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Dear Sirs:

SUBJECT: ROCKFORT QUARRY PEER REVIEW – TRAFFIC IMPACT AND HAUL ROUTE COMPONENT

1.0 BACKGROUND

In December of 1998 we completed a peer review of the Truck Haul Route Study for the proposed Rockfort Quarry in the Town of Caledon as prepared by Cole, Sherman & Associates Ltd. (now URS Canada Inc. and referred to herein as URS). Furthermore, in September of 2003 we completed a further review of additional information provided in response to our first peer review.

Our previous peer review concluded that URS had not fully addressed all of the requirements specified in Official Plan Amendment 161. More specifically, we had identified the following:

1. The traffic counts, collision records, road conditions and other information needed to be updated.
2. The updated Traffic Impact Study needs to ensure that all the requirements outlined in the OPA 161 are addressed.
3. The updated study should address a horizon year of 2008 and a longer term horizon of 2021.

4. Although MMM agrees that the identified truck haul route is the preferred one, this needs to be re-evaluated and confirmed based on updated conditions, information and requirements as set out in OPA 161.
5. The truck haul routes to the west, north-west and south-west should be identified.
6. If Winston Churchill is identified as a secondary truck haul route, the required road improvements should be identified and evaluated.
7. The Traffic Impact Study should be expanded to include downstream impacts to Highway 410. Three scenarios were to be assessed:
 - o No extension of Highway 410
 - o Highway 410 extended through to Mayfield Road
 - o Highway 410 extended through to Highway 10
8. That additional information be provided to justify the Adjala Pit site as an appropriate proxy site.
9. If Winston Churchill is not identified as a secondary truck haul route, then the entrance to the quarry should be modified to physically preclude trucks from turning to/from the west along Olde Baseline Road.
10. The improvements to the roads along the truck haul route should be updated.

Subsequently in May, 2005 URS submitted an updated Traffic Impact and Haul Evaluation Report (four volumes) with respect to the proposed Rockfort Quarry in the Town of Caledon.

That report assessed various truck haul routes, and determined that the most appropriate haul route is Alternative B, consistent with their previous recommendations. The preferred route includes:

- Olde Baseline Road from the quarry entrance to Mississauga Road
- Mississauga Road from Olde Baseline Road to King Street
- King Street from Mississauga Road to Highway 10

In the case of intersection operations, these were based on traffic counts from 2003 factored to 2006, 2009 and 2012 conditions, the latter being when maximum production is expected to start. The intersections analyzed included:

- Olde Baseline Road at Mississauga Road,
- Mississauga Road at King Street,
- King Street at Highway 10.

These were the only intersections that were analyzed as part of the May, 2005, study.

Although a preliminary review of their May, 2005 documents had been undertaken by MMM in 2005, the peer review was suspended, awaiting further information and updates from the James Dick team.

URS Canada Inc. issued an Addendum to the Rockfort Quarry Town of Caledon Traffic Impact and Haul Route Evaluation Study Report in July, 2008. This very brief Addendum report relies heavily on the previous reports prepared by URS/Cole Sherman and Associates Ltd.

The current peer review by MMM reflects both the Addendum report as well as the previous 2005 more comprehensive report since the Addendum report supplements and updates some of the previous work, but does not replace it. For example, road conditions were not updated in the 2008 Addendum report.

1.1 ASSESSMENT WITHIN CONTEXT OF THE 2003 PEER REVIEW

The above noted recommendations arising from the MMM 2003 peer review have been addressed by URS in their subsequent submissions as follows:

1. Traffic counts, collision records, road conditions and other information were updated up to 2003 in the 2005 report. Traffic counts were further updated to 2006/2007 conditions in the July, 2008 Addendum report. These reflected available data from MTO and the Region of Peel. URS also undertook traffic counts in June, 2008, which were also reflected in the Addendum report. No update to the collision analysis was undertaken in the Addendum report. The report notes that “the Region of Peel was contacted for more recent collision data for the study area but this information is not readily available.” (p.5)
2. For the most part, the requirements of OPA 161 have been addressed. Section 2.2 herein discusses this in further detail.
3. The horizon years have been updated to 2011, 2014 and 2017 in the Addendum report. The horizon year of 2021, which was recommended in 2003 has not been considered. Given the passage of time, a horizon year of 2025 is now recommended.

4. The comparative analysis of alternative truck haul routes has been updated in the Addendum report.
5. Secondary truck haul routes have still not been identified, notwithstanding the fact that local deliveries were noted as anticipated to occur.
6. Winston Churchill has not been identified as a secondary haul route, as no secondary routes have been identified.
7. An analysis of impacts to Highway 410 has not been provided, however, reasons were detailed in Section 9.C.6. of the May, 2005 URS report (Volume 1).
8. Additional information to justify the Adjala Pit as a proxy site has not been provided.
9. Although the current entrance design has been modified to indicate a large radius at the north-east corner of the site driveway intersection with Olde Baseline Road and only a 5 metre radius at the north-west corner of this intersection, this would still not physically preclude an eastbound left turn into the site.
10. Further information regarding necessary improvements to the preferred truck haul route was provided in Sections 6.E and 7.E. of the May, 2005 URS report (Volume 1).

