

Department of Natural Resources

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ENVIRONMENTAL ASSESSMENT REGISTRATION DOCUMENT

Proposed Aggregate Quarry, Gear Pond

**Prepared by:
Department of Natural Resources
January 18, 2013**

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1. NAME OF UNDERTAKING:

Gear Pond Aggregate Source, St. John's

2. PROPONENT:

Department of Natural Resources
P.O. Box 8700
St. John's, NL
A1B 4J6

Minister:

Hon. Tom Marshall
Department of Natural Resources
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St. John's, NL
A1B 4J6

Principal Contact Person for purposes of environmental assessment:

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Department of Natural Resources
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3. THE UNDERTAKING:

(a) Nature of the undertaking:

The proposed project involves the development of a bedrock aggregate quarry site within the greater St. John's area to provide a long-term source of aggregate for the purpose of construction. The Harbour Arterial Mineral Workings Area (HAMWA) is the only area in St. John's which is zoned principally for the extraction of aggregate and will be insufficient to supply aggregate to the greater St. John's area within several years at the current rate of extraction. Demand is not expected to slow in the coming years.

(b) Purpose/Rationale/Need for the Undertaking:

Several companies are interested in acquiring rights to rock quarries in the northeast Avalon. Quarry rights confer a strong competitive advantage in the construction business providing a low cost source of crushed stone aggregate, an essential component in all construction activities. The location of any rock quarry is extremely important; most of the costs associated with aggregate relate to trucking. A source close to St. John's is preferable.

There is generally a shortage of aggregate sources in the Northeast Avalon. The HAMWA is the only area in St. John's which is zoned principally for the extraction of aggregate. The area was zoned as mineral workings by the City of St. John's in the 1970s and is now divided entirely into about 20 quarry leases with about 16 different operators (Figure 1). As a result, the area is a hodgepodge of individual lots/leases being exploited at variable rates. Some of the larger operators have very little minable material remaining, while other smaller operators have sufficient material to sustain their efforts at the current extraction rate for many years to come (F. Kirby, Manager, Quarry Materials, 2012, pers. comm.). Reclamation work will likely be a long, protracted and costly endeavour.

The demand for additional quarry materials is high due, in part, to aggressive housing developments in response to increased demand for new homes driven by large new construction activities, primarily within the resource sector (CHMC, November 5, 2012). Examples of some of the construction activities currently underway in the city include new offices and hotels, expansion of the St. John's International airport, a new long-term care facility in the Pleasantville area, and expansion of the St. John's Convention Centre among others. In September, the provincial government announced an investment of almost \$16.8 million in support of new municipal infrastructure in St. John's (Municipal Affairs press release, September 10, 2012). The funding will support street rehabilitation, public works depot renovations, sidewalk replacement, retaining wall rehabilitation, bridge rehabilitation, a new community centre in Southlands, and non-profit housing. Overall, investment in the St John's area in 2012 is expected to reach \$650 million and the population is expected to see a further 6% growth (Re/Max Housing Market Outlook 2013).

These new projects will all require a source of aggregate and the only area currently zoned for the extraction of aggregate (the HAMAW) contains insufficient resources to accommodate the city's new and proposed infrastructure projects. The Gear Pond Aggregate Source area was identified as an area that is removed from current housing developments, is underlain by rocks that have potential for use as aggregate for construction, and is characterized by relatively flat topography and dense trees to keep operations out of sight for maximum aesthetic value.

4. DESCRIPTION OF THE UNDERTAKING:

a) Geographic Location:

The Gear Pond Aggregate Source is located south of the Trans Canada Highway at Paddy's Pond. Access can be gained from the TCH by exiting at Paddy's Pond. Cross the overpass to the east side of the TCH, drive parallel to the highway and turn left onto North Pond Road and head south toward Gear Pond (Figure 2). Note that this road is quite rough and likely not maintained. A four wheel drive pick-up truck is recommended. The total area of the site is about 400 hectares.

b) Physical Features:

The area is located within the Maritime Barrens Ecoregion and wildlife species in the area are typical of boreal forest species of this ecoregion. Most of the area is tree-covered, with minor bogs and fens. Forest access roads cut through the area and these are heavily used for recreational purposes including snowmobile and ATV use (Figure 3). The area is also popular for moose hunting (Management Area 35).

