MUNICIPAL ENTERPRISES LIMITED
JAMES RIVER QUARRY EXPANSION, JAMES RIVER, ANTIGONISH CO. NS

Registration Document for a Class 1 Undertaking Under Section 9 (1) of the NS Environment Assessment Regulations

April 2014

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1.0 INTRODUCTION

Municipal Enterprises Limited (herein after referred to as "Municipal") of Bedford, Nova Scotia is proposing to expand an existing quarry located at 380 Leslie Road, James River, Antigonish County, Nova Scotia. An approval to expand the quarry is required under the Nova Scotia Environmental Assessment Regulations. The registration of this Environmental Assessment is in response to Schedule A of the Environmental Assessment Regulations, Undertaking B.2., "*A pit or quarry that is larger than 4 ha. in area for extracting building or construction stone*."

Municipal is a private Canadian company. It is incorporated under the laws of Nova Scotia and registered to do business in Nova Scotia under the Nova Scotia Corporations Registration Act. Municipal's Registry of Joint Stock Certificate is attached in **Appendix A** "Property Information." It is important to note that Municipal Enterprises Limited is the parent company of Dexter Construction Company Limited, which is referred to within the appendices.

Address:

927 Rocky Lake Drive,
P.O. Box 48100
Bedford, NS, B4A 3Z2
Phone: 902-835-3381

Proponent Contact:

Gary Rudolph, P. Eng.
927 Rocky Lake Drive,
P. O. Box 48100
Bedford, NS, B4A 3Z2
Phone: 902-835-6346

Consultant Contact:

Mr. J. H. Fraser, M. A. Sc., P. Geo.
H2O GEO Environmental Services Inc.
Phone: 902-443-4227 (Office); 902-497-5597 (Cell)

It is noted that the existing quarry operates under an existing "Industrial Waste Permit Approval # 2012-080060, as attached to a letter dated January 24, 2012 to Mr. Gary Rudolph (Municipal Enterprises Limited) from Mr. Paul J. Keats, B. Tech. (Env.), Eng. Tech., CET; District Manager, Nova Scotia Environment. This letter and Approval (NSE File # 92100-ANT-2012-080060) is also attached in **Appendix A** "Property Information".

2.0 THE UNDERTAKING

2.1 NAME

Municipal proposes to expand the existing James River quarry for the production of aggregate, primarily used in the road and local construction industry. The proposed undertaking will be referred to in this document as the quarry and encompasses an area of 31 hectares.

2.2 Location

The site is located in James River, Nova Scotia at 380 Leslie Road (PID # 01240837 and PID # 10118032) in Antigonish County, Nova Scotia, 1:50000 NTS 11E/9, 5048552 Northing, 567257

Easting, Air Photo S. W. Corner, 2007404 L-18, 28 July 2007 (**Figures 1 & 2 (below) and Drawing 1, Appendix B**). The site is positioned within an un-zoned area along the north-east side of Leslie Road. The property that is being expanded has previously been developed as a result of quarrying and construction material processing activities.

The property is wholly owned by Municipal Enterprises Limited, and is presently un-zoned. The quarry property encompasses a total of approximately 62.0 hectares; however it is important to note that this EA document encompasses an area of 31 hectares.

Figure 1 - Project Location

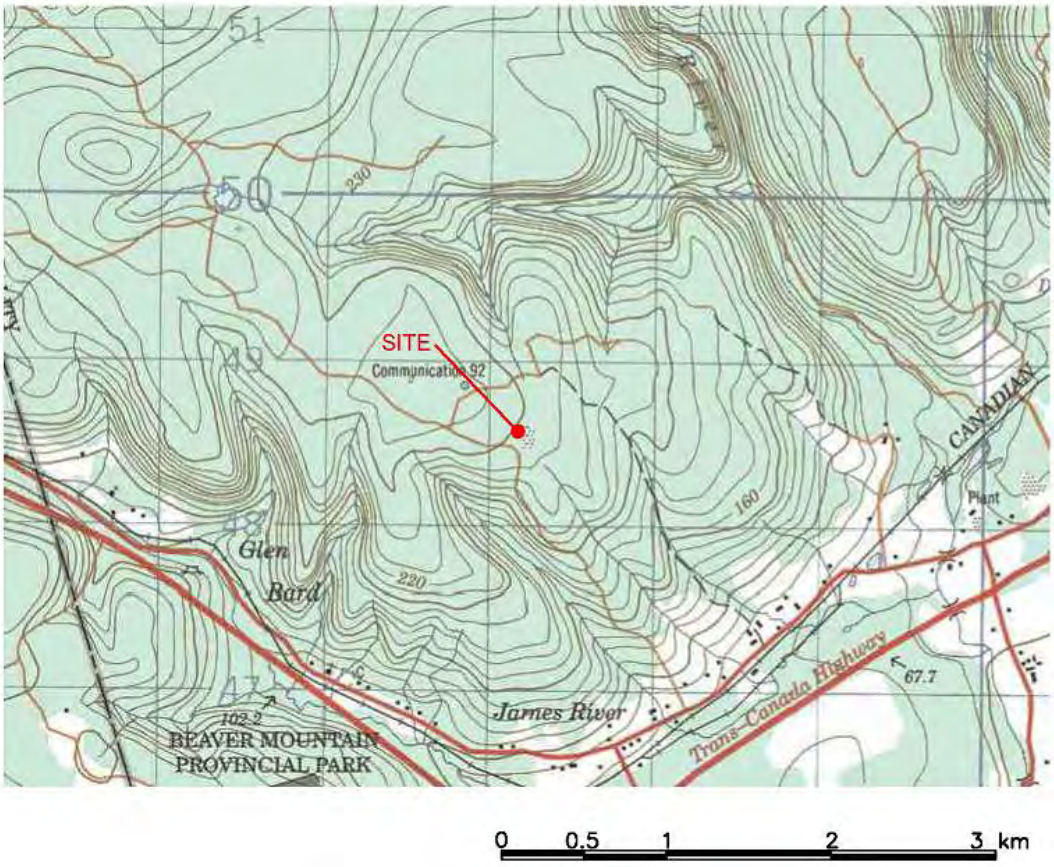

Figure 2 – Site Location and Adjacent Land Uses

3.0 SCOPE OF THE UNDERTAKING

As noted previously, Municipal intends to expand the existing James River quarry for the continuing purpose of extracting and supplying aggregate for the road and local construction industry. The existing quarry has been in operation for many years and encompasses an area of approximately 3.96 ha., of which 3.2 ha is actively developed. This EA covers an area of 31 hectares and includes this existing operational area. The existing quarry face is approximately 15 meters (m) in height and the disturbed area includes on-site related facilities including a scale house, sedimentation infrastructure, as well as a portable asphalt plant, crushing, washing and stockpiling areas. In 2011 and 2012 Municipal has extracted an average of approximately 100,000 to 200,000 tonnes of aggregate per year from the quarry. There are no off-site projects related support facilities, other than Leslie Road and related transportation corridors used to transport the product to local destinations.

It is Municipal's intent to continue quarry operations on the property, using existing infrastructure. It is anticipated that future operations will involve the extraction of approximately 100,000 tonnes/year for the foreseeable future. However, the annual quantity will vary depending on local demand and associated project requirements.

3.1 PURPOSE/NEED FOR THE UNDERTAKING

Municipal proposes to expand the existing James River quarry for the production of aggregate, primarily used in the road and local construction industry. The primary benefit will be to the people of Nova Scotia via the continued construction and maintenance of the Provincial highway system.

3.2 CONSIDERATION OF ALTERNATIVES

Municipal operates rock quarries throughout Nova Scotia and Atlantic Canada and uses modern industry standard methodologies in all phases of the extraction, processing and delivery processes. Alternative processes are always being considered in terms of their efficiency, cost effectiveness and environmental mitigation advantages. Continuing operations of the James River quarry expansion will be assessed on an ongoing basis to ensure that the best available techniques are being utilized in all phases of day to day operations.

