REPORT

Scoped Natural Heritage Impact Assessment Duntroon Quarry Lowering

Submitted to:

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Submitted by:

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1 INTRODUCTION

WSP was retained by Walker Aggregates Inc. to undertake an Environmental Assessment for an amendment to the Aggregate Resource Act Site Plans for the Duntroon Quarry and Duntroon Quarry Expansion.

A pre-consultation meeting was undertaken with the Township of Clearview on April 17, 2024, regarding a number of items, including the proposed lowering of the quarry floor at the original Duntroon Quarry south of Township Road 91 and the Duntroon Quarry Expansion north of Township Road 91 (approved in 2014 and in operation from 2016 to present). The extraction area footprint of the quarries will remain unchanged, however, the depth of the extraction of the quarries is proposed to be lowered to between 485 metres above sea level (masl) and 490 masl across the entire Site. Currently the majority of the site is permitted to extract to an elevation of 500 metres above sea level (masl), with a portion permitted to be extracted to a depth of 490 masl. The Township of Clearview requested that a Terms of Reference (TOR) be submitted for the assessment of potential impacts to natural heritage features. This TOR outlined the associated water resources investigation that will be completed as part of the assessment. The Township peer Reviewer Burnside supported the Natural Environment TOR with a comment requesting that the monitoring data from the current AMP be provided to the Township as well as the provincial Ministry. These monitoring reports are provided to the Township currently and will continue to be provided as part of operations and monitoring. The TOR for the study are provided in Appendix A along with WSP's response to Peer review comments related to the water resources assessment.

2 PURPOSE

The purpose of the impact assessment is to support the application approvals process for the proposed lowering of the quarry floor. The Expansion Quarry studies completed for approval that encompassed the area of the original quarry were completed between 2003 to 2013 and assessed the impacts for the Duntroon Expansion. As a Condition of Approval, the operations are subject to extensive monitoring of groundwater, surface water and natural heritage features as per the Duntroon Adaptive Management Plan (AMP). The AMP includes a collaborative assessment of both water resources data and complementary natural heritage feature assessment for both wetlands, watercourses and vernal pools (including created amphibian habitat, i.e., Miller pond). Given that the licenced extraction areas are not changing, the potential impact is associated with the additional radius of influence from dewatering to facilitate the extraction of bedrock at the proposed new depth. As such, this proposed assessment as outlined in the approved TOR will primarily focus on the potential to affect features that are reliant on groundwater discharge, namely, in this area, wetlands and watercourses.

This assessment draws on the on-going water and ecological monitoring that is part of the Duntroon AMP. Watercourse monitoring involves monitoring of temperature and baseflow with ecological monitoring for fisheries related attributes to be initiated if water related thresholds are triggered. Water related thresholds including those below the brow of the escarpment have not been triggered, as such no ecological monitoring has been initiated for fisheries as conditions remain consistent with baseline ranges.

A component of the AMP is the Ecological Enhancement and Mitigation Monitoring (EEMM) program. The EEMM program is designed to make sure the ecological mitigation measures are properly implemented and includes the woodland program (which includes vegetation monitoring), Millar Pond relocation, the Bridson Pond enhancement, and butternut tree plantings among others. Vegetation monitoring began in 2019 at wetlands within the Rob Roy Swamp PSW Complex (RR2 and RR6) and ANSI wetlands A and B. The monitoring results are considered in this assessment of the proposed quarry floor lowering.

This report specifically addresses the requirements of a Natural Environment Technical Report (NER) (Aggregate Resources of Ontario Provincial Standards, Section 2.2) that accompany the applications for Below Water Operations. This report also meets the requirements of an Environmental Impact Statement (EIS) for the Township of Clearview

The purpose of this report is to assess potential environmental impacts of the proposed lowering of the quarry floor on the Site with respect to the following:

- The environmental features and functions in the Study Area.
- The influence of lowering the extraction depth on the surrounding natural environment.

The potential impacts of the proposed extraction on groundwater and surface water resources are discussed separately in detail in the Proposed Duntroon Quarry Lowering Level 1 and 2 Water Report (WSP 2025) and have been incorporated where appropriate in this report as it relates to potential impacts to natural heritage features.

The report is formatted in manner to systematically address the policy of the Provincial Policy Statement (PPS) related to natural heritage which are consistent with Aggregate Resources Act (ARA) requirements and the polices of the Niagara Escarpment Plan which are similar to the PPS policies but include additional items such as seepage areas and springs; and habitat of special concern species in Escarpment Natural and Escarpment Protection Areas.

3 ENVIRONMENTAL POLICY CONTEXT

The Site is located in the Township of Clearview, County of Simcoe. Documents reviewed to gain an understanding of the natural heritage features and regulations that are relevant to the proposed Site and Study Area consisted of the following:

- The ARA (Ontario 1990) and the Aggregate Resources of Ontario Standards (MNRF 2020)
- The Provincial Planning Statement (MMAH 2024)
- The *Fisheries Act* (Canada 1985)
- The *Migratory Birds Convention Act* (Canada 1994)
- The *Endangered Species Act* (Ontario 2007)
- Ontario Regulation 41/24: Prohibited Activities, Exemptions, and Permits under the Conservation Authorities Act (Ontario 2024)
- Township of Clearview Official Plan
- County of Simcoe Official Plan
- Niagara Escarpment Plan

An overview of the above noted legislation and policy documents are discussed in Sections 3.1 to 3.9.

3.1 Aggregate Resources Act

Applicants for a Class A licence are required to prepare an NER in accordance with the ARA Provincial Standards (MNRF 2020). The NER is required to identify the designated natural heritage features and areas on, and within 120 m of the Site, as defined in the PPS (MMAH 2024) with guidance from supporting technical manuals prepared by the Ministry of Natural Resources (MNR) (MNR 2000, 2010; MNRF 2014, 2015a). Where any of these features/areas have been identified, the report must identify and evaluate any negative impacts on the natural features/areas, including their ecological functions, and identify any proposed preventative, mitigative or remedial measures. The report must also identify if the Site or any of the features/areas are located within a natural heritage system that has been identified by a municipality in ecoregions 6E and 7E or by the province as part of a provincial plan.

3.2 Provincial Planning Statement

The PPS was issued under Section 3 of the *Planning Act* and came into effect on October 20, 2024, replacing the earlier version issued on May 1, 2020, titled the Provincial Policy Statement, 2020. The natural heritage policies of the PPS indicate that:

4.1.1 Natural features and areas shall be protected for the long-term.

4.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

4.1.3 Natural heritage systems shall be identified in Ecoregions 6E and 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.

4.1.4 Development and site alteration shall not be permitted in:

a) significant wetlands in Ecoregions 5E, 6E and 7E; and,

b) significant coastal wetlands.

4.1.5 Unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in:

a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;

b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);

c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);

d) significant wildlife habitat;

e) significant areas of natural and scientific interest; and,

f) coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 4.1.4(b).

4.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

4.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.

4.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.3, 4.1.4 and 4.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

3.3 Fisheries Act

The purpose of the *Fisheries Act* (Canada 1985) is to maintain healthy, sustainable, and productive Canadian fisheries through the prevention of pollution and the protection of fish and their habitat. All projects undertaking work in or near-water must comply with the provisions of the *Fisheries Act*.

Measures to protect fish habitat include avoiding in-water work (i.e., below the high-water mark) and work on the banks or shoreline of watercourse/waterbody, as well maintaining riparian vegetation. Any project that is unable to avoid impacts to fish or fish habitat will require a project review (DFO 2019). If it is determined through the Fisheries and Oceans Canada (DFO) review process that the project will result in death of fish or the harmful alteration, disruption, or destruction of fish habitat (HADD), an authorization under the *Fisheries Act* is required. This includes projects that have the potential to obstruct fish passage or impacts flows.

Proponents of projects requiring a *Fisheries Act* Authorization are required to also submit a Habitat Offsetting Plan, which provides details of how the death of fish and/or HADD to fish habitat will be offset and outlines associated costs and monitoring commitments. Proponents also have a duty to notify DFO of any unforeseen activities during the project that cause harm to fish and outline the steps taken to address them.

3.4 Migratory Birds Convention Act

Most birds in Canada are protected by the federal *Migratory Birds Convention Act* (MBCA; Canada 1994), which prohibits the disturbance or destruction of migratory birds, their eggs and nests on all lands in Canada, even incidentally. Upon the enforcement of the Migratory Birds Regulations, 2022 (MBR, 2022; Canada 2022) in July 2022, nest protection has been limited to active nests for most migratory bird species. Schedule 1 of the MBR, 2022 identifies 18 migratory bird species whose nests are protected year-round and must be confirmed inactive for a defined period (ranging between 12 and 36 months depending on the species) before they can be disturbed or destroyed. The nests must also be registered at the start of the defined period.

Although Environment and Climate Change Canada (ECCC) can issue permits allowing the destruction of nests for scientific purposes or to prevent damage being caused by birds, there are currently no permits available to exempt development, including maintenance and rehabilitation activities. ECCC advises that proponents schedule activities outside of the migratory bird nesting season to avoid incidental take. Proponents can apply for a damage or danger permit to remove or actively deter migratory birds from structures if it can be clearly demonstrated that the bird activity is causing damage to the structure or poses a health and safety concern for people (e.g., large nesting gull colonies generating waste in public places).

3.5 Species at Risk

3.5.1 Endangered Species Act

SAR designations for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of the Environment, Conservation and Parks, species are added to the provincial *Endangered Species Act* (ESA) which came into effect June 30, 2008 (Ontario 2007). The legislation prohibits the killing or harming of species identified as endangered or threatened in the various schedules to the Act. The ESA also provides habitat protection to all species listed as threatened or

endangered. As of June 30, 2008, the Species at Risk in Ontario (SARO) List is contained in Ontario Regulation (O. Reg.) 230/08.

Subsection 9(1) of the ESA prohibits the killing, harming, or harassing of species identified as 'endangered' or 'threatened' in the various schedules to the Act. Subsection 10(1) (a) of the ESA states that "*No person shall damage or destroy the habitat of a species that is listed on the SARO list as an endangered or threatened species*".

The ESA also provides general habitat protection to all species listed as threatened and endangered under the Act. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA. The ESA has a permitting process to allow alterations to protected species or their habitats. In addition, the ESA allows for a registration approach for projects meeting specific conditions.

3.6 Conservation Authorities

The Site and Study Area are located within the jurisdiction of two Conservation Authorities and is regulated under O. Reg 41/24 – Prohibited Activities, Exemptions, and Permits under the *Conservation Authorities Act, R.S.O. 1990*. Through this, Authority has the responsibility to regulate activities in natural and hazardous areas (e.g., areas in and near rivers, streams, floodplains, wetlands, slopes and shorelines). As this project is under the purview of the ARA, this regulation does not apply and no permits from Conservation Authorities are required.

3.7 Township of Clearview

A pre-consultation meeting was undertaken with the Township of Clearview on April 17, 2024, regarding a number of items including the proposed lowering of the quarry floor at the original Duntroon Quarry south of Township Road 91 and the Duntroon Quarry Expansion north of Township Road 91.

The Township of Clearview requested that the TOR be submitted for the assessment of potential impacts to natural heritage features. This TOR also outlines the associated water resources investigation that will be completed as part of the assessment and is included in Appendix A. The TOR forms the basis of this scoped EIS/NHIA

This Natural Heritage Impact Assessment as indicated in the TOR will include:

- Background data review focused on wetlands and watercourses,
- Review of AMP annual monitoring reports,
- five-year comprehensive AMP report (WSP, September 2021); and,
- findings of hydrogeological study completed by WSP (Proposed Duntroon Quarry Lowering Level 1 and 2 Water Report (WSP 2025))

The Niagara Escarpment Plan (NEP)

The Duntroon Quarry and Duntroon Quarry Extension are located within the Niagara Escarpment Plan Area and fall under the jurisdiction of the Niagara Escarpment Planning and Development Act (NEPDA). The site is designated as a *Mineral Resource Extraction Area* in the NEP.

The objectives of the Niagara Escarpment Act are provided in the Niagara Escarpment Plan (NEP) (2017):

1) To protect unique ecologic and historic areas;

2) To maintain and enhance the quality and character of natural streams and water supplies;

3) To provide adequate opportunities for outdoor recreation;

4) To maintain and enhance the open landscape character of the Niagara Escarpment in so far as possible, by such means as compatible farming or forestry and by preserving the natural scenery;

5) To ensure that all new development is compatible with the purpose of the Plan;

6) To provide for adequate public access to the Niagara Escarpment; and

7) To support municipalities within the Niagara Escarpment Plan Area in their exercise of the planning functions conferred upon them by the Planning Act.

Amendment for Mineral Resources Extraction

The Mineral Resource Extraction Area designation includes mineral aggregate operations licensed pursuant to the Aggregate Resources Act and areas where mineral aggregate resource extraction may be permitted, subject to the policies of the NEC Plan.

OBJECTIVES

1) To designate Mineral Resource Extraction Areas where licensed mineral aggregate operations are permitted.

2) To minimize the impact of mineral aggregate operations on the Escarpment environment.

3) To encourage progressive rehabilitation of mineral aggregate operations.

4) To encourage rehabilitated mineral aggregate operations to be restored to a state that is of equal or greater ecological or agricultural value than the original characteristics of the site.

5) To ensure that, after a licence is surrendered, the land is re-designated to a land use designation that is compatible with the rehabilitation of the site, the designation criteria of adjacent lands, the surrounding Escarpment environment and existing land uses in the area.

6) To encourage, where possible, the integration of rehabilitated lands into the Niagara Escarpment Parks and Open Space System.

It should be noted that the proposed lowering of quarry floors adds no additional land area to the existing licence or extraction area, as such most of the NEP provisions are not applicable to quarry floor lowering amendment.

Policy for Development Affecting Water Resources

The objective of the NEP is to ensure that hydrologic features and functions including the quality, quantity and character of groundwater and surface water, at the local and watershed level, are protected and where possible enhanced.

1) The following are key hydrologic features within the meaning of the Plan:

   - permanent and intermittent streams;
   - lakes (and their littoral zones);

- seepage areas and springs; and
- wetlands.

2) Development is not permitted in key hydrologic features with the exception of accessory facilities; forest, fisheries and wildlife management to maintain or enhance the feature; conservation and flood or erosion control projects, the Bruce Trail, and other trails, infrastructure, where the project has been deemed necessary to the public interest.

3) If, in the opinion of the implementing authority, a proposal for development within 120 metres of a key hyrologic feature has the potential to result in a negative impact on the feature and/or its functions, a hydrologic evaluation will be required that:

   a) demonstrates that the development, including any alteration of the natural grade or drainage, will protect:

      i) the key hydrologic feature or the hydrologic functions of that feature,

      ii) the quality and quantity of groundwater and surface water

      iii) natural streams or drainage patterns; and

      iv) the overall water budget for the watershed, including existing and planned municipal drinking water systems.

Policy for Development Affecting Natural Heritage

The objective is to protect and where possible enhance natural heritage features and functions, in order to maintain the diversity and connectivity of the continuous natural environment.

