to page 57/58, Halton Region asks which routes would be used by St Marys to deliver aggregate to Halton Region, estimated at 10% of the production of the proposed quarry.
- Page 63, Section 6.4: Again, the report shows details of alternative rail spur options, but not the proposed road access point which is of greater ultimate importance.

#### *Section 7. Alternative Strategies for Quarry Trucks*

- Page 68: Tools to Control Truck Traffic: the proponent should address how agencies can enforce a truck management policy, and how the system would survive any future change in ownership of the quarry. There are concerns among CART members as to how, for example, trucks would be prevented from using Guelph Line, which is currently a truck route.

#### *Section 8. Selection of Alternative Haul Routes*

Begins on page 73.

- The report is more than a report on baseline conditions. It also describes the process of reaching a long and short list of links and preferred routes for the

proposed haul route(s). This process was illustrated on the poster boards discussed in the November 16, 2007 CART meeting and shown (in revised form) at the Public Open House on November 29, 2007. This process was the focus of Panel 25, and CART's comments on that panel at the CART meeting were recorded as:

*"What was the evaluation criteria/value system, in particular why are some communities and churches/schools avoided while others are not? What thresholds were applied to determine the inclusion/exclusion of routes?"*

*Furthermore, why are extensions or new road constructions considered to be a constraint? Why is Guelph Line, Milborough Town Line, Derry Road ruled out? Guelph Line is a designated truck route and an alternative route to reach the Queen Elizabeth Expressway (QEW).*

*Right-of-ways; pavement widths; and road structure/quality are considered a constraint, but this information may require considerable research. However, may be beneficial for future PIC's as a panel.*

*Campbellville was not entirely avoided as Reid Side Road is directly adjacent to the neighbouring subdivision.*

*Lastly, a key constraint will be access location (yet to be determined). This will potentially affect the choice of route."*

- The first level screening is a qualitative assessment of alternatives rather than a screening, which implies a more definitive approach (i.e. exclusionary rather than cumulative or comparative factors) to including or excluding options from further study. The descriptions of the screenings do not represent a clearly traceable account of the criteria applied and the individual or aggregate conditions that exclude or qualify a link or route for further study.
  - Exhibit 8-3 shows the eliminated links and other maps show the alternative haul routes, but there should be a key map that identifies all links and their number references. The number references for the eliminated road links have been changed in Section 8.2.1 and on Exhibit 8-3 so that they are not easily cross-referenced with the descriptions in Section 8.2.2 and Appendix B (which should be referenced in Section 8).
- 
- There is a lack of supporting information for the "carry forward" decision for each link, and where there is information there appears to be a lack of consistency in presenting and applying it. For example, in Appendix B, Table 1, Link #1 has 34 driveways as a "disadvantage" under Existing and Planned Land Use, whereas it has an "advantage" – "not many homes and driveways" under Social Environment. On page 79 of the report, Link #1 is reported to have not 34 but "approximately 47 driveways". These may include business and institutional as well as residential driveways, but this is not made clear. For Link #13, the

presence of only 14 driveways is a disadvantage for both land use and social criteria. For most links, the number of driveways is not provided.

The report therefore identifies advantages and disadvantages – though not consistently – without providing a traceable account of the information on which they are based, the applicable decision rules, and how advantages and disadvantages (or potential environmental effects) were combined to make decisions as to whether to carry links forward.

- Halton Region has requested details of any criteria or weighting applied in arriving at the short list of routes. In addition, the overall environmental effect of a haul route would be an aggregate of the effects of the component links, and this information is not provided in the descriptions of the haul routes in Section 8.5.

The proponent team responded to this concern in their May 20 memo, stating:

*“Prior to the analysis and evaluation, a long list of alternatives was reduced to a short list of alternatives. The short list of alternatives comprises the 5 alternative haul routes carried forward. Details of the rationale used to arrive at the short list can be found in the existing conditions report submitted previously. Our approach was not to consider any one constraint as a fatal criteria for eliminating a road link, rather the constraints were considered collectively. A road link was eliminated from further consideration where there was a better candidate as determined through the collective consideration of all potential constraints.”*

This explanation may describe an overall approach but it does not explain why one link or route survived and not another. The concerns have not been resolved in the Baseline Conditions Report or in subsequent submissions by the proponent.

#### *Section 9. Traffic Operations Approach and Methodology*

- Page 117: are the sight distances based on trucks, passenger vehicles, bicycles, or all types of vehicles? Do they take the level of visibility or the relative speeds of different types of vehicle into account?
- The City of Hamilton Transportation and Transit Section has commented that the evaluation should have included consideration of equivalent standard vehicle units (rather than simply the number of vehicles), V/C ratios and the future level of service. These matters can be addressed further in the CART peer reviewer’s detailed review.

#### *Section 10. Alternative Haul Route Analysis of Existing Baseline Conditions*

- At the November 15, 2007 and January 16, 2008 meetings between the proponent team and CART it was agreed that railway crossings are to be addressed by the study, but no baseline information on railway crossings is provided in the report. There is also no discussion of Emergency Detour Routes, as was agreed to at the meeting.