3.3 Scope of the Environmental Assessment

The scope of the environmental assessment is in keeping with the Nova Scotia Environment document entitled “Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia” as well as Municipal’s experience with respect to similar projects over the past several decades. The scope also takes into consideration that the quarry is, at present, operational, and subject to an existing Industrial Waste Permit Approval. The following sections of this document outline the key “Valued Environmental Components” addressed by the EA document, and presents an evaluation and summary of the benefits and potential drawbacks to the environment during all phases of the proposed undertaking.

4.0 PUBLIC INVOLVEMENT

4.1 Methods of Involvement

Municipal has engage various public entities, as outlined below and as the EA requirements do not include a direct public involvement program, public notification to date has focussed on notifying local officials of Municipal’s intent to file an EA application to expand the existing James River quarry. In this regard, the following persons have been briefed regarding the intent of this EA document:

Mr. Randy Delorey; MLA Antigonish

Mr. Russel Boucher; Warden Antigonish County

Mr. Hugh Stewart, Councillor, District # 3

Town of Antigonish

Gerard Juliean, Paqtnkek First Nation

Heather MacLeod-Leslie, KMKNO

Municipal has also advised Gerard Julien of the Paqtnkek First Nation of Municipal’s intent to file the Registration Document for a Class 1 Undertaking Under Section 9 (1) of the NS

Environmental Assessment Regulations. As part of the above noted letter, Municipal had copies Heather MacLeod-Leslie of the Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO), the Native Council of Nova Scotia and the Office of Aboriginal Affairs. A letter outlining the details of the project was sent to Gerard Julien on October 15, 2013 and copied to the other three (3) agencies noted above. This letter is included in **Appendix F**. No responses from any of these agencies have been received to date. Municipal will continue to request feedback on the EA document and will provide any responses received to NSE. It is also important to note that Municipal has reviewed the possibility of including other First Nations communities; however feel that due to the proximity of the Paqtnkek First Nations community that they would be the primary First Nations community related to this EA document.

4.2 Public Concerns

No public concerns regarding the project have been received to date. Municipal will document any concerns and provide to NSE.

4.3 Future Steps

The public will be notified of the EA Registration via an advertisement in the Chronicle Herald on April 16, 2014 and an advertisement in the Antigonish Casket on April 16, 2014. A copy of the newspaper advertisement is included in **Appendix F.** Prior to April 16, 2014, Municipal will also notify the Paqtnkek First Nations, KMKNO, Office of Aboriginal Affairs, Native Council of Nova Scotia, Municipality of Antigonish and the Town of Antigonish via letter, advising of the upcoming newspaper advertisements and indicating that the EA document is available for review.

5.0 DESCRIPTION OF THE UNDERTAKING

5.1 Human Uses of the Environment

5.1.1 Mi'Kmaq

The Pictou-Antigonish Highlands are included in the territory traditionally occupied by the Mi'Kmaq. Mi'Kmaq would have used all areas in the highlands to some degree, although upland areas such as those occupied by the James River quarry would have had less use, and now have a lower potential for archaeological resources than lowland areas, which would have a medium to high potential (Davis Archaeological Consultants Ltd., Archaeological Resource Impact Assessment for the Glen Dhu Wind Farm, 2008). Mi'Kmaq are likely to participate in the same activities in the study areas are the general population of Antigonish County, including recreational use, hunting and fishing, collection of edible plants, but in addition the gathering of ceremonial foods, etc. Mi'Kmaq fish for Atlantic Salmon in James River. Particularly near the railway crossing and downstream of Highway 104, in October-November (C. MacInnis ret'd DFO Biologist, pers. Comm., 2013). No Mi'Kmaq communities are near the site, the nearest being communities east of Antigonish and to the west in eastern Pictou County. Antigonish County communities are in Paq'tntek First Nation (Pomquet and Afton, and Summerside, located near Pomquet east of Antigonish), and communities of Pictou Landing First Nation (Boat Harbour, Fisher's Grant and Mergomish Harbour) in the Pictou/New Glasgow area of Pictou County.

Two tribal councils exist in Nova Scotia: the Confederacy of Mainland Mi'kmaq (CMM) and Union of Nova Scotia Indians (UNSI). CMM is a not-for-profit organization that was incorporated

in 1986, and their mission is to promote and assist Mi'kmaw communities. Both Pictou Landing First Nation and Paq'tntek First Nation are members of CMM. The Native Council of Nova Scotia (NCNS) represents Mi'kmaq people living off-reserve. The NCNS is a self-governing agency located in Truro. Statistics Canada estimated that in 2006 approximately 48% of the Mi'kmaq populations lived off-reserve. The goal of NCNS is "to operate and administer a strong and effective Aboriginal Peoples Representative Organization that serves advocates and represents our community."

The Mi'kmaq Rights Initiative (Kwilmu'kw Maw-klusuaqn; KMK) also represents Mi'kmaq. The mission of KMK—whose name means, "we are seeking consensus."— is "to address the historic and current imbalances in the relationship between Mi'kmaq and non-Mi'kmaq people in Nova Scotia and secure the basis for an improved quality of Mi'kmaq life." The initiative is to negotiate between the Mi'kmaq of Nova Scotia, the Province and the Government of Canada. KMK's main office is located in Millbrook. The Atlantic First Nations Environmental Network (AFNEN) is an environmental organization of Mi'kmaq communities and organizations The CMM and UNSI are members and CMM is currently the acting coordinator. The AFNEN includes a representative from each Mi'kmaq organization and community interested in environmental issues. The Network meets regularly during the year through meetings, conferences, and the Internet to discuss environmental matters or concerns.

A Mi'kmaq food fishery for Atlantic Salmon and trout is observed on the James and West Rivers near the quarry site. Otherwise no Mi'kmaq ceremonial or cultural uses have been identified for the James River quarry site or vicinity, nor is the area known to be used for other purposes, based on the background review and previous cultural reviews for other environmental assessments in the area, the Archaeological Resources and Reconnaissance Survey (CRM, 2013 – **Appendix E**) and the Nova Scotia Museum database search (S. Weseloh MacKean, Coordinator, Special Places, pers. Comm. 2013).

5.1.2 Water Supply Areas

The site is south of a Protected Water supply area for the Town of Antigonish Water Supply Reservoir, which is northeast of the site (K. Proctor, Town of Antigonish, pers. Comm., 2013). None of the surface water runoff from the quarry enters the Town of Antigonish water supply area.

5.1.3 Land Use

In addition to the quarry, lands on the uplands in the vicinity is primarily forest resource, with two telecommunications towers and associated grounds on the northwest edge, and livestock and dairy farms occupying the lower slopes adjacent to Highway 4. The main road accessing the property (Leslie Road) continues northwest to meet Browns Mountain Road which is a forest road/hiking trail originating as the Strathglass Road at Marshy Hope and leading inland to Browns Mountain. Hunting, recreational vehicle use ((ATV's, snowmobiles and motorcycles) are the main recreational uses of the site. Much of the Crown Land in the area is leased to forestry companies which are harvesting on a moderate rotation. A large section of lands on Browns Mountain-Eigg Mountain have been set aside as a wilderness area, the Eigg Mountain-James River Wilderness Area, under the provincial Wilderness Protection Act. A large portion of the James River watershed north of the site is set aside as a Protected Watershed Area for the Town of Antigonish water supply (K. Proctor, Town of Antigonish, pers. Comm.., 2013).

5.1.4 Forestry

Most of the land in the Pictou-Antigonish Highlands to the north of the project location is Crown Land under license to forestry companies, and is in various stages of regeneration from previous harvesting. No old growth stands occur within 13 km of the site. Parts of the land to the north of the site are included in the Eigg Mountain-James River Wilderness area, which encompasses approximately 4,150 ha, about half of the forest land in the area, which will not be harvested in the future.

