

Summary Report

Talbot Sand and Gravel Ltd Macpherson Pit

Part of Lot 6, Concession 12
Municipality of Central Elgin
(formerly Yarmouth Township)
County of Elgin

September 2022



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1.0 INTRODUCTION

This report has been prepared in support of an application by Talbot Sand and Gravel Limited for a new licence adjacent to their existing licence ref no. 2134. The application is for a Class "A" licence, pit below water, as specified in the *Aggregate resources of Ontario standards: A compilation of the four standards adopted by Ontario Regulation 244/97 under the Aggregate Resources Act*. It summarizes the information and conclusions of the consultants who have contributed to the preparation of the site plans including:

- Hydrogeology: Groundwater Science Corp.
- Natural Environment: Terrastory Environmental Consulting Inc.
- Archaeological Assessment: Timmins Martelle Heritage Consultants
- Noise: HGC Engineering Limited
- Resource Assessment: Applicant

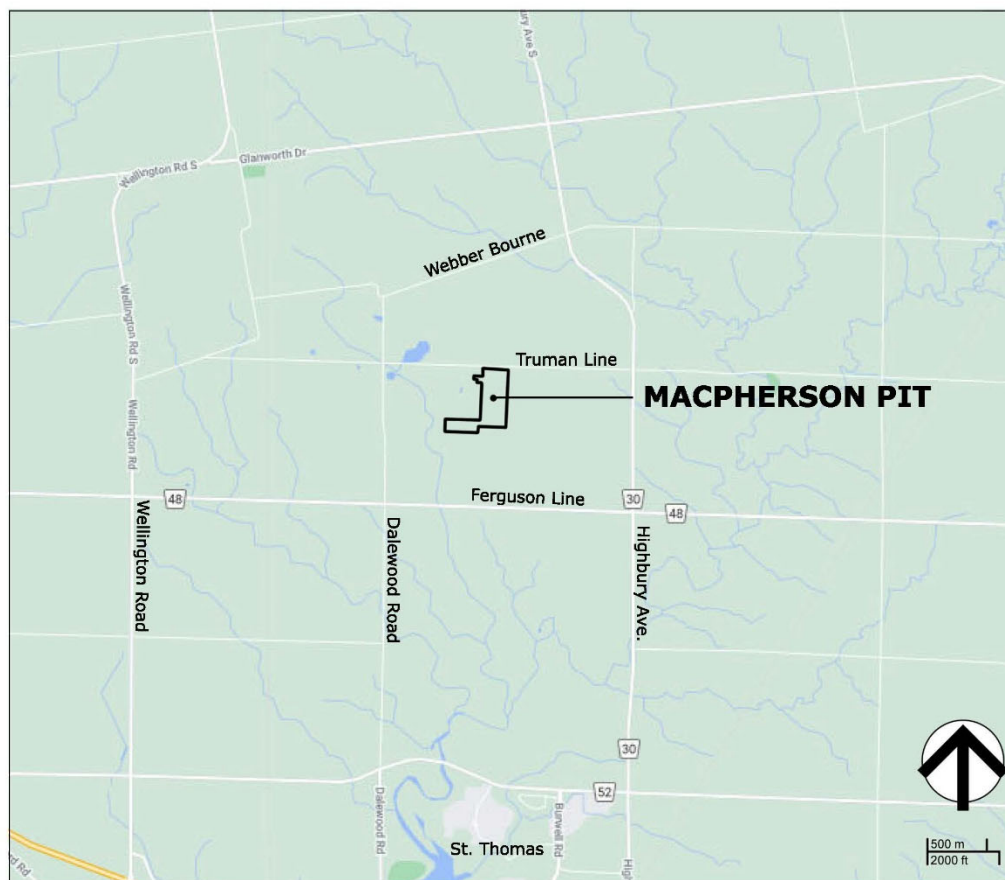
The report is intended to supplement the information contained on the site plans which have been prepared by Harrington McAvan Ltd (Appendix F), and to assist in the review of the planning and licensing applications which the company has filed with the Municipality of Central Elgin and the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF).

2.0 SITE DESCRIPTION

The proposed licence is for 23.4 hectares (57.8 acres) located in part of Lot 6, Concession 12, in the Municipality of Central Elgin (formerly Yarmouth Township), County of Elgin, north of St. Thomas. Refer to location map (Figure 1). The area proposed to be extracted is 20 hectares (49.4 acres).

