



Final

**Air Quality Review
Rockfort Quarry**

**155915
November 2008**



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Prepared by:

A handwritten signature in black ink, consisting of several fluid, overlapping strokes. The signature is positioned to the right of the text "Prepared by:" and above a horizontal line.

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1. INTRODUCTION

AMEC was requested by Town of Caledon to undertake a review of air quality issues related to the proposed Rockfort Quarry in the Town of Caledon. The review focussed on air quality issues raised in the proponent's application for a quarry license. These issues were discussed in context of relevant legislation and guidelines. Sources of information included:

- Air Quality Assessment for the Rockfort Quarry, dated July 30 2008, by Rowan Williams Davies & Irwin Inc.
- Planning and Justification Report, 2008
- Aggregate Resources Act Site Plans (Application) (dated July 30, 2008),
- Environmental Impact Assessment, Proposed Rockfort Quarry, Ecoplans Limited, August 2000,
- visit to the proponent's site in Brechin Ontario in 2003 (with Greg Sweetnam of James Dick)
- review of relevant environmental legislation, Town of Caledon's Official Plan and Ministry of the Environment guidelines on land use compatibility and separation distances.

The predominant air quality issue related to quarrying operations is dust (particulate matter). In any large materials handling operation, dust is generated from blasting, materials handling, crushing, wind-blown dust erosion, and truck traffic on paved and unpaved roads. The magnitude of these emissions is directly related to the amount of material handled and the level of activity. Mitigation for these types of emissions is possible, but needs to be carefully designed and implemented. Frequently, off-site impacts from these types of operations occur due to poor or inadequate operational procedures and mitigation.

Particulate matter is a variety of solid and liquid particles that remain suspended in the air. It includes smoke, fumes, dust, pollen, metals and soil materials. Impacts of particulate matter are related to health effects, effects on vegetation, visibility and effects on exposed materials (e.g. building materials, paint finishes). Emissions from quarrying and aggregate operations are predominantly crustal materials released by materials handling.

The health impacts of particulate matter are directly related to the composition of the particle as well as the size of the particle. Smaller particles (less than 2.5 μm) can penetrate deep into the human lung and at elevated levels, can lead to adverse effects (e.g. respiratory symptoms, decreased pulmonary functions).

Excessive quantities of deposited particulate matter can adversely affect vegetation. Particles can cover the leaves and plug stomata and cause a reduction in the growth and yield of some plants.

Fine particulates can also cause visibility reduction. Particles absorb and scatter light, thereby causing a reduction in long-range visibility. Moisture and particulate characteristics are important in assessing the extent of the visibility reduction.

Particulate matter can also create environmental concerns related to the soiling and corrosion on surfaces. Deposited dust can require increased cleaning of surfaces. Also, the chemistry of the particle may be corrosive to some materials requiring, not only increased cleaning, but potentially replacement of damaged materials or use of more corrosion resistant surfaces. Quarry and aggregate dust from the proposed quarry is predominantly limestone that is non-corrosive.

2. LEGISLATIVE FRAMEWORK

2.1 OVERVIEW

Air quality in Ontario is regulated by the Ontario Ministry of the Environment (MOE). With a few exceptions, none of which are applicable to this project, the Federal government does not directly regulate air emissions. Municipalities and local governments also do not typically regulate or control air emissions, but do deal with air quality impacts through zoning and land-use.

The current quarry application to the Ontario Ministry of Natural Resources (MNR) is part of a larger process that potentially will lead from initial planning through to final approvals and operation. At this stage, consideration is being given to the proponent's application for a license under the Aggregate Resources Act. The Ministry of Environment and the local governments are able to raise concerns and issues through the consultation process, but are not responsible for approving the application. Such responsibility lies with MNR. In the next stages, the proponent will be required to submit rezoning and Official Plan Amendment applications through the local government and Certificates of Approval (Air) through the MOE for the on-site operations. There is typically much overlap in timing with these processes. As well, even though the MOE does not have a specific approval capacity in the zoning activities at the local level, the MOE has established land-use compatibility guidelines to assist local governments with appropriate zoning and land-use planning.