5.1.5 Hunting and Trapping

The quarry site is expected to support wildlife species characteristic of Antigonish County, with a tendency for some of the more uncommon species to occur due to the remoteness and proximity to the protected forest areas to the north. Predominant upland species reported in trapping catch for Antigonish County likely occur near the site including mink, bobcat, fox, racoon, skunk, squirrel, weasel, coyote and fisher (www.novascotia.ca/natr/hunt/uplandgame-stats.asp#abundance). Antigonish County reported the third highest catch provincially in terms of mink and red fox in the 2011-12 period. The area supports white-tail deer, although the County reported a below median white-tail deer harvest in the 2003-12 period and only about 3% of the total provincial harvest in 2012. An important deer wintering area has been identified to the northeast of the quarry site, bordered on the west by the James River. Of upland game species (e.g. Snowshoe Hare, Ruffed Grouse and Ring-necked Pheasant) only the former two are harvested but Antigonish County has a comparatively low rank with only 3% of the total harvest in the 2010-12 period. Antigonish County Black Bear harvest is expected to follow the increasing trend occurring in the Province.

5.1.6 Recreational and Mi'kmaq Fishing

No recreational fishing takes place on the site but the lower reaches of some of the watercourses that originate outside the quarry property support brook trout which can be fished by locals. The streams are dry for parts of the year during which fishing does not take place. West River and James River are important for recreational fishing, with species including Brook Trout, Brown Trout and Atlantic Salmon. Mi'kmaq fish for Atlantic Salmon in James River, particularly near the railway crossing and downstream of Highway 104, in October-November (C. MacInnis ret'd DFO Biologist, pers. comm. 2013). James River extending from the dam to the junction with West River is fished for Brown Trout at night from April 15th to August 31st (NS Anglers Handbook, 2013). West River is a special trout management area with a regulated fishery.

5.1.7 Archaeological Resources

No records of archaeological resources of significance occur in the study area, and the potential for pre-contact and historical archaeological resources is low and low to moderate, respectively (S, Weseloh MacKeane, Coordinator, Special Places, pers. comm., 2013). The James River area was the site of a major thrust of settlement in Nova Scotia, and some of the farms in the area date back to earlier times and may have more recent historical significance. The Glen Bard Cemetery, located about 2 km southwest of the quarry on Highway 4, is significant for its use by early and prominent settlers. The old Glen Bard United Church at the cemetery site was demolished about a decade ago, but the Bethel Presbyterian Church, built in 1929, is still maintained under the management of the First Presbyterian Church of New Glasgow. It is open

for services from July 1st to Labour Day, and is under the pastoral charge of the Barney's River Presbyterian Church in Kenzieville (Rev. G. Matheson, First Presbyterian, pers. Comm.., 2013).

A more-detailed archaeological/cultural assessment was completed for the quarry expansion (CRM 2013), and determined, in turn, that the study area exhibited low potential for archaeological and/or historical resources, and no areas of high archaeological potential were identified during a site visit (August 27, 2013). (**Appendix E**).

5.1.8 Parks and Protected Areas

No significant habitats listed in the NSDNR Significant Habitats Database occur in the immediate vicinity of the site, and there are four designated parks and protected areas in the surrounding area. Eigg Mountain Wilderness Area and James River Protected Water Area, both north of the project site and protected under provincial acts (NS Protected Wilderness Act & NS Environment Act, respectively); and James River & Beaver Mountain Provincial parks, southwest of the project area, day use parks for picnicking and hiking (ACCDC, 2013). A day-use park formerly existed along Highway 4 and closed, later replaced by the Beaver Mountain Provincial Park. Also, NS Department of Natural Resources has identified a deer wintering area immediately east of the site, which borders James River (See Figure 17, Envirosphere, 2013, **Appendix D**).

Eigg Mountain Wilderness Area – Designated from Crown Lands under the NS Wilderness Protection Act in March 2005. The wilderness area encompasses 4,150 ha. It includes the headwaters of the James River, which is the water supply for the Town of Antigonish (K. Proctor, Town of Antigonish, pers. Comm.., 2013). The area includes forest which has previously been logged as well as forest under management.

James River Protected Water Area – The James River Watershed is regulated under the NS Environment Act and serves as the Town of Antigonish primary drinking water supply. The reservoir and dam for the supply are located in the southwest corner of the water supply area, and includes crown lands as well as portions of the Eigg Mountain Wilderness Area.

James River Deer Wintering Area - Wintering areas are locations, typically with good forest cover and browse, located on south-facing slopes, where white-tailed deer have been known to congregate naturally. Forest practices in the area follow guidelines to ensure adequate conditions for the species are maintained.

Beaver Mountain Provincial Park – Beaver Mountain is a 133 ha, day-use park in the NS Provincial Park system. The Park is wheelchair accessible offering a 1 to 1.6 km paved loop of trails, picnic areas and an interpretive area and signage. The upland on which the quarry is located is visible from the Park, however, the quarry and the quarry access roads are not.

5.1.9 Recreational/Cultural Activities

The site is relatively inaccessible and there are no recreational facilities or recreational/cultural activities carried out in the immediate vicinity of the site. Logging trails are used locally for ATV's and the access road connects with hiking trails (e.g. the Browns Mountain trail north of Marshy Hope) and with trail and snowmobile networks in the protected lands (Eigg Mountain Wilderness Area and the Town of Antigonish Protected Watershed area to the north). A notable waterfall (James River Falls) is located on the river where it crosses the Browns Mountain trail

about 4.5 km north of the quarry, and is a destination for hikers. Hunting by locals likely takes place on lands adjacent to the property.

Glen Bard Cemetery, James River – Along Highway 4 (i.e. the old highway) west of the quarry, the Glen Bard Cemetery is a designated Provincial Heritage Property: burial place of Bard MacLean, a famous Gaelic poet. Glen Bard United Church and cemetery, located about 1.5 km southwest of the quarry, were established in 1813, the church was dismantled about a decade ago, but the cemetery is maintained and is used by the Bethel Presbyterian Church located not far to the west (Rev. G. Matheson, First Presbyterian Church, pers. Comm.., 2013).

Riverside International Speedway—Riverside International Speedway is located on the south side of Highway 104 about 2.5 km due south of the quarry site. In 2013 it put on five stock car race events in the June-September period, and has been operated nearly continuously since 1969. The site can support 600 recreational vehicles and during the main race weekends over 1,000 people can be on site. Access to the site from Highway 104 is direct via the Beaver Meadow interchange, which is the same one used by trucks from the quarry site.

Keppock Mountain Ski/Mountain Biking Area—Until the late 1990s, the Keppock Mountain or "The Keppock" was a local downhill ski operation when it proved uneconomic and closed. In recent years mountain bikers began using the area and recently a non-profit recreational group—Positive Action for Keppock (PAK) have begun developing a trail area and system at the site focused on downhill runs but with a view to including trails for both cross country biking and Nordic skiing[1], and PAK hosted an opening event in June 2013. Keppock Mountain is located on the uplands south of Highway 104, about 5 km due south of the quarry site, and runs are visible.

5.1.10 Residential/Commercial/Industrial Development

The land near the James River quarry has a low population density, with the major land use in farms and low-density single- and multiple family[2] dwellings concentrated along Highway 4. The nearest homes/farms—a farm on the lower slope on the west side of Leslie Road; and a single family residence on the east side, which is occupied only seasonally—are about 1 km from the quarry and there are no homes or farm buildings within 800 m of the quarry.

