6. ALTERNATIVE TRANSPORTATION SOLUTIONS

In keeping with the Terms of Reference for this study, the study team undertook a review of alternative modes/solutions for the transportation of quarried material from the proposed St. Marys site. Two main transportation alternatives were considered:

- Rail
- Road

Given the character of the Amabel Dolostone market, it is expected that the proposed quarry will largely serve customers in the Region of York and the City of Toronto to the northeast of the quarry. The quarry will serve multiple customer destinations. These destinations can change constantly as a result of construction projects reaching completion and new projects being started.

The following sections outline the economic and environmental implications of adopting a rail or road transportation solution. As required by the Terms of Reference, special attention is given to the environmental implications.

Section 6.1 considers aggregate production and transportation policy in Southern Ontario. **Section 6.2** examines the implications of choosing rail. **Section 6.3** considers two rail options (a northern spur and a southern spur from an existing rail line). **Section 6.4** considers the environmental implications of the two rail options and the need for supporting new rail facilities at the quarry site. **Section 6.5** examines the implications of choosing road. **Section 6.6** summarizes the analysis of road and rail options, and selects the preferred mode of transport.

6.1 Aggregate Production and Transportation Policy in Ontario

The City of Hamilton and the Ministry of Natural Resources (MNR) provide insight into Ontario's policy regarding the production and transportation of aggregates.

MNR emphasizes the economic and environmental importance of minimizing hauling distances: "Approximately 85% of total aggregate production takes place in southern Ontario where the demand for aggregates and aggregate-derived products is the highest. The cost of transportation is estimated to be approximately 60% of the total cost of aggregate. Therefore, the economic value of an aggregate deposit is based not only on the quantity of the deposit, but also how close the deposit is to its final destination. Extracting aggregate resources close to where they are being utilized can also be considered the most environmentally sensitive

alternative. Trucking resources long distances increases greenhouse gas emissions, which is one of the top environmental concerns in the world today[33]."

The City of Hamilton's Goods Movement Policy Paper[34] points out that "The rail mode is primarily used for long distance bulk good" and that "the opportunity for expansion of short-haul rail services in the GTA and City of Hamilton area is limited." The paper also points out that "it is estimated that two-thirds to three quarters of the truck traffic movements in the GTA and Hamilton are captive markets since they cannot be served by rail." The paper recognizes that "The biggest opportunities for rail are probably in the intermodal sector, moving goods manufactured and assembled in the GTA and City of Hamilton area and surrounding areas to and from other locations across Canada."

Although policy appears to favour road haulage for short distance, the project team considered rail as well as road haulage for the proposed quarry.

6.2 Rail Alternative

The single greatest advantage to using trains to transport aggregates from the quarry is that there would be relatively few aggregate trucks in the vicinity of the quarry. As suggested in **Section 6.1,** there are, however, a number of serious problems associated with rail:

- In particular, most aggregate customers do not have access to rail service. Rail does not serve most of the quarry's potential near term customers.
- New markets for aggregates are also unlikely to be served by rail.
- The rail alternative implies using trains to transport the aggregates from the quarry to:
  - A few destinations with direct rail access
  - A transfer station (possibly more than one transfer station), and then by truck to multiple destinations
- As there is no existing rail service at the quarry site, it would be necessary to construct a new rail spur from the existing Canadian Pacific (CP) rail line to the quarry. It is estimated that the rail spur would be one to two kilometres long and would require significant new construction and substantial land acquisition.
- A new spur line might have an environmental impact on the lands affected by construction and operation.
- To reach the quarry, a new spur line would require a new level rail crossing (on Milburough Line).
- New aggregate handling and transport facilities would be required at the quarry
- New aggregate handling, transfer and transport facilities would be required at each customer's site the quarry.

[33]Ministry of Natural Resources, "Managing Aggregate Resources." http://www.mnr.gov.on.ca/en/Business/Aggregates/2ColumnSubPage/STEL02_167024.html. (August 13, 2008)

[34] IBI Group, "Development of Policy Papers for Phase Two of the Transportation Master Plan for the City of Hamilton Goods Movement Policy Paper-Final Report," January 2005.