Specific requirements for the MNR quarry license application procedure have been provided by the proponent. Issues related to this license application and supporting documents are discussed in Section 3.

As well, the proponent has provided a Dust Impact Study for the Rockfort Quarry (RWDI, Aug. 2000). This is discussed in detail in Section 4.

The following sections review each of the relevant pieces of legislation and guidance documents as they specifically apply to air quality and the current proposal.

2.2 AGGREGATE RESOURCES ACT

The Aggregate Resources Act of Ontario (as amended in 1997 by Bill 52) was established to provide management of the aggregate resources in Ontario. The act also has the listed purpose:

“to minimize adverse impact on the environment in respect of aggregate operations” (Aggregate Resources Act, RSO 1990, c. A.8, as amended, s. 2(d))

In the definition of the word environment, specific mention is made of the air environment.

“environment means the air, land and water or any combination or part thereof.....” (Aggregate Resources Act, RSO 1990, c. A.8, as amended, S. 1(1))

As part of the duties of the Minister (Section 12 (1) (a)), there must be consideration of “the effect of the operation of the pit or quarry on the environment” and there must be consideration of “the effect of the operation of the pit or quarry on nearby communities” (Section 12 (1) (b)). These aspects are not further defined or clarified in the Act.

MNR provides further direction for license applications under the Provincial Standards (1997) that have been developed to support the Aggregate Resources Act.

2.2.1 Aggregate Resources Act - Provincial Standards

Provincial standards were developed to support the Aggregate Resources Act. The standards set requirements for:

- Site plan standards;
- Report standards;
- Prescribed conditions;
- Notification and Consultation;
- Operational standards; and
- Annual Compliance Reporting.

As noted in the Introduction of the Provincial Standards, these were developed to provide minimum requirements for delivery of the Act.

There are a few specific requirements in the Standards that address air quality issues. These are:

- I. The Standards recommend that in the preparation of the reports that accompany an application, reference should be made to the Environmental Protection Act (EPA). The EPA and regulations under the EPA are very specific with respect to air quality issues (see Section 2.3 for further details).
- II. Prescribed Conditions in the Standards are minimum requirements that cannot be varied or rescinded by the Minister of Natural Resources or the Ontario Municipal Board (OMB), but on a site-specific basis additional conditions can be attached.
- III. Under the Prescribed Conditions for a Class “A”, Category 2 license the following conditions, that impact air emissions, are required:
 - A. Dust will be mitigated on site. (Condition 3.1)

- B. Water or another provincially approved dust suppressant will be applied to internal haul roads and processing areas as often as required to mitigate dust. (Condition 3.2)
- C. Processing equipment will be equipped with dust suppressing or collection devices, where the equipment creates dust and is being operated within 300 metres of a sensitive receptor. (Condition 3.3)
- D. If required, a Certificate of Approval will be obtained for processing equipment to be used on site. (Condition 3.8)

No other specific air quality conditions are required under the Aggregate Resource Act Provincial Standards. There are also no specific details provided on the application of the above requirements.

2.2.2 Rockfort Quarry Application

The requirements under the ARA are fairly general and broad. The application does meet these requirements.

Conditions 3.1 and 3.2 are met on the plans. No specific mention of Condition 3.3 is shown, but distances to sensitive receptors from the processing area are greater than 300 m. Rockfort has agreed to obtain a Certificate of Approval (Condition 3.8); including the development of a Best Management Plan under their Certificate of Approval (see following Section).

Specific comments concerning the Site Plans are made in Section 3.

2.3 ENVIRONMENTAL PROTECTION ACT

Air quality in Ontario is regulated under the Environmental Protection Act (EPA), through Sections 14 (adverse effects), Section 9 (requirements for Certificates of Approval), Provincial Regulation 419 and the MOE's ambient air quality criteria (formerly Regulation 337).

Desirable ambient air quality levels in Ontario are set in the list of Ambient Air Quality Criteria (Feb 2008). Ambient air quality criteria are used to determine the acceptability of air quality in a given region. These criteria are not source specific and all contributing sources are considered. These are used by the MOE to determine areas that require specific air quality action. The MOE's monitoring network provides details on the existing levels of air quality in an area.