The following are key natural heritage features within the meaning of the Plan:

- Wetlands
- Habitat of endangered species and threatened species
- Fish habitat
- Life Science Areas of Natural and Scientific Interest
- Earth Science Areas of Natural and Scientific Interest
- Significant valleylands
- Significant woodlands
- Significant wildlife habitat
- Habitat of special concern species in Escarpment Natural and Escarpment Protection Areas

Development is not permitted in key natural heritage features with the exception of accessory facilities; forest, fisheries and wildlife management to maintain or enhance the feature; conservation and flood or erosion control projects, the Bruce Trail, and other trails, infrastructure, where the project has been deemed necessary to the public interest.

Where policies or standards of other public bodies or levels of government exceed the policies related to key natural heritage features or key hydrologic features in this Plan, such as may occur with habitat of endangered species and threatened species under the Endangered Species Act, 2007; with natural hazards where section 28 regulations of the Conservation Authorities Act apply; or with fisheries under the Federal Fisheries Act, the most restrictive provision or standard applies.

If in the opinion of the implementing authority, a proposal for development within 120 metres of a key natural heritage feature has the potential to result in a negative impact on the feature and/or its functions, or on the connectivity between key natural heritage features and key hydrologic features, a natural heritage evaluation will be required that:

a) demonstrates that the development, including any alteration of the natural grade or drainage, will protect the key natural heritage feature or the related functions of that feature;

b) identifies planning, design and construction practices that will minimize erosion, sedimentation and the introduction of nutrients or pollutants and protect and, where possible, enhance or restore the health, diversity and size of the key natural heritage feature;

c) determines the minimum vegetation protection zone required to protect and where possible enhance the key natural heritage feature and its functions; and

d) demonstrates that the connectivity between key natural heritage features and key hydrologic features located within 240 metres of each other will be maintained and where possible enhanced for the movement of native plants and animals across the landscape. except with respect to a key natural heritage feature that is solely the habitat of endangered species or threatened species, which is subject to Part 2.7.8 below.

Development within the habitat of endangered species and threatened species:

a) located within Escarpment Natural Areas and Escarpment Protection Areas, is not permitted, except for development referred to in Parts 2.7.2 a) b) c) d) or e) which may be permitted provided it is in compliance with the Endangered Species Act, 2007.

4 DESCRIPTION OF PROPOSED QUARRY LOWERING

The Duntroon Quarry (Site) operated by Walker Aggregates Inc. (WAI) is located on County Road 91, west of the village of Duntroon in the Township of Clearview, County of Simcoe, as shown on **Figure 1**. The Duntroon Main Quarry (ARA Licence no. 3514) is located south of Township Road 91 on Part Lot 24, Concessions XI and XII, while the Extension Quarry (ARA Licence no. 607841) is located north of Township Road 91 on Part Lot 25, Concessions XI and XII. The Site is located east of Osprey Quarry (ARA Licence no. 608061) operated by St. Mary's Cement (formerly referred to as the MAQ Aggregates Inc. (MAQ) Highland Quarry), which is located on Part Lots 20 and 21, Concession A, Town of The Blue Mountains, Grey County. The boundary between Simcoe and Grey Counties occurs along Osprey-Clearview Townline (Grey Road 31) on the west boundary of the Site. The locations of these quarry properties and additional lands owned by WAI are shown on **Figure 2**.

The Main Quarry has been in operation on the south side of Township Road 91 since the early 1960s. However, extraction from the Site currently occurs within the Extension Quarry licence granted in 2014, and extraction within Phase 1 was initiated in June 2016. The two quarries are connected by a tunnel under Township Road 91. A summary of the Licence area and Limit of Extraction is provided in **Table 1.1**.

Table 1.1: Quarry Licence Area and Limit of Extraction

	Main Quarry (ARA Licence 3514)	Extension Quarry (ARA Licence 607841)
Licence Area	57.5 hectares (142.1 acres)	65.9 hectares (162.8 acres)
Limit of Extraction	47.1 hectares (116.4 acres)	58.5 hectares (144.6 acres)

The Main Quarry and Phases 1 to 3 of the Extension Quarry are licenced to extract the bedrock resources to a geodetic elevation of 500 metres above sea level (masl). Phase 4 of the Extension Quarry is licenced to extract the bedrock resources to a geodetic elevation of 490 masl. The proposed quarry deepening would facilitate extraction to the interpolated elevation of the Fossil Hill Formation contact across both quarries within the existing limit of extraction area.

Like the existing licences, the proposed quarry deepening will be developed below the natural groundwater table and will continue to be dewatered to maintain dry working conditions. WAI is required to obtain a site plan amendment for the proposed quarry deepening under the ARA.

5 METHODS

The Natural Environment Impact Assessment (NEIA) is based on the approved TOR provided to the Township of Clearview for the proposed quarry lowering. The assessment included a review of background data, confirmation and update to existing conditions and evaluation of significance of natural heritage features, review and incorporation of water related investigations and impact assessment as it relates to natural heritage features.

The NEIA draws on the ongoing monitoring results that are part of the Duntroon Adaptive Management Plan (AMP) for the Duntroon Quarry Expansion (Walker 2013).

5.1 Background Data Collection

A background review of the following sources will be completed to update the extensive suite of information already collected and being collected on an ongoing basis in the area of the quarry to document Existing Conditions, including but not limited to:

- Land Information Ontario (LIO) database (MNRF 2024)
- Natural Heritage Information Centre Data (NHIC; MNRF 2024)
- Fisheries and Oceans Canada online mapping tool of aquatic SAR (DFO 2024)
- Township Of Clearview Official Plan Schedules (2022)
- Current MNRF Wetland Evaluation Files and wetland delineation updates
- Historic and updated Fisheries data records from MNRF and Conservation Authorities.
- Atlas of Breeding Birds of Ontario (Cadman et al., 2007) and ebird
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2022)

- LIDAR topographical information
- Current high resolution Satellite imagery and recent Site drone survey data.

5.2 Existing Conditions and Evaluation Of Significance

Existing Conditions are reviewed using the noted data sources in addition to the on-going AMP monitoring data collected for features above and the brow of the escarpment.

These existing conditions will be described for adjacent lands in the predicted radius of influence of the quarry where potential impacts may occur due to the proposed lowering of the quarry floor.

These data are presented in figure(s) highlighting the location and type of natural heritage features with a focus on those reliant on water and where water regime dynamics are important to their form and function. This Existing Conditions description of features and mapping is used in evaluating the significance of these features from an ecological and policy perspective.

5.3 Water Related Investigations

Concurrent to WSP's Natural Heritage assessment, WSP also completed an assessment focused on the additional impact of lowering the quarry floor to determine the potential impacts that may influence groundwater discharge to sensitive features, namely baseflow/temperature in watercourses and hydroperiods of wetlands.

The hydrogeological study included an investigation of potential impacts to private water wells, springs/seeps along the Niagara Escarpment, and watercourse/wetland features which are reliant on groundwater discharge. The Site setting is well studied through previous hydrogeological reports completed as part of the licensing of the Expansion quarry and the on-going AMP monitoring program. Nonetheless, a review of the Site setting was completed including the results of additional hydraulic testing completed on the deeper bedrock interval (i.e., 485 masl to 500 masl). In addition, proposed changes to the AMP monitoring program are provided in the Water Report.

These existing conditions are instrumental in understanding the potential impacts. Specifically, the Natural Heritage Impact Assessment will be a collaborate evaluation of groundwater dependent natural heritage features, including baseflow for tributaries with fish habitat and wetlands that may be dependent on groundwater discharge for a portion of their water budget.

6 BACKGROUND REVIEW AND ECOSYSTEM SETTING

6.1 Background Review

The investigation of existing conditions in the Study Area included a background information search and literature review to gather data to update the data collected during studies for the Duntroon Quarry Expansion about the local area and provide context for the evaluation of the natural features. A number of resources were used, including:

- Level One and Two Water Report (WSP 2025)
- Aerial imagery
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Breeding Bird Atlas of Ontario (OBBA) (Cadman et al. 2007)

- DFO Aquatic SAR Mapping (DFO 2025)
- eBird species maps (eBird 2025)
- iNaturalist occurrence records (iNaturalist 2025)
- MNR Fish On-Line (MNR 2025a)
- MNR Land Information Ontario (LIO) geospatial data (MNR 2025b)
- Natural Heritage Information Centre (NHIC) database, maintained by the MNR (NHIC 2025a)
- Ontario Butterfly Atlas (Jones et al. 2025)
- Ontario Moth Atlas (Kaposi et al. 2025)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Species at Risk in Ontario (SARO) List (MECP 2025)
- Species at Risk Public Registry (ECCC 2025)
- Vascular Plants at Risk in Ontario (Leslie 2018)
- The Atlas of the Mammals of Ontario (1994);
- ANSI data files; and
- Consolidated Wetland Evaluations.

Current background data were collected and reviewed to identify designated significant natural areas, significant species occurrences and landscape context.

Vegetation

Information concerning vegetation communities and plant species was evaluated to determine potential significance at a number of different levels. A search of the NHIC database was conducted with particular emphasis on vascular flora and vegetation communities identified as species at risk or species of conservation concern in Ontario. This information was reviewed in conjunction with the known habitat types on the proposed license area to determine which species and communities may occur and have the potential to be affected by the quarry proposal.

In reviewing the NHIC database, American Hart's-Tongue Fern (*Asplenium scolopendrium var. americanum*), Butternut (*Juglans cinerea*), and Black Ash (*Fraxinus nigra*) were the only species of significance found in close proximity to the proposed license area. One significant vegetation community is known from the study area: Bulbet Fern – Herb Robert Open Shaded Limestone / Dolostone Cliff Face Type. Provincial significance of vegetation communities was based on the draft rankings assigned by the Natural Heritage Information Centre (Oldham et al., 1995). The provincial status of all plant species is based on Newmaster et al. (1998), with updates from the database of the Natural Heritage Information Centre (NHIC, 2001). Identification of potentially sensitive plant species is based on assignment of a coefficient of conservatism value (CC) to each native species in southern Ontario (Oldham et al., 1995). The CC value, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

Herpetofauna (Amphibians and Reptiles)

A search of the NHIC Herpetofaunal Atlas was conducted with particular emphasis on reptiles and amphibians identified as species at risk or species of conservation concern in Ontario. This information was reviewed in conjunction with the known habitat types on the proposed license area to determine which species may occur and have the potential to be affected by the quarry proposal.

In reviewing the NHIC Herpetofaunal Atlas, Eastern Milksnake (*Lampropeltis triangulum*), Snapping Turtle (*Chelydra serpentina*), Midland Painted Turtle (*Chrysemys picta marginata*), Jefferson Salamander (*Ambystoma jeffersonianum*), and historical records of Eastern Massasauga (*Sistrurus catenatus*) were documented as occurring within the study area overlapping the project site. Information in the NHIC Herpetofaunal Atlas mapping is not presented at a scale to allow for a determination of whether the Massasauga was identified in the proposed license area, there are however, no recent records since 1982. All other species identified above through the NHIC Herpetofaunal Atlas have modern, recent records and are anticipated to be present within the broader study area.

Breeding Birds

A search of the NHIC database and Ontario Breeding Bird Atlas (Cadman et al. 2007) was conducted with particular emphasis on avian species identified as species at risk or species of conservation concern in Ontario. This information was reviewed in conjunction with the known habitat types on the proposed license area to determine which species may occur and have the potential to be affected by the quarry proposal.

In reviewing the NHIC database and Ontario Breeding Bird Atlas, Eastern Wood-Pewee (*Contopus virens*), Wood Thrush (*Hylocichla mustelina*), Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*), Canada Warbler (*Cardellina canadensis*), Louisiana Waterthrush (*Parkesia motacilla*), Barn Swallow (*Hirundo rustica*), and Grasshopper Sparrow (*Ammodramus savannarum*) were documented as occurring within the study area overlapping the project site. Habitat for Eastern Wood-Pewee, Wood Thrush, and Canada Warbler is present within the project site, while habitat for Bobolink, Eastern Meadowlark, Barn Swallow, and Grasshopper Sparrow is present adjacent to the project site (but not on it).

Aquatic Resource Background

A search of the NHIC database and Canadian Freshwater Mussel Guide was conducted with particular emphasis on aquatic species identified as species at risk or species of conservation concern in Ontario. This information was reviewed in conjunction with the known habitat types on the proposed license area to determine which species may occur and have the potential to be affected by the quarry proposal.

In reviewing the NHIC database and Canadian Freshwater Mussel Guide, Eastern Pondmussel (*Ligumia nasuta*) and Wavy-rayed Lampmussel (*Lampsilis fasciola*) were documented as occurring within the study area overlapping the project site.

A review of available fisheries data and assessment of the potential impact on Brook Trout (*Salvelinus fontinalis*) from the discharge of groundwater from the proposed Duntroon Quarry expansion into the headwaters of the Batteaux Creek and Beaver and Pretty Rivers was also undertaken.

Overview NHIC

The NHIC searches, conducted as part of the background review, revealed that sixteen (16) species of provincial significance and one (1) vegetation community are listed as occurring in the general area of the proposed expansion.

6.2 Ecosystem Setting and Regional Context

The Study Area is located at the southern edge of Ecoregion 6E (Lake Simcoe – Rideau), which covers just over 6% of southern Ontario (Crins et al. 2009). Ecoregion 6E is underlain by bedrock of dolomite and limestone and is characterized by gently rolling surface terrain interspersed by drumlin fields and moraines. Soils are primarily mineral-based and dominated by Gray Brown Luvisols and Melanic Brunisols. The majority of the region is covered by cropland or pasture (57%), with 16% covered by forest and 4% covered by water (Crins et al. 2009).

The license area of the Duntroon quarries is located within the Niagara Escarpment physiographic region (Chapman and Putnam, 1984). The Niagara Escarpment physiographic region is one of the most prominent physiographic formations in Southern Ontario. The escarpment represents the edge of the Guelph, Amabel and Lockport geologic formations and is characterized by vertical cliffs and exposed bedrock that has been stripped of overlying soil materials. The Niagara Escarpment extends from the Niagara Peninsula, around Lake Ontario, and north to Georgian Bay. The characteristics of the Escarpment are variable along its length, with some sections being completely covered by aggregate materials commonly associated with moraines. In the vicinity of the proposed license area, the physiographic formations include dolostone plains and till moraines. Walker's lands lie to the west, within 1 km of the brow of Niagara Escarpment where the Amabel Formation is near the ground surface.

Watersheds create natural divides for the hydraulic features associated with the proposed license area. The four watersheds in close proximity to the proposed license area are: Pretty River subcatchment (northeast), Batteaux Creek subcatchment (east), Mad River subcatchment (south) and Beaver River subcatchment (west). The Batteaux Creek and Beaver River subcatchments cover the majority of the license area and surrounding lands. The Mad River subcatchment is south of the existing Duntroon Quarry. The Batteaux Creek, Pretty River and Mad River watersheds generally flow east down the Niagara Escarpment. The Beaver River watershed flows west through the Beaver Valley. Eventually, all systems flow north into Nottawasaga Bay.