- Page 125, Existing Cycling Facilities: There is no information on the extent to which these routes are used for bicycle transportation or recreation, as agreed to at the November 2007 meeting, and the factors that encourage or discourage their use for these purposes.
- Page 134, Collision Analysis, 4<sup>th</sup> paragraph: St Marys should verify that no collisions were reported along Campbellville Road, Twiss Road or Reid Side Road (2002-2006). This would appear to be an error.
- Appendices C1 and C2 should label "Reid Side Road".
- Appendix C2, (Existing Volume with Seasonal Adjustment): Eastbound left-turn volumes are too low at Guelph Line & Reid Side Road. Halton Region's May 2005 TMC indicates higher volumes. This assessment should be re-evaluated.

### **Natural Heritage Existing Conditions Report**

The following preliminary comments on the Natural Heritage Existing Conditions Report were provided by City of Hamilton staff. Conservation Halton has been asked to further review these materials.

#### *Section 2.2 Vegetation Communities*

- Please include a colour copy of the ELC mapping in the report. The mapping that was included could not be interpreted.
- There were numerous site visits conducted for vegetation community studies (October, November, December); however, all of them are outside of the appropriate timing window (usually June till September). Additional field work would have to be conducted within the appropriate timing window.

#### *Section 2.3 Aquatic Resources*

- The field surveys were completed outside of the appropriate timing windows. Winter surveys are not suitable for determining existing watercourse conditions. Additional field work will have to be completed within the appropriate time period.

#### *Section 4.0 Baseline Conditions*

- The report notes that 14 ESA's, and one ANSI are located within 100-metres of one or more of the alternate routes. As a component of this study an examination of amphibians, reptiles and mammals that are within these natural heritage features should be examined. Existing road crossings by faunal species should be examined to determine if there is an alternative route that tends to be used more for crossings than another. Also any faunal species that may be more sensitive to noise or increased disturbance should be examined.

- The proposed haul routes cross numerous watercourses of four sub-watersheds of Bronte Creek. Consideration should be given to the type of watercourse (i.e. warmwater vs. coldwater) intended to be crossed. The route that would have the least amount of impact on the fisheries should be considered. The proposed crossings of Bronte Creek appear to all contain fish habitat and specifically potential redbreast dace habitat. Perhaps an alternative route should be considered that would not impact such a sensitive habitat.
- Planning staff recommend that due consideration be given to accurately inventoried natural environment heritage features and their functions when choosing potential haul routes. Areas should be chosen that would have the least amount of impacts to the features and ecological functions of existing natural heritage features (ESA's, ANSI's, fisheries, wildlife, amphibians and reptiles).
- Please forward a copy of the future report containing the potential final route selections for review and comment by Natural Heritage Planning staff. Some preliminary analysis based on the above noted comments should be completed to aid in determining the most ideal haul route.

Other members of CART may provide their own natural heritage comments as part of the ongoing review process and as the process proceeds.

### **Land Uses Existing Conditions Report**

Halton Region staff comments as follows:

The report prepared by Glen Schnarr and Associates and dated April 2008 was reviewed within the context of the policies of the Halton Region Official Plan [2006]. The following is a list of issues or concerns identified through this review:

1. The report itself would benefit from an appendix dealing with the Halton Region Official Plan and an overlay of the proposed Haul Routes on this plan.
2. The page numbers as identified in the Table of Contents do not correspond with the sections or text of the report.
3. On page 6, at the end of Section 3.0, it states that the St. Mary's Quarry will be consistent with among other things public health and safety. How do we know this as being true in the absence of a full and complete review?
4. On page 15, Section 7.1.3, these lands are also designated Escarpment Rural Area in the Region of Halton Official Plan. This land use designation and the associated policies need to be examined and included in this assessment.
5. On page 17, Section 7.1.6.1, last paragraph, there are no lands designated Greenlands "B" along the stretch of road identified as a potential haul route. This section indicates that the assessment is in between Concession 11 and Campbellville Road. The lands designated as Greenlands "B" are substantially east of Milborough Line.

6. On page 18, Section 7.1.8, 2<sup>nd</sup> paragraph, within the C.3.1. Schedule of the Town of Milton Official Plan, no lands along Reid Side Road are designated "Hamlet Industrial" or "Institutional". Are these designations outside this land use schedule on lands located on the north side of the road and if so, the references need to be corrected and the appropriate schedule identified. There are lands however designated Church or Cemetery in the Campbellville Hamlet land use schedule C.3.A that are along this stretch of road.
7. On page 19, Section 7.1.9.2, 1<sup>st</sup> paragraph, on the lands located between the south side of Highway #401 and the Reid Side Road, there are no lands used for agricultural purpose. These lands are used in their entirety for the Highway 401 interchange.

Other members of CART may provide their own land use comments as part of the ongoing review process and as the process proceeds.

### **Socio-Economic and Business Impact Existing Conditions Report**

Halton Region comments as follows:

The report prepared by Gartner Lee and dated March 2008 was reviewed within the context of the policies of the Halton Region Official Plan [2006] and also assessed through a site visit by staff. The following is a list of issues or concerns identified through this review:

1. On page 33, Table 17, the reference in the table to St. David's Presbyterian Church and Cemetery should also have an "X" on Criteria 1 and 3.
2. On page 30, Section 4.15.3, the report states that the Community of Campbellville businesses should be taken into consideration yet on page 34, Table 18, they are not included in the review.