2.0 ASSESSMENT WITHIN CONTEXT OF OFFICIAL PLAN POLICIES

2.1 TOWN OF CALEDON OFFICIAL PLAN AMENDMENT 161 POLICIES

As noted in MMM's 2003 Peer Review, OPA 161 distinguishes between lands identified as Aggregate Resource Lands and those identified as "Aggregate Reserve Lands". The subject lands have been identified by the Town of Caledon as "Aggregate Reserve Lands"; however, this designation is contested by James Dick and is one of the issues to be determined by the OMB.

Section 5.11.2.4.14 in OPA 161 notes that the following information needs to be addressed in a Traffic Impact Study for Aggregate Resource Lands:

- “(a) the proposed haul route(s) which may be necessary to service potential markets;
- (b) land use, land use activities and the character of adjacent lands (including any significant environmentally sensitive features) along the proposed haul route,

including the identification of existing and permitted land uses that may be significantly affected by the proposed haul route. With respect to those roads identified in Section 5.11.2.5.1, this information will only be required for those lands in the immediate vicinity of the proposed pit or quarry;

- (c) an evaluation of alternative haul routes and the identification of the haul route(s) with the least impact;
- (d) the physical characteristics of the potential haul routes including road classification, load limits, surfacing and character (e.g. rural, scenic) and the identification of any physical constraints to heavy truck traffic, such as vertical or horizontal curves, sight lines or shoulders;
- (e) anticipated increase in traffic generated by the proposed extractive operation, and any increase in background traffic;
- (f) description of the proposed operation including the phasing where applicable, and resulting trip generation, distribution and vehicle composition;
- (g) the horizon year that will be used in determining future impacts;
- (h) assumptions concerning passenger car equivalents;
- (i) traffic impacts (both operational and physical) resulting from the truck traffic generated by the proposed operation, including impacts on road structure, traffic flow and safety and the mitigation measures required to address these impacts;
- (j) whether improvement of the roads proposed to be used as a haul route(s) is necessary, the costs of such improvement, any anticipated impacts on significant environmental features affected by such improvement, and whether an Environmental Assessment is required for this improvement;
- (k) the status of the road in the Region of Peel and Town of Caledon Official Plans and whether the proposed use of the road as a haul route conforms to these planning documents; and
- (l) distance from the entrance of the proposed operation to the nearest haul route as defined in Section 5.11.2.5.1.”

2.2 CONFORMANCE WITH RESPECT TO OPA 161 POLICIES

Previously, the report submitted in 1998 was termed “Truck Haul Route Study”, although it was essentially a Traffic Impact Study. The May, 2005 report has been termed “Traffic Impact and Haul Route Study” and addresses both aspects. The 2008 Addendum was with respect to the 2005 Traffic Impact and Haul Route Evaluation Study Report.

The applicant has in both the 2005 and 2008 reports re-evaluated all considered haul routes and has selected the best available route to the primary market area. We are in agreement with their selection to service the primary market areas based on the information presented.

A Traffic Impact Study is required by Policy 5.11.4.2 (b) of OPA 161. The items to be included in the Traffic Impact Study have been generally addressed, however, some of them in not as much detail as required by the policies outlined in OPA 161. More explicitly, the information provided does not meet all of the requirements specified in Section 5.11.2.4.14, as follows:

- (a) As already mentioned, a proposed haul route for the primary market (to the south and south-east of the proposed site) is identified in the report. Three alternatives are evaluated in Section 7 of the report. Alternative B was found to be the best option. With respect to secondary truck haul routes, the 2005 report states that any demands from other market areas “would likely be minimal and would be considered as local deliveries” (Section 9.A.2). Local deliveries can occur only once to a specific location, or can occur occasionally, but on a repetitive basis. For such a situation, when deliveries to the north and west of the proposed site occur sporadically, but on an ongoing basis, a secondary truck haul route should be identified and evaluated.
- (b) This item is addressed in the 2005 report. Section 6.E of that report provides descriptions of the existing land uses, the land use activities and the character of the adjacent lands. This section also includes descriptions of the environmentally sensitive features present along each haul route. However, no mention is made as to the permitted land uses along each alternative haul route as per the Town of Caledon Official Plan, or the Zoning By-law. These should have been included. Appendix F of the 2005 report includes the locations and detailed descriptions of driveways and existing land uses along each proposed haul route.