The region surrounding the license area is extensively forested. Forested areas on the license areas are part of a massive, more than 24,000 ha, network of connected woodlands. This network includes the "Kolapore/Duncan Mega Woodland" to the northwest, approximately 4 km to 5 km outside the proposed license area.

7 NATURAL HERITAGE CONDITIONS AND IMPACT ASSESSMENT

An assessment was conducted to determine the significance of natural features as well as SAR observed or determined to have the potential to use the Study Area. The assessment was completed by analysing natural environment data collected through the current background review (2025) and previous characterization of natural heritage attributes, using the methods and criteria outlined in the following sources:

- Natural Heritage Reference Manual [NHRM; (MNR 2010)]
- Significant Wildlife Habitat Technical Guide [SWHTG; (MNR 2000)]
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E [SWHCS; (MNRF 2015a)]
- Habitat mapping for provincially endangered and threatened species through application of ESA regulated habitat or General Habitat Descriptions to the Site, where available

An assessment was then conducted to determine how the proposed deepening may negatively impact both significant natural features and other features such as seep and springs that are specifically named in the NEP.

The assessment is completed in consideration of the existing condition and two key sources of information, the on-going AMP monitoring which provides real time knowledge of the affects of the current and past quarry operations and the *Proposed Duntroon Quarry Lowering Level 1 and 2 Water Report* (WSP 2025.

The following sections are formatted in a manner to address both the PPS - Wise Use and Resource Management for Natural Heritage, as required by the ARA standards, and the NEP polices where they differ from the PPS (i.e. seep and springs). The assessment includes:

- An overview of Existing Conditions pertinent to the assessment,
- AMP monitoring findings related to understanding impact assessment; and,
- Impact assessment of the proposed deepening of the quarry floor for each of the natural heritage features

7.1 Significant Wetlands and Wetlands

Significant wetlands are areas identified as provincially significant using evaluation procedures established by the province, as amended from time to time (MNRF 2022). Wetlands are assessed based on a range of criteria, including biology, hydrology, societal value, and special features.

Wetlands in the area of the Duntroon quarry and illustrated on figure 2 and 3 and included:

- Provincial Significant Wetland - Rob Roy Wetland Complex Swamps 1, 2, 3, 5 and 6, and Carmarthen Lakes Farms Wetland
- Wetland - ANSI Wetlands A and B
- Wetland – Wetland units below the brow of the escarpment

The wetland vegetation characteristic are described in table 1.

Wetland Characteristics

Wetland	ELC & Location	Description
RR1	SWD 2-2	Young to medium-aged forest dominated by green ash with a high admixture of white elm; fewer occurrences of red maple, yellow birch, silver maple, and balsam poplar were also observed. The shrub layer is well developed, composed of elm, ash, balsam fir, silver maple and basswood. The herbs were represented by sensitive fern, yellow dog's-tooth violet, wood nettle, calico aster, spotted joe-pye-weed, white snakeroot, woolly blue violet, and fowl meadow grass.
RR2	SWD 3-2	Silver maple-dominated swamp, flooded in the spring with up to 40 cm of water. A medium to old age, well-structured community. Canopy subdominants included silver maple and yellow birch. The shrub layer was composed of red and silver maple saplings, yellow birch, elm, red-osier dogwood and balsam fir. The herb layer during spring flooding was only developed around elevated tree bases, but during the summer drawdown covered the entire forest floor, where it was represented by sensitive fern, dwarf raspberry and spinulose wood fern.
RR3	SWD 2-5	Vegetation community was complexed with MAM2-2. While red-osier dogwood was abundant in this community, severe grazing prevented this species from out- competing the reed-canary grass and forming a dominant thicket. While these shrubs were obviously mature, many were no taller than 50cm. Mature tamarack specimens were observed, but rare throughout this community. Soils were moist.

Wetland Characteristics		
Wetland	**ELC & Location**	**Description**
RR4	In Quarry	Located in MAQ Active Quarry
RR5	In Quarry	Located in MAQ Active Quarry
RR6	SWM1-1/SWM1-2	Eastern white cedar was accompanied by balsam fir, yellow birch, green ash and trembling aspen. Shrubs included choke cherry, round-leaved dogwood, as well as saplings of cedar, ash and birch. The herb layer was rich and composed of sensitive fern, wood fern, spotted joe-pye-weed, spotted touch-me-not, and bitter nightshade. Mature red maple and balsam fir were abundant throughout the canopy of this community, with occasional occurrences of yellow birch, white birch, and white elm in primarily the sub-canopy; black ash was abundant throughout the sub- canopy. The understory was moderately dense, with an abundance of silky dogwood and tree saplings. Herbaceous species included spinulose wood fern, sensitive fern, violet species, and sedge species; a formal assessment was not possible given the time of year. Soils were generally moist to fresh, with very few pools of surface water. However, past presence of surface water was obvious based on degree of root exposure; duration of inundation may be lengthy given the texture of the exposed roots and pale colouration. Depths appeared to have reached ~40cm.
ANSI A	SWD 2-2	Young to medium-aged forest dominated by green ash with a high admixture of white elm; fewer occurrences of red maple, yellow birch, silver maple, and balsam poplar were also observed. The shrub layer was well developed, composed of elm, ash, balsam fir, silver maple and basswood. The herbs were represented by sensitive fern, yellow dog's-tooth violet, wood nettle, calico aster, spotted joe-pye-weed, white snakeroot, woolly blue violet, and fowl meadow grass.
ANSI B	SWM 1-1	Eastern white cedar was accompanied by balsam fir, yellow birch, green ash and trembling aspen. Shrubs included choke cherry, round-leaved dogwood, as well as saplings of cedar, ash and birch. The herb layer was rich and composed of sensitive fern, wood fern, spotted joe-pye-weed, spotted touch-me-not, and bitter nightshade.

Note: Carmarthen Farms Lake Wetlands is not included in the table as it is under historic influences associated with the original, existing quarry.

Smaller wetland parcels also occur below the brow of the escarpment that are generally greater than 120 m from the quarries but are part of the AMP monitoring program. These wetlands are often associated with seeps and springs and are combination of near surface catchment water, groundwater discharge and private landowner constructed ponds. They are observed to be responsive to precipitation events.

To the south of the Main Quarry, there is a relatively large, mapped wetland feature, referred to as the Carmarthen Lakes Farms wetland. As reported in the Water Report 2025, this feature is monitored as part of the AMP monitoring program (DP3) and is not anticipated to be affected by the proposed quarry deepening.

AMP Wetland Monitoring

A number of wetlands are subject to on-going monitoring associated with the AMP for the Duntroon expansion quarry. The monitoring is a collaboration of both water monitoring and ecological monitoring. Water monitoring which has generally documented the known groundwater lowering associated with dewatering as well as the near surface monitoring used to determine if triggers were being hit. Water levels remain within the acceptable trigger

level. Vegetation monitoring began in 2019 at wetlands within the Rob Roy Swamp PSW Complex (RR2 and RR6) and ANSI wetlands A and B. The most recent wetland monitoring report summary report describes the methods and results from the fifth year (2023) of wetland vegetation surveys and compares results with previous survey years.

The vegetation monitoring report concludes that for the most part the wetlands remain consistent in their floristic character and remain as healthy wetland communities. RR6 appears to be experiencing inundation over a long period which is changing the character of the wetland floristic diversity. However, the wetland remains as a wetland feature but will succeed to a more open canopy wetland environment. This wetland is within the predicted radius of influence, but receives direct discharge from the quarry dewatering which offsets impacts from underdraining.

Ecological monitoring to complement the water level monitoring includes two components: vegetation monitoring and wildlife monitoring. Wildlife monitoring in wetlands is focused on amphibians (Anura: frogs and toads and Urodela: salamanders). Amphibians are excellent indicators of the health of the wetland area and water regime trends that could be affecting wetland function. See Section 7.4 Significant Wildlife Habitat.

Monitoring of the newly created Millar Pond was initiated in 2021 (Stantec 2021) and added to the LTTEM program in 2023. See Section 7.4 Significant Wildlife Habitat

Below the brow of the escarpment, during the months of June, July and August, bi-weekly monitoring is completed at the Escarpment Springs stations SW10, SW11, SW11A-E, SW21C, SW24A and SW77. Monthly monitoring is conducted at other times of the year. Monitoring includes field temperature measurement and an assessment of flow conditions through either the use of an electromagnetic flow meter or in some cases by visual assessment.

As per the Level 1 and 2 Water report (WSP, 2025), the escarpment seeps and springs to the east of the Extension Quarry are predicted by the numerical model to experience a limited decrease in annualized groundwater discharge relative to the predicted groundwater discharge for the current approved extraction. Discharge from the escarpment springs is naturally variable relative to prevailing climatic conditions and the predicted decrease in discharge would likely not be distinguishable from natural variability in the seepage discharge. The contingency measures in the AMP were included to mitigate potential impacts to the escarpment seeps and springs.

Wetland Impact Assessment

The wetlands in the vicinity of the quarries are within the predicted radius of influence for the approved quarry extraction. Considering both water related triggers and ecological monitoring, there have been no perceived impacts to the features that may be related advancing operations, progressive deepening of the quarry and associated lowering of the groundwater.

Based on the understanding of the water regimes at the Site and the predicted modelled minor decrease in annualized baseflow, there are no anticipated negative impacts to natural heritage features.

The on-going implementation of the AMP program provided in the Level 1 and 2 Water report should be continued to support performance compliance and maintain the natural heritage feature function.

7.2 Significant Woodlands

With respect to overall health of the natural features in the Study Lands, woody vegetation, particularly trees, are better long-term indicators of change in a vegetation community. Tree health can be influenced by several factors

such as flooding, insect pests, fungal pathogens, windfall, ice storms, natural decline, competition with other trees and direct impacts to stem or roots.

The purpose of the reforestation component of the EEMM program is to track the ecological development of the reforested areas and to compare the ecological characteristics to established targets for ecological form and function. If the monitored conditions differ from the target conditions, modifications to the enhancement plans are implemented.

Monitoring of the EEMM programs is ongoing to provide a quantitative measure of the success of the plans over time and includes a mechanism for implementing additional efforts (i.e., adaptive management) when needed to so that the established restoration targets are achieved.

Woodland AMP Monitoring

Based on the plot monitoring of the rehabilitation forest areas the trees in the study area were generally healthy. with a few exceptions. Of the black ash trees adjacent Plot T5-1, some were noted to be healthy and others in decline in 2020. From 2021 to 2023, all black ash trees adjacent to Plot T5-1 are in decline. This could potentially be due to the higher water levels in this swamp compared to 2019 and/or potentially a result of the widespread emerald ash borer beetle that is affecting ash trees throughout southern Ontario.

No other notable changes were observed in the general health of trees from 2019 to 2023 within and adjacent the transects and plots as reported in the Walker Aggregates Duntroon Quarry Expansion, Reforestation Monitoring Program: 2023 Monitoring Report (Stantec 2023).

Woodland Impact Assessment

The woodlands are associated with uplands environments and are not influenced by groundwater conditions. This conclusion is supported by the AMP forest monitoring demonstrating that woodlands are in good health and successionally progressing. Cattle grazing is the one condition that has negatively affect the regrowth of one of the plots in the woodland monitoring program.

Based on the observations at the site, the maintenance of the current footprint as it related to upland areas and the monitoring of reforestation areas, the application to deepen the Duntroon Quarry and Duntroon Quarry Extension and the associated additional lowering of the groundwater to facilitate operations will not have a negative impact on the woodland natural heritage features. Woodland monitoring through the AMP is proposed to continue should the proposed deepening be approved.

7.3 Significant Valleylands

General guidelines for determining significance of valleylands are presented in the NHRM (MNR 2010). Significant valleylands may also be defined and designated by the local planning authority. There are no significant valleylands at the Duntroon quarry site.

7.4 Significant Wildlife Habitat

There are five general types of SWH: seasonal concentration areas, migration corridors, rare vegetation communities, specialized habitats, and habitat for SOCC. The specific habitats considered in this report are evaluated based on the criteria outlined in the Ecoregion 6E Criterion Schedule (MNRF 2015).

According to the PPS, development is permitted within SWH where it is demonstrated there will be no negative impacts to the feature or its ecological functions.

There are two key SWH habitats at the Duntroon site that are within the licensed area, namely Amphibian breeding pools and American Hart's Tongue Fern (AHTF). There are other terrestrial SWH components outside of the license area associated with the Niagara escarpment, however, these species and SWH habitat are not impacted with the site operations. Given that the proposed lowering does not involve any extension of the quarry footprint, it is reasonable to concluded these features will not be impacted by the proposed deepening of the quarry floor. Amphibians and AHTF are discussed below.

Amphibian Breeding Habitat

There are no direct impacts associated to the habitats at the seven predetermined amphibian monitoring stations. Each station location was based on previous amphibian monitoring at the Site and on the AMP monitoring commitments. Station 7 was added to the amphibian monitoring program in 2023 to continue monitoring the amphibian breeding compensation habitat after the removal of the original Millar Pond

AMP Monitoring

Ecological monitoring to complement the water level monitoring includes two components: vegetation monitoring and wildlife monitoring. Wildlife monitoring in wetlands is focused on amphibians (Anura: frogs and toads and Urodela: salamanders). Amphibians are excellent indicators of the health of the wetland area and water regime trends that could be affecting wetland function.

The focus of the wetland component of the Long-Term Trend Ecological Monitoring (LTTEM) program is on amphibian vernal breeding pools and maintaining hydroperiods that are suitable for continued hydrophytic plant growth in the surrounding wetland zones. Wetland water level monitoring is conducted as part of the LTTEM program. Long term trends in these wetland features and their functions are considered and interpreted with reference to long term climatic trends.

The first year of monitoring at the new Millar Pond was completed in 2021. Surveys consisted of amphibian habitat assessments, egg mass surveys and breeding call surveys.

Amphibian Ponds Impact Assessment

The Amphibian Monitoring Program at the Walker Aggregates Inc. Duntroon Expansion Quarry was completed successfully in 2023, fulfilling the requirement of the AMP. Data of amphibian habitat, egg mass occurrence and breeding calls at each survey station were collected, which provides data on the amphibian community and amphibian abundance at the Site. These vernal pools are within the influence of the existing drawdown area The diversity and abundance of amphibian communities in 2023 were similar to results from previous years and considered to be good with healthy populations of anurans. Frog and salamanders were observed in the newly created Millar Pond feature.

Based on these observations and the conclusions of the water report, no negative impacts are anticipated to these features as a result of the proposed quarry deepening.

American Hart's Tongue Fern

The AMP requires annual monitoring of an extensive American Hart's Tongue Fern (*Asplenium scolopendrium* var. *americanum*) colony within the Expansion Quarry starting two (2) years prior to quarry operations commencing in Phase 2B (per the registered site plans). The monitoring program is to be implemented annually for three (3) years from the commencement date, at which point the required effort will be re-evaluated.

As operations were anticipated to begin in Phase 2B in 2025, baseline assessments of AHTF conditions were completed in 2022, 2023, and 2024.