Other members of CART may provide additional comments on the socio-economic and business impact report.

### **Agriculture Existing Conditions Report**

Halton Region comments as follows:

The report prepared by Conna Consulting Inc. and dated March 31, 2008 was reviewed by Regional Staff. The Region of Halton has no comments on this report at this point in time. We do however reserve the right to comment as the study progresses.

---

Other members of CART may provide additional comments on the agricultural report.

### **Air Quality Existing Conditions Report**

The report prepared by RWDI and dated April 3, 2008 was reviewed by the Halton Region Health Department and the following are their comments:

RWDI Air Inc. was retained to evaluate ambient air quality baseline conditions and baseline health impacts along five alternative haul routes for a proposed quarry at

11<sup>th</sup> Concession Road East and Milbrough Line, City of Hamilton. In the Introduction, the Final Report states “This Air Quality Existing Conditions report...documents baseline ambient air quality along proposed haul routes and discusses the potential impacts on human health associated with existing air quality.” (p.1)

The Region is concerned about the potential haul routes which run through Halton Region, particularly Links 26 and 27 through Campbellville. Our comments are restricted to whether or not the ‘existing conditions report’ adequately assesses existing air quality and human health impacts in the vicinity of the five alternative haul routes as a basis for evaluating future impacts due to increased truck traffic along potential haul routes.

General Comments:

Overall the report is confusing and does not clearly explain the methods, the limitations of the methods, or the results. This study does not appear to indicate anything meaningful about air quality in the local community examined. Nor does it provide any basis for making an evaluation of health impacts. For a study such as this to properly assess existing air quality, two things are required.

First, an assessment of ambient air quality in the area of the proposed undertaking is required. This may be determined by selecting air quality data from a nearby representative site (i.e., not influenced by a point source) or by selecting several surrounding sites and averaging the results or by installing air monitoring equipment in the local area and collecting data for a period of time.

The second piece of information required is an assessment of air quality along the roadways as impacted by existing traffic emissions. The traffic volume counts provided need to be used with data (or defensible assumptions) about fleet composition and a vehicle emissions model to estimate the contribution from existing traffic to the air quality in the localized area. This would provide the baseline for comparison to increased traffic volumes resulting from the undertaking. Determining these baseline air levels would also provide information to assess potential impacts on human health – the stated purpose of the study.

A number of problems arise when examining air quality from monitoring stations near roads of similar traffic volume and then inferring air quality in the area of interest (as appears to have been done for this study). Traffic volume is just one variable influencing air quality in a region and traffic volume counts give no indication of the fleet composition, e.g., light duty gasoline vs. heavy duty diesel, which is crucial when evaluating vehicle impact on air quality. There is no indication for the ‘representative’ sites selected, how close the monitors at those sites are to the nearby roads – the influence on air quality of traffic emissions drops dramatically with distance from a roadway. Other influences on general air quality in an area can include water bodies (e.g., Lake Erie for the Simcoe site) and general topography (e.g., the area around Dorset).

Specific Comments:

1. On page 3, the report indicates that between 80 and 95% of DPM is fine particles (PM<sub>10</sub>) when in fact, between 80 and 95% of DPM is fine particulate matter (PM<sub>2.5</sub>), which is much more harmful to human health than "coarse" particulates, PM<sub>10</sub>. Terminology regarding particle size is confused. Fine particles are PM<sub>2.5</sub> (also known as respirable particulate) not PM<sub>10</sub> (also known as inhalable particulate). The terminology chosen should be clearly explained and then used consistently throughout the report.
2. On page 3 the report states "Since diesel exhaust is not a significant source of these substances [SO<sub>2</sub>, VOC, PAHs], the potential for adverse health effects due to exposure to these substances contributed by the additional truck traffic by local residents is considered minor."

There are many traffic corridor studies that dispute this premise; they all suggest that human health along traffic corridors can be negatively affected by vehicle-related exhaust, particularly from diesel-fuelled vehicles, because of the localized impact associated with emissions along busy traffic corridors.

Also, the statement is unsupported by projections of increased truck traffic and is premature – the report is supposed to be assessing existing air quality, not dismissing potential future impacts on air quality should the undertaking proceed. Presumably, that is the subject of a future, detailed study referred to in the previous paragraph, which the Health Department would like to review when it is completed.

3. On page 5, the methodology needs to be more clearly explained including limitations. More recent traffic count data may be available from municipalities for vehicle emissions modeling. It may be useful to examine multiple years to determine potential trends in direction of air quality prior to the undertaking.
4. To help determine ambient air quality in the area, monitoring data are available for both PM<sub>2.5</sub> and PM<sub>10</sub> for a number of years and locations in Ontario (see historical Air Quality in Ontario reports by MOE and results from the federal government's NAPS network).
5. On pages 6, 7, and 8 the report says that it is conducting a baseline health impact assessment and that it relies on the AAQC and the AQI, for that purpose.

The AAQC are the Ministry of the Environment's air standards for these air pollutants. However; the standards for CO, NO<sub>2</sub> and SO<sub>2</sub> are based on health studies that are decades old, and health impacts have been demonstrated at air levels well below the air standards for these air pollutants as demonstrated by the work of Toronto Public Health, McMaster University, the Ontario Medical Association, and Health Canada. So the report can indicate that the air levels are within the air standard but that is not a health impact assessment.

