

Cambridge Aggregates Inc.

NORTH DUMFRIES PIT EXPANSION

PLANNING REPORT

December 2009

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1. EXECUTIVE SUMMARY

Cambridge Aggregate Services Inc. is the Licensee for the existing North Dumfries Pit, which became operational in early 2008. Zoning By-Law 2197-06 was passed by the Township Council in November 2006. Following an OMB Hearing, on a Motion to dismiss an appeal by neighbor Mr. Randy McLean, in May 2007, the proposed Site Plan was approved. Licence No. 607701 was issued by the MNR on December 3, 2007.

The property comprises 41.6 ha (103 ac). It includes a westerly woodlot and natural heritage area, associated with the adjacent Milroy Lake PSW and Waterloo ESPA 60; and an easterly 5.9 ha (14.6 ac) woodlot. The excavation area is 22 ha, about 52% of the site.

Annual production is 500,000 to. A Haul Road Agreement with CBM enables truck access to Cedar Creek Road, Waterloo Region Road 97, through the Dance Pit to the north. Site preparation was implemented in December 2007. Excavation began in the spring of 2008.

Cambridge Aggregates Inc. (CAI) is joint venture between Cambridge Aggregate Services Inc. and Essroc Canada Inc. The Company has entered into an agreement with the owners of the abutting lands to the east. This agreement will enable CAI to rezone, license and operate a gravel pit expansion on two properties, situated north and south of Alps Road. As Figure 1, the October 2008 airphoto indicates, it is not intended to license the northeasterly area, adjacent to the City of Cambridge or an existing woodlot, southwest of Alps Road. The proposed licence area comprises 39.7 ha north of Alps Road and 13.8 ha to the south, a total of 53.5 ha (132 acres).

The proposed pit expansion is designated **Mineral Aggregate Resource Area** in the Waterloo Region and North Dumfries Official Plans. Gravel pits are permitted, in prime agricultural areas, in the **Provincial Policy Statement**, 2005 and in the regional and local official plans. Progressive rehabilitation for continued agricultural production, is required.

Waterloo Region's Growth Management Plan forecasts a 2029 population of 710,000, a 35% increase over the estimated 526,000 in 2011. Significant quantities of sand, gravel, asphalt and concrete will be required to satisfy the infrastructure requirements of the Region and the Greater Golden Horseshoe.



The average depth of aggregate material is estimated to be about 12 m. The proposed annual production is 500,000 to/year. The operational concept is:

1. Complete the development of the existing pit Stages A and C, with processing in the CBM Pit, adjacent to the north, to create an 11 ha processing and stockpile area;
2. Excavate easterly, then southerly, then easterly within the property north of Alps Road, with primary crushing and a processing plant within the existing pit;
3. Excavate easterly within the property south of Alps Road, utilizing a conveyor from the excavation face to the processing area, including, a conveyor tunnel under Alps Road.
4. Maintain the existing haul road, through the adjacent CBM Pit, to Cedar Creek Road.

The two Licences will be merged with 1 millions to/year combined production.

The proposed Site Plan has been developed in consultation with a team of experts in agricultural soils, cultural heritage, natural environment, noise and dust control, traffic planning and water resources management. Their reports are appended. As set out in this planning summary, the proposed Site Plan is consistent with the standards established for the existing pit and meets the requirements of the *Provincial Policy Statement, 2005*; the *Aggregate Resources, Environmental Protection* and *Ontario Water Resources* Acts; and the Waterloo Region and North Dumfries Township Official Plans.

- the proposed pit should yield about 7 million tonnes of high quality aggregate;
- the maximum depth of excavation will be 1.5 m above the water table, with groundwater monitoring for the life of the operation;
- vegetated berms, landscape screening and the Company's adaptive management and contingency plans will enable effective control of dust and noise;
- 78% of the site, approximately 36 ha will be progressively rehabilitated for prime agricultural land;
- no significant natural heritage features will be adversely affected by the proposed operation and the protection of habitat within the adjacent woodlands will continue; and
- two findspots of archaeological interest will be subjected to mitigative examination in 2010 and the historic Slater stone farmhouse has been conservatively buffered.