Major physical features of the undertaking will include open pit aggregate operations, laydown areas, garages, crushers and asphalt plants (Figure 4).

c) Construction:

Aggregate operations are usually developed in stages but at a rapid pace. Generally boundary surveys are completed first followed by 1) the submission of an application for a quarry lease complete with development plans and financial assurance, 2) the issuance of a quarry lease, 3) site development (stripping, stockpiling of organics for rehabilitation and development of laydown areas), 4) the development of open pit quarry operations, 5) crushing of material and 6) transportation of the product to market– (crushed stone, cement and/or asphalt.)

During construction, there is potential for noise, site drainage, dust pollution and general litter.

The area is now designated for Agricultural use, though there is only one farm in the immediate area. Approval of the Gear Pond Aggregate Source will require agreement for this use by Crown Lands and will require re-zoning by the City of St. John's.

d) Operation:

It is estimated that the area could be divided up into 6-10 new quarry leases. Each operation will consist of the blasting of rock with subsequent transport of the material using a combination of trucks and front end loaders. Each operation will also have an on-site crusher and may have an asphalt plant.

Potential pollutants during the operation would include site drainage, noise, airborne emissions (dust and fly rock), and possible fuel or oil leaks. Site runoff will be directed to vegetated areas and barriers may be installed (as required) to prevent siltation of water bodies or streams. Any domestic waste generated will be collected and disposed of as per the Waste Material Disposal Act. All equipment will be equipped with appropriate emission controls. All vehicles will follow a designated route and will be properly maintained to minimize noise and exhaust and muffler systems will be inspected regularly to ensure effective operation. Petroleum products will be handled and stored as per Storage and Handling of Gasoline and Associated Products Regulations, under the

Environmental Protection Act. The proposed site is located greater than three km from residential areas.

e) Life Expectancy of Operation and Rehabilitation Plan

The proposed area is expected to provide aggregate for the greater St. John's area and much of the northeast Avalon for roughly 50 years. Operation plans and rehabilitation plans will be designed by professional geotechnical engineering consultants and will comply with the Quarry Materials Act and Regulations. Operations will be conducted in a logical, staged sequence to streamline and minimize the cost of ultimate rehabilitation design. Financial assurance is required for rehabilitation purposes.

f) Occupations:

It is estimated that each operation will at a minimum employ the following: 2 equipment operators (front end loaders), 6 truck drivers, 1 or 2 crusher operators, 2 asphalt plant operators, 1 heavy duty mechanic, 2 air track drill operators and 1 operations manager.

g) Alternative Sites:

An alternative site could involve expansion of the HAMWA southward to Paddys Pond (Figure 5). No direct access to the area of expansion is currently available but the area could be accessed by extending existing roads from the current workings. A Conception Bay South Bypass Road has been proposed for the area and this could potentially provide alternative access to the site in future.

The area considered for expansion extends approximately 750 metres south of the current Harbour Arterial Mineral Area Workings area and varies from less than 100 metres wide up to approximately 750 metres wide.

The expansion area is located on a hill and would be visible from the TCH and possibly from the Foxtrap Access Road. Visibility issues are one of the main concerns with this alternative source of aggregate.

Alternate areas were also evaluated in 2002. These included:

1) Bay Bulls Road across from Bay Bulls Big Pond – rejected due to issues associated with the East Coast Trail 2) Trans Canada Highway – Cochrane Pond area – now rejected due to the pending housing and commercial development and 3) Trans Canada Highway/Kenmount Road – now rejected due to ongoing housing developments in this area.

h) Project Related Documents:

-attached maps showing the location of the Gear Pond Aggregate Source area.