The site consists of gently sloping agricultural fields used to grow cash crops, with higher ground in the northeast part of the property (see Figure 2 and 3 photos). Elevations generally range between 257 m asl in the northeast to 253 m above sea level (a.s.l.) in the southwest. The wooded lands in the southeast part have been excluded from the area to be extracted (see Figure 4 photo). Refer to Terrastory report in Appendix B for a detailed description of the woodlot and the site plans for the extraction limit adjacent to this feature. A house and buildings belonging to the applicant are located to the west of the property (see Figure 5 - photo) and are not included in the licensed area.

The Talbot Sand and Gravel pit licence no 2134 is located to the west of the extension property (see Figure 6). The existing pit is permitted to extract below the water table. The surrounding lands are mainly in agricultural use. There are farm and non-farm residences located along Truman Line as shown on the site plans. There is a hydro easement with steel towers located along the eastern boundary of the property, north of the woodlot (see Figure 2).



Google Maps, Web

Location Map

Talbot Sand and Gravel Macpherson Pit



Figure
1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6

3.0 PLANNING AND LAND USE CONSIDERATIONS

The protection and management of aggregate resources has been deemed to be of provincial significance and their development is regulated by specific legislation. In addition to the Aggregate Resources Act (ARA), the development of aggregate extraction operations must respect the provisions of the Planning Act and consider the policy framework established by the regional and municipal planning documents.

The area to be licensed is designated in the Official Plan for Central Elgin as “Agricultural” (Schedule A: Land Use) and the majority of the area is identified as an “Area of potential Aggregate Resource” (Schedule A3: Aggregate Resources). Refer to Figure 7. Extraction of mineral aggregate resources and petroleum resources is permitted within the Agricultural Area in accordance with the policies contained in Section 3.5 of the Central Elgin Official Plan. (OP Section 2.1.4.1 c).

The area to be licensed is currently zoned ‘OS’ Open Space and is currently in Agricultural use. A Zoning By-law Amendment is required to permit the proposed pit.

The Planning Justification Report, prepared by Esher Planning Inc. for the associated Planning Act application, will provide a comprehensive review and analysis of the proposal in the context of provincial and local planning documents and policy. This includes: the Provincial Policy Statement (PPS, 2020), the County of Elgin Official Plan, the Central Elgin Official Plan as well as the Zoning-By Law for Central Elgin.

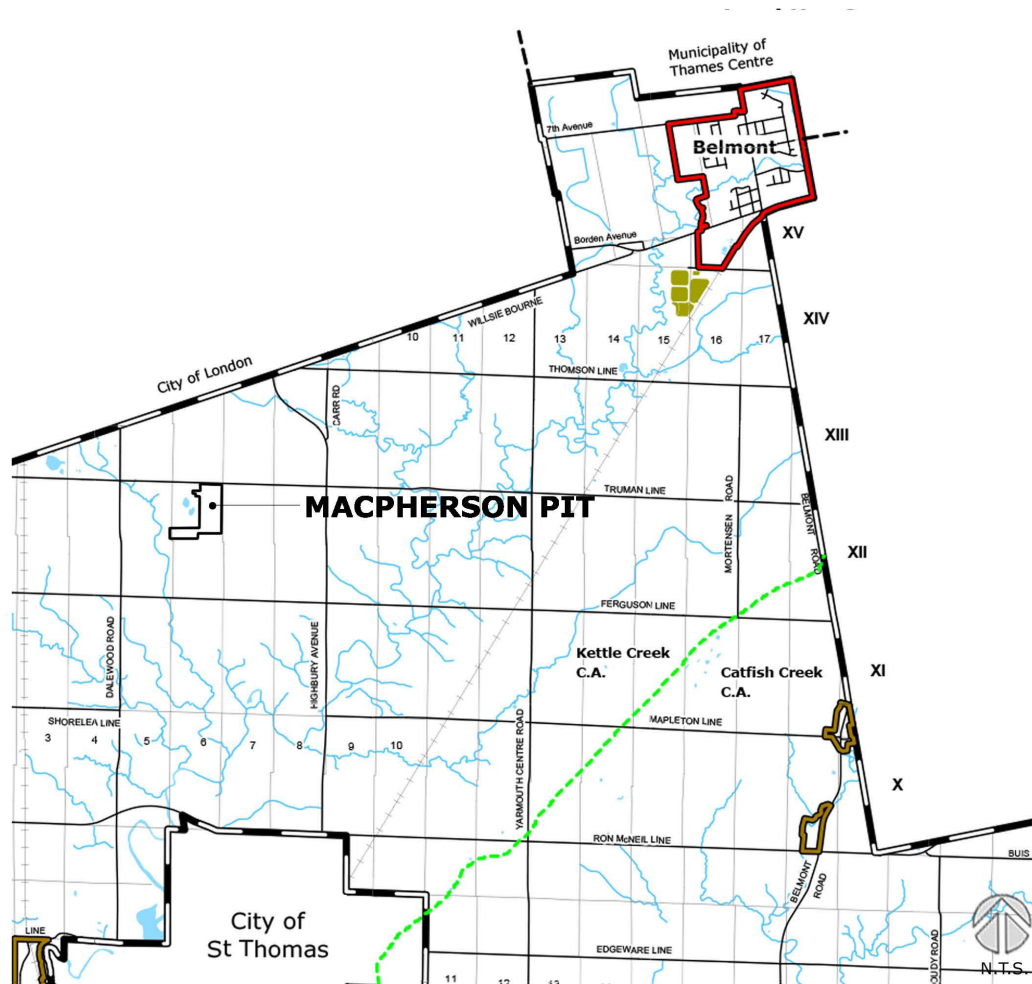
The operations and the rehabilitation of the pit have been designed to minimize impacts and propose that the lands will be progressively rehabilitated to create an open water pond and wetlands area together with some meadow area. The Hydrogeology Report evaluates the impacts of the proposed below water extraction on ground and surface water resources, including an assessment of any impacts to water wells near the site. The Natural Environment Report evaluates the impacts of the proposal on significant wetlands, woodlands, fish habitat, and habitat of endangered species and threatened species located on the site and on adjacent lands. The report identifies measures to ensure there are no negative impacts on these natural features or their functions.