10. PROPOSED SITE PLAN

Cambridge Aggregates plans to excavate up to 500,000 tonnes of material annually for processing within the existing, licensed pit. Activities in the proposed expansion will be limited to excavation, from face heights of 7 to 12 m and conveyance of the aggregate material to the existing pit processing area. Initially, conveyance will be by rubber tired loader and truck, if necessary. However, a conveyor will be installed as soon as the working area permits. If approved by the Township, a conveyor tunnel under Alps Road will be constructed. The proposed annual production from the proposed pit is 500,000 tonnes in addition to the production of the existing pit.

The proposed Site Plan has been prepared on a topographic base with 1 m contours prepared from October 2008 airphoto. Boundaries were derived from Reference Plans 67R-1017 and 67R-3366. It comprises three drawings, as set out in the *Ontario Provincial Standards* under the *Aggregate Resources Act*, for a Category 2, Class A Pit Above Water:

Existing Features
Operational Plan
Rehabilitation Plan

A copy of the proposed Site Plan is bound in Appendix 8 and described in the following text.

10.1 EXISTING FEATURES

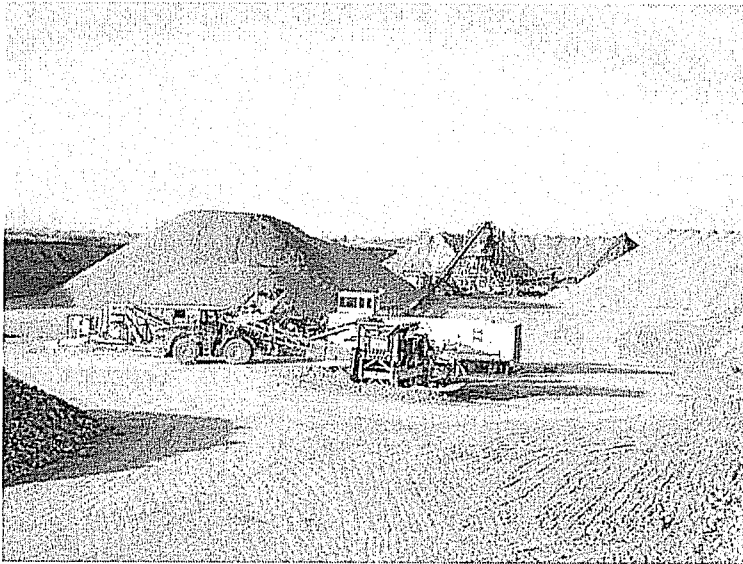
The area to be licensed is 53.5 ha, with 45.8 ha or 86% to be excavated. As shown on Figure 22, this drawing includes contours, surrounding roads, woodlots and buildings, entrances and key onsite features.

Archaeological study features are shown in red, as described in Section 8.1.

Groundwater monitors MW09-01 to MW08-03 and original monitors MW1/03 and MW3/03 are coloured blue.



10.2 OPERATIONAL CONCEPT



The haul route through the CBM Pit to the north will continue for the life of the proposed expansion.

All processing will be within the existing pits, at least 7 m below ground level.

When the processing area is located in the existing Cambridge Aggregates Pit, it will be about 10 m below grade.

The existing 4 to 5 m pit berm will be maintained. A new, landscaped berm will be built to mitigate views and potential dust for City neighbours.

Excavation from the proposed pit floor will be 7 m (23 ft) minimum below existing ground elevations.

Perimeter berms of 3 to 6 m height will be progressively developed, as prescribed by the noise control consultant.

Aggregate will be transferred from the expansion to the processing plant by pit floor conveyor.

Pit operation will be sequential, with progressive rehabilitation to maintain agricultural production.