- If aggregates are transported to a transfer station and then transported by truck to individual customers who have no rail service, land would be required for the transfer station, and new handling, transfer and transport facilities would be required at the transfer station.
- The transfer station option requires triple handling of the aggregate material. Aggregates must be brought by truck to quarry railhead, transferred to the train, and then transferred back to a truck to travel to the final destination. Multiple handling of material is not efficient, adds to the cost of the material, and increases delivery times.

6.3 Two Options for Building a Spur Rail Line to the Quarry Site

Despite the business and logistical problems associated with rail, the possibility of bringing a spur line to the quarry site was examined in detail. The analysis examined the environmental impact of a spur line. Land ownership and other non-environmental factors were not considered.

Exhibit 6-1 shows the ecological land classification (ELC) mapping completed for the property and surrounding area. (The map was created by Stantec Consulting.)

Exhibit 6-1 shows the natural features that might be affected by choosing rail to transport the aggregates. The natural features include:

- Provincially Significant Wetlands (PSWs – Ministry of Natural Resources (MNR))
- Ecologically Sensitive Areas (ESAs – City of Hamilton)
- Deer wintering areas (MNR)
- Watercourses

There are two rail lines in the study area: the CP Hamilton Subdivision, and the CP Galt Subdivision. The CP Hamilton Subdivision runs roughly north-south just east of Centre Road, and then intersects Milburough Line near Concession 10 E and McNiven Road at 3rd Sideroad before intersecting the CP Galt Subdivision at Guelph Junction. This line is shown in black in **Exhibit 6-1**. The CP Galt Subdivision runs east-west crossing Campbellville Road just east of Twiss Road and remaining north of Campbellville west of Twiss Road. This line is shown in **Exhibit 3-1**.

The new rail spur would run east from the site and connect to the CP Hamilton Subdivision. Two alignments were considered. The northern option (marked in red and labelled 1 in **Exhibit 6-1**) is discussed in **Section 6.3.1**. The southern option (marked in red and labelled 2 in **Exhibit 6-1**) is discussed in **Section 6.3.2**. These two alignments were selected to avoid ESAs, PSWs and deer wintering areas as much as possible.