Pursuant to Section 14 (1) of the EPA, "no person shall discharge a contaminant or cause or permit the discharge of a contaminant into the environment that causes or is likely to cause an adverse effect." An adverse effect is defined in the EPA as, among other things:

- impairment of the quality of the natural environment for any use that can be made of it,

- injury or damage to property or to plant or animal life,
- harm or material discomfort to any person,
- an adverse effect on the health of any person,
- interference with normal conduct of business,
- loss of enjoyment of normal use of property.

(EPA, RSO 1990, c. E.19, as amended, s.1(1))

Any discharge to the air, requires a Certificate of Approval (Air) under Section 9 of the Environmental Protection Act. A Certificate of Approval (Air) is required prior to the construction and operation of a process that will emit to the atmosphere. This Certificate is obtained from the Ministry of the Environment and will indicate the terms and conditions of the MOE's approval. These conditions can include emission limits, operating conditions and maintenance requirements. Compliance with a Certificate of Approval does not imply overall compliance with the Act. Sources are still governed by other provisions in the Act, including not causing an adverse effect (S.14).

Regulation 419 also requires that specific sources cannot cause exceedances of specific air quality criteria provided in the Regulation and subsequent lists published by the MOE. These criteria are applied against specific modelled concentrations (point-of-impingement) determined at a location away from the source. These points-of-impingement are typically at the fence-line for near-ground level emissions and at the maximum off-property concentrations for elevated sources.

The MOE requires a facility to meet Reg. 419 point-of-impingement criteria for the combined emissions from a facility, not just for a single emission point. But background or existing air quality is not considered in Reg. 419.

"As of Oct. 1, 1998 all applications for Section 9 Approvals must include enough information to demonstrate that the entire facility complies with Section 5 of Regulation 346..." (MOE announcement - undated)

This demonstration, according to the MOE's Air Emission Summary and Dispersion Modelling Report guidance material (Guideline A-10), does not have to include fugitive dust emissions, if the facility provides an acceptable dust management plan (Best Management Plan (BMP)) for fugitive dust control.

2.3.1 Rockfort Quarry Application

The Rockfort Quarry will require a Section 9 Certificate of Approval for air emissions. This approval will be required prior to construction. The current reports are structured as a support for a Certificate of Approval submission. As such, a Best Management Plan has been provided, and the impact of fugitive dust (e.g. roadways) has not been included in the impact assessment.

Though the ambient air quality criteria are not specifically enforceable with respect to a specific facility, these criteria are relevant for assessing air quality impacts in broader assessments (e.g. land use changes and Environmental Assessments). This would require an assessment of background air quality levels. Rockfort Quarry has provided some discussion on background and other nearby sources, but no specific assessment of cumulative impact has been considered.

A more detailed review of the specific application reports is provided in Section 4.

2.4 LAND USE AND ZONING

The property will require re-zoning and an Official Plan Amendment to allow for aggregate extraction. Though the MOE does not exercise any jurisdiction in land use issues, it does provide local governments with guidelines related to environmental issues and land use planning. These are reviewed in the following sections.

2.4.1 Region of Peel

The Region of Peel's Official Plan also addresses various environmental issues. It is the policy of the Regional Council to "protect, maintain and enhance the quality and integrity of ecosystems, including air..." (OP s 2.1.3.2).

As part of the Region's Official Plan, it is recognised that the planning responsibility for mineral resources is shared by the Province, the Region and the area municipalities. In that context, the Region has developed a number of environmental policies that direct the area municipalities to permit development in or adjacent to the High Potential Mineral Aggregate Resource Areas only if issues of public health, public safety and environmental impact are addressed (OP s 3.3.2.5 (c)) and to require that all extraction and processing be located, designed and operated so as to minimize environmental, community and social impacts (OP s 3.3.2.7).

2.4.2 Town of Caledon – Amendment No. 161 (New Aggregate Policy)

A review of the new policy indicates that the following sections are applicable to air quality. These are:

5.11.2.4.2 (c) – the Applicant has assessed the social impacts....and demonstrated that the proposal will not have any unacceptable impacts.