In summary, the proposed pit:

- Has been evaluated to ensure there are no significant negative impacts on the natural environment, groundwater resources, and the agricultural system.
- Is designed to mitigate potential impacts on surrounding neighbours from noise and dust of the proposed operations.
- Conforms with the policies of the County and local Official Plan.
- Is consistent with the Provincial Policy Statement.
- Represents wise management and use of resources.

4.0 AGRICULTURAL CLASSIFICATION

In *The Soils of Elgin County Report no 63, Ontario Centre For Soil Resource Evaluation by L.W. Schut, Ontario Ministry of Agriculture and Food, 1992*, the soils on the property are mapped as CA/b (see Figure 8). These soils are classified as 2FM in the report.



Municipality of Central Elgin, Official Plan, Schedule 1 - Land Use Structure, February 2013

Land Use

Talbot Sand and Gravel Macpherson Pit

LEGEND:

Settlement Areas

- Urban Settlement Area
- Rural Settlement Area

Agricultural Areas

- Rural Development Area
- Agricultural

Employment

- Employment Areas



Figure
7



Talbot Sand and Gravel Macpherson Pit

GP GRAVEL PIT
CA CALEDON
NM NOT MAPPED
VC VALLEY COMPLEX
TA TAVISTOCK
MU MURIEL
GO GOBLES



Figure 8

On page 32 of the report the following is stated, *“Caledon soils have developed on 40 to 100 cm thick veneers of coarse textured lacustrine materials which are underlain by gravelly coarse textured fluvial outwash materials. They usually occur on upper to crest slope positions, especially in landscapes where imperfectly or poorly drained soils also occur. The topography associated with Caledon soils ranges from nearly level to very gently sloping or undulating. Slopes generally range from 1 to 5%. Caledon soils are well drained and rapidly permeable. They have low water holding capacities and slow surface runoff, except on slopes greater than 5% where runoff may be moderate.*

Caledon soils are rated Class 2FM for common field crops when topography is not a limitation. They have fertility limitations and also tend to be droughty. With supplemental irrigation, they are highly suitable for a wide range of special crops if the surface slopes are not too steep. Caledon soils are susceptible to wind erosion. Planting cover crops, establishing windbreaks, and carrying out management practices which maintain organic matter levels, will aid in reducing the risk of erosion by wind.”

According to the applicant, recent crop yields were about 50 bushels/acre for beans and 180 bushels/acre for corn. This is slightly above the average yields noted by the Ontario Ministry of Agriculture and Food and Rural Affairs during 2004 to 2019 for Elgin County of 48.1 bushels/acre for beans and 173.8 bushels/acre for corn.

