

High Potential Mineral Aggregate Resource Areas: Mapping Methodology

Peel 2051 Discussion Paper (Draft)

May 2023



This policy discussion paper (including any attachments) has been prepared using information current to the report date. It provides an assessment of provincial policy conformity requirements, recognizing that Provincial plans and policies were under review and are potentially subject to change. The proposed direction contained in this discussion paper will be reviewed to ensure that any implementing amendments to the Regional Official Plan and Town of Caledon Official Plan will conform or be consistent with the most recent in-effect provincial policy statement, plans and legislation.

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1. Introduction

1.1 Peel 2051 Official Plan Review

The Region of Peel's Regional Official Plan (ROP) is the long-term policy framework for land use planning decision-making. It sets the Regional context for detailed planning by protecting the environment, managing resources, directing growth and setting the basis for providing Regional services in an efficient and effective manner. The *Planning Act* requires municipalities to update their Official Plans to ensure that the policies remain current and are consistent with Provincial plans and policies. The Peel 2051 Regional Official Plan Review and Municipal Comprehensive Review (MCR) was initiated in 2013 to review the Regional Official Plan for planning to the year 2051 and to achieve Provincial conformity with recent updates to Provincial plans and policies.

Peel 2051 includes a review of thirteen focus areas to ensure conformity with the Provincial Policy Statement, 2020, A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2019), the Greenbelt Plan (2017), the Oak Ridges Moraine Conservation Plan (2017) and the Niagara Escarpment Plan (2017) which provide Provincial direction for land use planning and the protection of the local environment and resources.

On April 28, 2022, Regional Council passed By-law 20-2022 to adopt the new "April 2022 Region of Peel Official Plan" (ROP), which addressed updates for twelve of the thirteen focus areas. At the time of adoption, the Aggregate Resources Policy Review was still underway and proceeding as a further phase of the Peel 2051 Regional Official Plan Review. On November 4, 2022, the Minister issued a Notice of Decision approving the new ROP with 44 modifications. This approval repealed and replaced the Regional Official Plan adopted in 1996 including all subsequent amendments made to it on the same date. The new Region of Peel Official Plan, as approved by the Minister, came into effect on November 4, 2022. The Aggregate Resources Policy Review will now consider changes to the policies and mapping in the new April 2022 ROP as approved by the Province.



1.2 Purpose of the Methodology Document

In relation to mineral aggregate resources, a comprehensive policy review and review of the mapping of deposits of mineral aggregate resources in the Region of Peel is required. The mapped deposits of mineral aggregate resources in Peel has recently been updated by the Province and the revised mapping will need to be incorporated into the Region of Peel and Town of Caledon Official Plans. This is because the Provincial Policy Statement, 2020 directs that where provincial information is available, deposits of mineral aggregate resources shall be identified and protected for long-term use. In the Regional Official Plan mineral aggregate resources are identified on Schedule D-2 as High Potential Mineral Aggregate Resource Areas (HPMARA). In the Town of Caledon Official Plan, mineral aggregate resources are

identified on Schedule L as Caledon High Potential Mineral Aggregate Resource Areas (CHPMARA). However, the mapping of HPMARA and CHPMARA need to be updated to reflect the more recent provincial mapping of resource deposits and new policy affecting where resource extraction is constrained. The purpose of this report is to document the recommended methodology used to produce and update the HPMARA/CHPMARA maps, which is Schedule D-2 to the Regional Official Plan and Schedule L to the Town of Caledon Official Plan. The mapping methodology is providing supporting information to the Joint Aggregate Policy Review being conducted by the Town of Caledon and Region of Peel.

2. Overview of Mineral Aggregate Resources in Peel Region

Mineral aggregate resources include sand, gravel, earth, shale, stone, limestone, dolostone, sandstone, rock and other material prescribed under the Aggregate Resources Act that are suitable for construction, industrial and manufacturing purposes. Sand, gravel, stone and bedrock resources have been extracted in Peel for many years for construction and manufacturing purposes.

Sand and gravel deposits available for extraction are present in the Town of Caledon. These deposits were laid down over thousands of years through glacial processes and are found in a variety of landforms including moraines and outwash deposits. Extraction activity in Peel is concentrated in the western half of the Town in the Caledon Outwash deposits (a glacial deposit), and in parts of the Orangeville Moraine. These areas contain material considered suitable for a wide variety of aggregate products. Sand and gravel resources in Brampton and Mississauga have been utilized in the past and depleted or are now considered unavailable due to urbanization.

Peel's surficial geology is underlain by various types of bedrock including shales, sandstones, limestones and dolostones. Of these, the Amabel Formation is known to contain very high quality rock (dolostone) suitable for all road aggregate uses, including hot mix paving and construction aggregate because of its durability. The resource is of provincial significance.