No further update or further detail is provided in the July, 2008 Addendum Report. Section 7G of the Addendum report states “As there were no significant land/road network changes affecting the haul route study area, the previous operational

assessment undertaken for each haul route alternative was still considered to be applicable.”(p.5)

- (c) Section 7 of the May, 2005 report evaluates all three alternatives with respect to:
- a. Policy Conformance;
 - b. Social Environment;
 - c. Natural Environment;
 - d. Cultural Environment;
 - e. Physical Factors;
 - f. Economic Factors; and,
 - g. Operational Factors

Subject to the deficiencies noted in relation to items (a) and (b) above, all of these aspects have generally been considered appropriately from a transportation perspective. With the exception of the Operational Factors, Alternative B is identified as the preferred option. Peer reviewers with particular expertise in these disciplines may have additional comments. It should be noted that data related to bus stop impacts, is included within Section 7.B to address social environment impacts. In the 1998 Truck Haul Route study report by Cole, Sherman & Associates, it was noted that the information came from the Peel Board of Education/Dufferin-Peel Roman Catholic Separate School Board, however, these references are not mentioned in the 2005 report. This data should also have been updated in the Addendum to reflect more current conditions.

Section 7 of the July, 2008 Addendum report includes a further assessment and evaluation of alternative haul routes. No changes were noted with respect to the natural environment (although Section B.1.6 in Appendix 1. Volume 4 has been updated, based on the Comprehensive Broader Scale Environmental Study (CBSES) for the Caledon Aggregate Resources Area 9-A). The economic factors including capital and operating costs were updated, although it is not certain whether these are 2008 costs. The rates used in the Addendum report were compared to the MTO Parametric Estimating Guide 2007). This provides construction costs for various types of road improvements using similar per km breakdown. On that basis the unit rates identified in this section of the Addendum report appear to be reasonable. Under Operational Factors, updated traffic counts were obtained only for the recommended haul route. No other updates were undertaken with respect to operational factors (eg. no updated land use or collision analysis). Other elements that also were not updated included:

- a. Policy Conformance
- b. Social Environment
- d. Cultural Environment
- e. Physical Factors

The assessment and evaluation of alternative haul routes detailed in Section 7 of the Addendum report concluded: “Alternative B is still preferred because it requires the least additional capital cost and only marginally more annual operating cost than Alternative C”. (p.5)

- (d) Section 6.E of the 2005 report outlines the classification of the roads in each alternative. It also outlines the existing load limits along each route and whether or not these will have to be removed. Descriptions regarding the surfacing and character of each road are provided in this section, along with a description related to the horizontal and vertical alignment. Further, Section 7.E of the May, 2005 Report (Volume 1) evaluates each alternative with respect to physical factors. Table 7.4 summarizes an alignment assessment, with Table 7.6 outlining a cross-section assessment, of each proposed alternative. Sightlines and shoulder widths are included in Appendix I, where a more detailed safety review of the proposed truck haul route is provided. Sight distances and shoulder widths at major points of interest (i.e. proposed entrance of quarry, major intersections, etc.) should have also been discussed in the body of the report.

The 2008 Addendum report only notes that “The timing and scope of anticipated improvements to certain Regional Road sections of the various haul route alternatives have changed since the preparation of the Report” (p.3). No further updates have been provided, for example related to the current structural integrity of the roads.

- (e) Section 5.D.2 of the May, 2005 report outlines the anticipated daily and hourly truck traffic for various shipment scenarios. Appendix A outlines the existing traffic volumes (with base count data from 2003). Appendix B outlines the future background and total background traffic for the Mississauga Road/King Street, and Mississauga Road/Olde Baseline Road intersections. No background or total traffic volumes are provided for the Highway 10/King Street intersection, other than in the analysis summary sheets in Appendix G. This intersection should have been included in Appendix B.

The July, 2008 Addendum report includes Figure 3A which outlines the hourly distribution of loads for Caledon Sand and Gravel Inc. for 1997 and 2007. “This

shows that the hourly distribution pattern used in the earlier report has remained generally consistent through time, particularly during the critical AM Peak Period, and no changes to subsequent analysis using this material was considered necessary.” (p.2) We are in agreement that the graphs indicate consistency. The slight changes would not materially impact the findings.

- (f) The description as to the proposed operations is found in Section 5.A of the May, 2005 Report (Volume 1) which discusses a license application with an annual shipment limit of 2,500,000 tonnes. Phasing related to the quarry development is discussed in Section 5.B. Section 5.D discusses the site generated traffic including the truck types in Section 5.D.1 and the daily and hourly truck traffic forecasts for different scenarios in Section 5.D.2. The three alternative truck haul routes described in Section 6.E reflect the different truck routings to and from the site.

The only additional information provided in the July, 2008 addendum report is with respect to the previously noted graph showing the average percentage of daily truck shipments for the months of October, 1997 and October, 2007.

- (g) Section 9.C.1 specifies the horizon years used in the May, 2005 report in determining the future impacts as being 2006, 2009 and 2012. The horizon year 2012 was analyzed as a typical year, as well as under maximum conditions. 95th percentile days and maximum days were included in all three horizon years.

In the July, 2008 Addendum Report the horizon years were delayed to 2011, 2014 and 2017, with 2017 estimated to be the earliest year of full capacity production and normal shipping levels.