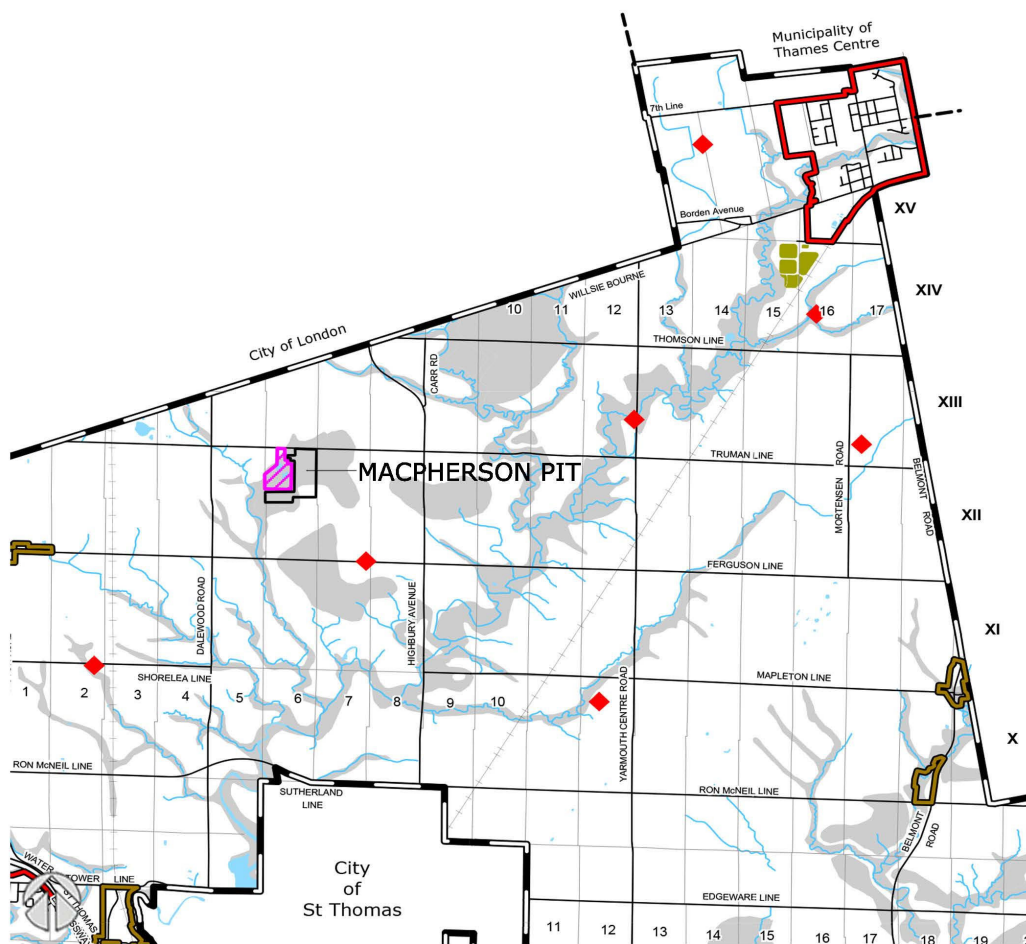
Extraction will extend to elevation 229 m asl or about 12 m below the groundwater table on the majority of the property, except in the areas with limited resources in the northeast part of the property, as determined in the hydrogeological assessment by Groundwater Science Corp. and shown on the site plans. Rehabilitation techniques to restore areas to agriculture will include the following as indicated on the site plan:

- Deep ripping to eliminate compaction, where necessary
- Backfilling the areas with available on-site overburden and rough grading
- Removal of stones larger than 100 mm, as required
- Spreading of available on-site topsoil and fine grading
- Seeding with an appropriate grass/legume mixture
- Using accepted farming practices to restore to agricultural use

Maximizing agricultural rehabilitation on the site to the same agricultural capability complies with Section 3 Agricultural Policies in the Official Plan and the Provincial Policy Statement (2020) which states, *“In prime agricultural areas, on prime agricultural land, extraction of mineral aggregate resources is permitted as an interim use provided that the site will be rehabilitated back to an agricultural condition.*

5.0 QUALITY AND QUANTITY OF AGGREGATE ON SITE

Mapping of the property shown on the *Preliminary Geological map P606, Pleistocene Geology of St. Thomas Area (East Half), 1970*, shows the majority of the site within deposit 6b. Deposit 6b are deltaic deposits in Lake Maumee II covered by silty sand of Lake Maumee III. A portion of the site in the south-central part is mapped as Deposit 3, Port Stanley silty clay till and clayey silt till in places covered by thin patches of lacustrine silt; ground moraine plains and end moraine ridges. Refer to Figure 9 for Aggregate Resources mapping from the Municipality of Central Elgin Official Plan, Schedule ‘A3’.