-Municipal Affairs news release dated September 10, 2012 -

<http://www.releases.gov.nl.ca/releases/2012/ma/0910n01.htm>

- Re/Max Housing Market Outlook 2013 -

<http://www.remax.ca/miscellaneous/REMAX%20MEDIA%20REPORTS/OUTLOOK%202013/REMAXHousingMarketOutlookRpt2013.FNL.pdf>

-CMHC News Release dated November 5, 2012 –

<http://www.marketwire.com/press-release/st-johns-housing-market-to-remain-stable-1721482.htm>

5. APPROVAL OF THE UNDERTAKING:

Permits that are required include;

Permits

Quarry Lease

Heavy Equipment Operator Licence

Certificate of Approval for the Operation of an Asphalt Plant

Fuel Storage Permit

Water Use Licence

Permit to Operate

Department

Natural Resources

Service NL

Service NL

Service NL

Environment and Conservation

City of St. John's

6. SCHEDULE:

The earliest projected start date would be about June 2014. Approval of the Undertaking by the City of St. John's would require re-zoning of the proposed area from Agricultural to Industrial land use. Apparently, this process requires at least 18 months. The other issue that must be resolved before the Undertaking can proceed is the proposed designation of the area as a protected watershed in association with Thomas Pond, located one km to the northwest. It is hoped that the need for aggregate and paucity of available resources will provide sufficient basis and argument for the necessary reviews to be conducted in support of this project.

7. FUNDING:

The Department's intention is to first reserve out the entire Gear Pond Aggregate Source Area from quarry activity as per Regulation 5 (1) of the Quarry Materials Regulations. Under this Regulation, the minister may determine areas which will not be available for the issuance of quarry permits or exploration licences. The Department would then publish a Request for Proposals (RFP). Proponents will be required to submit a detailed proposal outlining timing and nature of construction and operations, details of contracts with identified buyers, approximate annual production rates and methods of rehabilitation. Successful proponents would then be granted quarry rights, as per the Quarry Materials Act. Quarry Inspectors from the Department of Natural Resources would conduct periodic site inspections to ensure compliance with the Quarry Materials

Act and Regulations. Rehabilitation will occur once an individual quarry has been exhausted of usable material.

8. SUBMISSION

Respectfully submitted:

Date

Signature of Chief Executive Officer

Appendix 1: Sample Description and Results

On November 27, 2012 three geologists from the Mines Branch visited the Gear Pond site to determine the conditions of the access route and to sample the material to ensure suitability as a source for aggregate. The individuals were Andrea Mills, Project Geologist (Exploration Monitoring), Fred Kirby, Manager of Quarry Materials, and Jerry Ricketts, Project Geologist (specializing in surficial geology). Access route and conditions are discussed in Section 4(a) of this document.

A small outcrop (approximately 1 m x 1.5 m) was identified along a narrow dirt road trending south through the proposed area. The coordinates of the sample site are 356887 m E, 5254170 m N (NAD 27, Zone 22; see Figure 3). The rock is buff- to tan-weathering siltstone, medium grey on the fresh surface and is likely part of the Drook Formation of the Conception Group (Figure 6). Approximately 200 pounds of rock (3-4" fragments) were collected from the site and delivered to the Soils Laboratory of the Department of Transportation and Works on November 28, 2012.

Results

Test results were well below the maximum specifications outlined by the Department of Transportation. Resistance to degradation of coarse aggregate by abrasion and impact (Los Angeles Abrasion, ASTM C – 131 and 535) was adequately below the specified maxima. The total loss by Los Angeles Abrasion (ASTM C – 131) was 12.92%, well under the recommended maximum of 35%. The 100/500 ratio (ASTM C – 535), a measure of material lost after 100 rotations and after 500 rotations of the Los Angeles machine, was 0.260 (recommended maximum is 0.265). The result for Freezing and Thawing (CSA A23.2 – 24A) was 4.6%, well under the recommended maximum of 8%. Results for the coarse and fine Micro Deval tests (resistance to degradation by abrasion) were 4.47% and 12.60%, respectively, also well under recommended maxima of 19 for both.

Additionally, petrographic number analysis was completed by Dr. Lawson Dickson on December 11, 2012. Petrographic number is the sum of products of the petrographic factors indicating the rock quality. The lower the petrographic number the more superior the rock quality, which is expressed in the range of 100 to 1000 (Bragg and Norman, 1988). Deleterious substances, weathering and fractures all reduce the overall quality of a rock. The petrographic number determined for the Gear Pond sample is 101.2, indicating high quality for aggregate purposes.