The AQI has been shown to be a poor indicator of human health impacts. A study conducted by Dr. David Pengelly for Toronto Public Health demonstrated that about 92% of the air pollution health impacts experienced by Toronto residents occur when air quality is rated as "good" or "very good". This is why the Federal and Provincial governments have worked to develop the new Air Quality Health Index (AQHI) which is being piloted in communities across the country.

6. On page 7, the statement is made "Except for benzene, these substances [in Table 4: formaldehyde, 1, 3-butadiene, acetylene, benzene, propane] are not considered overly toxic to humans." Formaldehyde and 1, 3-butadiene are listed in IARC under Group 1: Carcinogenic to humans. Although data may not be available for formaldehyde for 2003, data are available for at least 2001 and 2002 in appendices to the Air Quality in Ontario reports for those years. The inhalation unit risk presented for benzene comes from a Health Canada document intended to be used as guidance for risk assessment at federally owned contaminated sites. Depending upon assumptions, such as defining negligible risk as 1 in 100,000, this may not be applicable for comparison with ambient air levels of benzene.
7. In Table 2, some pollutants are compared to an Ontario average and some pollutants are compared to one or three of the four 'representative' sites listed on page 5. The only pollutant compared to all four representative sites is ozone which is a secondary pollutant not emitted by vehicles. There is no discussion of why the 50<sup>th</sup> percentile for PM<sub>2.5</sub> is virtually the same from a site near traffic volumes of less than 2,000 vehicles a day and a site near traffic volumes of almost 10,000 vehicles a day.
8. In Table 3, it appears that the 50<sup>th</sup> percentile for NO<sub>2</sub> from the Simcoe site (9,950 vehicles/day) is being used as representative for the Hwy 6 segment South of Parkside Drive (42,500 vehicles/day) and for Concession 11 between Milborough Townline and Centre Rd (516 vehicles/day) with no explanation or justification.

Halton Region and other members of CART may provide additional comments on air quality existing conditions and impacts as the study proceeds.

### **Noise Conditions Existing Conditions Report**

---

The report prepared by RWDI (Noise Conditions – Existing Conditions Report for Flamborough Quarry Haul Route Study), dated April 4, 2008 was reviewed by Halton Region's Transportation Services and provides the following preliminary comments;

None of the 'Short Listed' Haul Routes include Halton Regional roads, except for Guelph Line at the MTO ramps. At this point in time, we do not have any preliminary concerns/comments.

Halton Region and other members of CART may provide additional comments on existing noise conditions and impacts as the study proceeds.

### **Built Heritage and Cultural Landscape Assessment**

This report was reviewed by Halton Region. Halton Region has no comments on this report at this point in time. We will rely on our municipal partners at the Town of Milton to identify any built heritage related issues related to the two houses identified to be located within the Region.

Other members of CART may provide additional comments on existing noise conditions and impacts as the study proceeds.

### **Archaeological Assessment (Stage 1) – Existing Conditions Report**

The Region of Halton will rely on the expertise provided by the Ontario Ministry of Culture. This report should be provided to them for their review and comment.

Other members of CART may provide additional comments on existing noise conditions and impacts as the study proceeds.

### **Road and Pavement Engineering – Existing Conditions Report**

The report prepared by Golder Associates (Road & Pavement Engineering – Existing Conditions Report for Flamborough Quarry Haul Route Study), dated April 2, 2008 was reviewed by Halton Region's Transportation Services and provides the following preliminary comments.

None of the 'Short Listed' Haul Routes include Halton Regional roads, except for Guelph Line at the MTO ramps. At this point in time, we do not have any preliminary concerns/comments on this report.

Other members of CART may provide additional comments on existing noise conditions and impacts as the study proceeds.

### **Municipal Structures and Drainage Existing Conditions Report**

As none of the 'Short Listed' Haul Routes include Halton Region related infrastructure, except for Guelph Line at the MTO ramps, Halton Region does not have any comments or concerns on this report as this time.

---

Other members of CART may provide additional comments on Municipal structures and drainage as the study proceeds.

## **2. PIC #4 draft poster boards and background material, May 20 and June 11, 2008.**

The following is a consolidation of material from memos prepared for the City of Hamilton and distributed to CART to assist CART members in reviewing the PIC #4

materials, together with comments submitted by CART members. The review is structured around the materials initially received from the St Marys team on May 20.

CART Memorandum

This memorandum introduces the package of materials and provides information on aggregate supply and demand, and on the selection of alternative haul routes. The latter two sections of the memo appear to provide responses to comments provided by CART members on the proponent's Baseline Conditions materials, provided in April 2008, however these CART comments are not referenced.