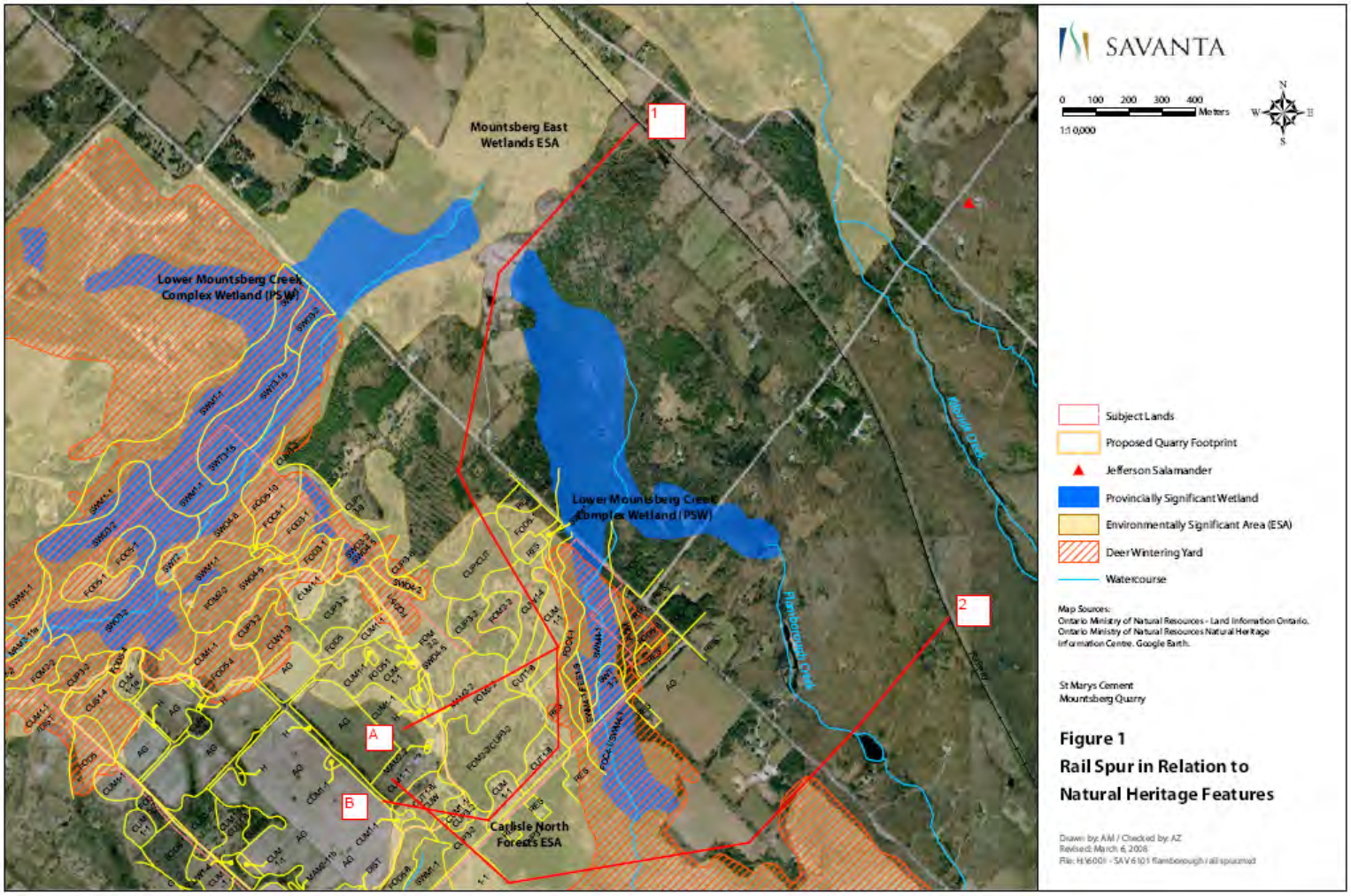

Exhibit 6-1: Potential Rail Spur in Relation to Natural Heritage Features

6.3.1 Rail Spur 1 – Northern Route Option

The northern rail spur option is 2.2 km long and crosses through woodland, but avoids intrusion into the ESAs and the deer wintering areas. The spur includes one road crossing, at Milburough Town Line. It enters the quarry property from the north and travels south and then west into the quarry property, mainly through disturbed cultural vegetation communities (plantations, woodland, thicket, and meadow). Intrusion into the more mature woodland communities is minimized. Where the cultural communities end, the rail spur traverses a band of more mature woodland before entering the proposed quarry footprint.

Two options (A and B in **Exhibit 6-1**) for crossing the more mature woodland were considered. Option A is shorter and cuts through a woodland unit that is less mature than surrounding units. Detailed field inspections suggest that Option A would have limited effects on the ecological characteristics of the remaining woodland. Option B passes through an area dominated by cultural communities, but we understand that limited space is available for the spur (i.e. the area would be constrained by berm construction, etc.).

6.3.2 Rail Spur 2 – Southern Route Option

The southern rail spur option is 1.7 km long. The alignment includes two road crossings, the first at Milburough Town Line to the west, and the second at 11th Concession to the north. The southern alignment travels from the main line through a treed swamp/lowland forest and a coldwater tributary of Flamboro Creek (i.e. a fish habitat). After crossing the Town line, but before the 11th Concession, the alignment passes through a deer wintering yard, and then crosses a second tributary of Flamboro Creek. After entering quarry property, the rail spur crosses a cultural meadow and a short band of mature woodland (White Pine Plantation) before reaching the quarry footprint.

6.4 Environmental Implications of the Rail Spur Options and New Rail Facilities at the Quarry Site

Table 6-1 summarizes the two rail spur options' key intrusions into natural features. Both alignments have effects on the local landscape and the natural heritage features and functions. The table shows that the northern alignment has fewer environmental effects than does the southern alignment.

Table 6-1: Key Intrusions into Natural Features

CRITERIA	NORTHERN ALIGNMENT	SOUTHERN ALIGNMENT
Approximate length	2.2 km	1.7 km
Intrusions into ESA	Yes – similar extent	Yes – similar extent
Intrusions into Deer Wintering Area	No	Yes – through approximately 300m of delineated habitat
Watercourse Crossings	No	Two
PSW Intrusions	None	None
Woodland Intrusions	Yes - similar	Yes - similar

Although the northern alignment minimizes the potential for direct environmental effects, the use of rail would require the creation of loading facilities (and perhaps other ancillary features) that would consume some additional lands and would result in additional indirect environmental effects.