Sample results clearly indicate that rock in the Gear Pond area is suitable for aggregate. However, this is based on one sample and further analysis is recommended.

Appendix 2: Sample Test Results (Soils Laboratory of the Department of Transportation and Works)

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF TRANSPORTATION AND WORKS
MATERIALS ENGINEERING DIVISION

TEST RESULTS SUMMARY

Project No.: Pre-Tender Date Sampled: November 27 2012
Project Name: _____
Sampled By: Andrea Mills
Contractor: Mines and Energy Date Tested: November 28 2012
Name of Source: Gear Pond Lab Number: M-219-12
Location: _____ Tested By: Barrett/Hurley
Sample Description: Rock Intended Use: _____

DESCRIPTION OF TEST	TEST METHOD	RESULT	UNIT	SPECIFIED	
				MIN	MAX
Los Angeles Abrasion - Total Loss - 100/500 Ratio	ASTM C - 131 ASTM C - 535	12.92 0.260	% -		35 .265 Agg, .280 Gran
Absorption Coarse Aggregate Fine Aggregate Crushed Fine Aggregate Naturally Occuring Fines Blend Sand	ASTM C - 127 ASTM C - 128		% %		1.75 Surf RCU80+ 2.0 (Other)
Bulk Specific Gravity Coarse Aggregate Fine Aggregate Crushed Fine Aggregate Naturally Occuring Fines Blend Sand	ASTM C - 127 ASTM C - 128		kg/m ³ kg/m ³	2200	
Petrographic Number	CSA A23.2 - 15A		-		135 Agg, 150 Gran
Low Density Material	CSA A23.2 - 4A		%		1.0
Crushed Particles RLU - 60, 70, 80 RLU - 100, RAD - 100 RCU - 80	ASTM D - 5821		% % %	50 70 90	
Flat & Elongated Particles	ASTM D - 4791 SEE SPEC.		%		20
Loss By Washing	ASTM C - 117		%	TOTAL 1/4	1.75 Pit, 2.0 Quarry
Coating & Stripping	ASTM D - 1664		%		> 95 Not in Spec.
Freezing & Thawing	CSA A23.2 - 24A	4.60	%		8 RCU80+, 10 Other
Plasticity Index	ASTM D - 4318		-		0
Deleterious Material	CSA A23.2 - 3,4,&15A		%		1
Clay Size Particles	ASTM D - 422		%		20
Modified Lotman Test Ratio Rating	AASHTO T 283		% -	0.80 0	10
Fine Micro Deval	ASTM D - 7428	12.60	%		19 Agg, 30 Gran
Coarse Micro Deval	ASTM D - 6928	4.47	%		19 Agg, 25 Gran
Sand Equivalent Value	ASTM D 2419		%	50	
Fine Aggregate Angularity	ASTM C - 1252		%	45	

Appendix 3: Petrographic Number Analysis

DEPARTMENT OF WORKS, SERVICES AND TRANSPORTATION Materials Engineering Division

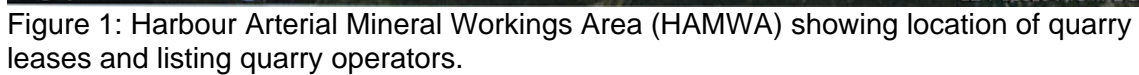
PETROGRAPHIC NUMBER ANALYSIS

Geologist(s) Lawson Dickson P. Geo.
 Date Dec 11 / 2012
 Project Number _____
 Area _____
 Sample Number M-219-12
 Site Number _____
 Silt/Clay Coating none
 Staining 6% minor iron stainings
 Weathering 12% minor surface weathering
 Sphericity low
 Rounding angular
 Fractured Faces 5-8
 Texture smooth
 Grain Size fine
 Hardness hard

PETROGRAPHIC NUMBER ANALYSIS			
Rock Type	% of Sample	Petro. Factor	Petro. Number
fine-grained, hard, sandstone - fresh	88	1.0	88.0
fine-grained, hard sandstone - slightly weathered	12	1.1	13.2
Petrographic Number of sample			PN = 101.2