- The discussion of aggregate supply and demand reaffirms the material contained in the Baseline Conditions report and does not address a number of the concerns raised in earlier comments to the proponent regarding the calculation and use of haul direction information. It indicates that the details on supply and demand "are not intended to guide the selection or interpretation of evaluation criteria and indicators.", but this information is in fact used to support findings under the Greenbelt Plan policy criterion in the comparison of alternatives.
  - The discussion of the selection of alternative haul routes also does not resolve the concerns regarding the traceability of the process of selecting the short list of haul routes, as raised earlier in relation to the description of that process in the Baseline Conditions transportation report. While the Baseline Conditions material provides a large volume of data on the alternative links, the process of collective consideration of criteria and the identification of "better candidates" and the elimination of other links is unclear.
  - CART members also raised other concerns with the Baseline Conditions report including a lack of future total traffic projections, and missing information on the proposed quarry entrance location and background information on rail crossing interruptions that are not resolved here. One of the poster boards provided on June 11 shows peak hour traffic volumes to 2031 on the recommended preferred route, and supporting information for this information will be considered as part of the peer review by IBI Group. An estimate of the percentage of traffic that would be delayed at rail crossings is used in the short list comparison, but, again, supporting information is not provided. City staff were informed during a conference call on May 13, 2008 that the truck entrance is proposed to be on Milborough Line.
- 
- The unresolved issues raise questions as to whether the information and analysis provided to date is sufficient to support the selection of the short listed routes that were carried forward into the selection of the recommended preferred site that was to have been presented at Public Information Centre #4.

Summary of Transportation Analysis

As noted above, the transportation analysis is to be subjected to detailed review by CART's transportation peer reviewer; therefore these comments are provisional, pending that review.

- Page 2, Trip Generation and Distribution: The study team re-calculated the projected total number of trucks per day generated by the proposed quarry and arrived at the estimate of maximum truck traffic that had been established previously – 570 return trips per day or 1140 inbound and outbound trips.
- Although the proponent team's initial analysis indicates that all unmet aggregate demand would be to the northeast, this is not a reasonable real-world conclusion on which to base the likely distribution of truck trips. It is inevitable that truck trips will be made in other directions both to and from the site. Concerns earlier provided by City staff regarding the projected distribution of truck trips remain unresolved. Although Growth Plan information and mapping is provided, the actual anticipated distribution appears to be based on a more intuitive and short-term approach. Short-to-mid range trips that would not be made via Highway 401 (e.g. into Halton via Guelph Line and west along Campbellville Road) are not addressed.
- In terms of employee trip distribution, it is unclear as to how the 2006 Transportation Tomorrow Survey (TTS) conducted by the University of Toronto Joint Program was utilized in this analysis.

The intersection data provided in the report will be examined as part of IBI's detailed peer review.

Analysis Matrix

In some cases alternatives are rated in the range of low-medium-high, or there is information on the incidence of features potentially affected (stream crossings, for example), and in other instances both are provided. Some effects such as noise and air quality that depend to a degree on the number of trucks are expressed as a "truck exposure index" or a similar score or rating reflecting the number of affected features, sometimes the degree of effect, and the number of trucks. There is usually no specific description of potential mitigation or enhancement measures that would assist in determining how a net environmental effect was derived.

---

Particular items noted from the matrix are as follows:

- Information on natural heritage and land use features, for example, is not supported by mapping that would show reviewers where these features are. Conservation Halton has been asked to review the natural heritage information provided in the Baseline Conditions natural heritage report, and this will complement the review conducted by the City of Hamilton as described above.

- The City of Burlington has questioned the assignment of “sensitivity” levels to different types of land use in the land use evaluation, as well as comments on the degree of conformity with plans. This can be reviewed further by other affected municipalities during the more detailed review.
- The matrix provides information on the number of properties where there is potential for property removal to accommodate road widenings, but there are no maps showing where these widenings would occur.
- The Transportation evaluation includes information as to the percent chance of being delayed at level crossings, but there is no information on the length of such delays or the implications for mixed quarry and non-quarry traffic.
- Where information is provided on change in road function it should be noted that most of the increased traffic will comprise heavy trucks. Also, there is potential for existing/projected traffic to be redistributed if a quarry is implemented.
- It is not clear which road sections would undergo the estimated increase in traffic under the “Increase in Traffic” indicator.
- While effects on bicycle safety are said to be mitigated by the provision of bicycle lanes, the change in the nature of the use of the haul route has the potential to deter recreational and other cyclists from using the route, at least while the quarry is operating.
- The cost evaluation includes only horizontal and not vertical road alignment improvements.
- Highway #6 was included in all of the preferred routes, with different truck traffic levels depending on the route configuration, so the numbers and extent of features in the matrix reflect this for all alternatives. Under some criteria different impact values are identified for different sections of the route, whereas for others (such as potential for disruption to residents’ use and enjoyment of property), no distinction is made despite the differing character and the mix and volume of background traffic levels along different sections of the route.
- Ratings and information are provided for each alternative under each indicator, but are not aggregated by criteria or categories of criteria.

#### Evaluation Approach and Results

- The sequence of activities set out in the Terms of Reference for the Transportation Study indicates that the evaluation approach is to be provided to the Agency Review Group for review and comment before it is actually applied, however the proponent team has provided this information with its first draft of the evaluation materials.
- Alternative Route #3 is preferred to the other alternatives under the Aquatic Environment, Social and Community Impacts, Economic Environment and Business Impacts, Cultural and Heritage Resources and Transportation criteria groups. It is not preferred under the Terrestrial Environment, Land Uses and Costs categories, although none of these latter categories comprise “most important” categories. Alternative # 1 is indicated as the lowest cost option, but

the evaluation does not reflect additional haul costs resulting from indirect routes to primary markets – Route 3 is claimed to be the most direct.