The objectives of the AHTF monitoring program are:

- To determine whether the forest buffer is functioning as anticipated to protect the population and/or assess if dust from quarry activity causes a change in habitat conditions in the AHTF colony
- To identify the cause-and-effect mechanism and implement appropriate mitigation measure(s) if the plants decline as a result of quarry activity
- To document natural changes in habitat conditions unrelated to quarry activity which may be causing a change in the AHTF colony

Baseline data for the AHTF colony was collected in 2022, 2023, and 2024. At present, there is no indication of change in the microclimate of the woodland feature where the ferns are located.

Impact Assessment

The monitoring of the ATHF and the results to-date of baseline data collection are not a result of the quarry operations or depth of quarrying.

The quarry operations currently show no indication of impact on the population associated with microclimate or dust impacts. As such, no negative impacts are anticipated from the proposed deepening of the quarry.

7.5 Significant Areas of Natural and Scientific Interest

The Province determines the significance of ANSIs according to standardized evaluation procedures. The Duntroon Escarpment Forest Life Science ANSI is a regionally significant life science ANSI that is located adjacent to the license area (Figure 2).

The Duntroon Escarpment Forest ANSI is approximately 98 ha in area, spanning across Lots 25-26, Clearview Township Concessions 11-12. The ANSI supports 15 vegetation community types sustaining 213 vascular plant species. Thirty-eight (38) species of breeding birds were recorded in the proposed license area, including a number of forest-interior bird species (Riley et al., 1996:351).

The Duntroon Escarpment Forest ANSI has not been identified as provincially significant ANSI in accordance with the PPS. However, it does have regional and local importance.

ANSI Impact Assessment

Development may be permitted in or adjacent to an ANSI if it is determined that the development will not have a negative impact on the ANSI feature. The ANSI is located at least 10 m outside of the proposed extraction area and there will be no direct negative impact on this regional ANSI feature from the deepening of the quarry floor as the footprint of the quarry remain the same.

7.6 Fish Habitat within Watersheds

The Duntroon quarries occur in the watersheds of four river systems. The Beaver River system flows west to the Beaver Valley and is the system that occurs predominantly above the escarpment brow, it encompasses most of the quarry areas. The Pretty River (northeast), Batteaux Creek (east), and Mad River (south) are found below the brow of the escarpment and flow east. Their catchments for the most part are beyond the footprint of the quarry,

however, portions of their headwaters systems are driven by groundwater contributions at depths coincident with the bottom of the quarries in the pre-quarry deepening scenario. The rivers are cold water fisheries habitat with naturally reproducing native brook trout Brook trout require upwellings and cold-water temperatures to maintain appropriate conditions for propagation and survival. The location of the boundaries for the Beaver River, Pretty River, Batteaux Creek and Mad River Watersheds are shown on Figure 1.

Summary of the surface water features within these basins and features based on the on-going AMP monitoring program are provided below followed by an impact assessment

Beaver River Watershed

The Beaver River Watershed includes the Main Quarry and the western portion of the Extension Quarry; although it is inferred that the original pre-development watershed boundary likely did not extend as far to the east. Surface drainage near the Site generally flows from east to west and forms the headwaters of one of the eastern tributaries of Beaver River, which ultimately outlets to Georgian Bay at the community of Thornbury.

Surface drainage is generally slow and meandering due to the relatively flat topography and as a result, wetland features are commonly observed. The Rob Roy Swamp wetland complex, a Provincially Significant Wetland (PSW), is situated to the west of the Site. The individually units of the wetland complex in closest proximity to the Site are shown on Figures 2 and 3. It is noted that discharge from both the Main and Extension Quarries (under ECA No. 1521-A4VJ4X) as well as the St. Mary's Osprey Quarry (under ECA No. 1371-AFQN25) is directed to Rob Roy Swamp 6 west of the Main Quarry near station SW1 as report in the Water Report.

AMP Monitoring

Surface water stations reported in the Water Report SW1, SW2, SW0-2 and SW6A and drivepoints DP1, DP2, DP4 and DP8 are included in the on-going AMP monitoring program to monitor flow and temperature conditions within Rob Roy Swamp 6. Surface water station SW3 and drivepoints DP5 and DP7 are also in place to monitor conditions within Rob Roy Swamp 2 north of the Extension Quarry. Flow at SW3 has typically not been observed outside of the spring freshet and late fall. It is noted that Rob Roy Swamp 3, 4 and 5 are monitored under the St. Mary's Osprey Quarry monitoring program.

Batteaux Creek Watershed

The headwaters of Batteaux Creek originate at the escarpment east of the Site, with flow east and then north to Nottawasaga Bay just east of Collingwood. The watershed formerly includes the eastern portion of the Extension Quarry limit of extraction; however, runoff within the extracted area is now diverted to the Main Quarry for discharge off-site to Rob Roy Swamp 6 as noted above. It is inferred that the eastern portion of the Main Quarry would likely also have been included in the Batteaux Creek watershed prior to development of the Site.

Flow within many of the tributaries which originate along the escarpment originates as discharge from springs and seeps that occur near the base of the Amabel and / or Manitoulin Formation dolostone. In the upper reaches of the drainage basin, flow is relatively high owing to the steep grades along the escarpment.

AMP Monitoring

Flow and temperature monitoring at these headwater locations are included in the on-going AMP monitoring program as stations SW9, SW10, SW11 (A through E), SW13, SW14, SW15, SW19, SW21 (A to C) and SW22 (A and C). The individual channels progressively merge to form the main channel of Batteaux Creek just west of County Road 124 at station SW19 (see Figure 1 for location).

It is noted that the AMP monitoring program also includes flow and temperature monitoring at station BC Control, situated outside of the influence of quarry dewatering (see Water report). The control station monitoring was included in the AMP to distinguish the effects of climate conditions on Batteaux Creek from potential quarry impacts for assessment of trigger exceedances and AMP annual reporting.

Pretty River Watershed

The Pretty River watershed is situated north of the Site, with headwaters originating at the escarpment and flowing north into Georgian Bay at Collingwood. Drainage conditions in the headwaters of the basin are similar to those of Batteaux Creek, with flow originating as discharge from springs and seeps occurring near the base of the Amabel and / or Manitoulin Formation dolostone. Flow is relatively high in the upper reaches of the basin due to the steep grades along the escarpment.

AMP Monitoring

Surface water stations SW16, SW17, SW17A, SW18, SW24A and SW77 at spring / seep locations northeast of the Extension Quarry are included in the on-going AMP monitoring program to monitor flow and temperature conditions. The individual channels merged to form the main channel which is monitored at station SW18 where the tributary intersects Concession 10 (see Figure 2 for location).

Similar to the Batteaux Creek watershed, the AMP monitoring program includes control station PR Control for flow and temperature monitoring to distinguish the effects of climate conditions on Pretty River from potential quarry impacts. Refer to Figure 1 for the location.

Flow within Pretty River is also monitored at Environment Canada (EC) station 02ED031 as detailed in the Water Report

Mad River Watershed

The Mad River watershed is situated south of the Site and includes Edward Lake, an offline waterbody located within the Carmarthen Lakes Farms agricultural lands south of the Main Quarry. The Mad River flows to the Nottawasaga River east of the study area and ultimately discharges to Georgian Bay at Wasaga Beach. The headwaters of Mad River originate above the escarpment west of the community of Singhampton, where flow conditions are slow moving due to the relatively flat grade. East of Singhampton, the river cuts through the escarpment bedrock at Devil's Glen Provincial Park and forms a 75 m to 100 m steep-walled valley where much of the upper section of the escarpment bedrock units are exposed. The Mad River is considered beyond the influence of quarry operations at the Site since it is situated more than 3 km to the south and as such, no monitoring stations are included in the AMP.

South of the Main Quarry, there is a relatively large waterbody situated on the Carmarthen Lakes Farms property, referred to as Edward Lake. The lake is reportedly about 4 m deep and is bounded to the west, north and east by bedrock knob hills. It is inferred that recharge to the lake occurs as localized runoff and groundwater discharge from the bedrock aquifer. Excess water discharges via an overflow outlet in the southwest corner of the lake, where it is directed to the roadside ditch and is inferred to flow south. This feature is not monitored as part of the AMP monitoring program as it is outside of the quarry influence.

Fisheries Impact Assessment

A number of PITM trigger exceedances have been observed since extraction within the Extension Quarry proceeded into the Phase 2A area in 2021. However, the exceedances are not attributed to the quarry due to (a)

the sporadic, generally discontinuous nature of the trigger exceedances, and (b) the interpreted drawdown cone from the Extension Quarry currently does not extend beyond the Licence boundary.

Consistent “too wet” trigger exceedances have been noted at the Rob Roy Swamp 6 stations DP2, DP4 and DP8. Where trigger exceedances have been observed, conditions typically returned to the “green zone” for the subsequent event suggesting that no trend exists. In any case, replacement of the discharge pipe (running through the RR6 wetland) was completed in early 2024 to limit direct discharge to the wetland and help reduce “too wet” trigger exceedances.

The proposed quarry deepening will induce a reduction in groundwater levels (i.e., drawdown) around the Site due to lowering of the dewatering sump elevations, referred to as the radius of influence. The purpose of this impact assessment is to quantify potential effects of the proposed quarry deepening to features within the radius of influence, over and above the predicted effects of the approved Extension Quarry and neighbouring Osprey Quarry extraction.

The existing AMP includes monitoring of the following features within the predicted radius of influence for the proposed quarry deepening:

- Local private residential wells;
- Wetland hydroperiods for the Rob Roy Swamp wetland complex and the ANSI Wetland
- Groundwater seeps and springs along the Escarpment east of the Site which form the headwaters for tributaries of Pretty River and Batteaux Creek; and
- Groundwater / quarry dewatering discharge to tributaries of the Beaver River west of the Site.

Sections 3.2.2.1 and 3.2.2.2 of the Level 1 and 2 Water Report (WSP, 2025) specifically address the impacts to these features.

As noted previously, the predicted changes in discharge to these features would likely not be distinguishable from natural variability. As such, the predicted impacts are considered acceptable and consistent with the approved AMP and will continue to support viable cold water fish habitat. No adverse surface water or ground water impacts are predicted as a result of the proposed quarry deepening. Surface water flow rates and temperature are rigorously monitored as part of the PITM, and quarry discharge quality is monitored as part of the ECA.

7.7 Habitat of Endangered and Threatened Species

General habitat protection is provided by the ESA to all threatened and endangered species. General habitat is defined as the area on which a species depends directly or indirectly to carry out life processes, including reproduction, rearing, hibernation, migration or feeding. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA

Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.3, 4.1.4 and 4.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

The one Endangered and Threatened species that occurs with the existing license area is the Butternut tree species. There are no impacts to these species from the proposed deepening since the extraction footprint remains the same.

7.8 Seepage Areas and Springs

Seeps and springs are a defined policy component of the NEP that is relevant to the Proposed Duntroon Quarry Deepening. Seeps and springs offer water contribution to tributaries that are found in the Batteau and Pretty River that are cold-water systems. These tributaries begin from direct fish habitat approximately in the vicinity of North Nottawasaga Concession 10 which is east of the quarry and east of the brow.

The seeps and springs are monitored as part of the AMP. It should be noted a number of seeps coming off the escarpment (such as SW24, SW11) discharge to human-made ponds on private property (Figure 2). The human-made ponds tend cause a more significant role in downstream flows and temperature. Some of these seep monitoring locations are recommended for removal from the AMP monitoring network as they are not good indicators of potential impacts.

Flow within many of the tributaries which originate along the escarpment are discharged from the springs and seeps that occur near the base of the Amabel and / or Manitoulin Formation dolostone. In the upper reaches of the drainage basin, flow is relatively high owing to the steep grades along the escarpment.

AMP Seep Monitoring

Flow and temperature monitoring at these headwater locations are included in the on-going AMP monitoring program as stations SW9, SW10, SW11 (A through E), SW13, SW14, SW15, SW19, SW21 (A to C) and SW22 (A and C). The individual channels progressively merge to form the main channel of Batteaux Creek just west of County Road 124 at station SW19 (see Water Report WSP 2025, Figure 1 for location).

Seeps Impact Assessment

As discussed in the Water Report, the escarpment seeps and springs to the east of the Extension Quarry are predicted to experience a limited decrease in groundwater discharge relative to the predicted groundwater discharge for the approved Phase 4 extraction of less than 10% below baseline conditions at maximum quarry depth. The predicted decrease in discharge would likely not be distinguishable from natural variability in the seepage discharge. This predicted discharge change remains above the 15 % threshold that is established for these features in the AMP. The contingency measures in the AMP were included to mitigate potential impacts to the escarpment seeps and springs.

There are no anticipated negative impacts t the seeps and their associated ecological relationship to the cold water fisheries in the downstream watercourses

7.9 Habitat of special concern species in Escarpment Natural and Escarpment Protection Areas

Special Concern species are a defined policy component of the NEP that is relevant to the Proposed Duntroon Quarry Deepening. Special Concern species are a subset of Significant Wildlife Habitat. Background data section 6.1 offers a broad review of the potential species that could occur area including those in the escarpment areas. Section 7.4 address significant wildlife Habitat and those species that are know to occur in the licence area and surroundings, namely amphibian breeding and American Hart's Tongue Fern.

AMP Monitoring

As addressed in section 7.4, amphibian breeding habitat and American Hart's Tongue Fern are SWH components that are monitored as part of the AMP program.

Special Concern Impact

The proposed deepening does not increase the footprint of the quarry and is unlikely to influence any special concerns species. Potential impacts are associated with water changes and those changes are not considered to be negative impacts to water reliant features and by extension their associated fauna or flora.

It is recommended that proposed modifications to the AMP program, as outlined in Section 4.1 4.1 of the Water report be adopted.

8 AMP MONITORING

Based on the finding of this report, no additional specific ecological monitoring is required or recommended. Monitoring of surface and groundwater, as modified and recommended in the Water Report (WSP 2025) will be implemented for the proposed deepening amendment. If the results of the surface and groundwater monitoring program indicate the potential for adverse impact to surface water features, then appropriate mitigative actions would be employed.

9 SITE PLAN NOTES

In consideration of this NHIA there are no specific additions to the existing site plan notes for Natural Environment with respect to the deepening.

10 SUMMARY AND RECOMMENDATIONS

The proposed deepening of the Duntroon Quarry has been evaluated in this Natural Heritage Impact Assessment that assesses potential environmental impacts of the proposed aggregate extraction on the Site with respect to the following:

- The environmental features and functions in the Study Area.
- The influence of lowering the extraction depth on the surrounding natural environment.

The potential impacts of the proposed extraction on groundwater and surface water resources are discussed separately in detail in the Proposed Duntroon Quarry Lowering Level 1 and 2 Water Report (WSP 2025) and have been incorporated where appropriate in this report as it relates to potential impacts to natural heritage features.

This report is consistent with the terms of reference approved by the Township of Clearview, the ARA requirements for Aggregate quarry applications standards, the policies of the PPS Wise Use and Resource Management for Natural Heritage, Section 4.1 (MMAH 2024) and the relevant polices of the current Niagara Escarpment Plan (NEC 2017, Consolidated 2024).