The potential direct and indirect environmental effects of using rail are:
- Some forest removal (mature and cultural communities)
- Intrusions into the ESA
- Removal of some area of cultural meadow east of Milburough Line

The final extent of the rail spur options' environmental effects can, of course, only be assessed when final designs and alignments are considered.

6.5 Road Alternative

Road is the most common transportation choice for aggregates because transporting aggregates by truck has some important advantages over rail:
- As road transport is highly flexible, it is easy to serve multiple destinations directly from the quarry, and it is easy to accommodate changing customer patterns and requirements.
- Only one mode of transport is required, eliminating the need for transfers between train and truck.
- Road is regarded as the most cost-effective mode of transport.
- If road transportation is chosen, it is not necessary to build a new rail spur line through the surrounding natural environment.
- If road transportation is chosen, the need for expensive new rail infrastructure is minimized.

Road is also associated with several disadvantages. Truck traffic would increase on the designated haul route(s) in the vicinity of the quarry. Additional truck traffic implies an increase in traffic delay, congestion, noise, dust, vibration, and other disturbances to residents. Safety and the potential impact on the community and the natural environment must also be considered.

6.6 The Preferred Mode of Transport

The advantages and disadvantages of rail and road transportation, and the policies of MNR and the City of Hamilton were reviewed. The findings suggest that the preferred mode of transportation for the proposed quarry's aggregates is road.

The transport of aggregates by truck from the quarry directly to customers has major advantages in terms of cost and efficiency. In particular, only trucks can transport the aggregates directly from the quarry to each customer. In addition, the environmental disadvantages of trucks (upgrading of roads, increased traffic, and various types of pollution) are not overcome by choosing rail as an alternative. Mitigating measures will, of course, be introduced to counter the environmental disadvantages of trucks.

The cost advantages of hauling heavy loads by rail do not apply to the short distances between the proposed quarry and most of its customers. Rail would require investment in a new spur line from the quarry to the existing rail line. Even if this spur were built, most customers would still require truck delivery. As a result, rail requires investment in a new spur line, new rail facilities at the quarry site, and a transfer station (possibly more than one transfer station) where the aggregates would be transferred to trucks for delivery to multiple destinations. The new rail line and supporting infrastructure would require an additional level rail crossing across Milburough Line, and would be at the expense of environmentally sensitive habitats including mature woodland, areas used by deer, meadows, and watercourses used by local fish species.

7. ALTERNATIVE STRATEGIES FOR QUARRY TRUCKS

7.1 Alternative Strategies

There are two alternative strategies for quarry trucks. The selected alternative strategy will have a considerable influence on the selection of alternative haul route(s). The following section explains each alternative strategy in detail.

7.1.1 Alternative Strategy 1 – Quarry Trucks Permitted To Use Available Truck Routes

One option for the proposed quarry is to allow trucks to travel on roads where trucks are currently permitted but subject to load restrictions. Since Concession 11 E and Milburough Line are located adjacent to the proposed quarry, they are included for this alternative strategy as routes that would be available to trucks. These roads are illustrated in **Exhibit 7-1.**

By allowing trucks to use the shortest routes, this alternative has the major advantage of minimizing transport costs, road upgrades, and greenhouse gases emissions.

However, this alternative of permitting quarry trucks to use any available truck route where they are currently permitted is <u>not</u> being carried forward for two main reasons. The first reason is that truck traffic would increase on many more roads throughout the study area. The second reason is that the quarry truck traffic would affect many more residents within the study area.

Exhibit 7-1: Long List of Alternative Haul Routes

For these reasons, St. Marys is proposing a different strategy involving designated haul routes which would prohibit quarry trucks from using any road that is not a designated haul route.

7.1.2 Alternative Strategy 2 – Quarry Trucks Must Use Designated Haul Routes

St. Marys is proposing a haul route strategy for the proposed quarry, where quarry trucks would be compelled to travel on designated haul routes only. Quarry trucks would be prohibited from using any road that is not part of a designated haul route.