- There is a brief narrative description of how different elements within each category were considered, however there is no supporting mapping to show where affected features and required right-of-way widenings are located. With the exception of mitigation of sight distances and the introduction of bicycle lanes, there is no explicit consideration of the availability and effectiveness of mitigation or enhancement measures as applied to potential environmental effects, so that it is unclear whether the preferences are as a result of full consideration of net environmental effects, as required by the Municipal Class EA, for example.
- For the “**quantitative evaluation**”, the description indicates that the proponent team assigned numerical weights to the criteria categories, criteria and indicators, to reflect their relative importance. These weightings are said to be informed by input from the public and agencies, but the process of deriving the weighting scheme is not explained. Table 2 shows these weightings by category, but not by criterion or indicator. While the highest weightings are given to the Social and Community Impacts (26) and Transportation (17) categories, the Aquatic (12) and Terrestrial (12) Environments are weighted separately. The City of Burlington has commented that the weighting scheme does not give sufficient consideration to the range of importance of categories, because all categories are given relatively high ratings. Also, the methodology appears to favour individual (Alternatives # 1-3) rather than combined (#4-5) routes.
- Levels of preference or performance ratings for each alternative route under each criterion were determined on a scale of 1 -10. These are based on values such as numbers of features, as a surrogate for actual environmental effects. The scores indicated for different levels of performance do not allow for a zero impact or zero value performance rating, and it is unclear how this affects the overall evaluation.
- The description indicates that minimum and maximum values of the range of conditions encountered (such as the range in the number of residences on the alternative routes) were used to define the range of effects from “low” to “high” (rather than a professional judgement of what actually is a high or low impact). This has the potential to distort the evaluation, for example where there is a narrow range of impacts that are, in reality, all “high” or “low”. At the same time, some ranges of values in the matrix do not cover the full range from “low” to “high”. Ratings are provided for some criteria in the evaluation matrix but not for others. Also, neither the matrix nor the description of the evaluation approach provide the weightings or the scores under each criterion or indicator.
- Table 2 indicates that the scores in the table are “weighted scores”, however the maximum score under each criteria category is 124 in every case. Since the

criteria categories have different weightings, it would be expected that the maximum weighted scores under each category would have been different, with higher maximum scores for the categories with the highest weightings. In their June 11 response the St Marys team identified an error in producing this table and provided a table with revised scores, however CART was not provided with the calculations that led to these new results.

- The range of total scores among the route alternatives was relatively narrow in the May 20 information, however it became wider with the submission of a revised table on June 11. The difference between preferred Route #3 and Route #1 is now 7.6%, which is still fairly narrow and susceptible to minor changes in weightings and values. The description indicates that sensitivity testing was done, using a range of weightings, but the weightings utilized and the results of this testing are not provided. Supplementary information was provided on the June 11 revised poster boards, but it still does not allow the sensitivity analysis to be traced.
- Potential effects on Highway 6 play a role in making Alternative Route 3 preferable to Alternatives 1 and 2. In some instances, however, no distinction is made between a feature such as a residence on Highway 6 and a residence on a more rural road.
- Overall, for both the qualitative and quantitative evaluations of the alternative routes the proponent team has provided details of findings under each of the criteria and indicators, and the overall results of the evaluation. At the same time, much of the information required to trace the identification of scores and preferences from the base data is not provided and the supplementary information provided on June 11 does not resolve this concern. It is possible that the proponent team intends to provide this information as part of its draft and final reports, however not enough information has been provided to fully test the validity of the evaluation process at this time.

#### Recommended Preferred Alternative and Potential Mitigation

This material includes a detailed description of design features of Alternative #3 and associated road improvements and mitigation measures. These will be examined in more detail as part of the review by CART's transportation peer review consultant.

- 
- The material concludes with a recommendation that "environmental assessment studies for the proposed road improvements (following the Provincial Class Environmental Assessment guidelines) are carried forward and involve public consultation". In fact any Class EA work would be conducted under the Municipal Class EA and/or Class EA for Provincial Transportation Facilities. Both of these documents require public consultation for prescribed types of project. The proponent does not indicate whether a screening will be required under the Canadian Environmental Assessment Act.

Display Boards for PIC #4

The hard copies of the draft display boards provided to the Agency Review Group are in a different order to those provided in digital format. The following commentary relates to and utilizes the numbering sequence of the hard copies, and the number in parenthesis is the digital format reference. The comments relate only to the substantive content of the transportation study as reflected on the display boards, particularly where information is presented that does not appear in the background materials, and not to details of format.