In concert with the review of the on-going AMP and current monitoring of natural heritage features, the consideration and findings of Proposed Duntroon Quarry Lowering Level 1 and 2 Water Report (WSP 2025) and the assessment herein, it is concluded that the application to deepen the Duntroon Quarry and Duntroon Quarry Extension will not have a negative affect on natural heritage features as defined by the noted polices and plans.

11 LIMITATIONS

This report was prepared for the exclusive use of Walker Aggregates Inc. (WAI). The report, which specifically includes all tables, figures, and appendices, is based on data and information collected by WSP Canada Inc. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by WSP Canada Inc. as described in this report.

WSP Canada Inc. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. WSP Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, WSP Canada Inc. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

12 CLOSURE

We trust this report meets your current needs. If you have any further questions regarding this report, please contact the undersigned. Curriculum Vitae are provided in Appendix B.

Signature Page

WSP Canada Inc.

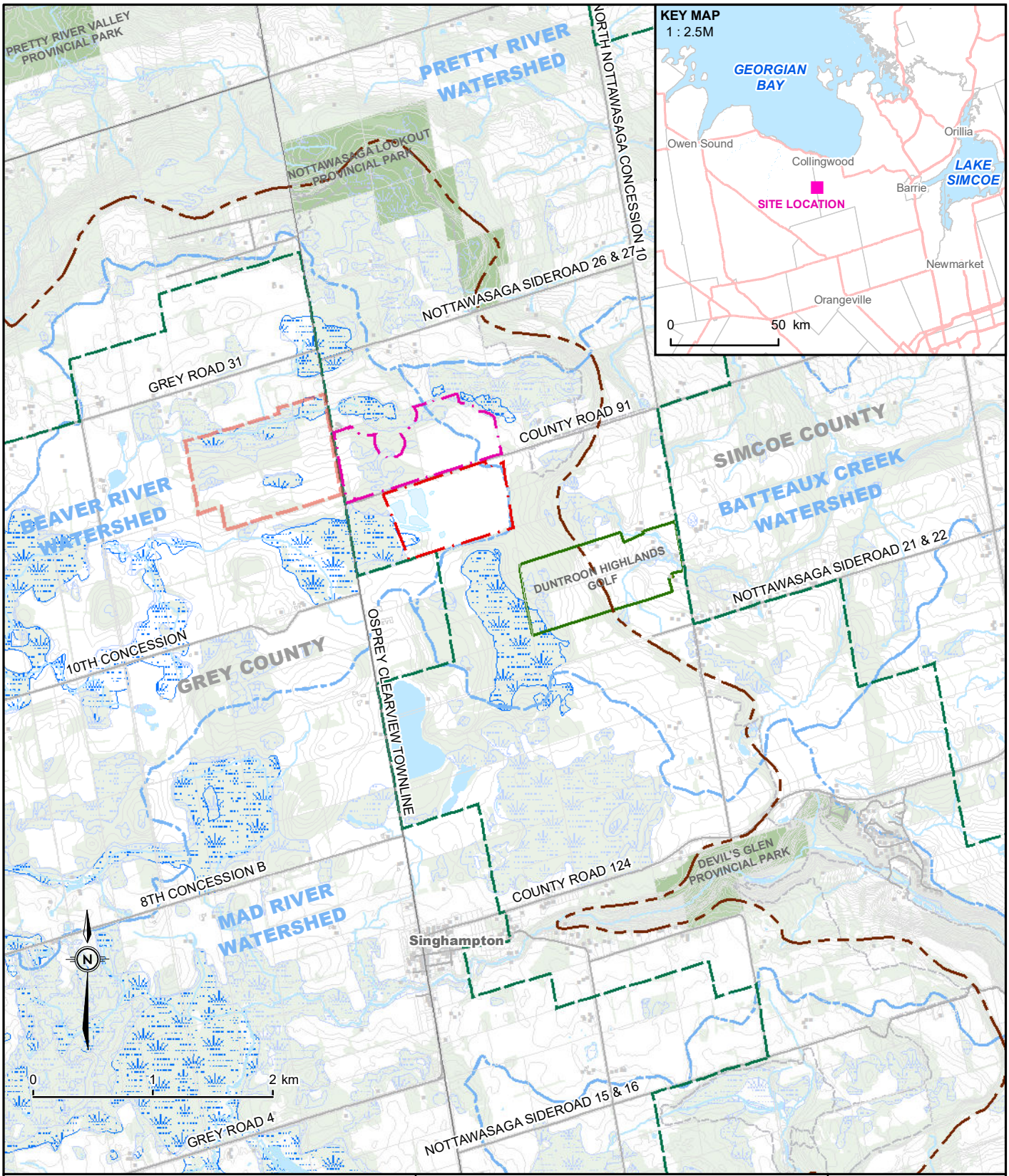
Ken Burrell, MES
Senior Ecologist

Daniel Eusebi BES, RPP, MCIP
Senior Principal Ecologist

KB/DE/ld

https://wsponlinecan.sharepoint.com/sites/ca-ca0055727.9161/shared documents/06. deliverables/6. lowering report - 2025/ca0033354.8741_r_rev0_nh report_quarry lowering_2025_sept29.docx

FIGURES



LEGEND

- EXTENSION QUARRY LICENSED AREA
- MAIN QUARRY LICENSED AREA
- OSPREY QUARRY (ST. MARYS CEMENT) LICENSED AREA
- NIAGARA ESCARPMENT COMMISSION POLICY AREA
- APPROX. NIAGARA ESCARPMENT

NAD 1983 UTM Zone 17N

SITE LOCATION MAP

NATURAL HERITAGE IMPACT ASSESSMENT
PROPOSED DUNTROON QUARRY DEEPENING
For Walker Aggregates Inc.

DATE:	PROJECT:	FIGURE No:
JULY 2025	CA0033354.8741	1

SCALE: 1 : 45,000

DRAWN BY: JLD

C:\Users\leigh.davis\WSP O365\CA0033354.8741 CA-Duntroon Quarry - 2024 Hydrogeological Study - Project Folders\05. Technical\Graphics\NEW\CA0033354.8741-200-F1-LM.mxd

EAGLE CRESCENT
NORTHWAY ROAD
NOTTAWASAGA LOOKOUT PROVINCIAL PARK
NOTTAWASAGA SIDEROAD 26 & 27
NORTH NOTTAWASAGA CONCESSION 10
GREY ROAD 31
ROB ROY SWAMP 1
ANSI WETLAND A
ANSI WETLAND B
ROB ROY SWAMP 2
ROB ROY SWAMP 3 / 4
Phase 2B
Phase 2A
Phase 4 Phase 1 Floor 490 masl
Phase 3B
Phase 3A
TOWNSHIP ROAD 91
OSPREY CLEARVIEW TOWNLINE
ROB ROY SWAMP 5
SOUTH NOTTAWASAGA CONCESSION 10
ROB ROY SWAMP 6
DUNTROON HIGHLANDS GOLF
10TH CONCESSION
CARMARTHEN LAKES FARMS WETLAND
NOTTAWASAGA SIDEROAD 21 & 22
ROB ROY SWAMP 7

LEGEND

- APPROX. WORKING FACE
- APPROX. NIAGARA ESCARPMENT
- WATERCOURSE
- EXTENSION QUARRY LICENSED AREA
- LIMIT OF EXTRACTION
- MAIN QUARRY LICENSED AREA
- OTHER LANDS OWNED BY WAI
- OSPREY QUARRY LICENSED AREA (ST. MARY'S CEMENT)
- PROVINCIALLY SIGNIFICANT WETLAND (PSW)
- ANSI WETLAND A
- ANSI WETLAND B
- OTHER WETLANDS
- APPROX. REFORESTED AREA
- WOODLOT

0 150 300 600

1:15,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
2. ANSI - AREA OF NATURAL AND SCIENTIFIC INFORMATION

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. BASE MAP:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

CLIENT
WALKER AGGREGATES INC.

PROJECT
NATURAL HERITAGE IMPACT ASSESSMENT PROPOSED DUNTROON QUARRY DEEPENING
DUNTROON, ONTARIO

TITLE
SITE PLAN

CONSULTANT

wsp

YYYY-MM-DD	2025-10-15
DESIGNED	---
PREPARED	JM
REVIEWED	---
APPROVED	---

PROJECT NO.	CONTROL	REV.	FIGURE
CA0055727.9161	0001	A	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

PATH: S:\Clients\Walker Industries\Duntroon\05 PROJ\CA0055727.9161\40 PROD\0001 (M Assessment\CA0055727 9161-0001-HN-0000.aprx PRINTED ON: AT 12:17:45 PM

ROB ROY SWAMP 3
ROB ROY SWAMP 2
ANSI WETLAND A
ANSI WETLAND B
OSPREY CLEARVIEW TOWNLINE / GREY ROAD 31
PHASE 3B
PHASE 4
PHASE 2B
PHASE 2A
PHASE 3A
PHASE 1
COUNTY ROAD 91
TUNNEL
SITE ENTRANCE
SITE OFFICE
STOCKPILE AREA
PLANT AREA
VALVE
ROB ROY SWAMP 6

LEGEND

- EXTENSION QUARRY LICENSED AREA
- LIMIT OF EXTRACTION
- MAIN QUARRY LICENSED AREA
- OTHER LANDS OWNED BY WAI
- OSPREY QUARRY LICENSED AREA (ST. MARYS CEMENT)
- APPROX. WORKING FACE
- WETLAND
- MAIN QUARRY DISCHARGE
- EXTENSION QUARRY DISCHARGE

NOTES:
1. 2020 ORTHOIMAGERY PROVIDED BY GREY COUNTY.
2. 2023 ORTHOIMAGERY PROVIDED BY SIMCOE COUNTY.
3. SITE AERIAL PHOTOGRAPH OBTAINED DURING OCTOBER 2023 DRONE SURVEY BY WAI.

N

0 150 300 m

NAD 1983 UTM Zone 17N

2023 QUARRY CONFIGURATION

NATURAL HERITAGE IMPACT ASSESSMENT
PROPOSED DUNTROON QUARRY DEEPENING
For Walker Aggregates Inc.

DATE: JULY 2025	
PROJECT: CA0033354.8741	
SCALE: 1 : 6,000	
DRAWN BY: JLD	FIGURE No: 3

55 KING STREET, SUITE 600
ST. CATHARINES, ON L7R 3H5
T 905-687-1771 | F 905-687-1773 | www.wsp.com

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APPENDIX A

Terms of Reference

13 June 2024 Project No. CA0033354.8741

Rossalyn Workman
Town of Clearview
217 Gideon Street
Stayner, ON
L0M 1S0

TERMS OF REFERENCE FOR NATURAL ENVIRONMENTAL AND WATER RESOURCES IMPACT ASSESSMENT – LOWERING A PORTION OF THE QUARRY FLOOR DEPTH AT THE DUNTROON QUARRY AND DUNTROON QUARRY EXPANSION

Dear Ms. Workman,

1.0 INTRODUCTION

WSP was retained by Walker Aggregates Inc. to undertake an Environmental and Water Resource Assessment for an amendment to the Aggregate Resource Act Site Plans for the Duntroon Quarry and Duntroon Quarry Expansion.

A pre-consultation meeting was undertaken with the Town of Clearview on April 17, 2024, regarding a number of items including the proposed lowering of the quarry floor at the original Duntroon Quarry south of Township Road 91 and the Duntroon Quarry Expansion north of Township Road 91 (Approved in 2014 and in operation from 2016 to present). The extraction area footprint of the quarries will remain unchanged, however, the depth of the extraction of the quarries is proposed to be a uniform elevation across the entire Site. Currently a portion of the site is permitted to extract to an elevation of 500 metres above sea level (masl). The proposal is to allow the entire site to be extracted to a depth of 490 masl. The Township of Clearview has requested that Terms of Reference (TOR) be submitted for the assessment of potential impacts to natural heritage features. This Terms of Reference also outlines the associated water resources investigation that will be completed as part of the assessment.

The purpose of this letter is to provide a TOR that outlines the proposed scope of work for the impact assessment to support the application approvals process for the proposed lowering of the quarry floor. The Expansion Quarry studies completed for approval that encompassed the area of the original quarry were completed between 2003 to 2013 and assessed the impacts for the Expansion. As a Condition of Approval, the operations are subject to extensive monitoring of groundwater, surface water and natural heritage features as per the Duntroon Adaptive Management Plan (AMP). The AMP includes a collaborative assessment of both water resources data and complementary natural heritage feature assessment for both wetlands, watercourses and vernal pools (including created amphibian habitat, i.e., Miller pond). Given that the licenced extraction areas are not changing, the

potential impact is associated with the additional radius of influence from dewatering to facilitate the extraction of bedrock at the proposed new depth. As such, this proposed assessment will primarily focus on the potential to affect features that are reliant on groundwater discharge, namely, in this area, wetlands and watercourses.

2.0 PROPOSED IMPACT ASSESSMENT OVERVIEW

The Impact assessment will focus on the existing extensive background data for wetlands and watercourses, AMP annual monitoring reports, the most recent five-year comprehensive AMP report (WSP, September 2021) and the proposed hydrogeological study to be completed by WSP Canada Inc.

3.0 BACKGROUND DATA COLLECTION

A background review of the following sources will be completed to update the extensive suite of information already collected and being collected on an ongoing basis in the area of the quarry to document Existing Conditions, including but not limited to:

- Land Information Ontario (LIO) database (MNRF 2024)
- Natural Heritage Information Centre Data (NHIC; MNRF 2024)
- Fisheries and Oceans Canada online mapping tool of aquatic SAR (DFO 2024)
- Township Of Clearview Official Plan Schedules (2022)
- Current MNRF Wetland Evaluation Files and wetland delineation updates
- Historic and updated Fisheries data records from MNRF and Conservation Authorities.
- Atlas of Breeding Birds of Ontario (Cadman et al., 2007) and ebird
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2022)
- LIDAR topographical information
- Current high resolution Satellite imagery and recent Site drone survey data.

4.0 PROPOSED WATER RELATED INVESTIGATIONS

Concurrent to WSP's Natural Heritage assessment, WSP will also be completing an assessment that focuses on the additional impact of lowering the quarry floor to determine the potential impacts that may influence groundwater discharge to sensitive features, namely baseflow/temperature in watercourses and hydro period of wetlands.

The hydrogeological study will include an investigation of potential impacts to private water wells, springs/seeps along the Niagara Escarpment, and watercourse/wetland features which are reliant on groundwater discharge. The Site setting is well studied through previous hydrogeological reports completed as part of the licensing of the Expansion quarry and the on-going AMP monitoring program. Nonetheless, a review of the Site setting will be

provided, including the results of additional hydraulic testing completed on the deeper bedrock interval (i.e., 490 masl to 500 masl). If necessary, proposed changes to the AMP monitoring program will be provided.

5.0 EXISTING CONDITIONS AND EVALUATION OF SIGNIFICANCE

Existing Conditions will be updated using the noted data sources in addition to the on-going AMP monitoring data collected for features above the brow of the escarpment.