5.11.2.4.2 (d) – the Applicant has completed all environmental investigations and studies required....and demonstrated that the proposal will not have any unacceptable impacts

5.11.2.4.2 (j) – the Applicant has demonstrated that the impacts from dust and other air pollutants will be mitigated to acceptable levels;

5.11.2.4.3 (b) – the proposed operational plan minimizes impacts on surrounding land

The dust impact report begins to address these issues. There are still significant issues that need to be addressed prior to this requirement being satisfied. These are detailed in Section 4 of this review.

Section 5.11.2.4.3 (a) – the monitoring program proposed by the Applicant will be adequate.

This condition will apply to air monitoring and reporting to the Town. This is further confirmed in **Section 5.11.2.9.2**, which specifically indicates that dust, and impact monitoring is required. As well, monitoring of licence conditions, required in **Section 5.11.9.2** could include mitigation activities and responses and actions taken with respect to complaints.

Section 5.11.2.4.9 (a) and (b)– Conditions of licence or notes on the site plan...

Many of the recommendations and suggestions in the Dust Impact study are not reflected in the licence application or on the notes to the site plan. This would need to be done to ensure that these and other negotiated mitigation and monitoring requirements are part of the specific site requirements.

Section 5.11.2.1.2.subject to the Applicant providing planning justification having regard to the potential impacts that affect the broader community,

and

Section 5.11.2.4.13 Any impact studies required by this Plan, will include, where appropriate, an assessment of social impacts based on predictable, measurable, significant, objective effects on people caused by factors such as noise, dust.....studies will be based on Provincial standards, regulations and guidelines.....

At this point the proponents dust impact study indicates no potential impacts. We do not agree with their assessment. Dust impacts are likely in the area immediately surrounding the site. (see Section 4 for details). These impacts need to be addressed.

Section 5.11.2.9.2 ...database will be updated annually to monitor ...compliance with conditions of licence...dust...

This clause is discussed above as part of **Section 5.11.2.4.3 (a)**.

2.4.3 Ministry of the Environment - Land Use

Though the MOE is not directly involved in land use planning, MOE has realised that many environmental issues can result due to incompatible land uses. The MOE has developed a series of guidelines to be used when a change in land use is proposed. Specifically, the MOE

has developed guidelines to minimize or prevent adverse effects through the use of buffer zones. These guidelines are:

D-1: "Land Use and Compatibility"

D-1-1: "Land Use Compatibility: Procedure for Implementation"

D-1-2: "Land Use Compatibility: Specific Applications"

D-1-3: "Land Use Compatibility: Definitions"

D-6: "Compatibility Between Industrial Facilities & Sensitive Land Uses"

D-6-1: "Industrial Categorization Criteria"

D-6-3: "Separation Distances"

The guidelines and associated procedures are applicable under circumstances when a new facility is proposed and an existing sensitive land use (which includes residential properties) is within the facility's potential influence area. Specifically the guideline states:

"If a proposed use is permitted in the official plan, but rezoning is required, or if both redesignation and rezoning are required, then this guideline shall apply." (Guideline D-1 s 2.3.2)

The guidelines and procedures focus on the use of separation distances from the proposed facility to the sensitive land uses. It is the proponent's responsibility to determine the zone of influence for the facility. Specifically, Procedure D-1-1 requires the proponent to evaluate the severity of the impacts both before and after mitigation.

In the absence of site-specific studies (D-6), the MOE recommends that pits and quarries be treated as a Class III industrial facility and that the potential influence area and minimum separation distances for such a facility be used in land use planning. Class III facilities are defined as facilities having a high probability of fugitive emissions. For Class III facilities, the MOE has identified the potential influence area, wherein adverse effects may occur, to be 1000 m. Even with mitigation, the MOE suggests a minimum separation distance of 300 m. It is important to note, that in this guideline, the MOE recommends that these distances be measured from property line to property line, not from specific source to residential building.