- *Board 8 (7) Implementation of Haul Route Study Recommendations*  
Does the proponent team anticipate a need for an Official Plan Amendment to implement the proposed haul route? Note that the only likely trigger for CEEA would be a requirement for a permit under the Fisheries Act.
- *Board 10 (21) PIC #2 Results*  
Note that under item 20 the proponent has committed to be responsible for “development costs associated with the accommodation of quarry trucks”. This should include a statement as to whether this includes all of the cost of implementing Alternative 3 as currently proposed. Under item 34, we suggest that the proponent maintain a web archive of all material posted on its website, rather than removing material as time goes on. Overall, responses to comments are very brief.
- *Board 12 (31) PIC #3 results*  
For Item 28, it should be noted that the proponent owns additional lands adjacent to the quarry that could be used for an expansion at some future date. Again, responses to comments are very brief. While PIC#3 was intended to obtain input on the evaluation approach and the importance of the evaluation criteria, this information is not included in the display.
- *Board 15 (12) Preliminary Constraints Map*  
The proponent should provide mapping of land use and natural heritage and other features and areas where additional right of way width will be required so that PIC attendees can readily identify effects on their own properties and neighbourhoods. St Marys provided sample mapping of the required ROW in their June 11 supplementary materials, but no additional mapping of other features.
- *Boards 16-21 (14-18): Individual Alternative Haul Route Maps*  
None of the maps show the proposed access between the proposed quarry and the public road system (the proponent team has informed Hamilton staff that the access would be onto Milborough Line). There is potential for the access itself to generate environmental effects that should be considered as part of the haul route selection process.

The recommended section types all show cross sections as accommodated within existing rights – of – way, whereas the evaluation indicates that additional property will be required to widen rights-of-way in some areas.

- There is a proposal to improve visibility on Campbellville Road west of Milborough Line, even though this section of Campbellville Road is not on a proposed haul route. This appears to recognize that some haul trucks will use this route even though the proponent has indicated it can enforce adherence to a formally defined haul route. The “improvements” on Milborough Line comprise reconstruction, widening, bicycle lanes and a 50km speed limit. These design details will be considered as part of the detailed peer review to be conducted for CART.

### **3. Conclusion**

These interim comments are provided to assist the St Marys team in reviewing its haul route evaluation and selection process. Findings presented here may be modified as part of CART’s continuing review of the PIC #4 materials.

---

---

## **APPENDIX B**

---

### **Cross-Section Design And Analysis**

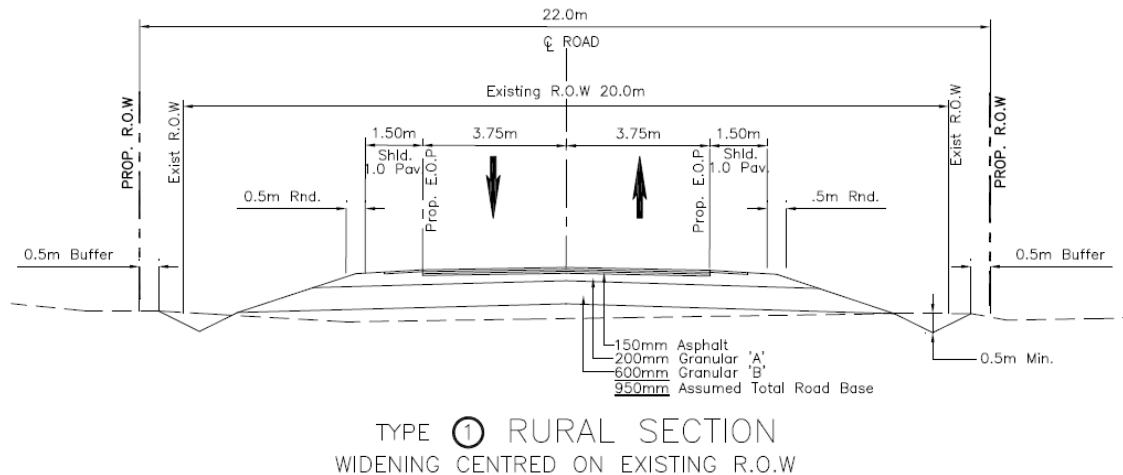
# CROSS-SECTION DESIGN AND ANALYSIS

For this study two types of cross-sections are proposed: rural (requires property acquisition) and urban (within the existing right-of-way). For the purpose of the analysis the rural cross-section was applied as it has the most significant impacts due to property acquisition and was therefore deemed more conservative. However, given the challenges that can be associated with land acquisition, the urban design that fits the existing right-of-way was also given consideration. It was concluded that this design would not require land acquisition however it would have a more significant impact on the existing character of the road and has a higher associated cost of construction.

Figure 1, Figure 2, Figure 3, and Figure 4 illustrate the proposed road bed design and shows rural and urban alternative cross-sections for both Type 1 and Type 3 sections.