Comments 4% flat fragments

- 1A & B - Modern Paving
- 2 - Rock Construction
- 3A & B - Cougar Engineering
- 4 - Weir's Construction
- 5 - Humber Valley Aggregates and Asphalt Ltd.
- 6 - Modern Paving
- 7 - Challenger Construction
- 8 - Provincial Paving
- 9 - Pyramid Construction
- 10 - Nfld Soiltech
- 11 - Standard Paving
- 12 - Farrell's Excavating
- 13 - Dept. of Natural Resources
- 14 - Fairview Investments
- 15 - Triple J Aggregates
- 16 - Farrell's Excavating
- 17 - Farrell's Excavating
- 18 - Pennecon Ltd.
- 19 A & B - Carl Healey
- 20 - Clarks Trucking & Excavating
- 21 - Municipal Construction
- 22 - Greenslades Construction



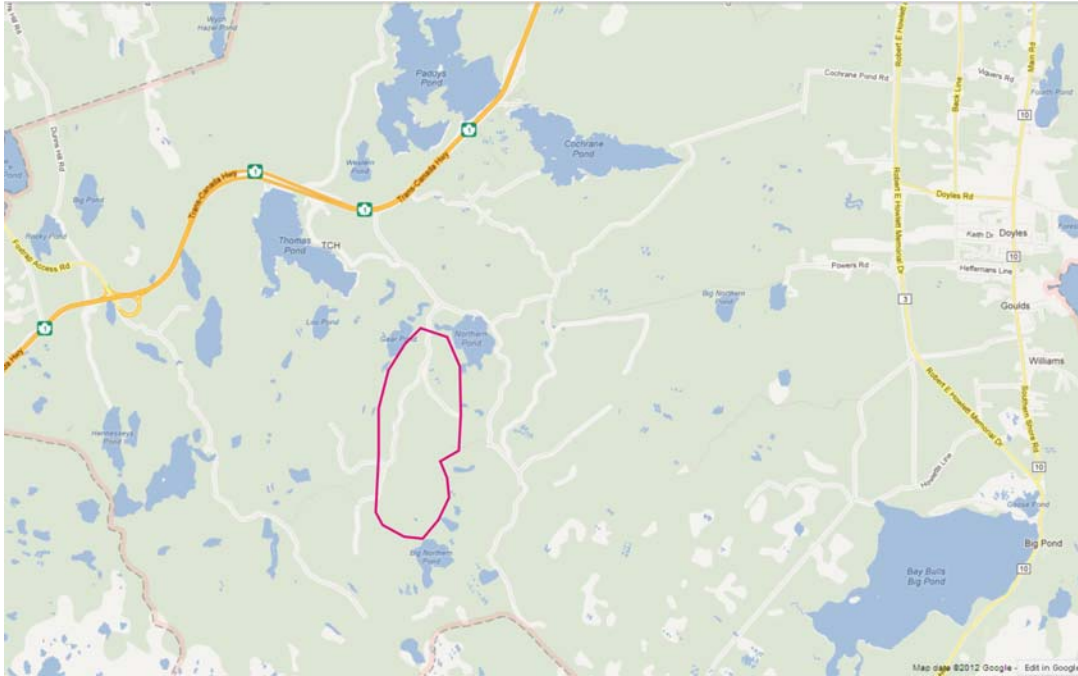


Figure 2: Google road map illustrating road access from the Trans Canada Highway to the Gear Pond Aggregate Source area.



Figure 3: Proposed Gear Pond Aggregate Source area (outlined in red). Red star shows location of 200 lb sample of grey siltstone sampled by Natural Resources personnel on November 27, 2012 (utm coordinates: 356887 m E, 5254170 m N; NAD 27, Zone 22).



Figure 4: Active quarry operation, ~1.5 km north of the proposed Gear Pond Aggregate Source area.



Figure 5: Google Earth image of the southern part of the Northeast Avalon, showing locations of the Gear Pond Aggregate Source area and the alternative site (expansion of the HAMWA).



Figure 6: Medium grey siltstone from the Gear Pond sample site (sledge hammer is approximately 60 cm in length).