2.4.4 Rockfort Quarry Application

The current application addresses the issues raised in the Official Plan policies for land use changes. The application does not address the MOE guidelines for recommended separation distances for proposed facilities of this type. In our experience, it would be prudent, even at the license application stage, for the proponent to provide an analysis of the potential zones of influence and possible impacts. It is possible that during the preparation of the studies for land

use changes, modifications to the site plan or operations may be required. Some of this has been addressed in the recent Dust Impact Study for the Rockfort Quarry (see Section 4).

3. APPLICATION REVIEW

The application for the proposed quarry operation was prepared in accordance with the MNR requirements for submission. As part of this application, various aspects relevant to air quality were provided. The following table provides specific statements found in the site plans and the application reports that are relevant to air quality, the source of the statement (i.e. the document provided by the proponent) and our review/comment concerning the specific part of the application document.

Table 1: Review of Specific Air Quality Aspects of the License Application

	Statement	Source/ Reference	Comment/Review
1.	“on-site mobile equipment includes...” (A. General Operations. Item 6)	Notes and References on Site Plans (July 30, 2008) Plan 2 of 5	No water trucks for mitigation are listed. These are referenced in the Dust Impact Study, but not directly listed in the application.
2.	“The existing residential uses on the site will be allowed to continue throughout the life of the operation. Tenants in the on-site residences are/will be aware of the quarry operation and are not afforded full protection from noise, dust...” (Notes B - Onsite Buildings Item 1)	ibid. Plan 3 of 5	To obtain Section 9 approval under EPA, the proponent will have to demonstrate that these residences are not subject to adverse effects as defined in the Act. This has not been demonstrated in the documentation that has currently been provided (including the Dust Impact Study). On-site workers are protected by occupation health and safety regulations, but these would not be applicable to families residing on the site. This would not only impact the residences at the south end of the site, but also the James Dick residence.
3.	“An additional portable plant may be located on the quarry floor..” (D – Processing – Item 3)	ibid.	No specific details on operation, mitigation and potential impacts of this plant are provided in the application, or in the Dust impact study. The temporary plant is discussed, but not this portable plant.

	Statement	Source/ Reference	Comment/Review
4.	“main internal haul route will be paved between the site entrance and the scales. This paved surface will be kept clean and free from accumulated mud and silt.” (E - Haul Routes Item 2)	ibid.	Paved routes are an excellent mitigation of potential dust emissions. It is important that appropriate cleaning techniques be undertaken. Some dry sweeping techniques create significant dust impacts, simple water “dribble” trucks do not adequately clean paved surfaces. See Section 4 for proposed mitigation.
5.	“Dust will be controlled on site...(H – Dust Control)	ibid.	This item reflects the C of As that will be issued by MOE. We have not see this is MNR site plans before. Usually the specifics of the MOE requirements are included. Not clear how MNR would enforce this? Or if they could? As such, all enforcement of the dust management are deferred to MOE through the C of A.
6.	Potential Vegetation Sensitivity to Dust (Section 4.3.4 – Vegetation – Dust))	Environmental Impact Assessment. Proposed Rockfort Quarry, prepared by Ecoplans Limited.	Agree with general conclusion. Dust accumulation will occur on vegetation near the quarrying operations. This will be at levels below which effects are likely to occur. However, Ecoplans does point out the mature deciduous forest and swamp along the Niagara Escarpment route and the woodland and northeast wetland adjacent to the site are expected to be sensitive to excessive dust generation. No further studies are provided to define these issues.
7.	Dust: “with implementation of the recommended mitigation measures, impacts should be contained to an acceptable level” (Section 4.3.4)	ibid.	See Section 4 with respect to Dust Impact Study.

4. AIR QUALITY ASSESSMENT – REVIEW

The review of the July 30, 2008 Air Quality Assessment prepared by RWDI for the Rockfort Quarry applications raises a number of concerns. Issues related to the Air Quality Assessment are discussed in detail in the following table.