How can St. Marys compel quarry trucks to use only the designated haul route? Optional measures could include, but not be limited to:

- Traffic signage to designate the haul route(s);
- Truck prohibitions on roads that are not part of the haul route(s);
- Enforcement using hired police;
- Penalties for truckers who deviate from the designated haul route(s);
- "Hot line" for residents to call about quarry trucks that deviate from the designated haul route(s); and
- Additional options to compel trucks to use the designated haul route(s) are being considered.

7.2 Tools to Control Truck Traffic

One of the issues that has been raised is ensuring that truckers adhere to the designated haul route(s). At other locations, St. Marys has found that a process that is centred on their Truck Haulage and Safety Policy has been effective. The following sections outline St. Marys' truck policy and provides a case study of how it was effectively applied at their Limehouse Pit.

7.2.1 St. Marys Truck Policy

The following outlines CBM Aggregates, a division of St. Marys Cement Inc. (Canada) ("CBM"), Truck Haulage and Safety Policy that was first issued in June 2004 and revised in March 2007.

7.2.1.1 Purpose

This policy is designed to ensure:

- the occupational health and safety of all of CBM's employees, carriers, independent brokers, independent contractors and members of the public; and
- independent truck drivers hauling material off CBM property shall follow prescribed rules on and around CBM's operations.

CBM is committed to meeting or exceeding all of the legal requirements, duties, and the standards set by the applicable provincial health and safety legislation and highway traffic legislation.

7.2.1.2 Scope

Geographical: This policy is not limited specifically to CBM's sites, but also extends to the arterial routes that surround all of CBM's operations.

Persons Covered: This policy applies to:
- all carriers, independent brokers, independent contractors engaged to haul aggregates for CBM (referred to herein as "Carriers"); and
- CBM employees.

7.2.1.3 Responsibilities and Tasks of Carriers

Carriers will comply with the following rules, and will be responsible to ensure that all of their employees, agents or contractors who drive trucks will comply with the following rules:

1. Compliance with Policy and Laws. All drivers must have a full understanding of CBM's Aggregates Truck Haulage & Safety Policy, as amended from time to time, the ***Ontario Occupational Health and Safety Act***, the ***Highway Traffic Act*** and its regulations, and adhere to the safe work procedures as detailed therein. Carriers will abide by all applicable federal, provincial, municipal laws and regulations, including by-laws and hours of operation.
2. Trucks shall not pass vehicles of any class on entrance haul roads at any CBM location and must observe the right of way.
3. There is no unnecessary stopping or parking on entrance inclines at any CBM location. In the event of breakdown, trucks must have wheels chocked and display warning flares or reflective indicators.
4. All trucks must be equipped with a properly functioning backup safety alarm and be maintained in accordance with the provisions of the Highway Traffic Act, and its regulations.
5. Drivers must remain in their vehicles at all times when on CBM property except for the following designated areas: overload areas, scale house, tarping areas and "Designated Areas".
6. When drivers are out of their vehicles in the Designated Areas they must wear a safety vest, safety footwear and it is strongly recommended that drivers take reasonable precautions by wearing hard hats as well.
7. Drivers must tarp and inspect all loads, clean loose material from tailgates and sideboards at the tarping or overload areas only.
8. Drivers must obey all signs posted on CBM property and follow instructions issued by CBM staff while on CBM property.
9. After a load has been completely emptied at the stockpile area, the box must be lowered completely before the driver leaves the area. Under no circumstances should a driver have the truck in motion while the box is being lowered.
10. The use of intoxicating substances such as drugs and alcohol will not be permitted at CBM locations at any time. Persons under the influence of any intoxicating substance will not be allowed entry to CBM property.