Several quarries operate in the general vicinity of the James River quarry, including an aggregate quarry on Gravel Pit road and aggregate and gypsum quarries operated by Nova Construction on Brierly Brook Back Road. An inactive sand and gravel pit operation, which formerly operated a concrete plant, is located on Highway 4 on the east side of James River (D. MacDonald, James River, pers. Comm.., 2013).

It is noted that there are no mineral claims in the area of the James River quarry. The nearest claim is a Non Mineral Registration by Nova Constructions over their gypsum mine several km. to the east.

[1] http://www.somegoodadventure.com/general/new-bike-trails-the-keppoch/.

[2] A 2-unit apartment building is located on Highway 4 opposite the junction with Beaver Meadow/Addington Forks road.

5.1.11 Tourism and Viewscape

The James River Quarry is located on the top of an upland plateau near the maximum elevation for the area as a whole, and as such is only marginally visible from the surroundings. From the top of the overburden piles there is a line of sight to the lands around the Town of Antigonish and the uplands south of Highway 104 including Keppoch Mountain, and potentially the quarry could be seen from the higher elevations in the Keppoch Mountain area. The access road for the site (Leslie (formerly Tower) Road) is inconspicuous from Highway 4, similar in appearance to typical connector roads.

5.2 Existing Quarry Operations

The existing quarry operations involve blasting, crushing, washing, stockpiling of aggregate and associated trucking on an as required basis. In addition, a portable asphalt plant is occasionally situated on the property. The quarry has operated in accordance with an existing "Industrial Waste Permit Approval #2012-080060, as attached to a letter dated January 24, 2012 to Mr. Gary Rudolph (Municipal Enterprises Limited) from Mr. Paul J. Keats, B. Tech. (Env.), Eng. Tech., CET, District Manager, Antigonish District Office, Nova Scotia Environment (**Appendix A**). The quarry also operates in accordance with the Nova Scotia Pit and Quarry Guidelines. These Guidelines apply to all pit and quarry operations in the Province and provide separation distances for operations, including blasting, liquid effluent discharge limits, suspended particulate matter limits, sound level limits and requirements for a reclamation plan and security bond. Municipal is committed to the utilization of Best Management Practices in all phases of their operations, including the on-site management of air quality, greenhouse gas emissions, noise, dust and water quality and will operate in accordance with applicable Federal and Provincial legislation and standards.

Blasting, crushing, washing and trucking have occurred on an as required basis, however it is noted that blasting has occurred on an average of 2 to 3 times per year. Municipal has also conducted surface water sample collection and analysis from March, 2012 through July, 2013 (on-going), which involved grab sampling for hydrogen ion concentration (pH) and, Total Suspended Solids (TSS), the results of which are outlined in **Table 1**.

TABLE 1. – James River Water Sampling Analysis (2012-2013)

SAMPLING DATE	pH (units)[1]	TSS (mg/L)[2]
27-March-2012	7.61	2.0
30-July-2012	8.06	ND
08-August-2012	8.08	ND
23-August-2012	8.14	ND
26-September-2012	7.98	5.2
26-October-2012	8.07	11.0
28-November-2012	8.03	ND
29-December-2012	7.97	ND
27-January-2013	8.07	ND
26-February-2013	7.99	ND
19-March-2013	7.75	ND
21-April-2013	7.54	ND
25-May-2013	7.81	3.6
28-June-2013	7.84	2.2
25-July-2013	7.95	20

Site Discharge Limits – James River Quarry Ind. Waste Discharge Permit App. # 2012-080060:

1 – pH Grab Sample 5-9 units/pH Monthly Mean 6-9 units

2 – TSS Short Term Increase 25 mg/L/Long Term Increase 5mg/L

In addition to the above noted data, Municipal also arranged for the collection and analysis of a rock sample for sulphur content to determine if the material was sulphide bearing. The results of this analysis yielded a sulphur concentration of 0.014 % (0.44 kg H_2SO_4/tonne), which is well below the minimum (0.4 % S; 12.51 kg H_2SO_4/tonne) defined by NSE as sulphide bearing material and is therefore not acid producing. The laboratory results of this sample, and an associated lab duplicate, are included in **Appendix C.**

5.3 Future Quarry Operations

Municipal proposes to expand the James River quarry for the extraction, storage and removal of aggregate, primarily used in the road and local construction industry. This EA is focussing on current needs, but also future needs; therefore are requesting the EA approval for 31 hectares. The active footprint, including all related operational, storage and surface water control facilities, of the quarry will be approximately 31 ha.

Although totally dependent on local market conditions, it is anticipated, at this time, that future development will involve the production of approximately 100,000 tonnes of aggregate per year, for a period of approximately 20 years. The rock face would be constructed in a north-easterly direction from the existing face (**Drawing # 2, Appendix B**). **Drawing # 2, Appendix B** identifies the total 31 hectare expansion area. With an expansion area of 31 hectares, it is anticipated that a total tonnage of approximately 2,000,000 tonnes, which based on an average annual tonnage removed of 100,000 tonnes represents a project life of approximately 20 years. It is further noted however, that the total proven resource of the quarry is estimated at 10,000,000 tonnes and has a total potential life of approximately 100 years. For operational purposes it is important to understand that quarry operations will generally coincide with the road construction season; therefore it would be reasonable to anticipate seasonal operations within a similar timeframe (April – December). The quarry will likely operate 24 hours per day when in operation and may operate for as many as 32 weeks per year, or as little as 0 weeks per year, depending on local demand and project requirements. Municipal is committed to the utilization of Best Management Practices in all phases of their operations, including the on-site management of air quality, greenhouse gas emissions, noise, dust and water quality and will operate in accordance with applicable Federal and Provincial legislation and standards.

It is noted that the above noted estimate does not take into consideration wetlands identified within the crosshatched area. If the quarry is expanded into this area, Municipal will follow the Wetland Alteration Approval Process, which will include contact with NSE to open negotiations regarding appropriate compensation and/or the creation of replacement habitat.

Aggregate production would commence with drilling and blasting and is consistent with current operations. A qualified blasting contractor would conduct this work. The blasting contractor would be responsible for blast designs and methods in accordance with the General Blasting Regulations contained in the Nova Scotia Occupational Health and Safety Act, 1996. Blasting would also be conducted in accordance with the Pit and Quarry Guidelines. Blasting and noise level guidelines respecting the time of day/day of the week will be followed and blast monitoring

will be conducted for every blast event and submitted to NSE upon request. The Industrial Approval stipulates routine surface water quality monitoring as well as blasting control and monitoring requirements.

It is anticipated that aggregate excavation will not take place below the deep bedrock water table. A small amount of unconsolidated material and upper fractured bedrock groundwater may be encountered as in previous operations, however this water, if encountered, will be directed to the existing surface water and sedimentation control system for treatment and controlled release.

The blasted rock will be excavated with an on-site excavator and processed by on-site portable crushing equipment. The various aggregate products will be stockpiled in designated areas within the quarry. Material, within the quarry, will be hauled and moved with a front end loader. Products will be transported from the quarry via tandem and tractor trailer trucks along Leslie Road to Trunk 4 (the Beaver Meadow Road), north to Highway # 104, a distance of approximately 2.7 km. The number of trucks hauling aggregate will be determined on a job by job basis, but currently averages approximately 2500 per year. The existing quarry currently employs one to two seasonal employees; however additional employees are on-site during aggregate production. These employment numbers are expected to remain consistent throughout the on-going operation. Drilling, blasting and trucking will require additional resources; however these activities are generally subcontracted on a job by job basis.

6.0 VALUED ENVIRONMENTAL COMPONENTS AND EFFECTS MANAGEMENT

The list of Valued Environmental Components considered for the assessment, and interactions with project components, are presented in **Table 2**. The environmental effects and potential impacts of the project along with their significance and suggested mitigations are outlined in the following sub-sections and are summarized in **Table 3**, included at the conclusion of this Section. In addition, “A Summary of Impacts and Mitigation on Valued Environmental Components” is presented as **Table 4**, also included at the conclusion of this Section.