Recognizing the time requirement for the OMB hearing, Board decision, environmental assessment, any potential appeals, detailed design and construction related to the required road improvements, a 2011 horizon year is not realistic.

- (h) Passenger car equivalents are not explicitly addressed in the May, 2005 report (Volume 1), however, Section 9.C.2 indicates that these are accounted for within the analysis software used. This has been confirmed by MMM.
- (i) Section 9 of the May, 2005 report (Volume 1) discusses the truck haul route traffic impacts. Section 9.B discusses physical and structural issues, however, specifics related to effects of heavy traffic on the pavement and surfacing of the roads are not provided. Section 9.C discusses operational impacts including intersection analyses and traffic delays based on a travel time/delay survey undertaken in 1998, which should have been repeated to reflect current conditions. Section 9.C in the

Addendum report updates the intersection analyses to reflect the 2008 operations, as well as the 2011, 2014 and 2017 operations.

It has been confirmed with the Region that the growth rates reflected in the Addendum Report are appropriate, with one exception. A reconfiguration of the Olde Baseline Road/Winston Churchill Boulevard is being contemplated by the Region to encourage traffic on southbound Winston Churchill Boulevard to make the southbound left turn onto eastbound Olde Baseline Road, rather than continuing southbound on Winston Churchill Boulevard. This would increase the traffic along Olde Baseline Road. At this stage it is not possible for the Region to forecast what that increase might be. Use of the zero percent growth rate in the interim needs to acknowledge that the projected volumes will need to be adjusted upward in the future in view of this Regional initiative.

MMM has also confirmed the capacity calculations. Some minor discrepancies that have been found are not material to the outcome. It should be noted that where maximum year 95th percentile day operations are forecast to be better than typical year 95th percentile day operations this is as a result a signal timing optimization.

Section 9.D in the May, 2005 report addresses safety issues including a collision analysis, however, collision data dates back to 2002 and should have been updated. The July, 2005 Addendum report states that recent collision data is now available. This has been obtained from the Region and will be forwarded to URS. It should be noted that MMM has undertaken a preliminary examination of this collision data and identified one issue – Olde Baseline Road from Rockside Road to Shaw's Creek Road in 2006. This involves a very short segment of roadway. As a result even one collision results in a high rate. URS will need to examine this information in greater detail.

- (j) Section 6.E in the May, 2005 report (Volume 1), along with Section 7.E and Table 7.6 outline the road improvements necessary for each of the alternative truck haul routes. The costs related to such improvements are outlined in Section 7.F in Tables 7.8, 7.9 and 7.10 for Alternatives A, B and C, respectively. Section 9.F and Appendix L discuss the environmental features being impacted by the necessary improvements. Social environment impacts are discussed in Section 9.E. Further, Sections 9.G.1 and 9.G.2 discuss the required class environmental assessment and the environmental assessment alternatives, respectively, for the necessary improvements.

The July, 2008 Addendum Report updates Section 9.E Social Environmental Issues, specifically related to 9.E.1, Built Community Impacts. The assumption is made that

“If the JDCL Ready Mix Plant in Bolton is considered to be the epicenter of the market area that Rockfort would serve (York and Peel), given its location with respect to the major growth areas of North Brampton, Caledon, Whitebelt, Vaughan and the new Highway 427 corridor, it can be seen that the reduction in haulage distances would be significant if Rockfort displaced a portion of the supply to the area from currently available Amabel quarry sources”. (p.8). Others will be commenting upon these community impacts.

- (k) The classification of the roads in the Region of Peel and Town of Caledon Official Plans are noted in Section 6.E of the May, 2005 report (Volume 1) under the respective alternatives. Each route has been evaluated with respect to policy conformance in Table 7.1 in Section 7.A of that report.
- (l) The distances to the nearest haul route as defined in Section 5.11.2.5.1 for each alternative truck haul route being evaluated can be found within each truck haul route description in Section 6.E of the May, 2005 report (Volume 1). Alternative C results in the shortest distance (7.64 km) to the point of reaching a high capacity arterial (Highway 10).

2.3 CONCLUSIONS WITHIN THE CONTEXT OF OPA 161

For the most part the requirements outlined in the OPA 161 have been met, however, there are several points that should be noted as follows:

- A secondary truck haul route should have been considered for deliveries to the north and west of the site since there are no guarantees provided that deliveries will not occur to destinations in those areas with respect to ongoing local deliveries.
- All permitted land uses as outlined in the Zoning By-law and Official Plan along each alternative route should have been included in the evaluation and description of each proposed haul route.
- Data with respect to school bus stops and collision history along the proposed haul route should have been updated as much as possible to reflect current conditions. As noted, more recent collision data is now available.
- Sight distances and shoulder widths at major points of interest should have been included in the body of the report for specific consideration in the evaluation of each alternative.

- The travel time/delay survey dates back to 1998. Road conditions and/or traffic volumes have likely changed since then. This survey should have been repeated to reflect current conditions.