These general Existing Conditions will be described for adjacent lands in the predicted radius of influence of the quarry where potential impacts are more likely to occur due to the proposed lowering of the quarry floor.

These data will be presented in figure(s) highlighting the location and type of natural heritage features with a focus on those reliant on water and where water regime dynamics are important to their form and function. This Existing Conditions description of features and mapping will be used in evaluating the significance of these features from an ecological and policy perspective.

6.0 IMPACT ASSESSMENT

Natural features will be evaluated for potential impacts from the lowering of the quarry floor to a uniform depth of 490 masl.

The assessment will rely on the evaluation completed by WSP as noted above for the proposed changes, in combination with the known existing conditions of natural heritage features that have been within the historical zone of influence.

These existing conditions are instrumental in understanding the potential impacts. Specifically, the Impact Assessment (IA) will be a collaborate evaluation of groundwater dependent natural heritage features, including baseflow for tributaries with fish habitat and wetlands that may be dependent on groundwater discharge for a portion of their water budget.

7.0 REPORTING AND MONITORING

WSP will prepare a scoped IA which updates and documents the existing conditions, provides an evaluation of relative sensitivities and significance of features, assess potential impacts of quarry extraction depth changes based on the hydrogeological study and natural heritage features understanding.

Figures will be prepared including an overlay of the location of natural features and predicted cone of influence to illustrate the area of potential impact. It is noted that the existing AMP already includes a number of mitigation options to be implemented should unacceptable impacts to features be observed. If required, alternative mitigation strategies will be considered for the proposed quarry deepening that both avoids impact to the natural features and identifies areas for long term protection of natural features and functions through appropriate monitoring and mitigation measures.

Monitoring

Ecological monitoring, including wetland and watercourse monitoring, is a component of the current AMP.

If required, additional monitoring will be added to the AMP to enhance monitoring of natural heritage features that may potentially be impacted.

8.0 SUMMARY

The purpose of this TOR is to provide an outline of the technical studies to address approval requirements for the proposed lowering of the quarry floor at the Duntroon Quarry and the Duntroon Expansion quarry.

If you have any questions, or wish to discuss the content of the above, please feel free to contact the undersigned.

Sincerely

WSP Canada Inc.

Daniel Eusebi BES, MCIP, RPP
Senior Principal Ecologist

Kevin Fitzpatrick, PEng
Senior Project Engineer

DE/KF/ld

CC: Ryan Wall, Walker Aggregates
Sarah Hansen, Walker Aggregates
Ryan Dosh, Walker Aggregates
Kevin Kehl, Walker Aggregates
Dave Munroe, Walker Aggregates
Brian Zeman, MHBC
Ellen Ferris, MHBC

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R.J. Burnside & Associates Limited 3 Ronell Crescent Collingwood ON L9Y 4J6 CANADA
telephone (705) 446-0515 **fax** (519) 941-8120 **web** www.rjburnside.com

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

October 8, 2024

Via: Email

Rossalyn Workman MURP, Dipl.MM, MCIP,
RPP
Manager of Planning
Township of Clearview
217 Gideon Street
Stayner ON L0M 1S0

Dear Ms. Workman:

Re: Terms of Reference Peer Review
Duntroon Quarry Expansion
Project No.: MCG100440.2000

We have received the provided documentation for the Terms of Reference for the Duntroon Quarry Expansion application. We have reviewed the following documentation:

- Terms of Reference for Natural Environmental and Water Resources Impact Assessment, prepared by WSP, dated June 13, 2024.
- Terms of Reference for Duntroon Haulage Tunnel Geotechnical Inspection Work, prepared by WSP, dated August 13, 2024.

We provide the following comments.

1.0 Natural Environment and Water Resources Impact Assessment

Comments provided by Kevin Butt, B.Sc. (Env), Eco. Rest. Cert. TRAQ, ISA Certified Arborist and Terrestrial Ecologist

Burnside has reviewed the Terms of Reference (TOR) for the Natural Environment and Water Resources Impact Assessment which is found in a WSP Canada Inc (WSP) letter dated June 13, 2014. WSP indicates that the purpose of the letter is to provide a TOR that" outlines the proposed scope of work for the impact assessment to support the application approvals process for the proposed lowering of the quarry floor." The current license permits extraction of rock in a portion of the site to 500 metres above sea level (masl). Walker Aggregates Inc. is applying to allow extraction across the entire site to a uniform depth of 490 masl.

1. Proposed Water Related Investigations - WSP does not provide any details on the monitoring plan or the types of water related investigations that will take place. As an initial first step, WSP should provide a review of the existing monitoring network and

identify new monitoring wells/monitoring locations that are required to assess the impacts of the 10m of additional extraction. WSP should also confirm that there are sufficient wells completed between 500 and 490 masl to allow for an assessment of impacts to be made in the areas where deeper extraction is proposed. If additional deeper wells are needed, they should be installed as soon as possible. A short memo describing the additions to the monitoring network should be prepared and circulated prior as soon as possible so that the monitoring program can be agreed upon.

2. Existing Conditions and Evaluation of Significance - Presumably the previous hydrogeological assessment included a prediction of the pumping rates required to dewater the pit to the proposed extraction depth. The TOR indicates that WSP plans on updating the Existing Conditions. This update should include an assessment of the predicted vs the actual dewatering rates required to allow extraction of the pit to the current licensed depth. If there are significant variations in predicted water level depths versus actual, WSP should utilize the new data to calibrate the groundwater model.

3. Impact Assessment - WSP does not indicate if any additional on-site investigations such as pumping tests/packer testing etc. will be completed. Since the fracture systems in bedrock are unpredictable, it may be necessary to complete additional testing if the area of deeper extraction is not immediately adjacent to an area where investigations to 490 masl have been completed.

4. Ecological Monitoring - The December 6, 2013 Adaptive Management Plan (AMP) was found on the Walker Aggregates website that was referenced within the TOR. It is agreed that comprehensive ecological monitoring is done within the scope of the AMP to protect the natural features and identified species including the wetlands and watercourses that the TOR identifies as priorities with the proposed downward expansion of the quarry. To date, it is understood that the recipients of the monitoring data have been MOE / MECP and MNR / MNRF. It is assumed that this monitoring data of the proposed expansion would be provided to the Township for their records – especially if additional monitoring, as identified within the TOR (end of Section 7.0), is required.

2.0 Haulage Tunnel Geotechnical Inspection

Comments provided by Stephen Riley, P. Eng, Senior VP, Public Sector

1. Recommendations to include the frequency of inspections at all stages of the tunnel life cycle including, before, during, and after lake filling.
2. Recommendations to including details on both dry and underwater inspections after lake filling.

cc: Patti Kennedy, Township of Clearview (enc.) (Via: Email)

APPENDIX B

Curriculum Vitae

DANIEL EUSEBI, BES, MCIP, RPP

Senior Principal Ecologist

Areas of practice

Landuse Planning – Natural Heritage

Natural Heritage Impact Assessment

Species at Risk Assessment, Overall benefit plans

Wetland impact analysis and mitigation development

Restoration, rehabilitation and natural heritage enhancement

Public Consultation

Adaptive management planning

Ecological monitoring plan development

Environmental policy understanding and implementation

Languages

English

PROFILE

Daniel is a Registered Professional Planner in Ontario and a senior ecologist at WSP. He has a broad range of expertise in the environmental field, gained over a 35+ year career. He has coordinated the environmental planning and implementation components for detailed natural science-based environmental assessments, environmental screenings, detailed design, rehabilitation, construction inspection and detailed post-development monitoring projects. Through his extensive experience, Daniel provides a wealth of knowledge concerning permitting and approvals for a number of environmental disciplines. He has lead the natural environment monitoring components of various development undertakings and integrated those findings with the findings of complementary disciplines such as hydrology and hydrogeology. He manages the public consultation phase for high profile projects and has provided testimony as an Expert Witness at the OMB and OLT.

Daniel's practical experience includes natural science based environmental assessments [flora, fauna and aquatics, often involving species at risk (SAR)], site decommissioning and redevelopment, design and implementation of protection techniques for development sites and linear facilities, and rehabilitation and restoration of natural areas, as well as compliance and performance monitoring.

EDUCATION

BES (Honours), Major in Environmental and Resource Studies, University of Waterloo, Waterloo, Ontario, Canada	1988

PROFESSIONAL DEVELOPMENT

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification (ELC) System for Southern Ontario, Turkey Point, Ontario, Canada	2011
Certificate, Ontario Ministry of Natural Resources / Ontario Wetland Evaluation System (OWES), North Bay, Ontario, Canada	2009

PROFESSIONAL ASSOCIATION

Certified Member, Canadian Institute of Planners

Registered Professional Planner, Ontario Professional Planners Institute

Member, Environment and Land Use Committees , Ontario Stone, Sand & Gravel Association

CAREER

WSP Canada Inc.	2024
Stantec Consulting Limited	2003 - 2024
Ecological Service Group Ltd	1990 – 2003
Ministry of Natural Resources	1989
Ministry of Agriculture and Food	1988

PROFESSIONAL EXPERIENCE

ENVIRONMENTAL ASSESSMENTS

- PRISM Pipeline Project, Environmental Permit and Approval Manager and Acquisition Coordinator. Environmental construction permits and approvals for all natural environment features. Work involved assessing natural environment baseline conditions and developing permit packages for crossing of natural environment features and assisting with the development of design mitigation. The pipeline traversed wetland, woodland and watercourse environments.
- Fox Hollow Subdivision Phase 1 External Sanitary Sewer - Water crossing, permits and approval package, Project Manager.
- Transportation Design, Construction Report and Aquatic Assessment. Highway 3 Road Improvement St. Thomas to Aylmer, Ontario Ministry of Transportation, Environmental Planner, Coordinated and managed the assessment of baseline conditions and natural environment permitting conditions for an MTO highway project. Activities included input to design elements and negotiating permits with the MNR.
- Fisheries Assessment and Letter of Intent - Highway 3 Improvements/Aquatic Crossings, Ministry of Transportation, Environmental Planner.
- Transportation Environmental Study Report, Highway 401 Bridge Rehabilitation at County Road 36 and Concession Road 7, Puslinch Township, Wellington County, Ministry of Transportation Ontario (MTO), Environmental Planner.
- Public Consultation Program for Remediation of Brownfield Site in Residential Neighbourhood, Pirelli Cable Inc, Project Manager, Developed two phase public consultation program for remediation of brownfield site. Presented information and completed individual liaison with affected landowners.
- NEB Environmental Assessment, Great Lakes Power Ltd., Project Manager, Coordinated public consultation program for high voltage power cable line – NEB Environmental Assessment. Involved preparation of notifications, presentation materials and establishment of public input database.
- Groundwater Assessment Investigations and Remediation Initiatives for southwestern Ontario Tank Farm and Pumping Station, Enbridge Pipeline Inc., Project Manager.
- Environmental Property Assessments, Preliminary Phase I Assessment for Contamination Identification, 50 Sites, Canadian National Real Estate Division, Project Manager.
- Phase I and II Environmental Property Site Assessments, Manager, More than 250 Phase I, and II Environmental Property Site Assessments in Ontario and Quebec for private industry, as well as federal and municipal governments.
- Ontario Manitoba Interconnection Project. Data Collection and Regulatory Agency Issue Assessment, Ontario Hydro, Resource Planner, Collected baseline condition information for a proposed Ontario Hydro line connecting Ontario and Manitoba grids. Assessed baseline conditions and provided input to the route selection undertaking.
- Highway 17 Route Planning Study and New Highway 69 Connection, GWP 5031-09-00, Sudbury to Markstay, Ontario, Natural Environment Planner,

Coordinated and managed collection of baseline environmental data, desktop and field including vegetation, wetlands and wildlife. Data was used in route planning, preliminary design, and environmental assessment study to develop a route for a future four-lane controlled access Highway 17 between Sudbury and Markstay, including a new Highway 69 connection to the Sudbury Southeast Bypass.

- Highway 401 Interchange Improvements/Structure Replacements, West Region GWP 3070-09-00, London, Ontario, Natural Environment Planner, Coordinated collection of baseline data to support preliminary design and environmental assessment for structure replacements and interchange improvements at Highway 401/Westminster Drive (Site 19-366 west of London), Highway 401/Highway 19 (Site 23-210 Ingersoll), and Highway 401/Norwich Avenue (Site 23-170, Woodstock), providing input to the Preliminary Design Transportation Environmental Study reports.
- Highway 144 Route Planning Study, Northeastern Region GWP 5023-09-00, Sudbury, Ontario, Natural Environment Planner, Coordinated and managed collection of baseline environmental data, desktop and field including vegetation, wetlands and wildlife. Data was used in route planning, preliminary design, and environmental assessment study to develop a future controlled access Highway 144 through the communities of Chelmsford and Dowling in the City of Greater Sudbury. Provided input to Transportation Environmental Study report.

ENVIRONMENTAL PLANNING

- Ontario Line Subway, Metrolinx, Toronto, Ontario, Canada, 2021-Present, Project Role: Senior Ecological Discipline Lead: The Ontario Line is a 15.6-kilometre stand-alone rapid transit line in Toronto. Dan is ecological Lead for the project. He coordinates and overseas Natural Environment Technical report for the Ontario Line project and various support Natural Heritage Impact Study (NHIS). The role involves supporting project planning, resource forecasting, design input, compensation assessment and design plan, coordination and implementation of Species at Risk (SAR) surveys and associated reporting in accordance with MECP permit D requirements under the Endangered Species Act Communities (key contact). DFO Request for Review and on-going Authorizations.
- Bowmanville Rail Expansion , Metrolinx, Oshawa and Clarington, ON, Canada, 2021-Present, Project Role: Senior Ecological Discipline Lead: Stantec, and a partner firm for Metrolinx's Bowmanville Rail Expansion project. Dan oversees the Natural Environment Technical Report (NETR). He manages the Species at Risk studies and in engaged in the proposed Permit D Authorization for the project under Endangered Species Act. Dan is also involved in managing and addressing Indigenous Community engagement as it relates to both terrestrial and aquatic biota. He provides senior assistance with high level negotiations with Regulatory Stakeholders.
- Environmental Impact Study, 781 Victoria Road Rezoning Application, Guelph, Ontario, 2008-2015, Senior Environmental Planner: Coordinated preparation of the EIS and draft EIR for the site, conducted agency liaison and made presentations before the Environmental Advisory Committee (EAC). Served as an Expert Witness at the Ontario Municipal Board (OMB). OMB Decision was successful.