Table 2: Review of Air Quality Assessment

	Statement or Issue	Location in Dust Impact Study	Discussion	Significance
1.	All roadways and traffic. (fugitive emissions) are not modelled	Throughout report.	RWDI states that under O.Reg 419 and MOE approvals, the impacts of these sources do not have to be assessed if a Best Management Plan is provided. This is correct for MOE's assessment for Certificate of Approval applications. Unfortunately, it does not provide the necessary impact assessments for zoning and other impact assessments needed to determine the appropriateness of this site.	Extremely. Dust can usually be well mitigated, but without actual impact assessment, it is not possible to determine the actual levels of impacts on both off-site and on-site residences.
2.	Residences in the Area (off-site)	Page 3, Page 14 and Figure 2	RWDI has used the specific residences as the receptors for assessing both impacts and compliance with standards. This does not account for other uses of the residents' properties.	Dust impacts will be greater at the properties closer to the site. Specific use of the homes as receptors does not account for other potential exposures by the residents on their properties. These should be considered.

	Statement or Issue	Location in Dust Impact Study	Discussion	Significance
3.	Residences in the Area (on-site)	Page 3	On-site residences. RWDI states these are not considered as receptors for air quality impacts.	If residences are to be allowed on-site, compliance with air quality standards must be demonstrated. On-site workers are protected by occupation health and safety regulations (which are typically set at higher levels of exposure), but these would not be applicable to families residing on the site. (see previous discussion under Site Plans)
4.	Dustfall		Not discussed or assessed. In response to previous comments indicates that it is addressed in Section 7. (It is not).	Could be significant. Dustfall is often a major nuisance impact related to quarrying and to large volumes of truck traffic. Should be assessed.
5.	PM10 and other standards	Page 10, Section 8	<p>PM10 is not assessed. Report notes that if SPM is within standards then PM10 is as well. Not necessarily true; model incorporates deposition calculations, so larger particles (SPM) are removed. This leaves higher proportion PM10 and finer particulate. These should be assessed.</p> <p>Also in the BMP included in as Attachment 2, it is indicated that PM10 can be as much as 55% of SPM..PM10 criteria is 50 ug/m3. If SPM is over 100 ug/m3, then PM10 could be exceeded. A similar argument can be made for PM2.5 (BMP notes this can be up to 14% of SPM)</p>	Significant. Fine particulate are health based whereas SPM is considered only as a nuisance.

	Statement or Issue	Location in Dust Impact Study	Discussion	Significance
6.	Primary Crusher	Through out	The Primary crusher will be located at the quarry face. This moves with the various Phases. RWDI considered it to be located at the processing area.	Significant.
7.	Emissions from mobile equipment	Page 11, Section 8.	RWDI indicates that for C of A, mobile sources are not considered. This is correct, but in an impact assessment it should be considered.	Not significant. Though it should be considered for completeness, exhaust emissions from mobile equipment is usually minor in comparison with other impacts (e.g. dust)
8.	Existing Dust levels at the site (background levels)	Page 12	Only a general discussion of background air quality is provided. To undertake a proper assessment of cumulative impact of this operation in the area, all sources (including traffic) and background should be considered.	Significant. To make appropriate landuse decisions, cumulative impacts should be assessed. This has not been done. MOE approval guidelines that don't require assessment of fugitives dust (with a BMP) are not applicable at this stage of decision making.
9.	Modeling: Phases of operation		Since no impact assessment of the fugitive dusts are undertaken, it was assumed only the central processing area is emitting dust. As such, no phasing assessment was done.	Appropriate assessment of all fugitives and primary crushing would require an assessment of different impacts at different phases. This is significant and should be done.
10.	Assessment of Routes -	Page 16, Section 14	Approach is valid. Fewest impacted receptors, lowest impacts. BUT at other locations, we have found routes and traffic to be very difficult ton enforce.	Significant. Truck traffic using different routes and at different times (i.e. queing prior to site opening) are often major issues. How has this been addressed?