3.0 TECHNICAL ASSESSMENT

3.1 BASE DATA

The July, 2008 Addendum report states that “Existing traffic volumes (2006/2007) for the recommended haul route were obtained from the Region of Peel and the MTO. In addition URS undertook traffic counts for the recommended route in June, 2005. These counts are summarized in Appendix A of this Addendum”. (p.1)

Traffic growth rates were developed for Olde Baseline Road from Winston Churchill Boulevard to Mississauga Road, for Mississauga Road from Olde Baseline Road to King Street and for King Street from Mississauga Road to Highway 10, on the basis of 1991 to 2007/2008 AADT counts.

The assumed growth rates are as follows:

- | | | | |
|---|----|---|--|
| - | 3% | - | Highway 10 |
| - | 2% | - | Mississauga Road |
| - | 2% | - | King Street (Mississauga Road to Highway 10) |
| - | 0% | - | Olde Baseline Road (Winston Churchill Boulevard to Mississauga Road) |
| - | 0% | - | King Street (West of Mississauga Road) |

The report also notes that historic turning movement counts were reviewed and a 2% per annum growth rate was applied.

The Region has confirmed that use of these growth rates is appropriate. However there are some anomalies in the forecasts presented in the figures in Appendix D of the Addendum report. For example, some turning movements at the Olde Baseline Road/Mississauga Road intersection for 6:00 – 7:00 a.m. for 2011 are less than existing. The same holds true for the 2014 forecasts as compared to 2011. Although these do not materially impact the findings, those minor discrepancies should be corrected.

The URS report data utilized data from Caledon Sand and Gravel (CS & G) and from the Brechin Quarry. Some data related to Caledon Sand and Gravel with respect to the hourly distribution of loads in 1997 and 2007 is provided in Figure 3A of the Addendum Report. It would be useful to have this updated information for both the Caledon Sand and Gravel Inc.

site and the Adjula Pit, if reliance is still being placed on both surrogate sites, with the truck traffic forecasts related to the proposed Rockfort Quarry recalculated on the basis of current data.

A travel time/delay survey was undertaken in 1998 to determine traffic delays related to loaded and unloaded quarry trucks. Again, this was undertaken ten years ago. Conditions, have likely changed since 1998. In order to more accurately estimate the impacts related to the inclusion of aggregate trucks on the traffic flow, the time/delay survey should be repeated to reflect current traffic and road conditions.

Section 7.B in the May, 2005 report evaluates the three alternative routes with respect to impacts on the social environment. Within this criterion, the impacts with respect to bus stops are evaluated. Data related to the number of bus stops located within each route was obtained from data provided by the “Student Transportation”. Bus stop location patterns can change depending on the number of students attending and the locations of their homes. Data related to bus stops should have been updated from 1997 to reflect 2008 conditions.

3.2 HORIZON YEARS/AGGREGATE SHIPMENTS

The horizon years analyzed in the July, 2008 Addendum report include 2011, 2014 and 2017.

Various scenarios were tested, including the following:

- 2011 Typical Year, 95th Percentile Day - 6:00 – 7:00 a.m.
- 2011 Typical Year, 95th Percentile Day - 7:00 – 8:00 a.m.
- 2014 Typical Year, 95th Percentile Day - 6:00 – 7:00 a.m.
- 2014 Typical Year, 95th Percentile Day - 7:00 – 8:00 a.m.
- 2017 Typical Year, 95th Percentile Day - 6:00 – 7:00 a.m.
- 2017 Typical Year, 95th Percentile Day - 7:00 – 8:00 a.m.
- 2017 Maximum Year, 95th Percentile Day - 6:00 – 7:00 a.m.
- 2017 Maximum Year, 95th Percentile Day - 7:00 – 8:00 a.m.
- 2011 Typical Year, Maximum Day - 6:00 – 7:00 a.m.
- 2011 Typical Year, Maximum Day - 7:00 – 8:00 a.m.
- 2014 Typical Year, Maximum Day - 6:00 – 7:00 a.m.
- 2014 Typical Year, Maximum Day - 7:00 – 8:00 a.m.
- 2017 Typical Year, Maximum Day - 6:00 – 7:00 a.m.
- 2017 Typical Year, Maximum Day - 7:00 – 8:00 a.m.
- 2017 Maximum Year, Maximum Day - 6:00 – 7:00 a.m.
- 2017 Maximum Year, Maximum Day - 7:00 – 8:00 a.m.

This represents a comprehensive number of scenarios with respect to those three horizon years. However as noted, a longer term horizon year (2025) should also be considered.

Section 5.A of the May, 2005 Report Volume 1 discusses the proposed operations of the quarry. The license application proposes an annual shipment limit of 2,500,000 tonnes, specifying that the 'typical' quantity of aggregate shipped in a year is estimated to be 1,500,000 tonnes. Section 5.B. lists the proposed phases of the extraction over its estimated 30+ years lifespan. Phase 1 of the quarry only accounts for 400,000 tonnes annually of aggregates being shipped, with the maximum volume of aggregates being 1,800,000 tonnes per year in phases 3 and 4.