Table 2. Valued Environmental Components (VECs) for James River Quarry Expansion.

Biophysical	Socioeconomic
Air Quality & Noise	Mi’Kmaq
Hydrogeology	Archaeological, Cultural and Historical
Hydrology	Recreation, Tourism & Viewscape
Water Quality	Wilderness
Wetlands	Land Use & Value
Aquatic Environments	Residential, Industrial & Agricultural Use
Fish & Fish Habitat	Recreational & Mi’Kmaq Fishing
Flora & Fauna Species & Habitat	Transportation
Species at Risk	Water Supply
	Parks & Protected Areas

6.1 Socioeconomic Impacts

6.1.1 Mi'Kmaq

The Mi'Kmaq occupied much of Nova Scotia prior to European contact and the lowlands and rivers such as the West River would have been used as travel routes. In more recent times, treaties made with the British and continued through Canadian law have maintained their rights to fish, and harvest wildlife and forest resources. The site does not have a cultural historical significance for the Mi'Kmaq and no artefacts indicating prehistoric or historical use were identified at the site (CRM, 2013, **Appendix E**).

Quarry operations would interact with Mi'Kmaq use only indirectly if untreated runoff from the site entered the James River, where there is a Mi'Kmaq food fishery; or if presence of the quarry influenced wildlife or game populations or hunting access or routes. The footprint of the proposed quarry expansion is relatively small (a maximum of approximately 31 ha over the lifetime of the quarry) which is small in relation to the available wildlife habitat in the area, and there are no likely cumulative effects of other activities in the area, and consequently none of these effects are considered significant.

6.1.2 Archaeological/Cultural/Historical

The land proposed for the quarry expansion has low potential for pre-contact and/or early historic native archaeological resources. The site was not settled by Europeans and has no on-site structures which could have cultural significance. The historic Glen Bard Cemetery located on Highway 4 is not in an area which will experience significant truck traffic originating at the quarry and is sufficiently far from the quarry to be expected to experience only low noise levels for visitors. Consequently the project will not have an impact on cultural/historical/archaeological features.

6.1.3 Recreational Activities

Recreational use of the environment in the vicinity of the site consists principally of hunting, snowmobiling, and use of motorized recreational vehicles. Cleared trails for logging equipment and clear-cuts on site are used by local hunters, and hikers and vehicular traffic may use the back roads to access trails in the Eigg Mountain James River Wilderness area. A local snowmobile club, the 'Snow Dogs', groom trails extending into the wilderness north of the site, extending from the telecommunications towers near the site. The volume of users is probably low, restricted to some locals as well as a cross section of hunters, recreational vehicle users which habitually use the area. Recreational users could be impacted if individuals trespassed on the site and encountered the open quarry faces but this is an extremely unlikely eventuality. In addition, it is noted that the quarry property includes warning signage and protective berms to advise individuals of the presence of the quarry.

6.1.4 Tourism and Viewscape

Tourists pass through the area mainly on Highway 104, from which the James River quarry cannot be seen. At higher elevations, such as the portion of the highlands south of the highway, at Beaver Mountain Provincial Park or Keppock Mountain, the quarry would barely be seen. Truck traffic from the quarry during periods of high utilization would be concentrated principally on Highway 4 and Highway 104 where it would contribute to added traffic and coincide with tourist traffic (which is also highest in the summer which is a peak period for aggregate use from the quarry) and could contribute to congestion (the Highway is not twinned at this point).

6.1.5 Wilderness

Few places in Nova Scotia are remote and have been untouched by human hands, but those that remain are valued by the people of Nova Scotia, particularly with the Province's rural culture based on historic settlement, land ownership and land use. In addition to its availability for experiences of Nature and isolation from civilization, wilderness offers benefits for protection and preservation of wildlife, contributing to tourism, forming the landscape, for example in distinctive features such as the Pictou-Antigonish Highlands, protection and regulation of surface waters, ecosystem services and economic benefits, in particular in relation to watershed protection and management.

The Province of Nova Scotia has a policy focused on setting aside a portion of its landmass in the form of wilderness areas. The James River quarry is on the margin of the Pictou-Antigonish Highlands south of a major set-aside of Crown Lands—the Eigg Mountain-James River Wilderness Area. With the exception of noise generated by the quarry, which will likely only be heard near the southern edge of this protected area, presence of the quarry is unlikely to disrupt any of the wilderness values or activities in the Eigg Mountain-James River Wilderness area. The quarry does not routinely block access to the interior of the wilderness area, and does not contribute areas of undisturbed landscape, being an area which has already been logged and is crossed by logging roads, as well as being adjacent to communications towers and grounds. It is itself on the edge of farmland, in an area which has moderate human use and development in the form of farms, and the transportation corridor (railway and highways) in the adjacent lowlands, which generate noise. The quarry is not highly visible, as it is on the top and would be developed in to the promontory at the site, and would not likely be seen by visitors to the area, in particular tourists, who would value the view and the sensation of a wild area.

6.1.6 Recreational Fishing & Hunting

Freshwater streams and ponds at the foot of the slope near Highway 4 in the vicinity of the quarry are used locally for recreational fishing for trout, and in James River and some lowland tributaries, for Atlantic Salmon, including a Mi'Kmaq food fishery. Only the extreme headwaters of the streams originate in the vicinity of the quarry where they do not support nursery areas for these species where the significant slope prevents access. Control measures on sedimentation and prevention of accidental contamination of the upper waters of these streams by the quarry will avoid impacts on the lower areas of the watershed where juveniles occur and the portions of streams even further downstream where these species may be fished. The quarry expansion will not affect recreational or Mi'Kmaq fishing, as changes in hydrology resulting from the quarry is likely to be insignificant. Water quality of the runoff from the Quarry is good for salmonids, including low turbidity and neutral pH, which would tend to maintain the quality of waters downstream for fish.

6.1.7 Land Use and Value

The land at the site is not suitable for agriculture due to the absence of good soil and presence of bedrock near the surface. Hardwood forests which predominated at the site have historically been logged and much of the upland in the vicinity of the quarry, with the exception of the Eigg Mountain-James River Wilderness area, will be logged in future. Although local trapping activity was not identified for the site, the area forms potential wildlife habitat for furbearers, as well as for species ungulates such as White-Tail Deer, which are hunted in the area. The footprint of the expanded quarry will be 31 ha and is exceedingly small in relation to the available lands in the area, and therefore would have a small overall impact on forest and wildlife resource use in the area.

6.1.8 Transportation

The quarry generates a moderate and variable level of truck traffic on Highways 4 and 104 but is not expected to change the existing traffic volumes significantly. Existing quarries on the Brierly Brook Back Road and Gravel Pit road frequently use Highway 4 as a route (C. MacDonald, Brierly Brook, pers. comm., 2013) so it is possible that higher levels of traffic from multiple quarries could, at times, occur, particularly if there is high demand for aggregate for local projects. There is little local private traffic which will be impacted, and the truck loading will impact the existing roads to some degree. Impacts on road condition are normal, and will have to be considered in the rotation of road repairs in the area.

6.1.9 Residential Use

No occupied permanent residences occur within 800 m of the quarry. The nearest homes are associated with a farm on the lower slope on the west side of Leslie Road; and a single family residence on the east side, which is occupied only seasonally. Blasting at the site will occur infrequently during daylight hours and will be unlikely to disturb owners of residences and farms. Activities will not impact wells, as they are located at a significant distance from the site. Most operations at the site occur during daylight hours, and on rare occurrences when they are undertaken at night, will involve minimal additional lighting and noise, which is unlikely to be a serious disturbance to local residents.