	Statement or Issue	Location in Dust Impact Study	Discussion	Significance
11.	Recommendations: monitoring		<p>Monitoring is recommended as a series of campaigns during the life of the site.</p> <p>Proper detailed operational plans could be developed to address monitoring results. A minimum of three monitors (triangulating the site) would be appropriate to address upwind and downwind considerations.</p>	No monitoring is recommended in the air quality report or best management plan.
Attachment 1 – ESDM report				
12.	Scenarios for modelling and production limits (maximum vs average rates).	Page 3, attachment 1	Maximum hour of 1200 tonnes is assumed for process, but only an “average” hour for loading. This is acceptable IF the maximum daily total loading averages to 1200 per hour for the day. Since standards are 24-hour based, the maximum daily loading should be considered.	Unknown significance. If the daily maximum is much higher than the average hour, then impacts could be greater. Since this is one of the major emissions, this could be significant.
13.	“Insignificant sources”	Page 4 Attachment 1	All of the fugitive sources listed in the BMP are listed as “insignificant”. Not sure this is quite appropriate. MOE does not require these sources to be assessed for a C of A, but that does not necessarily make them “insignificant”	Not significant. Semantics. I prefer to label them as significant, but not included in MOE application.
14.	Meteorological data	Page 10, Section 6.1.1 Attachment 1	Indicates pre-processed MOE met data used as “crops”, but since deposition was assessed, raw data would have been run through the AERMET processor. More details should be provided.	Not significant. Editorial. Would help in assessing methodology.

	Statement or Issue	Location in Dust Impact Study	Discussion	Significance
15.	Edits in Tables 5.1a and 5.1b	Tables in Attachment 1	<p>Footnote "5" is referenced in source location, but not provided.</p> <p>Title of Table 5.1b states 80 tonnes per hour. (probably a "column width" issue)</p> <p>Title of Table 5.1b states "permanent" plant. This is the portable plant scenario.</p>	Not significant. Editorial.
16.	Particle size for material handling	Appendix B, Attachment 1	Particle size is provided for combustion sources, but not for the material handling.	Unknown significance. If appropriate particle size was used, then this is fine. IF a particle size distribution was assumed that over estimates the large particle fraction, then impacts could be underestimated.
Attachment 2 – Best Management Plan (BMP)				
17.	Location of Primary Crusher	Page 2, Attachment 2	As noted previously, the primary crusher will be at the working face, not at the processing plant.	Significant in the assessment, but for the BMP not that significant, only editorial.
18.	Traffic flow	Page 3, Section 3.2	Indicates that all truck traffic will follow a given route to minimize impact. Is this enforceable?	Significant. If this cannot be ensured, then impacts on other roads (currently predicted to be zero) will occur.

	Statement or Issue	Location in Dust Impact Study	Discussion	Significance
19.	On site truck traffic and conveyors	Page 5, Section 4.1.1.	Indicates that conveyors will be used and trucks as supplementary transport only. Not clear how this is staged or "enforced". Agree conveyor is better, but Site Plans indicate either mode of transport. Conveyors have lower dust impact, so their use should be encouraged. Not clear how this is done.	Impacts will be lower with conveyors. With appropriate control, truck traffic emissions can also be controlled. Not clear how decision to use conveyor as a dust control measure will be used.
20.	Water truck with spray bar	Page 5, Section 4.1.1.	Truck will also have water cannon to control stockpiles and hard to reach areas. This is noted later in the BMP. Should be noted here.	Editorial.
21.	Cleaning of paved roads.	Page 5 Section 4.1.2	The text indicates sweeping and/or washing. Dry sweeping can be a very significant source of dust. Wet sweeping is required.	Editorial (probably)
22.	Tire washing.	Page 6 Section 4.1.2	Tire washing is included. Is it intended this be done all the time or only when appropriate? If the later, what will trigger truck washing. Proper design is required, poor truck wash station design can actually lead to further track out of silt.	Not significant. Further detail needed.
23.	Sweeping and cleaning of Town roads and speed limit on road	Page 6 Section 4.1.2	These are appropriate mitigation to reduce off-site impacts, but these are public roads. An agreement may be necessary with the Town to allow for this to occur.	Not significant. Further detail needed. If Town does not give approval for this, then the cleaning and enforcement may become a Town activity.