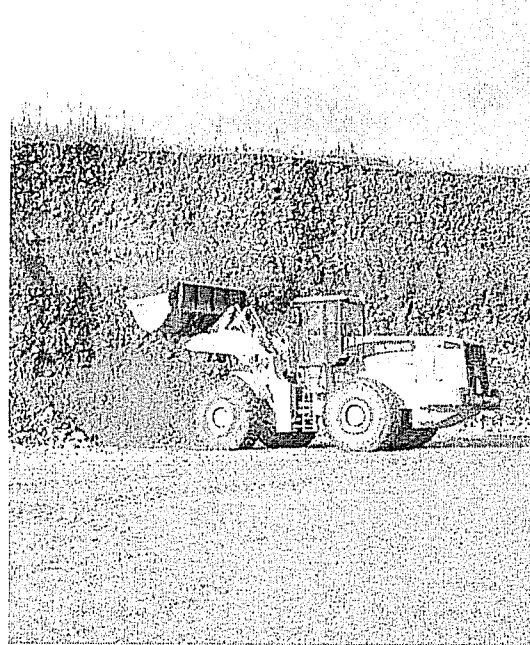


Figure 23, the Operational Concept illustrates the progression of the proposed pit once it has been partly developed. The northerly 8 -10 ha has been excavated to a depth of 9 - 10 m. The pit floor has been rehabilitated and the typical 8 ha active excavation area is advancing southerly.

Based upon an estimated 7 million tonnes of aggregate reserves, the proposed expansion may be in operation for 15 to 20 years.



10.3 OPERATIONAL PLAN

Figure 24 includes contours and spot elevations which indicate that the surface elevation of most of the site, north of Alps Road, varies from 321.5 to 322.8 m. There are several slopes and depressions in the easterly sector, with elevations as low as 313 m. The proposed pit floor, at the maximum depth of excavation varies from 309 m in the southeast to 311.5 m in the northwest.

The sequence begins in the northwest where the excavation depth will be approximately 12 m (39 ft). The face will be at least 7 m, depending on the size of the excavator. At 7 m it will screen the pit operations from view and mitigate noise. The existing 4 to 5 m berm, between the existing and proposed pits will be retained to screen the processing plant. A new 3 m berm will be created at the east boundary of the expansion, with tree screen planting to the east. This will provide dust and visual protection for the City neighbours.

Excavation will then advance southerly, toward Alps Road. A pit floor conveyor will be extended with the excavation face, to convey aggregate to the processing plant. During this first phase, the operator will maintain a 70 +/- m buffer between the excavation and the dwellings to the east.

Phase 2 involves excavation in an easterly direction, toward the neighbouring houses. This will provide shielding by maintaining, where permitted by the resource depth, a 7 m minimum face between the excavator and the neighbours. As Phase 2 is stripped, a berm will be completed along its east and south perimeter. Excess stripping material will be used to rehabilitate the Phase 1 pit floor. The hatch pattern on Figure 24 indicates the areas where equipment restrictions apply, to ensure noise levels meet Provincial standards.

Phase 3 is the excavation area south of Alps Road. As the arrows on Figure 24 indicate, the easterly excavation will be in a west to east direction, to shield the adjacent neighbour. A conveyor enclosed in a culvert is proposed to convey aggregate under Alps Road, to minimize traffic interruption. It is expected that the earth stripped from Phase 3 will be retained south of Alps Road to construct berms and ensure progressive rehabilitation.



10.4 REHABILITATION

Rehabilitation of the site will be progressive, with as much of the site as possible restored to similar soil quality for agriculture. As Figure 24 indicates, 3:1 perimeter slopes will be required to transition from the adjacent ground elevations to the rehabilitated pit floor. The resulting field areas will comprise about 30.5 ha, north of Alps Road and 5.3 ha to the south. This 35.8 ha total is approximately 78% of the proposed excavation area.

An estimated 61,000 m³ of soil material will be required to construct the perimeter berms. The agricultural rehabilitation sequence, set out in the DBH Soil report, provides for the placement of 300 mm of B horizon or subsoil and 200 mm of A horizon or topsoil on the pit floor and perimeter slopes. Therefore, removal of the berms, upon completion, will provide the soil required for about 122,000 m² or 12.2 ha of floor area, during the last stage of rehabilitation.

The pit floor and slopes will be rehabilitated for agricultural production and a natural heritage buffer, respectively. Detailed requirements are set out on Site Plan Drawing 3.

Pit floor rehabilitation - The objective is to create prime agricultural land by developing a natural soil profile from 1.5 to 2 m above the seasonally high water table. The pit floor should be ripped, prior to and following subsoil application, to alleviate compaction, then topsoiled and seeded with a grass/legume mix, annual cover crop and mulch to control dust and erosion. A grass/legume cropping sequence should continue for 3 to 5 years to improve soil fertility and structure. This can be followed by a normal crop rotation.