Municipality of Central Elgin, Official Plan, Schedule 'A3' - Aggregate and Petroleum Resources, February 2013

Aggregate Resources

TALBOT SAND AND GRAVEL Macpherson Pit

LEGEND:

-  Area of Potential Aggregate Resource
-  Licensed Aggregate Operation
-  Petroleum Pool
-  Petroleum Well



Figure
9

The September 16, 1994 geotechnical investigation prepared by Atkinson, Davies Inc for the subject property confirms that there are aggregate resources of varying quality of the site. Based on the 13 boreholes and sieve analyses completed, there would be a minimum of 1.8 million tonnes of aggregate above the water table, the majority would be sand and sandfill. About 20% of the deposit meets the specifications for Granular “B”.

The aggregate resources extend below the water table as shown in a number of the 1994 borehole logs. The existing licensed pit is permitted to extract the below water table resources up to 6 metres as shown on the approved site plans.

An additional six boreholes were completed on January 6 and 7, 2021 on the extension property. The boreholes comprised of three resource holes and three holes in which monitoring wells were installed to measure the groundwater table elevations. These boreholes supplement the information found in the 1994 geotechnical report and better outline the potential above and below water resources on-site. It is estimated that there are 1,337,000 m³ or 2,380,000 tonnes above water and 631,000 m³ or 1,240,000 tonnes below water for a total of 3.62 million tonnes of aggregate. The majority of the resources would be sand with gravel seams interspersed in the deposit. Two additional boreholes were drilled on the southern pit floor of the existing licence in 2022. Refer to hydrogeological report for details.

The estimated lifespan of the entire pit is 10-15 years based on the estimated rate of extraction of the resources and production to supply their markets.

The hydrogeology of the site is documented in the report completed by Groundwater Science Corp. dated June 2022. The high water table is interpreted to be located at elevations ranging between 242.1 to 242.2 m asl. The water table is relatively flat across the site. The proposed maximum depth of extraction will be about 12 m below the established groundwater table.

6.0 HAUL ROUTES AND TRUCK TRAFFIC

The majority of the aggregate from the site is expected to be utilized in the St. Thomas, London and the surrounding area. Therefore, trucks will continue to travel the existing haul routes being used by the existing licenced pit in the area to transport aggregate to the various demand areas, i.e. truck traffic will continue to use Truman Line and Highbury Street and the area will be influenced by activities associated with aggregate extraction.

After loading, trucks will exit onto Truman Line, a paved municipal road using the existing entrance/exit along the north boundary in the licensed pit 2134 (see Figure 5 - photo). Trucks will be expected to access the nearest designated “Truck Haul Route” by the shortest distance possible.

There should be no significant increase in truck traffic volumes on the designated haul routes associated with this proposal. Truck traffic associated with this aggregate operation will be based on an annual maximum tonnage limit of 250,000 tonnes. Assuming approximately 200 working days per year, the daily average extraction would be a maximum of about 1250 tonnes or about 50 truck loads. Over a ten hour working day, the average hourly movement would be 5 trucks out and 5 empty trucks in. For the purposes of this application, a trip generation of ten trucks in each of the peak hours, five in and five out, was assumed.

7.0 PROGRESSIVE AND FINAL REHABILITATION

The rehabilitation of the site back to a pond and agricultural after use complies the Provincial Policy Statement (2020). All existing topsoil and overburden on site will be stripped and stockpiled separately in berms or stockpiles and replaced as quickly as possible in the progressive rehabilitation process. Berms/stockpiles may be constructed on the perimeter of the site to attenuate noise and/or visual screening and will be used for rehabilitation of the site.

Side slopes may be built using on-site overburden, imported clean fill or with off spec materials found on site required for this purpose to improve the agricultural capability of the soil. This will facilitate both maximum resource utilization as well as timely progressive rehabilitation of the property. Refer to notes on the site plan in Appendix F for details of the progressive and final rehabilitation and hydrogeology notes regarding maximum depth of extraction in the site.

The amount of area disturbed will be minimized to reduce any impacts on the surrounding lands. There is limited on-site overburden and therefore, importation of clean, inert soil will likely be required for this property. Topsoil may also be imported to enhance the final rehabilitation to agricultural use. The final rehabilitation will be compatible with the surrounding lands and land use and maintain the existing natural features on and adjacent to the site. The owner will cultivate the rehabilitated lands and plant the areas with a cover crop of grasses and legumes to get the soil productive and return the land to crops. The pine trees to be planted along the edge of the south woodlot will remain after extraction and rehabilitation is completed.

Below water table extraction is proposed for the majority of the site to maximize resource extraction. On completion of the perimeter berms, on-site overburden stripped will be used to progressively backfill and rehabilitate parts of the site. This will minimize the amount of area disturbed at any given time. Importation of clean, inert soil will be limited to about 100,000 cubic metres soil required to complete the final rehabilitation.