The Georgian Bay Formation (a shale deposit) is found in the eastern part of the Peel Region. In the GTA the Georgian Bay Formation has previously been used extensively for brick manufacture, however, this deposit is overlain by deep deposits of overburden and is now generally inaccessible in Peel. The Georgian Bay Formation is also overlain by red shales of the Queenston Formation, which occurs throughout the central portion of the municipality and forms the base of the Niagara Escarpment. The Queenston Formation is also well suited for the manufacture of structural clay products such as brick and tile. One site in Caledon is currently licenced for shale extraction for brick manufacturing purposes.



These various deposits have been classified and mapped by the Ontario Geological Survey for identification in municipal official plans. The following sections describe the information sources and methodology being undertaken in the Peel 2051 Regional Official Plan Review to map deposits of mineral aggregate resources in the Region of Peel Official Plan.

3. Identification and Protection of Mineral Aggregate Resource Areas

3.1 Mineral Aggregate Resources in Peel Region

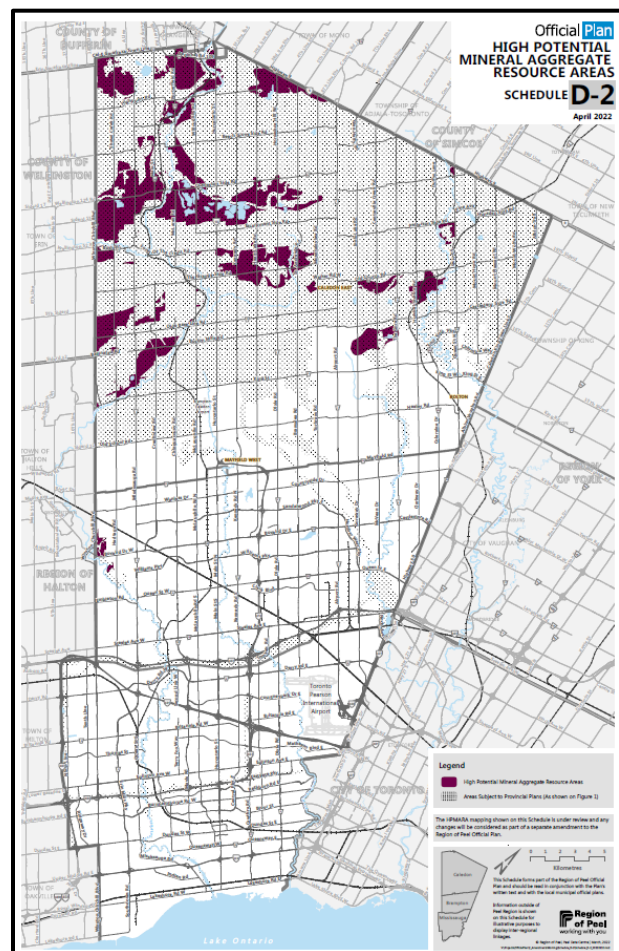
As noted in the 2019 Growth Plan, the Greater Golden Horseshoe (GGH) contains significant deposits of mineral aggregate resources, which require long-term management. Peel's mineral aggregate resource base consists of unconsolidated sands and gravels as well as accessible sequences of shale, sandstone and dolostone. Most of Peel Region's mineral aggregate production is in the high-quality sands and gravels of the Caledon and Credit Valley outwash deposits located in the Town of Caledon. Over the ten-year period from 2009 to 2019, the average annual production of mineral aggregate resources in Peel was 3.4 million tonnes. In 2019, 3.0 million tonnes of aggregate resources was produced in licenced operations in Peel.¹ Ensuring mineral aggregate resources are available in proximity to the demand that is the result of increased growth and development in Peel and the GGH requires the implementation of land use planning policy to identify and protect resource deposits in accordance with provincial direction.

3.2 Identifying Aggregate Resource Areas in Official Plans

The land use planning responsibility for mineral aggregate resources is shared among the Province, the Region and the local municipalities. The Region's responsibilities are to identify appropriate mineral aggregate resource areas for protection; to establish policies at the Regional level; to protect these resource areas for potential extraction; to direct the local municipalities to develop comprehensive mineral aggregate policies in their official plans; and to ensure that Regional interests are incorporated in local municipal planning decisions.

To support official plan policy implementation, High Potential Mineral Aggregate Resource Areas (HPMARA) are identified on Schedule D-2 to the Regional Official Plan and in accordance with the Provincial Policy Statement, 2020, policy 2.5.1 “*Mineral aggregate resources shall be protected for long-term use and, where provincial information is available, deposits of mineral aggregate resources shall be identified*”.