6.1.10 Water Supply

The Town of Antigonish Protected Watershed Area on the James River watershed is located north of the quarry site. However, the quarry is located on a portion of the watershed which feeds into James River below the dam and reservoir (located northeast of the site) and no runoff from the site would enter the reservoir. Dust from quarry operations, if uncontrolled, could be transported some distance and could enter the reservoir, particularly in summer when predominant winds are from the southwest and the quarry is most active. The proportion of the time that dust would be an issue, and during which there were significant enough winds to transport dust, is thought to be extremely small, and likely wouldn't impact the reservoir. Dust control measures will also be implemented at the quarry and adhere to the approved Industrial Approved emission limits will be maintained.

6.1.11 Industrial/Agricultural Activities

Quarry operations would indirectly impact the activities of two competing quarries (aggregate and gypsum) located on the Brierly Road Back Road. This is normal in a competitive environment, and the three quarries are already operating (for James River quarry the activity is an expansion of an existing operation).

6.2 Biophysical Impacts—Impacts of the Project on the Environment

6.2.1 Air Quality and Noise

Various project activities have the potential to generate dust, combustion emissions, and noise. In particular, operation of tree-clearing and grubbing equipment, rock drilling and blasting, as well as onsite routine operations contributes to increased dust and particulate levels. Activities at the quarry including crushing, equipment use, and truck movement, back-up alarms etc. will generate dust and noise at the quarry as well as along Leslie Road. Dust emissions during the construction phase will be localized and short term, and from the routine operations are expected to be minimal, and dust management will be undertaken, including use of water spray and covering working and lay down areas with blasted rock. Monitoring of airborne particulate

emissions will be conducted at the request of NSE and in accordance with the Pit and Quarry Guidelines and the Nova Scotia Air Quality Guidelines. In particular, Particulate Emissions shall not exceed the following limits at or beyond the Site property boundary:

Annual Geometric Mean 70ug/m^3

Daily Average (24 Hr.) 120ug/m^3

Combustion emissions will be generated from the operation of vehicles and equipment. Given the scope of the planned operations, these emissions will be minimal (i.e. restricted to one/two pieces of heavy equipment), localized and similar to those produced during previous operations. Ambient air quality monitoring will be conducted at the request of NSE.

Noise levels from the quarry expansion are expected to be similar to those produced during the current operations, and the proponent will ensure that they do not exceed those specified in the Nova Scotia *Pit and Quarry Guidelines*. Blasting is expected to occur infrequently (1-2 times per year) and will occur only during daylight hours.

Sound levels, as per the Pit and Quarry Guidelines and the existing permit, will be maintained at a level not to exceed the following levels (Leq) at property boundaries:

Leq 65dBA 0700-1900 (days)

60dBA 1900-2300 (evenings)

55dBA 2300-0700 (nights)

Blasting is expected to occur infrequently (1-2 times per year) and will occur only during daylight hours (0800 and 1800 hours). Concussion (air blast) is limited to 128dBl as measured within 7 m of the nearest structure not located on the site. Ground vibration is limited to 0.5 in/sec (12.5 mm/sec) as measured below grade or less than 1 m above grade in any part of the nearest structure not located on the site.

As indicated previously, Municipal is committed to the utilization of Best Management Practices in all phases of their operations, including the on-site management of air quality, greenhouse gas emissions, noise, dust and water quality and will operate in accordance with applicable Federal and Provincial legislation and standards.

6.2.2 Geology/Hydrogeology

The site is immediately underlain by a complex nature of glacial deposits, weathered and frost-shattered rock and soils derived from bedrock of various types and ages, glacially scoured basins and knobs, overlain by a thin, discontinuous veneer of till, shaped by glacial erosion. The till veneer, based on visual observations, appears to be less than 1 m thick, with significant areas of boulder terrain and/or bedrock outcropping. (NS Department of Natural Resources, Map 92-3; Scale 1:500,000 – Stea, R. R., Conley, H. and Brown, Y. (compilers). Bedrock geology in the general area consists of turbidic conglomerate, wacke, mudstone and minor basalt of the Georgeville Group, James River Formation. However the quarry site itself is located within an area of a granite pluton of middle to late Devonian age. (Geological Map of Nova Scotia. NS Department of Natural Resources, Minerals and Energy Branch, Map Me 2000-1; Scale 1:500,000 – Keppie, J. D., (compiler).

The site topography is generally flat to strongly rolling with the slope predominantly to the southeast toward an un-named stream trending southeast to the James River. It is anticipated that the surficial and shallow groundwater flow mirror the topographic flow. Therefore, it is anticipated that the local/site specific shallow groundwater will flow towards James River (southeast). It also anticipated that the bedrock aquifer will exhibit fracture flow. The pre-existing quarry area has been previously disturbed and altered for surface and shallow groundwater control, thereby altering the water flow regime in the immediate area, which has been directed off-site to the south, which eventually flows southeast towards an un-named brook and then to the James River.

Shallow groundwater is expected to discharge to the on-site surface water control structures; where ultimately it would become part of the surface water regime. The deeper bedrock groundwater regime in the general area is used for potable water source. However, a search of the NSE well log database notes that there are no well log records for the subject site or within 1.6 km. of the quarry property. The NSE Well Log data base identifies 34 wells located within 10 km. of the site. The nearest well noted by the database is located at 955 James River Road, approximately 1.6 km. south of the subject property. A drive by “windscreen” survey was completed along Trunk 4 through James River, immediately to the south of the quarry property. This process confirmed that homes with on-site wells were located at a distance of approximately 1.6 km. south of the quarry property. It is also noted that the actual depth of the bedrock water table at the quarry site is not known, however it is known that this water table has not been encountered during historic quarry operations. Given the fact that the quarry expansion is not intended to extend below the deep bedrock water table, it is concluded that this groundwater will not be encountered during future operations.

Activities associated with the project including forest clearing, grubbing and removal of overburden, and blasting, influence groundwater flow both spatially and temporally. Groundwater flows in soil layers will be reduced to the southeast, resulting in a decreased supply to those areas, but flows into the bedrock aquifer will likely not decrease significantly. The effect on overall groundwater patterns will be small, however, due to the small area of the quarry in relation to the area of landscape. The overall impact on hydrogeology at the site is therefore expected to be negligible.

6.2.3 Hydrology

Runoff from the surfaces in the quarry will probably increase peak flows slightly in the streams originating around the existing developed area, and the quarry expansion will lead to further increases in annual runoff; peak flows resulting from storms and runoff events; as well as reducing the duration of flows during dry periods. Quality of water leaving the site and entering flowage is high, due both to the onsite flow management and the bedrock source origin—rainwater over granite. Both factors have probably not impacted the quality of the surface waters in downstream areas significantly. Expansion of the quarry will result in further increases in peak flows to the stream; however the overall change will be extremely small due to the small size of the quarry relative to the overall watershed area of the adjoining surface waters and the runoff control measures used at the site.

6.2.4 Water Quality

Water quality downstream of the site is important for fish habitat in the lower watershed where the streams arising around the quarry property are visible from highways and roads. Blasting is not expected to result in groundwater quality changes, particularly with efforts to reduce releases of other chemicals such as nitrates used in blasting. Forest clearing and grubbing

activities can lead to releases of fines from the soil, resulting locally in elevated suspended sediment levels. There are no watercourses on site in the vicinity of the proposed expansion for direct transmission of suspended sediments to nearby surface waters, and which potentially could reach downstream areas. On-site water and sedimentation management both existing and to be established, including settling ponds, are expected to be capable of handling any suspended sediment issues.

The quarry has onsite sedimentation and flow management, which effectively mitigates release of fines from normal quarrying operations. Release of other contaminants such as oils and lubricants from operating equipment potentially can impact downstream areas, but this will be mitigated by normal precautions related to equipment operations. As indicated previously, Municipal has been collecting surface water samples, which serves as a baseline for ongoing operations at the property.