Rehabilitation of a pond/wetland will include the following as noted on the site plans:

- a) areas of open water as well as shallow and wide near-shore zones (wetlands);
- b) the pit floor will be left irregular and the edges of the wetlands will be sculpted to lengthen the shoreline for enhancing biological diversity and productivity;
- c) underwater habitat enhancement will employ logs, stumps and rock (see typical shoreline habitat details) and
- d) the pond/wetland will be naturally seeded from the existing wetland species such as willow, red osier dogwood, arrowhead, rushes, sedges and grasses.

As noted in the hydrogeological assessment by Groundwater Science Corp., the site acts as a recharge area, with groundwater flow contributing to the local and regional systems. Excavation of the proposed pit will internalize all overland runoff and convert it into infiltration and groundwater recharge through the soils replaced during rehabilitation. Final surface drainage will be internal and directed to proposed pond.

The final rehabilitation to a pond and agricultural use will be compatible with the surrounding lands and land uses. Rehabilitation to agriculture and areas rehabilitated to agricultural use are shown on the site plans.

8.0 SURFACE WATER

There are no natural surface water features located within the area to be licensed. There is a dug pond in the existing licensed pit to the west. The highly permeable sand and gravel soils underlying the site allow fairly rapid infiltration on the majority of the site. Refer to the hydrogeological assessment and site plans for details. There will be relatively little surface runoff expected from the site except during heavy rainfall events and spring snow melt over frozen ground, which restricts the infiltration of surface water into the underlying soil. Surface drainage is either internal or directed to the low areas to contribute to groundwater recharge.

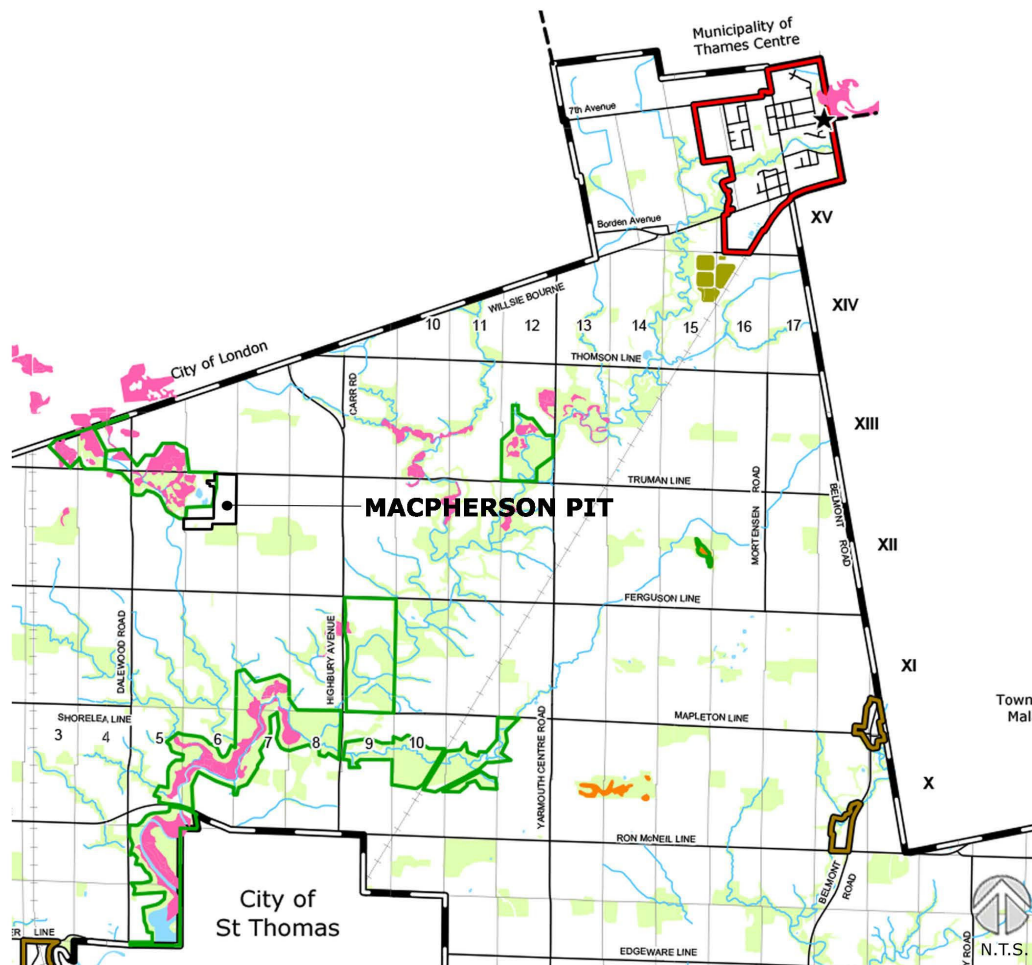
As noted on page 6 of the hydrogeological report: *“The edge of the Glanworth Wetland(swamp) Complex (PSW) occurs just within 120 m of the site. The wetland also extends further to the northwest. Based on a review of the site plan topographic information the wetland floor closest to the site (south of Truman Line) varies from approximately 249.9 to 253 mASL. The wetland edge from the site is described as a deciduous swamp (Terrastory).*