The first horizon year analyzed is 2011 which is when phase 1 is assumed to commence. As noted, extraction in phase 1 is assumed to be at 400,000 tonnes per year. Presumably up to 2,500,000 tonnes can be shipped annually if the market is there and operations can be accelerated accordingly. Thus, a maximum of 2,500,000 tonnes should have been tested for 2011.

The second horizon year analyzed (2014) is when phase 2 operations are assumed to commence and will continue until approximately 2016. Only 700,000 tonnes of aggregates are expected to be shipped per year during that phase. Again, unless the licence will be limited to 700,000 tonnes per year during this phase, the maximum potential annual shipment of 2,500,000 tonnes should also have been tested for 2014.

The third horizon year is 2017 when shipping levels are assumed to be at either typical (1,500,000 tonnes per year), or at a maximum (2,500,000 tonnes per year). This phase is assumed to continue for approximately another 7 to 20 years. Phase 5 is expected to take place 21 years after the start of the operations, with the maximum aggregate shipped per year expected to be 1,000,000 tonnes.

In our previous peer review we had recommended a horizon year of 2021 to be analyzed. The May, 2005 report provides explanations as to why this horizon year was not included in the Traffic Impact and Haul Route Study, with the main reason being that there are no proposed or approved developments in the area. While this may be true, the quarry production is expected to last for the next 30+ years. The phases with the maximum expected amount of aggregates extracted per year are phases 3 and 4 which again, are expected to occur approximately 20 years from now. Under these circumstances, and with the background traffic growth expected to happen in the next 20 years, it is still reasonable to consider a longer term horizon year (under typical and maximum conditions) beyond 2017 considered in the Addendum report, especially as the start up date is likely to be pushed back further due to the time required for a hearing, a decision related to that

hearing, the EA related to the road improvements, approvals and implementation of road improvements. For example, 2025 would be an appropriate longer term horizon in view of these uncertainties.

3.3 ROAD DESIGN STANDARDS

Section 6.D of the May, 2005 report (Volume 1) discusses the road design standards and the recommended design parameters. The report references both Ministry of Transportation of Ontario (MTO) and Transportation Association of Canada (TAC) standards for 2-lane rural roadways. Both are commonly accepted standards developed from similar engineering principles. In both cases recommended lane and shoulder widths are based on traffic volume and design speed. MTO standards recommend increased lane and shoulder widths (some categories) where truck percentages are high. TAC utilizes a range of widths and the designer would be expected to recognize factors such as truck percentages in selecting the appropriate width.

While the recommended design parameters are consistent with the identified design speed, it should be noted that in the Belfountain ESR a 70 km/h design speed was recommended for certain road sections (Olde Baseline Road from Winston Churchill Boulevard to Mississauga Road and Winston Churchill Boulevard from Olde Baseline Road to Terra Cotta), with an intended posted speed of 60 km/h. Presumably this has been done due to the fact that the topography in these areas would require significant cuts and fills to design to a higher standard.

However, given that these roads are situated in a sparsely populated rural area where drivers typically expect to travel at higher rates of speed, there may be a tendency for these road sections to be over-driven. Notwithstanding that the Belfountain ESR has recommended a design speed of 70 km/h, based on more recent discussions with the Region it is our understanding that they intend to maintain the current posted speed of 70 km/h and therefore will require that the road be designed to a design speed of 80 km/h.

The recommended pavement structure identified in Section 6.D. of the May, 2005 report provides an indication of the appropriate design for these roads. During detailed design more comprehensive soils investigations would typically be undertaken and more sophisticated design techniques used to select the appropriate pavement structure. Since trucks apply higher loads to the pavement and accelerate the deterioration of the structure, some increases in the thickness of pavement components should be anticipated for routes having high truck percentages. Based on our discussions with the Region it is our understanding that they would anticipate a pavement structure for Olde Baseline Road, Winston Churchill Boulevard and Mississauga Road, similar to that used for the reconstruction of Dixie Road from Mayfield Road to King Street (40 mm of HL3, 100 mm of

HL8, 200 mm of Granular 'A' and 500 mm of Granular 'B'). More frequent maintenance/rehabilitation should also be anticipated as truck volumes increase.

Section 7.E of the May, 2005 report assesses the three alternative routes with respect to physical factors. Table 7.4 notes the horizontal alignment elements of various road sections as being suitable, slightly sub-standard or sub-standard relative to a 70 km/h design standard. No definition of "slightly sub-standard" is given. The text indicates that for Alternative B the vertical alignment of certain sections of Mississauga Road falls in the 5 to 6 percent range. It could be inferred that this is the only reason the section is described as "slightly sub-standard", but this should have been clarified. While specific parameters are not reviewed in the report, the general assessment is consistent with our visual review of the roads.