- Metrolinx Stouffville Grade Separations, Natural Environment Manager: Managing and coordinating field studies, impact assessment related to natural features (fauna and flora) and documenting results and mitigation in a technical memorandum.
- Metrolinx Scarborough Junction and Grade Separation , Natural Environment Manager : Managing and coordinating field studies, impact assessment related to natural features (fauna and flora) and documenting results and mitigation in a technical memorandum.
- Metrolinx Lincolnville Go Station Existing Conditions Report, Metrolinx, Ecosystem Project Manager and ESA Management: Managed the natural environment studies for the Lincolnville Go Station site. Coordinate the field studies and wetland evaluation with MNRF. Assessed wetland impacts and Species at Risk habitat including development of SAR mitigation plans for Barn Swallow and bats. Provide design input for vegetation buffers species at risk habitat and wildlife crossings.
- Enbridge Gas Distribution Inc. GTA Project, Greater Toronto Area (GTA) Pipeline, Enbridge Gas Distribution Inc., Ontario, Environmental Permit and Approval Manager and Acquisition Coordinator: Responsible for coordinating acquisition of environmental permits and approvals from regulatory agencies for pipeline installation works, including MOECC, MNRF, Four Conservation Authorities and municipalities.
- Enbridge Gas Distribution Inc. GTA Project, Enbridge Gas Distribution Inc., Greater Toronto Area Pipeline, Ontario, Project Manager - Natural Environment: Construction inspection and compliance manager, environment. Responsible for the management of environmental discipline inspection and monitoring during construction. Disciplines managed include hydrology, archaeology, air, noise, vibration, environmental rehabilitation, restoration planting, wildlife, vegetation, and aquatic. Responsible for coordinating and managing health and safety requirements for environmental services and geotechnical disciplines.
- Hybridine Solar Farm, Municipality of Clarington, Ontario, Environmental Planner: Stantec was retained to complete a REA submission to the MOECC for a proposed 2 MW solar farm project on behalf of EDF. Daniel managed and coordinated information for the natural heritage lead for the NHA/EIS, completed consultation with MNRF regarding background data collection and natural heritage surveys. Assessed wetland and significant wildlife habitat at the site and developed mitigation strategies to reduce natural environment impacts from the project.
- Kortright Subdivision Environmental Impact Study, Victoria Road, Guelph, Ontario, Project Environmental Planner.
- Victoria Valley Golf Course Environmental Impact Study, Victoria Road South and Maltby Road East, Guelph, Ontario, Project Environmental Planner.
- Pergola Lands Environmental Impact Study, Gordon Street and Clair Road, Guelph, Ontario, Project Environmental Planner.
- Dallan Lands Environmental Impact Study, Clair Road, Guelph, Ontario, Project Environmental Planner.
- Clearview Stables Environmental Impact Study, 1065 Victoria Road South, Guelph, Ontario, Project Environmental Planner.

- Victoria Park Village, 1159 Victoria Road South, Guelph, Ontario, Project Environmental Planner.

ENVIRONMENTAL SITE MANAGEMENT

- St. Clair River Directional Drilling Operations and Regulatory Approvals, Vector Pipelines Ltd., Project Manager: Development of environmental protection procedures for directional drilling operations of the St. Clair River and coordinated regulatory approval requirements.
- PRISM Pipeline Project, Imperial Oil Ltd., Project Manager: Conducted ongoing monitoring and compliance requirements for directional drilling operation at the Grand River.
- Grand River Crossing at Cambridge, Union Gas, Project Manager: Preparation of Sediment Control Plan and Watercrossing Plans.
- First Nations Consultation Program and Training Program at Remote Site in Northern Ontario, Bell Canada, Project Manager: Programs involved presenting project remediation information to First Nations groups and providing training for community based employment opportunities.
- Crude Oil Leak Site, Enbridge Pipeline Inc., Project Manager: Conducted public liaison in emergency response scenario at crude oil leak site. Maintained ongoing public information liaison with affected landowners.
- Terrace Pipeline Project, Enbridge Pipeline Inc., Project Manager/Inspector: Environmental supervision of the directional drill, South Saskatchewan River (1100m drill).
- St. Clair River Sediment Quality Sampling Investigations, Vector Pipelines Ltd., Project Manager: Coordinated sediment quality sampling investigations of the St. Clair River for proposed directional drilling operations.
- Emergency Response Management Services - Wolverton Leak Site, Enbridge Pipeline Inc., Project Manager.
- Emergency Response Management Services - Bronte Junction Historic Leak Site, Enbridge Pipeline Inc., Project Manager.
- Emergency Response Management Services - Binbrook Leak Site (Spill Response and Land Rehabilitation), Enbridge Pipeline Inc., Project Manager.
- Emergency and Spill Response Services, Alltech Canada Inc., Project Manager.
- Emergency and Spill Response Management, Sarnia Suncor Metering Facility, Project Manager.
- Clarkson Station - Spill Response and Site Management, Enbridge Pipeline Inc., Project Manager.
- Decommissioning of Four Crude Oil Pumping Stations, Interprovincial Pipe Line Inc., Project Manager: Managed decommissioning of Four Crude Oil Pumping Stations: Keyser, Smithville, Wolverton and Bryanston.
- Golf Course and Estate Residential Facility, Town of Aurora, Project Manager: Environmental site peer review of mitigation and construction of golf course and estate residential facility-up site management for the Bronte Junction compound facility.

- Housing Development On-going Site Monitoring, City of Guelph, Project Manager: On-going Site Monitoring of South Creek, Clairfields, Clarington Place and Whitetail Sites.
- Meadowlily ESA, City of London, Project Manager: Environmental Inspection, Meadowlily ESA, Subdivision development project. Inspection of topsoil stripping, vegetation clearing, erosion and silt control, construction activities, dewatering and rehabilitation monitoring.

NATURAL SCIENCES & HERITAGE RESOURCES

- Numerous Environmental Impact Statements in the City of London and Surrounding Areas, for the City of London, York Developments, Sifton, Tricar, etc.: Project management EIS's and other discipline inputs to EIS in support of Official Plan and Zoning By-Law Amendments and development approvals as it relates to natural environment. Focus includes approvals with MECP, Conservation Authorities, DFO, and community Environmental Advisory Groups.
- Member of The City of London's Environmental Management Guidelines (EMGs) taskforce: Select Environmental Professionals chosen by the City of London to provide guidance for implementing the natural heritage policies of the London Plan. On-going.
- Richardson Farms Scoped Environmental Impact Study, Z Group, Ecosystem Project Manager: Assessed and presented the removal and transfer of a portion of Provincial Significant Wetland for approval to the UTRCA Board of Directors in the City of London. Approval was granted.
- Environmental Impact Study 1250 Gordon Street Guelph, Tricar, Ecosystem Project Manager: Assessed development impacts and identified bat Species at Risk habitat on site. Negotiated Approvals from the City for Impacts to woodland and wetlands.
- City of Guelph Development Projects: Senior environmental adviser and quality reviewer for a number of Guelph development projects, including, Blue Water Developments, Victoria Road, Tricar, 1250, 1858 Gordon Street, 71 Wyndam Street and 220 Arkell Road. Dan has directed the EIS and EIR components of the projects as well as the flora and fauna surveys and monitoring undertakings.
- Hardrock Mine, Greenstone Gold Mines (GGM), Geraldton, Ontario. Terrestrial Environment Discipline Lead: Terrestrial technical report in support of a combined Federal Environmental Impact Statement (EIS) and provincial Environmental Assessment (EA), Stantec was retained to assist with natural environment work and seek permits and approvals for the Hardrock Project, in Greenstone Ontario. Dan lead the development of Terrestrial component of Biodiversity Management and Mitigation Plan that addressed terrestrial diversity and compliance conditions of approval.
- Vector Pipeline Project, Vector Pipeline Ltd., Project Manager: Development of watercrossing technique design for environmental protection. Coordination of regulatory approval requirements.
- OCWA Water Pipeline at the Ausable River Watercrossing, Ontario Clean Water Agency, Project Manager: Developed and implemented environmental protection methods on-site.

- Medway Trunk Sanitary Sewer Crossings, City of London, London, Ontario, 2006, Project Manager / Environmental Planner: Coordinated preparation of watercrossing plans, including bed-level crossing for the Medway Trunk Sanitary Sewer project. Supporting studies included a Fisheries Habitat Assessment. Medway Creek supports a mollusc SAR (Wavy-rayed Lampmussel) and construction of the project involved mussel relocation and monitoring. Prepared the permits and approval package.
- Line Lowering at 403 Burlington - Rambo Creek Crossing, Interprovincial Pipe Line Inc., Project Manager: Preparation of Sediment Control Plan and Watercrossing Plans.
- Line 9C, Shell Take off to Sarnia Terminal, Interprovincial Pipe Line Inc., Project Manager: Preparation of Sediment Control Plan and Watercrossing Plans.
- Line 9C Sarnia Delivery Line, Enbridge Pipeline Inc., Project Manager: Development of watercrossing design for protection of water resource.

CEMENT / AGGREGATES

- CBM Aggregates Canada (Votorantim Cimentos) Master Service Agreement (MSA): Negotiated a multi-year MSA with CBM Procurement and CBM Director of Land, Resources and Environment.
- Natural Environment Level 2 Technical Reports. Walkers Uppers Quarry, ARA approval and JART process. Walkers Brother Inc., Thorold, Ontario, Project Manager / Senior Environmental Planner. OLT Expert Witness – On-going, currently in JART Process: Managed the Natural Environment Studies and Joint Agency Review Process (JART) and First Nations Engagement as it relates to natural environment for this large aggregate Quarry project. Involved in impact assessment and design option development with the client and MHBC to advance a feasible development scenario and reduce project risk.
- ARA Pit Application, Tikal Pit Application. Project Director for Natural Environment, Archaeology, Traffic Noise, Air Quality, Water Resources and Stakeholder Engagement. supporting Class EA for the Disposition of Crown Land. CBM Aggregates, Puslinch, Ontario| Project Director/Manager / Senior Environmental Planner
- Duntroon Quarry Application Adaptive Management Plan (AMP), Walker Industries, Collingwood, Ontario, Environmental Planner.: Manager for the on-going implementation and revisions to the Duntroon quarry AMP including assessing impacts and supporting amendments to current ARA Site Plans and license.
- ARA Quarry Application, Simpson Lake Quarry, Project Director for ARA Site Plans, Natural Environment, Archaeology, Traffic, Public Engagement and supporting Class EA for the Disposition of Crown Land. Coloured Aggregates, Renfrew, Ontario| Project Director/Manager / Senior Environmental Planner.: Directed project disciplines and negotiation with Regulators to a successful Quarry Permit under the ARA.
- Level 2 Natural Environment Technical Report, Maaskant Property, Lavis Contracting Co. Ltd, Clinton, Ontario, Environmental Planner and Director
- Peer Review: Natural Environment Report for the Proposed Category 4 – Class A – Above Water Rockridge Quarry, County of Peterborough, Municipality of

Trent Lakes, Ontario, 2019, Senior Environmental Planner: Stantec was retained by the County of Peterborough to conduct peer reviews of various technical studies in support of an Aggregate Resources Act application for a proposed limestone quarry at 110 County Road, Highway 507 (Lot 21, Concession 8 Municipality of Trent Lakes, County of Peterborough). For this assignment, Daniel reviewed the Natural Environment Level 1 & Level 2 Technical Reports prepared by NEA Inc. (2018) and associated background studies.

- Olszowka Aggregate Pit Species at Risk Authorization, CBM Aggregates, Project Manager: Developed a detailed mitigation and Overall Benefit plan for Blanding's Turtle Species at Risk for authorization under the Endangered Species Act.
- Natural Environment Level 2 Technical Reports and Site Plans for Aggregate Pits S1, S4 and T2 , Greenstone Gold Mines, Geraldton, Ontario, Project Manager / Senior Environmental Planner: Managed and coordinated the preparation of three aggregate reports and associated site plans to support the development of the Greenstone Gold Mine in Geraldton Ontario.
- Dufferin Aggregates Acton Quarry Extension Natural Environment Studies, Dufferin Aggregates, Acton, Ontario, Canada, Natural Environment Manager: Coordinated natural environment baseline studies for terrestrial plant and wildlife species. These studies were used to define the extraction footprint and design mitigation strategies, including monitoring and adaptive management planning.
- Levels 1 & 2 Natural Environment Technical Report and Environmental Impact Study for Proposed Simpson Lake Quarry, Coloured Aggregates, Coloured Aggregates, Bancroft, Ontario, 2012-present, Environmental Planner.
- Peer Review: Natural Environment Level 1 and 2 Technical Report for Proposed Category 8 - Class B Quarry (Above Water) East Half Lot 1, Concession 3 (Geographic Township of Galway) Peterborough County, Ontario, 2011, Environmental Planner.
- Peer Review: Scoped EIS for Dewdney Mountain Farms Ltd. Severance Application B75-11, Lots 28-32, Concession 15, Township of Galway-Cavendish Harvey, County of Peterborough, Ontario, 2011, Environmental Planner.
- Levels 1 & 2 Natural Environment Technical Assessment Report, Proposed Bromberg Aggregate Application, CBM Aggregates, Township of North Dumfries, Ontario, 2013, Senior Environmental Planner: Coordinated preparation of Levels 1 & 2 Natural Environment Technical Assessment Report for the proposed Bromberg Pit. Served as an key Expert Witness at the Ontario Municipal Board (OMB).
- Level 2 Natural Environment Technical Assessment Report for Aggregate Expansion, Hillsburgh Pit, CBM Aggregates, Erin, Ontario, 2008, Environmental Planner, Project Manager.
- Adaptive Management Plan, Nelson Aggregate Co., Burlington, Ontario, Environmental Planner.
- Landscape and Ecosystem Restoration Plan, Nelson Aggregate Co., Burlington, Ontario, Environmental Planner.

- Level 2 Natural Environment Technical Report, Nelson Aggregate Co., Burlington, Ontario, Environmental Planner.
- Duntroon Quarry Application Adaptive Management Plan (AMP), Walker Industries, Collingwood, Ontario, Environmental Planner.
- Levels 1 & 2 Natural Environment Technical Assessment Report for Aggregate Application, Godfrey Extension, CBM Aggregates, Peterborough County, Ontario, Environmental Planner.
- Levels 1 & 2 Natural Environment Assessment, Holman Pit| Capital Paving , Guelph Eramosa Township, Ontario, Environmental Planner.
- Levels 1 & 2 Natural Environmental Technical Assessment Report for Proposed Olszowka Aggregate Application, CBM Aggregates, Brant County, Ontario, Project Manager: Managed natural environment studies for development of proposed 140 hectare pit proposed by CBM Aggregates in Brant County. Management included natural environment surveys including species at risk. In addition the project involved engaging in stakeholder consultation with both public and private sectors including the presentation of the project during public information sessions. Extensive MNRF consultation was undertaken in response to species at risk on site. An Overall Benefit plan was developed in consultation with the MNRF for an ESA Authorization application. Expert Witness Testimony at the OLT.
- Level 2 Natural Environmental and Aquatic Assessment - Aggregate Quarry Application, Federal White Cement, Oxford County, Ontario, Project Manager.
- Level 2 Natural Environment Technical Report, Spencer Pit, Tri City Lands Limited, Guelph, Ontario, Environmental Director.

PUBLICATIONS AND PRESENTATIONS

Unique Features of Environmental Management System/ISO-14001 Application to Linear Facilities. 7th International Symposium on Environmental Concerns in Right-of-Way Management, 2002

KEN BURRELL, M.E.S.