Natural heritage slopes - The 3:1 perimeter slopes with 36 m average base width comprise about 10 ha. Where they are adjacent to or in close proximity of wooded areas, the goal is to develop a compatible woodland extension and buffer. For much of the south facing slope, south of Alps Road, an oak savanna woodland is proposed. During the first year, native and prairie seed mixes will be applied to the woodland and savanna areas, respectively. Woody plantings and shrubs can be established during the second year, when the initial groundcover has established. This will increase the onsite woodland areas by about 5.4 ha.



12. ENVIRONMENTAL MANAGEMENT

12.1 DUST CONTROL

Prescribed Conditions for Category 3 Licenses apply to all operations:

Dust will be mitigated on site.

Water or another provincially approved dust suppressant will be applied to internal haul roads and processing areas as often as required to mitigate dust.

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.

The proposed operational plan provides the Licensee shall conduct daily site inspections during summer operations and/or dry weather to identify any potential dust emission problems and take corrective measures. The daily site inspection shall be logged in a form satisfactory to the Ministry of Natural Resources. The log shall be made available to the Ministries of Natural Resources and Environment, if requested.

12.2 NOISE CONTROL

Aeroustics' Preliminary Noise Control Study is bound in Appendix 7.

The equipment operating in the pit expansion shall be limited to 2 front end loaders and the conveyor system to transport the material to the existing license for processing. Additional equipment restrictions apply as outlined below. The reference sound levels of the loaders should not exceed the levels specified in the table below. A well-maintained electric conveyor system is not considered a significant noise source.

Equipment	Reference Sound Level L_{EQ} (dBA) @ 30 m
Loader	73
Loader (Quiet)	68

Extraction operations in the expansion shall be restricted to the daytime hours 07:00-19:00. Perimeter berming will be required as indicated on the attached figure. The required minimum berm heights are specified. The phasing of berm construction will be specified at a later date.

The number of loaders operating in the expansion is restricted to one "regular" loader or two quiet loaders when extracting in the areas specified on Figure 26. When extracting in the immediate vicinity of receptor R1 as specified on the figure, only one quiet loader may operate. The first lift shall have a minimum height of 7 m, where permitted by the depth of the deposit.

The direction of extraction has been specified in those areas where it is a noise control requirement that the loader(s) will remain effectively shielded by the working face. Where the depth of the deposit exceeds the safe working height for the loader (+/- 7 m), the deposit shall be extracted in two lifts in close succession. The conveyor feed hopper must be located within 25 m of the working face in areas where the direction of extraction is specified.



During site preparation, equipment working at or near the surface will receive minimal acoustical shielding. A similar scenario may occur during rehabilitation. In order to minimize the noise associated with these activities, all equipment should comply with the noise emission limits outlined in MOE Publication NPC-115 "*Construction Equipment*".

12.3 NATURAL ENVIRONMENT

The site plan has been designed to avoid any natural environment areas. There are no watercourses or woody vegetation within the proposed excavation areas. The rehabilitation plan provides for about 5.4 ha of sloped buffer and re-vegetated setbacks, adjacent to the existing woodlands. Based upon an average excavation depth of 12 m, the base width of 3:1 slopes will be about 36 m. However, it is intended, as the rehabilitation slopes are created and subject to soil availability, that topographic variations will enable a more natural appearance and somewhat increased widths.

The Company intends to develop detailed planting plans for the natural heritage slopes well in advance of planting and to monitor effectiveness, maintenance requirements and mortality, in conjunction with the slope rehabilitation for the existing pit to the west.

12.4 WATER MANAGEMENT

- 1) The 3 monitors within the proposed expansion will be continuously monitored in conjunction with the 7 similar monitors in the existing pit to provide a comprehensive record on water table fluctuations.
- 2) Quarterly groundwater level downloading will be carried out to ensure maximum depth of excavation is maintained at 1.5 m or greater above the water table.
- 3) Groundwater quality samples will be recovered on an annual basis. This sampling program should continue for a period of two years after final rehabilitation of the site has taken place.
- 4) the Spill Contingency Plan used on the Client's adjacent licenced pit should be followed for any fuel handling that takes place on the property.