The unnamed drainage channel (west of the site, within 120 m) flows generally south from the wetland areas located northwest of the site. Based on available topographic mapping, the channel elevation is approximately 250 to 250.5 mASL at Truman Line. One branch of the channel is mapped as draining two ponds and the wetland area (elevation approximately 250 mASL) immediately north of Truman Line and northwest of the existing pit. A second branch of the channel is mapped as draining the wetland area south of Truman Line and adjacent the existing pit. Near the site the channel appears to be an agricultural drain. The channel becomes more naturalized south of Ferguson Line, and joins Kettle Creek approximately 2.6 km south of the site.”

Refer to Figure 10 for Environmental Features in the surrounding area.

9.0 MAXIMUM PREDICTED GROUNDWATER TABLE

From the available technical data, the maximum predicted water table elevation varies across the proposed extraction area from approximately 242.1 to 242.2 MASL as shown in the hydrogeological assessment completed by Groundwater Science Corp. The hydrogeological assessment recommends that the groundwater elevations in the monitoring wells be measured on a quarterly basis and the results be summarized for NDMNRF on an annual basis. As noted on page 8 of the Groundwater Science Hydrogeology report, “The proposed MacPherson Pit is not within any identified well Head Protection Area (WHPA) or Intake Protection Zone (IPZ). In addition, no WHPA-Q zone has been identified in this area.



Municipality of Central Elgin, Official Plan, Schedule 'A2' - Environmental Features, February 2013

Environmental Features

Talbot Sand and Gravel Macpherson Pit

LEGEND:

- ESA
- ANSI Earth Science
- ANSI Life Science
- Wetland Provincially Significant
- Wetland Locally Significant
- Wooded Area
- ★ Former Waste Site
- Urban Settlement Area
- Rural Settlement Area
- Rural Development Area
- Employment Areas



Figure
10

10.0 TECHNICAL REPORTS

10.1 Hydrogeological Level Assessment: Groundwater Science Corp. (Appendix A)

Based on the results of the Hydrogeological Assessment completed for the property, the following information is provided:

The following general private water supply protection recommendation should be listed on the site plan:

1. *Where the Ministry of Northern Development, Mines, Natural Resources and Forestry with the assistance of the Ministry of the Environment Conservation and Parks, according to existing water well interference protocols, has determined that the operation of the pit has caused any well water to be adversely affected, the licensee shall, at the licensee's expense, either deepen the well or replace the well to ensure that historic water production quality standards are maintained for that well. If this pit operation has caused a water supply problem, the licensee shall, at their expense, ensure a continuous supply of potable water to the affected landowner.*

In order to track water table elevations and groundwater quality at the site, the following monitoring program is recommended:

2. *Water level measurements shall be obtained on a quarterly (seasonal basis) at MW1, MW2 and MW3, as accessible.*
3. *Annual water quality samples for general parameters (anions and metals) and petroleum hydrocarbons shall be obtained at MW1 and MW3 (as accessible) on an annual basis.*
4. *The monitoring results will be summarized and submitted in an annual report to the Ministry of Northern Development, Mines, Natural Resources and Forestry.*

Conclusions:

For the purpose of the site plan, the established water table for the site, representative of the high water table elevation measured to date, is shown in this report.

Based on the results of this impact assessment, and, proposed monitoring and mitigation plan, there are no potential for significant adverse effects to groundwater and surface water resources and their uses; and, no potential significant impact to local groundwater aquifers, natural environment features or water supply associated with the proposed Macpherson pit extraction.

10.2 Natural Environment Level One and Two: Terrastory Environmental Consulting Inc. (Appendix B)

The following conclusions are presented in the Natural Environment report:

"In accordance with application standards for Class A pit licences pursuant to the Aggregate Resources Act, the Natural Environment Report provides a detailed characterization of the natural occurring within and adjacent to the proposed Macpherson pit at 43371 Truman Line in the Municipality of Central Elgin.