Senior Terrestrial Ecologist, Environment – Ecology

PROFILE

Ken Burrell is a Senior Terrestrial Ecologist who specializes in natural resource inventories and evaluations, research and impact studies. Ken has over 15 years of environmental consulting experience. He routinely completes natural area inventories, and has conducted extensive bird, ecological land classification, vascular flora, mammal, and herpetofauna surveys. He has worked on numerous projects which have focused on the identification of important natural features and the evaluation of the significance and sensitivity of these features.

As Terrestrial Lead for many projects, Ken is adept with the ecological components necessary to complete Class Environmental Assessments, Natural Environment Reports, Environmental Impact Statements, and Renewable Energy Approvals. He has demonstrated knowledge and experience of federal and provincial acts: *Species at Risk Act*, *Endangered Species Act*, and *Migratory Bird Convention Act*, in addition to municipal legislation.

Ken specializes in ornithology, herpetology, entomology, forest and plant ecology, ornithology, wildlife habitat assessments, and species at risk. Ken is certified in the Ontario Ministry of Natural Resources and Forestry Ecological Land Classification. Ken has extensive field work experience and conducting the monitoring of wetland and woodland vegetation and terrestrial wildlife. Ken regularly develops pre- and post-construction monitoring programs on a site-specific basis, following standard monitoring protocols. Ken's specific terrestrial biological monitoring expertise includes:

- Identification of significant and sensitive natural resources and wildlife species, and inventories of terrestrial biological resources.
- Provincial avian expert, including 20+ years of bird identification. Extensive survey experience related to vascular flora, Ecological Land Classification, birds, mammals, herpetofauna, odonata, and butterflies.

Areas of practice

Ornithology

Herpetology

Entomology

Forest and Plan Ecology

Wildlife Habitat Assessment

Species at Risk legislation

EDUCATION

Environment and Resource Studies, B.E.S., University of Waterloo	2011
Environment and Resource Studies, M.E.S., University of Waterloo	2013

PROFESSIONAL DEVELOPMENT

CPR and First Aid, St. John Ambulance	2022
Data sensitivity training, Natural Heritage Information Centre	2013
Scientific permit to capture and band migratory birds (expired)	2013
Ecological Land Classification, Ontario MNRF	2011

PROFESSIONAL ASSOCIATIONS

Birds Canada, since 2000	BC
Nova Scotia Bird Society, since 2019	NSBS
British Columbia Field Ornithologists, since 2018	BCFO
Canadian Society of Ornithologists, since 2014	SCO

Ontario Field Ornithologists, since 2001	OFO
Field Botanists of Ontario, since 2014	FBO

CAREER

Senior Terrestrial Ecologist, Environment – Ecology, WSP	2022 – Present
Senior Biologist, McIntosh Perry Consulting Engineers Ltd., Oakville, Ontario, Canada	2021 – 2022
Terrestrial and Wetlands Biologist, Natural Resource Solutions Inc., Waterloo, Ontario, Canada	2010 – 2021
Environmental Scientist [co-op], Stantec Consulting Inc., Guelph, Ontario, Canada	2006 – 2009

PROFESSIONAL EXPERIENCE

Aggregate Development

- Lafarge
  - Pike Pit Quarry Expansion, Paris, Ontario (2024 – present): Ecology Lead and Project Manager. Prepared a Natural Environment Report in compliance with the ARA in support of the Pike Pit expansion. Conducted fieldwork in support of the NER.
  - Coldwater Quarry Species at Risk Surveys, Coldwater, Ontario (2022 – present): Ecology Lead and Project Manager. Completed ongoing Species at Risk monitoring in support of the Coldwater Quarry and compliance monitoring.
  - MacDonald-Ritchie Pit, Species at Risk Surveys, Durham, Ontario (2025 – present): Terrestrial Lead. Completed Species at Risk screenings and fieldwork in support of compliance with the ESA.
- Walker Aggregates
  - Duntroon Quarry Ecological Monitoring, Duntroon, Ontario (2024 – present): Ecology Lead. Conducted post-construction monitoring in compliance with the Natural Environment Report submissions, including amphibian, vegetation, and American Hart's-tongue Fern monitoring.
- Sunrock
  - Burnt River Quarry Expansion, Coboconk, Ontario (2024 – present): Ecology Lead. Prepared a Natural Environment Report in compliance with the ARA in support of the Burnt River expansion. Conducted fieldwork in support of the NER.
- CBM
  - Sunderland Pit Ecological Monitoring, Sunderland, Ontario (2024 – present): Ecology Lead and Project Manager. Completed ongoing Species at Risk monitoring in support of the Sunderland Pit and compliance monitoring.

Renewable Energy

- Samsung-Pattern

  - Henvey Inlet Wind Energy Centre, Henvey Inlet First Nations, Ontario, Canada (2015 – 2021): Terrestrial and Wetlands Ecologist. Conducted pre-, during, and post-construction field investigations as part of the Natural Heritage Assessment process, with a specific emphasis on the Species at Risk permitting processes. Corresponding field surveys included: Bald Eagle nest monitoring throughout the breeding and brood rearing process, Kirtland's Warblers, Blanding's Turtle, Spotted Turtle, Massassauga monitoring throughout the active seasons. Reporting included post-construction monitoring associated with SAR birds and herpetofauna and Endangered Species Act (ESA) permit requirements.

- NextEra
  - Bornish Wind Farm, Middlesex and Lambton County, Ontario, Canada (2011 – 2017): Terrestrial and Wetlands Ecologist. Conducted pre-, during, and post-construction field investigations as part of the Natural Heritage Assessment processes, with a specific emphasis on Species at Risk permitting processes. Corresponding field surveys included: Bald Eagle nest monitoring throughout the breeding and brood rearing process, Wood Thrush, Eastern Wood-Pewee, Red-headed Woodpecker, SAR bats, and Ecological Land Classification surveys.
  - Summerhaven Wind Farm, Haldimand County, Ontario, Canada (2014 – 2020): Terrestrial and Wetlands Biologist. Conducted post-construction field investigations as part of the Natural Heritage Assessment process. Corresponding field investigations included: raptor and landbird migration surveys.
- Northland Power
  - Amherst Island Wind Farm, Lennox and Addington County, Ontario, Canada (2016 – 2021): Terrestrial and Wetlands Ecologist. Conducted post-construction field investigations as part of the part of the Natural Heritage Assessment processes, with a specific emphasis on Species at Risk permitting processes. Corresponding field surveys included: Short-eared Owl, winter raptor surveys, landbird migration surveys, and bat maternity colony assessments.
- Boralex
  - Port Ryerse Wind Farm, Norfolk County, Ontario, Canada (2015 – 2021): Terrestrial and Wetlands Ecologist. Conducted post-construction field investigations as part of the Natural Heritage Assessment process. Corresponding field surveys included; Bald Eagle (SAR) nest monitoring throughout the breeding and brood rearing process and landbird migration surveys.

Natural Heritage Inventories and Research

- Canadian Nuclear Labs Acoustic Bird Interpretations, Deep River, Ontario, Canada (2022-2023): Lead Avian Ecologist. Coordinated and interpreted acoustic bird calls throughout the Deep River CNL facility. Acoustic interpretations involved 300 hours of song analysis, resulting in the detection of avian Species at Risk. Acoustic interpretations were analyzed and summarized in a final report, along with recommendations.
- Canadian Wildlife Service / Environment and Climate Change Canada (2021 – 2025): Lead Avian Ecologist. Coordinated and interpreted acoustic bird calls throughout Ontario, primarily in the Hudson and James Bay Lowlands. Acoustic

interpretations involved over 2,000 hours of song analysis on behalf of the Ontario Breeding Bird Atlas-3. Song analysis included the detection of avian Species at Risk. Acoustic interpretations were analyzed annually and summarized in a final report.

- Defence Construction Canada and Department of National Defence, Canadian Forces Base Borden, Ontario, Canada (2022-2023): Lead Terrestrial Ecologist. Coordinated and executed surveys for black-legged ticks throughout CFB Borden. Surveys were designed to detected presence of black-legged tick and Lyme disease throughout CFB Borden to assist DND in the use of CFB Borden. Survey and lab results, along with recommendations, were provided to DCC and DND in a comprehensive survey report.
- Correctional Service of Canada Species at Risk Inventories, Ontario Institution Properties, Ontario, Canada (2017 – 2020): Lead Terrestrial Ecologist. Coordinated and performed species at risk field program, which consisted of natural heritage feature delineations, breeding birds, herpetofauna, vascular floral surveys, bat acoustic monitoring, and wildlife habitat assessments. Author to the Species at Risk Inventory and Evaluation Report. Client: Correctional Service of Canada.
- Rapids Clubtail Inventory and Surveys, Ontario, Canada (2017 – 2019): Lead Terrestrial Ecologist. Coordinated and won grant with the MNRF Species at Risk Stewardship Fund grant, which facilitated surveys for the Endangered Rapids Clubtail across northwestern and southeastern Ontario. Client: Ontario Ministry of Natural Resources and Forestry.
- Harris's Sparrow, Rapids Clubtail, Horned Grebe, Eastern Whip-poor-will, and Barn Swallow Committee on the Status of Endangered Wildlife In Canada Status Reports, Ontario, Canada (2015 – 2023): Lead Terrestrial Ecologist. Prepared and wrote the status report updates for the above-mentioned species. Client: Environment and Climate Change Canada.

PUBLICATIONS AND PRESENTATIONS

Publications

- COSEWIC. 2023. COSEWIC Assessment and Status Report on the Horned Grebe Podiceps auritus in Canada. Ed. K. Burrell, D. Riley, and N. Miller.
- COSEWIC. 2022. COSEWIC Assessment and Status Report on the Eastern Whip-poor-will Anthrostomus vociferous in Canada. Ed. K. Hoo, E. Graeme, and K. Burrell.
- COSEWIC. 2021. COSEWIC Assessment and Status Report on the Barn Swallow Hirundo rustica in Canada. Ed. D. Riley, K. Burrell, and N. Miller.
- Riley, D., B. Charlton, M. Burrell, K. Burrell, A. Guercio, W. Lamond, B. Mann, R. Martin, D. Sutherland. 2020. Ontario Bird Records Committee Report for 2019. Ontario Birds, 38(2)53-82.
- Burrell, K. and M. Burrell. 2019. Best Places to Bird in Ontario. Greystone Books Ltd. Vancouver, Canada. 278 pp.
- Burrell, M., B. Charlton, K. Burrell, J. Vandermeulen, A. Guercio, B. Mann, D. Sutherland, P. Pratt, and B Lamond. 2019. Ontario Bird Records Committee Report for 2018. Ontario Birds, 37(2)52-83.
- COSEWIC. 2019. COSEWIC Assessment and Status Report on the Rapids Clubtail Phanogomphus quadricolor in Canada. Ed. N.G. Miller and K.G.D. Burrell. 63 pp.

- Burrell, M.V.A., B.N. Charlton, K.G.D. Burrell, J.D. Vandermeulen, W.G. Lamond, T.B. Lucas, B.A. Mann, P.D. Pratt, and D.A. Sutherland. 2018. Ontario Bird Records Committee Report for 2017. Ontario Birds, 36(2):58–88.
- Burrell, M., B. Charlton, and K. Burrell. 2017. Ontario Bird Records Committee Report for 2016. Ontario Birds, 35(2)58-85.
- COSEWIC. 2017. COSEWIC Assessment and Status Report on the Harris's Sparrow Zonotrichia querula in Canada. Ed. K.G.D. Burrell. 46 pp.
- Burrell, K.G.D., J.H. Skevington, S. Kelso, M.V.A. Burrell, D.L. LeClair, and S.A. Mackenzie. 2016. A previously undocumented hybrid New World Warbler (Setophaga pensylvanica x S. magnolia) captured at Long Point, Ontario. The Wilson Journal of Ornithology, 128(3):624-628.
- Burrell, M. and K. Burrell. 2016. New species added to the Checklist of the Birds of Ontario: 1983-2016. Ontario Birds, 34(1)57-67.
- Burrell, K.G.D. and L.A. Knopf. 2016. The status of the Eastern Phoebe (Sayornis phoebe) in Cuba. Journal of Caribbean Ornithology, 29:18-20.
- Holden, B.R., and K.G.D. Burrell. 2015. Foraging by a Summer Tanager during a reorientation flight. Ontario Birds, 33:83–85.
- Burrell, K.G.D., Murphy, S.D., and B.C. Fedy. 2015. Diversity and abundance of landbirds in spring reorientation flights in the Pelee region, Canada. Ontario Birds, 33:70-82.
- Burrell, K.G.D., Burrell, M.V.A., and B.R. Holden. 2015. An unprecedented early spring influx of Acadian Flycatchers (Empidonax virescens) into southern Ontario, April 2014. Ontario Birds, 33(1): pp 34-43.
- Holden, B.R. and K.G.D. Burrell. 2015. The Cave Swallow, Petrochelidon fulva, in Ontario, 1989-2014. Ontario Birds, 33(1): pp 44-48.
- Ontario Ministry of Natural Resources. 2013. DRAFT Survey protocol for Henslow's Sparrow Ammodramus henslowii. Ed. Kenneth Burrell and Heather Fotherby. Prepared for the Ontario Ministry of Natural Resources, Peterborough, ON. ii + 17 pp. Submitted 04/2013.
- Holden, B.R. and K.G.D. Burrell. 2014. A birding perspective and analysis of Hurricane Sandy in Ontario, Autumn 2012. Ontario Birds, 32(1): pp 12-22.
- Friis, C., Burrell, K.G. and S.A. Mackenzie. 2013. Flight Times and Abundances of Three Shorebird Species Staging near Chickney Channel, James Bay, Ontario, Summer 2012. Ontario Birds, 31(1): pp 10-23.

Presentations

- Best Places to Bird in Ontario. Conducted numerous TV, radio, and newspaper interviews with the launch of this book. Presented at the following organizations:
  - Point Pelee National Park, ON. 10 May 2019.
  - Huron Fringe Birding Festival, MacGregor Point Provincial Park, ON. 25 May 2019. Key-note speaker.
  - Niagara Field Naturalists, Niagara Falls, ON. 11 September 2019.
  - Norfolk Field Naturalists, Simcoe, ON. 12 September 2019.
  - City of London, London, ON. 10 January 2020.

- The spring reverse migration of landbirds in the Pelee region: 2010 – 2012. Presented at the following organizations:
  - The Toronto Ornithological Club. Toronto, ON. 14 April 2014.
  - Guelph Nature, Bird Wing. Guelph, ON. 31 March 2014.
  - Ontario Bird Banding Association Annual General Meeting. Birds Canada, Port Rowan, ON. 23 February 2013.
  - Hamilton Field Naturalists Bird Study Group. Burlington, ON. 5 November 2012.
  - Kitchener-Waterloo Field Naturalists. Waterloo, ON. 18 April 2011.
- Burrell, K.G.D. 2012. An Introduction to Birding. Ecology Lab, Faculty of Environment. University of Waterloo, Waterloo, ON. 5 March 2012.
- Burrell, K.G.D. 2011. Avian Monitoring Methods. Faculty of Environment. University of Waterloo. Waterloo, ON. 18 September 2010 and 22 September 2011.

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