Additionally, within the same section, Section 7.E of the May 2005 report, a maximum grade of 5 percent is identified as the standard for vertical alignment. This value is appropriate, or even conservative, particularly given the topography of the area. However, sustained grades in excess of 3 percent typically impact truck performance. It would be appropriate to have reviewed the roadway profiles to determine whether truck climbing lanes should be considered.

Section 7.E of the May, 2005 report also evaluates the pavement structure along the proposed haul routes. This evaluation identifies that road sections having "High Class Bitumen" surface were considered "generally suitable when strengthened with additional pavement surfacing". While this may be the case, a more comprehensive investigation and analysis of the existing pavement structure would be necessary to definitively establish that resurfacing/strengthening is appropriate and cost effective under revised traffic conditions.

3.4 ROAD IMPROVEMENTS

In Section 7.E the May, 2005 (Volume 1) report notes an assumption that the various improvements documented in the Region's Belfountain ESR will be implemented prior to opening of the quarry. However, that ESR has since been abandoned. Further, as noted, the increase in truck traffic from the quarry would warrant upgrading of the pavement structures and/or incremental increases in geometric parameters (e.g. lane or shoulder width) from those which were previously proposed in the ESR, as it did not contemplate a new quarry in this area. In the Addendum Report URS recognizes that a further EA is required.

It should be noted that based on the documentation in Section 9.G of the May, 2005 report, it appears that the geometric improvements proposed in the Belfountain ESR are, for the most part, consistent with suitable standards if the quarry was in place. However, it is

difficult, based on the available information, to determine whether the roadway structure proposals are still appropriate when the quarry related truck traffic is included. Since pavement structure is not typically known at the time of an EA, refinement during detailed design is usually expected. With a substantial increase in truck traffic, some incremental increase in pavement structure thickness would be anticipated. It would also be reasonable to expect that other improvements (e.g. truck climbing lanes, turn lanes, etc.) may also be required.

Section 9.B.2 of the May, 2005 report (Volume 1) discusses the structural issues related to the proposed truck haul route. It states that Mississauga Road is “generally capable of supporting” the projected volume of heavy vehicles. However, results from a geotechnical evaluation should be provided, with a more detailed assessment on whether the road can in fact sustain such a load.

3.5 ROAD IMPROVEMENT COST ESTIMATES

Section 7.E in the May, 2005 report (Volume 1) evaluates the three alternative routes with respect to physical factors. Table 7.6 in that report outlines the structural assessment evaluation. In this table, the necessary upgrades, including whether it is reconstruction or resurfacing, are indicated. However, the length of road requiring either reconstruction or resurfacing is not specified.

In Section 7.F the haul routes are evaluated with respect to economic factors. These have been updated in Section 7.F. MMM has found them to be reasonable with respect to the capital costs reflected in Table 7.8 A and 7.9 A (p.4). However, maintenance and rehabilitation costs related to truck volume increases such as sweeping and future repairs to the road, are not considered. Reference is made to “annual operating costs to the truck operators” in the May, 2005 report. In the July, 2008 Addendum report “the operating costs are based on a revised average cost of \$0.20/tonne-Km for annual shipments of 1.5 MT”.(p.4) However, there is no recognition of operating and maintenance costs to the Region. While it is understood that vehicle operating costs increase with higher travel distances, increases in truck traffic will also result in increased wear and tear and thus higher operating and maintenance costs for the road (i.e. Regional costs).

Section B.3 Cost Analysis, in the July, 2008 Addendum Report (p. 183-184) updates Volume 4 of the May, 2005 report with respect to the costs related to upgrading the section of Mississauga Road from Olde Baseline Road to the Brampton Brick entrance. It is not possible for MMM to comment upon the cost estimates found in Table 1-7A without further details.

3.6 MODIFICATIONS TO THE ENTRANCE DESIGN

As per our previous peer review in 2003, we had recommended that if Winston Churchill Boulevard is not identified as a secondary truck haul route, the entrance design to the proposed quarry should be modified to preclude trucks from turning to/from the west along Olde Baseline Road. Winston Churchill Boulevard has not been identified as a truck haul route, as no secondary haul routes have been identified. Therefore, if this continues to be the case, we recommend that the design be further modified so as to preclude trucks turning to/from the west along Olde Baseline Road. However if occasional deliveries result in Winston Churchill Boulevard being identified as a secondary route, then the entrance design would need to accommodate this. In addition, improvements would need to be made to Winston Churchill Boulevard and Olde Baseline Road to the west of the site.

4.0 OTHER CONSIDERATIONS

Section 5.D.2 of the May, 2005 report (Volume 1) discusses the forecast daily and hourly truck shipments. It states that Saturday shipping may be necessary at times to fulfill demands. The frequency of this occurring should be estimated and quantified. If Saturday shipping is anticipated more than just a few times a year, then the traffic impact study should account for such a scenario, in which case the impacts on recreational activities such as those involving pedestrians, cyclists and equestrians, which tend to occur primarily on weekends, would be greater.