The NER has been prepared in support of the ARA licence application along with the Official Plan Amendment and Zoning By-law Amendment applications to the Municipality.”

“Based on the findings presented in the report, the following natural features with ecological and/or policy significance have been identified within the Study area:”

- a) Significant Woodland*
- b) Significant Wildlife Habitat*

“The extraction limit incorporates a 15 m dripline setback from the Significant Woodland. This setback will become (or remain in) natural, self-sustaining vegetation, and no acoustic berms have been specified within the buffer, which will be planted with two rows of Eastern White Pine. Best management practices are to be implemented to protect the Bank Swallow colony when pit extraction advances southward from the adjacent licence to the west.”

Overall, it has been determined that no negative impacts to the above-noted significant natural features will occur provided that all technical recommendations are implemented in full. The ARA site plan that directs and constrains pit operations incorporates all technical recommendations made herein.”

10.3 Cultural Heritage Resource Stage 1 and 2: Timmins Martelle Heritage Consultants (Appendix C)

The following recommendations are presented report:

The Stage 2 pedestrian survey resulted in the identification of one Indigenous findspot which does not qualify for Stage 3 testing based on provincial standards. As such, the subject property should be considered free of archaeological concern and no further assessment is recommended.

The following recommendations are presented in both reports:

“Should previously undocumented (i.e. unknown or deeply buried) archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48(1) of the Ontario Heritage Act.

The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar of Burial Sites, War Graves, Abandoned Cemeteries and Cemetery Closures, Ontario Ministry of Government and Consumer Services. As of December 2020, Crystal Forrest is serving as A/Registrar, replacing Nancy Watkins in this role. The new Registrar’s contact information is: 416-212-7499, Crystal.Forrest@ontario.ca.

10.4 Noise Assessment Report: HGC Engineering Limited (Appendix D)

The report has the following summary of the findings:

“The results of our analysis indicate that sound levels produced by worst case scenario operations are expected to comply with MECP Guideline limits with the implementation of noise control measures.”

The mitigation measures recommended in the noise report have been incorporated on the site plans and are found under the technical recommendations found on page 3 of the plans.

The report has the following conclusion:

“The results indicate that the sound emissions from the proposed pit operations, with the recommended noise control measures in place, are expected to comply with MECP guideline limits at all the neighbouring noise sensitive receptors under the worst case operating scenarios.”

10.5 Resource Assessment: Applicant (Appendix E)

10.6 Site Plans: Harrington McAvan Ltd (Appendix F)

11.0 CONCLUSION

With the investigation and planning undertaken to support the extraction and rehabilitation of this site, we are confident that the Site Plans, as prepared, adequately address and mitigate any potential adverse impacts of the proposed operation on the surrounding land uses while maximizing the utilization of the aggregate resources and the after-use potential of the property. We believe that the application for this new pit should be approved.

HARRINGTON MCAVAN LTD.



BERNIE JANSSEN, B.E.S.

Principal / Aggregate Resources Specialist

BJ/wp

Statement of Qualifications

Harrington McAvan Ltd

Bernhard Janssen, B.E.S., Principal and Aggregate Resource Specialist

Harrington McAvan Ltd is a firm of landscape architects practicing in Ontario for the past forty-eight years. The firm has expertise in landscape architecture, earth sciences, and biology, with a focus on stream and wetland restoration and rehabilitation projects.

Harrington McAvan Ltd (previously Harrington and Hoyle Ltd.) have been producing Site Plans for aggregate licenses for the past forty years and in that time have prepared well over 150 successful plans. The firm has consulted to the Ontario Ministry of Natural Resources on a variety of legislative initiatives and was retained in 1990 to prepare the *Generic 'Class A' Site Plans* as examples of new standards required under the Aggregate Resources Act (ARA). The firm is an associate member of the Ontario Stone, Sand & Gravel Association (formerly Aggregate Producers Association of Ontario).

Mr. Bernie Janssen received his Bachelor of Environmental Studies degree from the University of Waterloo in 1983. He had over fourteen years experience working in MNR's aggregate program in the greater Toronto and London areas, dealing with plans, license applications, and reports before joining Harrington McAvan Ltd in 1997.

Mr. Janssen specializes in compliance assessments and reports under the ARA, operations planning, and aggregate resource assessment. In 1998 he was granted approval by the Ministry of Natural Resources to prepare site plans under the Aggregate Resources Act.

August 2022