6.2.5 Freshwater Aquatic Environments

There are no permanent streams on the quarry property; and only intermittent flowages drain the south and north sides of the property. Drainage from the present quarry, flows south through several settling ponds. None of the proposed quarry expansion will be in the vicinity of the flowage and consequently there are not expected to be impacts. Use of woods trails for heavy equipment will be done with a view to minimizing impact on drainage; and maintenance of a vegetated buffer in areas not proposed for quarry development, are recommended to avoid impacts on water quality.

6.2.6 Wetlands

The quarry property has few wetlands. Part of one wetland (a 0.6 ha treed swamp) and another small seepage swamp (0.05 ha) may be removed by quarry development and avoidance is generally not practical. A treed riparian swamp south of the settling ponds (0.3 ha) will likely not be affected by future developments. None of the wetlands are a significant type. Potential removal of wetlands will trigger Provincial requirements for a wetlands alteration approval application, wetland delineation and functional assessment, and compensation. Municipal is committed to following the NSE Wetland Alteration Approval Process should wetlands be encountered.

6.2.7 Fish and Fish Habitat

None of the proposed project activities will physically impact the flowages which originate just outside the property boundary, on the north (on the upper James River watershed) and on the south (flowing down the southern slope to meet tributaries of James River in the vicinity of Highway 4 and the railway line). Management of runoff from the quarry and erosion and sedimentation control during movement of overburden will minimize release of suspended sediment. Soils at the site are relatively rocky and have an overall lower potential for the release of fines. The area affected by the quarry is relatively small in relation to the watershed as a whole, also reducing the extent of impacts.

6.2.8 Wildlife and Habitat

Expansion of the quarry over time will involve removal of up to 31 ha of existing terrestrial ecosystem (plants and animals). If at all possible, activities such as logging on the lands outside the quarry should be avoided, or if required for quarry expansion, be conducted using access through existing roads in the quarry proper. Invasive species can be a problem around quarry margins and a monitoring and control program may be undertaken in these areas, if required. If

there is a significant concern about any of the species, a plan will be developed to control the species.

6.2.9 Species at Risk

No plant or animal species at risk occur in the footprint of the proposed expansion of the quarry. Mobile wildlife of concern includes Moose, which in this area are uncommon but part of the small remnant 'mainland' population. Moose (and other large wildlife including black bear and deer) could fall into the quarry and although this is unlikely. Nothing on the quarry site would be particularly damaging to migratory birds, but lights during night operations during migration periods (August-September) would attract various bird species, which could include species at risk and, if possible, 24-hour operations in August-early September, should be avoided.

6.3 Other Undertakings in the Area

There are no known undertakings in the study area, with the exception of the proposed quarry expansion, as described herein.

Table 3. Potential interactions between project activities and operations and Valued Environmental Components (VECs) for James River Quarry expansion.

General Category of VEC	Biophysical								Socioeconomic										
Project Component (potential interactions shown by √)	Air Quality and Noise	Hydrogeology & Hydrology	Water Quality	Aquatic Environments	Wetlands	Fish and Fish Habitat	Flora & Fauna Species & Habitat	Species at Risk	Mi'Kmaq	Cultural/ Historical	Recreation, Tourism & Viewscape	Wilderness	Recreational & Mi'Kmaq Fishing	Water Supply	Land Use and Value	Transportation	Residential, Industrial, Agricultural	Parks & Protected Areas	Resource Use Forestry /Trapping
Construction																			
Site Clearing/Grubbing	√	√	√		√		√	√			√			√	√		√	√	√
Drilling	√										√						√	√	
Blasting	√	√	√	√		√	√		√		√		√	√			√	√	
Operation																			
Moving/Transporting Rock and Product	√										√		√	√		√	√	√	√
Crushing	√													√			√	√	
Washing	√	√	√	√		√	√		√								√	√	
Site Runoff Management		√	√	√	√	√			√									√	
Portable Asphalt Plant	√		√															√	
Onsite Materials Storage (e.g. recycled asphalt)			√																
Accidents (Oil/ Fuel Spills)		√	√	√	√	√	√		√		√		√						

Table 4. Summary of impacts and mitigation on Valued Environmental Components, James River Quarry expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
BIOPHYSICAL COMPONENTS						
Air Quality/Noise	Construction	Noise and dust from heavy equipment during logging and grubbing.	Significant	Negative	Monitor noise levels and schedule activity to avoid peak periods of outdoor use by locals and wildlife.	Not significant.
	Operation	Drilling and blasting; equipment for moving rock; crusher & heavy equipment operation.	Significant	Negative	Monitor noise levels and schedule activity to avoid peak periods of outdoor use by locals and wildlife. Institute measures for dust control.	Not significant.
Hydrogeology/ Hydrology	Construction	Forest and soil removal changes surface water flow.	Negligible	Negative	Likely small changes in groundwater and runoff patterns.	Not significant.
	Operation	Blasting fractures bedrock and changes groundwater flow patterns.	Significant	Negative	Monitor groundwater hydrology to determine changes.	Not significant.
	Operation	Quarry and work areas change surface water flows. Increased peak stormwater flows.	Significant	Negative	Onsite water management to moderate extreme surface water runoff and suspended sediment levels; measures to maintain normal flow regime.	Not significant.
	Operation	Accidental hydrocarbon spills and blasting residues contaminate groundwater	Significant	Negative	Measures to minimize danger of spills; on-site emergency numbers, spill kits etc.	Not significant.
Water Quality	Construction	Increased surface water flows and turbidity in watershed flowages	Negligible	Negative	Onsite water management to moderate surface water runoff and suspended sediment levels.	Not significant.
Water Quality	Operation	Dust & suspended sediment from operations potentially enter headwaters of stream. Chemicals (e.g. nitrates) from explosives entering runoff.	Significant	Negative	Onsite dust control and water management to moderate surface water runoff and suspended sediment levels. Closely monitor explosive residues after blasting.	Not significant.

Table 4. Summary of impacts and mitigation on Valued Environmental Components, James River Quarry expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
	Operation	Chemicals in runoff from materials (e.g. recycled asphalt) stored on site.	Negligible	Negative	Best management practice allows leaving piles exposed to the environment.	Not significant.
Freshwater Aquatic Environments	Construction	Higher peak flows and suspended sediment during activities.	Negligible	Negative	Onsite water management to moderate surface water runoff and suspended sediment levels.	Not significant.
	Operation	Retention of runoff for aggregate washing. Lower normal flows in watercourses adjacent to site.	Significant	Negative	Onsite water management to store additional wash water during off peak season, Preserve woodland in buffer areas of quarry.	Not significant.
	Operation	Releases of chemicals from blasting and runoff from materials stored on site.	Negligible	Negative	Measures to isolate chemical releases and runoff from stored materials piles.	Not significant.
	Construction & Operation	Routine releases and accidental spills of hydrocarbons on site.	Significant	Negative	Provide pollution prevention and emergency measures.	Not significant.
Wetlands	Construction	Removal of several small wetlands.	Significant	Negative	Compensate for wetland loss through NSE wetland alteration approval process. Develop onsite settling ponds as artificial wetlands. Maintain vegetated buffer for wetlands as long as possible before removal.	Not significant.
Wetlands	Construction	Routine releases and accidental spills of hydrocarbons on site.	Significant	Negative	Provide pollution prevention and emergency measures.	Not significant.
Fish & Fish Habitat	Construction	Change runoff patterns at site in local and adjacent watersheds.	Negligible	Negative	Quarry affects small area relative to watersheds as a whole and no streams occur on site.	Not significant.