11. CBM reserves the right to refuse to issue a weigh bill to a driver if the truck exceeds its gross allowable weight limits, or the driver cannot supply information as required.
12. Vehicles in excess of their MTO Gross Weight Documentation must dump surplus material before a loading ticket will be issued, with no exceptions.
13. Trucks must tare in every day. These measures are necessary to comply with the Ontario Highway Traffic Act.
14. For any change in trailer configuration, drivers must supply a new Gross Allowable Weight document issued by the Ministry of Transportation to each CBM location that the truck hauls from.
15. All drivers must be aware of Ontario Regulation 213/91, as amended by Ontario Regulation 628/05, Construction Projects, made under the Occupational Health and Safety Act, ("Construction Projects Regulation"), regarding safe distances from overhead power lines.
16. Drivers must be polite and courteous to local residents and avoid excessive engine noise including the use of engine brakes, except where safety considerations would merit such use.
17. When specified for a particular site, trucks are expected to follow designated haul routes.
18. Drivers must sign all free on board (FOB) tickets at the time of issue. All delivery tickets must be signed by the drivers and customers and returned to a CBM location preferably by the next business day.
19. Documentation Requirements. All Carriers must have, and supply CBM with, the following information upon initial entry onto the CBM premises (the "work place"), and thereafter upon request of CBM :
    a) Valid Driver's License for the class matching the type of vehicle driven;
    b) Ministry of Transportation Registered Gross Weight documents;
    c) A copy of vehicle permit (showing the owner of the vehicle and the registered gross weight of the vehicle);
    d) Proof of Insurance coverage, minimum of $2,000,000 (TWO MILLION DOLLARS);
    e) Valid Workplace Safety and Insurance Board ("WSIB") Clearance Certificate renewed every sixty days, or Independent Operator Clearance Certificate;
    f) Proof of valid C.V.O.R. certificate, maintained at an acceptable violation rate in accordance with the Ministry of Transportation's "Ontario's Safety Rating and Commercial Motor Vehicle Registration System Public Guideline"; provide a CVOR level II abstract upon request; and
    g) Proof of a current valid Annual Inspection Sticker and Certificate issued pursuant to the ***Highway Traffic Act***.

7.2.1.4 Violations by Carriers

Carriers which violate any of these rules will receive a maximum of two warnings. CBM will verbally warn the driver and will send a written warning to the Carrier. In the event that a third warning is given to any given driver, CBM reserves the right to:

a) Refuse to load a truck operated by that driver at any or **ALL CBM** locations;
b) Require that the Carrier replace that driver for any haulage services to be provided for CBM; or
c) Terminate its agreement with the Carrier.

In the event of a serious infraction of this policy, CBM reserves the right to suspend a driver's loading privileges without issuing any prior warnings.

7.2.1.5 Responsibilities of CBM Employees

CBM employees who deal with Carriers have a responsibility to:

1. Ensure Carriers and drivers follow the policy set out above;
2. Immediately report trucks that do not follow this policy by way of the Contact Record Form. This form shall be submitted to the appropriate CBM personnel. Upon receiving the Contact Record Form, CBM shall take appropriate action to correct the infraction; and
3. Make certain that there are no exceptions to this policy.

St. Marys works diligently to monitor and enforce the above policy and takes corrective action if necessary. If a complaint is filed and corrective action is required a Contact Record Form is issued that documents the date of the complaint, person complaining, explanation of their concern, and action taken to correct their concern. This process results in a corrective action and a routine follow up is carried out.

7.2.2 Limehouse Pit Case Study

It is our recommendation that a designated haul route is the best approach combined with St. Marys Truck Haulage and Safety Policy. This policy has been applied successfully at other locations such as the Limehouse Pit in Halton Hills.

The Limehouse Pit is located north of the 401 close to the village of Limehouse. The site had many unique challenges and resulted in a single haul route that requires all trucks travel east from the site regardless of which direction they need to go. The haul route is from Highway 7 onto Sideroad 22, through the village of Limehouse to 5th Line. The main entrance is on 5th Line (**Exhibit 7-2**).

Exhibit 7-2: Location and Haul Route Illustration for the Limehouse Pit

St. Marys encourages local residents to call them directly with concerns about the quarry trucks and whenever possible provide them with the license plate number in order for them to take the appropriate action. This has been effective in the past to keep trucks on the designated haul routes. The feedback from the local municipality was encouraging stating, “Halton Hills staff has experienced positive corporate responses from CBM SMC to haulage related issues.” Local police explained that no issues have been brought to their attention concerning trucks not adhering to the designated haul routes.

Based on previous successes and benefits of using a designated haul route, Alternative Strategy 2 was selected and carried forward in the haul route evaluation.

7.2.3 Design Features

Wherever possible, the design of recommended road alterations will facilitate truck movements in the direction of the selected alternative haul route and prevent un-designated movements. In combination with signage, these measures would include the strategic use of geometric design tools, raised medians, and concrete curb and gutter features in the design of the site access and recommended intersection alterations.