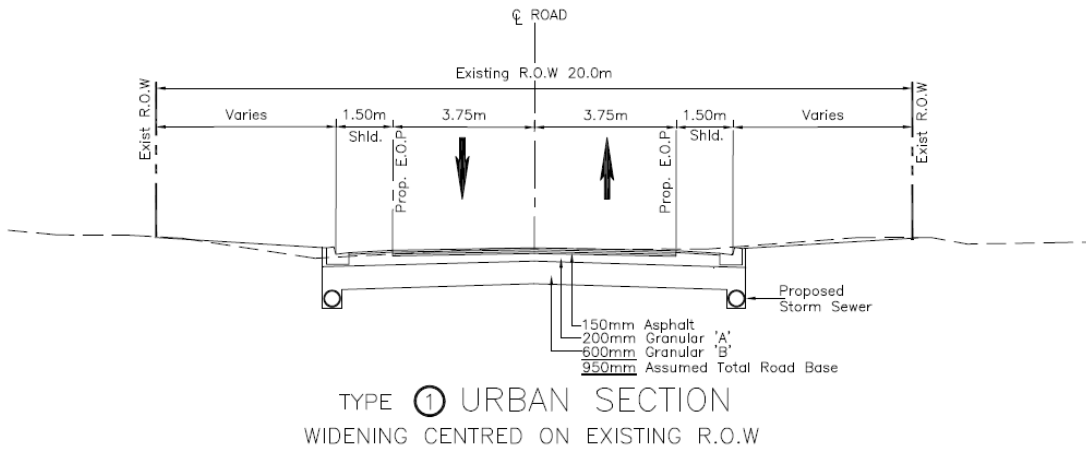
## Type 1

With the rural cross-section the proposed right-of-way is 2.0m greater than the existing 20m right of way. This cross-section allows for 3.75m travel lanes, 1.0m paved shoulder, 0.5m gravel shoulder, 0.5m rounding, and a drainage ditch.



**Figure 1: Type 1 Rural Cross-Section**

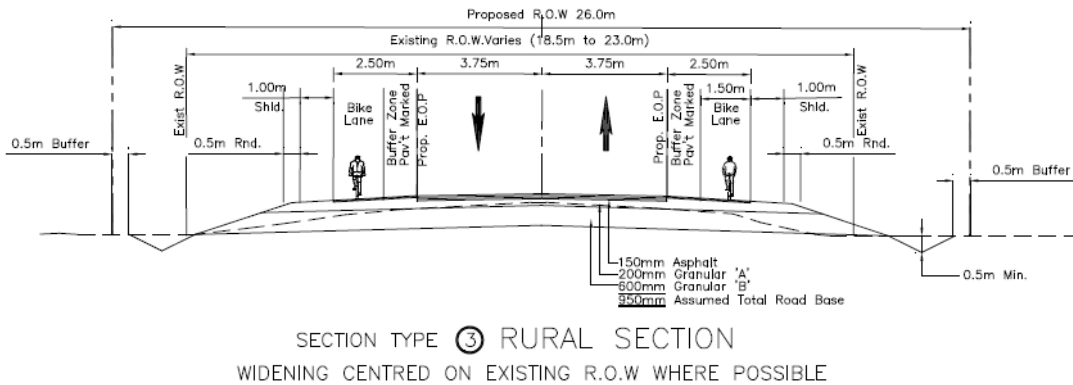
With the urban cross-section the proposed right-of-way fits into the existing 20m right-of-way. The cross-section allows for 3.75m travel lanes, and a 1.5m paved shoulder with curb and gutter.



**Figure 2: Type 1 Urban Cross-Section**

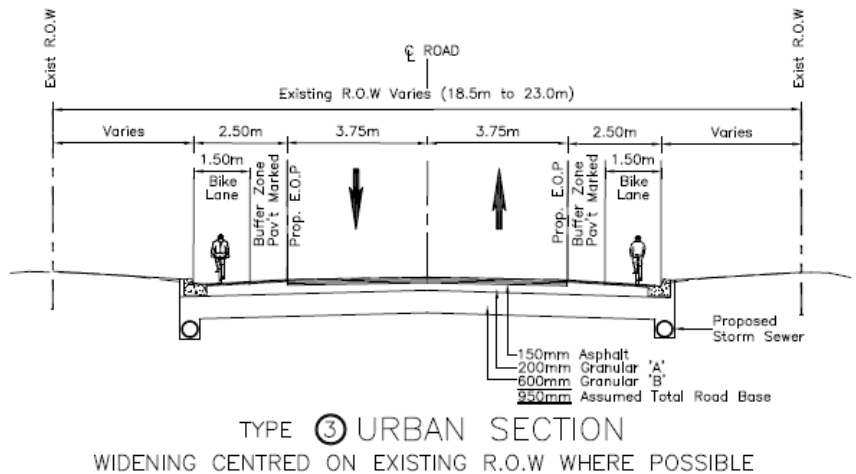
**Type 3**

With the rural cross-section the proposed right-of-way is 3m to 7.5m greater than the existing right-of-way depending on the varying existing cross-section. This cross-section allows for 3.75m travel lanes, 1.0m paved buffer, 1.5m paved bike lane, 1.0m gravel shoulder, 0.5m rounding, a drainage ditch and a 0.5m buffer.



**Figure 3: Type 3 Rural Cross-Section**

With the urban cross-section the proposed right-of-way can be fit into the existing right-of-way that varies from 18.5m to 23m. The cross-section allows for 3.75m travel lanes, a 1.0m paved buffer, a 1.5m paved bike lake, and curb and gutter with a minimum boulevard of 3m.



**Figure 4: Type 3 Urban Cross-Section**

It is important to note that both Type 1 and Type 3 section designs do not account for any changes in the existing profile and assume that widening is at existing profile grade.

While the urban cross-section fits into the existing right-of-ways, the storm sewer infrastructure and appurtenances increase the construction costs approximately 50 percent over the rural design. It is a trade off between the cost (and challenge) of purchasing land and constructing a more expensive infrastructure.

Applying the rural cross-section that would require land acquisition is a conservative approach for haul route comparative evaluation purposes. The decision on which cross-section to move forward with would be decided at the detailed design stage of an Environmental Assessment when pavement recommendations are finalized. Typically, resolution of the design details would occur during the subsequent Municipal Class EA process.