Table 4. Summary of impacts and mitigation on Valued Environmental Components, James River Quarry expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
	Operation	Change in flow regime in watercourse north and south of site	Negligible	Negative	Settling and retention ponds & onsite water management moderate flows.	Not significant.
	Construction & Operation	Routine releases and accidental spills of hydrocarbons on site.	Significant	Negative	Provide pollution prevention and emergency measures.	Not significant.
	Operation	Accidental spills into James River and other waters from truck accidents on Hwy 4.	Negligible	Negative	Recommend truck traffic use of Hwy 104. Provide pollution prevention and emergency measures.	Not significant.
Terrestrial Flora & Fauna & Habitat	Construction	Removal of Existing Communities	Negligible	Negative	Restore damaged and unused parts of the site (e.g. grubbings and waste rock piles) as soon as possible. Long-term site rehabilitation plan developed with NSE.	Not significant.
	Construction & Operation	Accidental releases, contamination of habitat.	Significant	Negative	Provide pollution prevention and emergency measures & response capability. Remediate any permanent areas affected by spills.	Not significant.
	Construction & Operation	Removal of potential forest and wildlife resource (i.e. wildlife habitat)	Negligible	Negative	Small area affected relative to total available. Minimize footprint of quarry. Restore and rehabilitate areas not used.	Not significant.
Species at Risk	Construction	No species at risk in the proposed footprint of the quarry.	Negligible	Negative	Monitor for occurrence of invasive in disturbed border of work area. Leave mature standing trees where possible as nest cavities.	Not significant.
SOCIOECONOMIC COMPONENTS						
Mi'Kmaq	Construction and Operation	Any land use conflicts with Mi'Kmaq Right to Use Land	Significant	Neutral	Consult with Mi'Kmaq First Nations.	Not significant.

Table 4. Summary of impacts and mitigation on Valued Environmental Components, James River Quarry expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
		Contamination of local watershed affects Mi'Kmaq Food Fishery in James and West Rivers	Negligible	Negative	Ensure negligible accidental and routine releases of contaminants to headwaters of James and West Rivers	Not significant.
Cultural and Historical Features	Construction and Operation	Noise and traffic impacts Bethel Presbyterian Church and Glen Bard Cemetery	Not significant	Negative	Schedule activities at quarry to avoid Sunday services.	Not significant.
Recreation	Construction & Operation	Controls on access to site via Leslie Road	Not significant	Negative	Avoid restricting recreational vehicle traffic along Leslie Road and to telecomm towers.	Not significant.
Tourism and Viewscape	Construction & Operation	View of site and industrial character	Significant	Negative	Maintain forested buffer around site to restrict views from Hwy 104, and Beaver & Keppoch Mountains.	Not significant.
Wilderness	Construction & Operation	Presence of the quarry near existing wilderness area; noise; light pollution.	Significant	Negative	Maintain forested buffer around site to restrict views; avoid nighttime operations requiring lights. Acknowledge and promote existing wilderness areas. Maintain a moderate size of operation at any time.	Not significant.
Recreational and Mi'Kmaq Hunting and Fishing	Construction & Operation	Accidental hydrocarbon spills and blasting residues contaminate surface waters	Significant	Negative	Provide pollution prevention, emergency measures & response capability. Identify and control contaminant releases.	Not significant.
	Construction	Loss of forested area under quarry footprint.	Not significant	Negative	Minimize area of land utilized; maintain forested buffer around active work area.	Not significant.
Water Supply	Construction and Operation	Blasting potentially impacts rock structures under James River dam.	Significant	Negative	Monitor the dam for vibration during one of the blasts; determine if there is an effect.	Not significant.
		Dust from operations could enter the James River Reservoir	Not significant	Negative	Dust control measures during construction and operation.	Not significant.

Table 4. Summary of impacts and mitigation on Valued Environmental Components, James River Quarry expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
Land Use and Value	Construction & Operation	Removal of potential forest and wildlife resource (e.g. forestry & trapping).	Negligible	Negative	Small area affected relative to total land available. Minimize footprint of quarry. Restore and rehabilitate areas not used.	Not significant.
Transportation	Operation	Wear on highway	Negligible	Negative	Current levels low and will not increase.	Not significant.
	Operation	Truck traffic	Not significant	No Change	Use good directional signs, viewing pull-offs, posted speed limits and speed policy in vicinity of quarry.	Not significant
Residential, Industrial, Agricultural Use	Construction & Operation	Noise for local residents	Not significant	Negative	Schedule activities to take place during off peak usage and daylight hours.	Not significant.
	Operation	Truck and recreational traffic interact.	Negligible	Negative	Ensure awareness of truck operators of local traffic and uses.	Not significant.
	Operation	Competition with other Quarries	Negligible	Neutral	Could affect sales of other quarries but could also result in efficiencies for both.	Not significant.
Parks and Protected areas	Construction & Operation	No local interactions	Not applicable	Not applicable	Not applicable.	Not applicable.

7.0 IMPACTS OF THE ENVIRONMENT ON THE PROJECT

The operating quarry will not be impacted by weather, including high rainfall and precipitation, through its nature and design, which includes site water management. The site has, in addition to sedimentation ponds, an system of runoff control basins created from the original quarry at the site, and has runoff control structures along the access road. Aggregate and other rock products stored at the site are stable under varying conditions of rainfall and wind. Municipal is committed to the utilization of Best Management Practices in all phases of their operations, including the on-site management of air quality, greenhouse gas emissions, noise, dust and water quality and will operate in accordance with applicable Federal and Provincial legislation and standards.

8.0 CUMULATIVE IMPACTS

No cumulative impacts (impacts arising from the project in combination with ongoing or foreseen activities) are likely to be caused by the project. The quarry is unlikely to have other quarries or industrial developments locate in the vicinity in future, which should result in additional noise, dust, activity etc. Presently the noise levels experienced at the quarry and in the immediate environs are a combination of three major sources, including Highway 104 (the main continuous source); the Cape Breton and Central Nova Scotia Railway; and Riverside International

Speedway which is periodic sources of noise; and the quarry operations themselves. Quarries on the Brierly Brook Back Road and Gravel Pit Road also generate noise, but activities at those sites are not expected to increase in future. The project itself occupies a small footprint in the landscape, and removes a relatively small amount of forest landscape, and other quarries would similarly have a relatively small footprint on the natural landscape.

9.0 MONITORING

None of the Valued Environmental Components in the vicinity of the James River quarry will be significantly impacted by the quarry expansion. Water quality at the site has been routinely monitored as a condition of the present approval, and monitoring would be continued. Noise levels are not expected to change as the quarry will not increase significantly in activity or withdrawals and similar levels of noise will be expected in future. However, monitoring will be conducted at the request of NS Environment. Municipal is committed to the utilization of Best Management Practices in all phases of their operations, including the on-site management of air quality, greenhouse gas emissions, noise, dust and water quality and will operate in accordance with applicable Federal and Provincial legislation and standards.

10.0 PUBLIC CONSULTATION

The Proponent has not held public or Mi'Kmaq consultations in the area about the proposed expansion of the James River quarry—public meetings are not required for the EA registration. However, it is important to note that Municipal has been in contact with various Government and First Nations individuals. Municipal will continue this dialogue, to the best of our abilities, to ensure any concerns that may be raised are addressed in a timely manner. All communication will be document and made available for NSE to review.

11.0 PROJECT CLOSURE

Remediation of the affected environment during the closure or decommissioning phase of the quarry will involve the execution of a Rehabilitation Plan developed in consultation with the NSE.

12.0 APPROVAL OF UNDERTAKING

Municipal will comply with all provisions of the Nova Scotia Environment Act and Regulations. Applications for Water Rights and Industrial Approvals will be submitted to the Antigonish District office of Nova Scotia Environment.

13.0 FUNDING

No public or other government funding is involved in the execution of this undertaking. All costs are borne by Municipal.

14.0 SIGNATURE OF CEO AND DATE

April 18, 2014

Date

Kurt Jacobs – CEO & President
Municipal Enterprises Limited