	Statement or Issue	Location in Dust Impact Study	Discussion	Significance
24.	Blasting and drilling emissions. "if possible, drilling and blastingwhen winds are blowing away from the property line.."	Page 7 Section 4.4	More detail is needed. How much flexibility does operator have with this? Specific triggers/directions should be provided to be able to comply with this BMP requirement.	Could be significant. If there is flexibility, a well designed and implemented program can significantly reduce dust impacts from drilling and blasting.
25.	"wind forecasts shall be monitored"...	Page 7 Section 4.5	These measures are appropriate, but more detail is needed to assess effectiveness and make this operational. Protocol should be developed now.	Not significant. Further detail needed.
26.	Meteorological station	Page 7, Section 4.5 and 8.2	Station should be sited with appropriate MOE/EPA station siting criteria.	Important to site station properly, but if agree to follow appropriate protocols, not a significant issue.
27.	"outsourcing of sweeper"	Page 8, Section 7	On page 5 it is indicated that site will have capacity to clean paved roads twice daily. It is not clear that this could be achieved by an outsourced cleaning service.	Needs clarification and resolution. Ability to clean up to 2 times daily is key.
28.	"twice daily inspection"	Page 9, Section 8	This approach makes a lot of sense, but in order to ensure that the approach is followed; record keeping should include the twice daily "observations" to ensure no visible plumes, (trucks and handling activities) and state of silt build up on roads.	Significant. The BMP and strict adherence to the plan is required to minimize impacts. Improved record keeping will assist in ensuring this works and that any subsequent revisions or corrective actions are assessed.

	Statement or Issue	Location in Dust Impact Study	Discussion	Significance
29.	Levels of corrective action	Page 10, 11 Section 8.3	<p>The tiered approach is excellent. Only suggestion is that this be coordinated, reviewed and updated with the CLC that will be established. Changes to the BMP may also require MOE notification and review.</p> <p>The BMP also indicates the town should be involved. This must be discussed and agreed to by the town.</p>	Important. The appropriate stakeholders, agencies and authorities should be involved; not just in the design of the program but with clearly defined roles.

5. CONCLUSIONS

Specific components and details of the license application discuss a number of areas that impact dust emissions and air quality. The Air Quality Report, site plans and other documents assesses air quality (dust) related to quarry operations, generated from blasting, materials handling, crushing, wind-blown dust erosion, and truck traffic. Particulate matter emissions relate to impacts on human health, vegetation, visibility and soiling and corrosion of surfaces.

The documents and reports have been critically reviewed and the details of the review have been provided in the previous sections. Based on this review, the Air Quality assessment is not complete.

The main areas of concerns are:

1. The Air Quality Report does not address M.O.E. D-6 Guidelines for recommended separation distances for the quarry. The analysis of the potential zones of influence and possible impacts should be provided by the applicant. The Guideline recommends a minimum distance of 300 m and a zone of influence of up to 1 km. Within that range, impact studies are required to demonstrate acceptable impacts.
2. The Air Quality Report does not demonstrate that on-site residents will not be subject to adverse effects. This is a requirement for approval under the Environmental Protection Act. There is no distinction in the Act between on-site and off-site residents. Typically on-site receptors are not addressed under the EPA as these are governed by occupational regulations. This is not the case with on-site residents.
3. There is no detail on the operation, mitigation and potential impacts of the additional portable plant that may be operational.
4. The impacts from dust on roadways and from traffic are not included in the impact assessment (i.e. air modelling). Not considering roadways and traffic leads to an underestimate of impacts and/or and reduced mitigation requirements. This lack of assessment does not allow an appropriate determination of potential air quality impacts and as such does not allow a proper determination of the appropriateness of the proposal from other land use perspectives.
5. Dust fall is often a major nuisance impact related to quarrying and large volumes of truck traffic. These need to be assessed.
6. The assessment of $PM_{2.5}$ impacts does not consider all sources (see 4 above); nor does the methodology employed for $PM_{2.5}$ assessment provide proof that there is no $PM_{2.5}$ issue. This needs to be re-assessed.
7. All sources (including traffic) and background air quality should be considered in assessing cumulative impacts.

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8. All fugitive dusts and the primary crushing (which moves during the operations) should be assessed for different impacts in different phases.