In the 2003 peer review it was recommended that three additional downstream road scenarios related to Highway 410 be included in the analysis. These were not included in the May, 2005 report. However, reasons were provided in Section 9.C.6 of that report. The report points out that the currently proposed phasing of extraction in the quarry would only be generating a small number of truck traffic by the year 2008 (phase 1), therefore the impacts to downstream traffic will be negligible. However the license application is for a much higher amount of extraction, therefore not precluding this even in the short term. We agree however with the fact that the addition of Rockfort Quarry traffic is not expected to impact the downstream study area by more than 5 percent volume/capacity ratio. We also recognize that Highway 410 has been extended in the interim. The report goes on to state that some of the new truck traffic from Rockfort Quarry is expected to replace some existing truck traffic from other quarries south and east of the site, especially downstream from the Highway 10/Mayfield Road intersection. If this argument was to be used it would need to be quantified. In view of arguments presented related to the percentage increase in traffic downstream, improvements to Highway 10 and the extension of Highway 410, we are in agreement that further downstream analysis is no longer required.

The term 'generally' is used extensively throughout the report, such as 'generally consistent with the GBE of 680' (Section 6.D) of the May, 2005 report, or 'generally compatible with O.P. Policies' (Section 6.E). This suggests that there are some inconsistencies or incompatibilities, which should be explained.

5.0 SUMMARY AND CONCLUSIONS

The May, 2005 Traffic Impact and Haul Rate Study (4 Volumes), was substantially more comprehensive than the November, 1998 Truck Haul route Study, Rockfort Quarry Town of Caledon, Traffic Analysis Update. By comparison, the July, 2008 Addendum report to the 2005 Traffic Impact and Haul Route Evaluation Study Report was very brief, and only updated some components of the 2005 report.

Recognizing that the application will be the subject of an Ontario Municipal Board hearing in the spring of 2009, we would recommend that the materials presented in the 2005 and 2008 documents be consolidated, updated and expanded to provide for one current and comprehensive document(s).

As noted, there are still a number of deficiencies vis-à-vis the requirements noted in the Official Plan Amendment 161. Also some of the base data needs to be updated. Items requiring update and/or elaboration include but are not limited to:

- Basic data such as collision reports, school bus stop information, and shipment details from CS & G.
- A secondary truck haul route for ongoing occasional deliveries to the north and west of the site.
- Permitted land uses along each of the alternative truck haul routes.
- Sight distance and shoulder width information at major points of interest, within the main body of the report.
- Specifics related to impacts of heavy truck traffic on the road design including pavement structure.
- An updated travel time/delay survey related to aggregate trucks.
- Testing of maximum shipment in each horizon year as the license would not preclude the maximum aggregate being extracted if the demand is present.

- The analysis of a longer term horizon year (e.g. 2025).
- A review of the road to determine whether truck climbing lanes should be considered.
- Clarification as to the meaning of the term “generally” and “slightly substandard” used in the report.
- Clarification as to whether the proponent will contribute to all necessary quarry related road upgrade costs as well as specifics related to maintenance costs.
- Further modification to the entrance design in the event that a secondary truck haul route does not require trucks at any time to turn to/from the west along Baseline Road.

Finally, there are fundamental questions about whether or not Olde Baseline Road will be upgraded from its current status to function as a haul route for the proposed quarry. These questions are beyond the scope of this peer review and need to be determined by Regional Council. Firstly, Olde Baseline Road is not currently identified as a truck route by Regional by-law. Heavy trucks are restricted at all times. The Rockfort Quarry application assumes that Olde Baseline Road will be designated as a truck route from the proposed site entrance just east of Winston Churchill Boulevard, through to Mississauga Road. Alternatively, Winston Churchill Boulevard would need to be upgraded and used. Winston Churchill Boulevard also has a commercial vehicle axle load restriction at all times from Bovaird Drive West through to Bush Street. This includes the area adjacent to the proposed Rockfort Quarry. Hauling by rail is not an option since the proposed quarry is not situated near an existing rail line.

Secondly, the structural and other upgrades that would be necessary to convert Olde Baseline Road between Winston Churchill Boulevard and Mississauga Road into a truck route would require an updated Environmental Assessment Study to be undertaken, including public consultation, with the subject project approved and the capital improvements scheduled and then implemented. Although an EA has been included for 2011 within the Region’s Ten Year Capital Plan, no guarantees exist that this will proceed as scheduled since priorities change from year to year. Even if completed, the EA could also be delayed through the approval process, for example by a Part II order request.

The currently proposed schedule for the Rockfort Quarry is predicated upon all of the necessary approvals for heavy trucks on Olde Baseline Road being in place by 2011. This schedule does not appear to be realistic, given all of the above considerations.

We trust that these comments are of assistance.

Yours very truly,

MMM GROUP LIMITED

A handwritten signature in cursive script, appearing to read "Geri Kozorys-Smith".

Gerri Kozorys-Smith, MCIP, RPP
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Partner

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