The HPMARA shown on Schedule D-2 is not a land



¹ The Ontario Aggregate Resources Corporation. Aggregate Resources Statistics in Ontario: Production Statistics. 2019.

use designation. The HPMARA is an overlay that identifies the locations where development or activities are restricted in order to protect aggregate resources for potential extraction and use. The HPMARA overlay represents the lands that contain primary and secondary sand and gravel resource deposits and selected bedrock resources that are not constrained by provincial or municipal policies that prohibit aggregate resource extraction.

Within the HPMARA, mineral aggregate extraction is permitted in conformity with the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan, the Greenbelt Plan and the Provincial Policy Statement, where applicable, and subject to planning justification, environmental and compatibility study requirements. By identifying the locations where significant deposits of aggregate resources occur, the Region, Town, landowners and residents can make decisions that support the protection of the resource from development and activities that would preclude or hinder their extraction and use.

The mapping of HPMARA areas does not indicate that aggregate extraction is permitted, as any application to establish or expand an aggregate extraction use is subject to policy requirements to ensure matters related to community impacts, public health, public safety and environmental protection are addressed. Individual applications for resource extraction operations are assessed through a land use planning process to determine the individual merits of each application and that approval would represent good planning. Lands outside the HPMARA may also be proposed for extraction, subject to these same policy requirements as would apply to any application for extraction within the HPMARA.

3.3 Source Information for Mapping HPMARA in the Official Plan

HPMARA areas are delineated in order to protect deposits of mineral aggregate resources (sand and gravel and bedrock) identified by the Province. “*Deposits of mineral aggregate resources*” are defined in the Provincial Policy Statement as:

An area of identified *mineral aggregate resources*, as delineated in Aggregate Resource Inventory papers or comprehensive studies prepared using evaluation procedures established by the Province for surficial and bedrock resources, as amended from time to time, that has a sufficient quantity and quality to warrant present or future extraction.²

By definition, the source documents for the mapping of mineral aggregate resource deposits are Aggregate Resource Inventory Papers (ARIPs). The most recent ARIP 165 (Revised) for the Region of Peel was published by the Ontario Geological Survey in 2009³. The revised ARIP report replaces the previous ARIP 165 version that was published in 1996 that was the source information for the mapping of resource deposits currently included in the Region of Peel and Town of Caledon Official Plans. The report includes an inventory, evaluation and updated mapping of sand and gravel, and bedrock resources for the Region. The ARIP mapping is produced based on detailed field assessments of selected areas to delineate and determine the quality and quantity of aggregate within an area. Field assessments are complemented by interpretations of aerial photographs, geological information and previous reports.

² PPS, 2020, Section 6.0 Definitions, p 40.

³ Golder Associates Ltd. and Rowell, D.J. 2009. Aggregate Resources Inventory of the Regional Municipality of Peel, Southern Ontario; Ontario Geological Survey, Aggregate Resources Inventory Paper 165– Revised, 57p.

Deposits of mineral aggregate resources are classified into four levels of significance⁴:

Selected Sand and Gravel Areas

Criteria used to identify and classify selected sand and gravel areas include deposit size, aggregate quality, deposit location and setting.

Primary - represent areas in which a major resource is known to exist. Primary sand and gravel resource areas are now typically mapped for protection in municipal official plans, including in the current Region of Peel and Town of Caledon official plans.

Secondary – represent areas believed to contain significant amounts of sand and gravel. The ARIP for Peel indicates that although deposits of secondary significance are not considered to be the “best” resources in the area, they may contain large quantities of sand and gravel and should be considered as part of the aggregate supply of the area. Currently, both the Region of Peel and Town of Caledon map deposits of secondary significance in their official plans.

Tertiary – tertiary deposits are not considered to be important resource areas because of the low quantity of resources, or because extraction of the resource would not be feasible. Tertiary deposits are not mapped in the Region of Peel and Town of Caledon official plans.

Selected Bedrock Areas - selected bedrock areas are classified on the basis of a single level of significance using criteria similar to those used to classify sand and gravel deposits including aggregate quality/suitability of the resource deposit for use, deposit size and accessibility. Selected bedrock resource areas are primarily determined based on the areal extent of thin overburden material overlying suitable deposits. Deposits with a drift thickness of 1 meter or less constitute potential resource areas because of their easy access. Where drift thickness is up to eight meters thick quarrying is possible, and these areas also represent potential resource areas. Bedrock overlain by 8 to 15 meters or greater of overburden is generally considered to be too great to allow economic extraction.

ARIP Maps 1A and 2 shown in Figures 1 and 2 below identify the selected sand and gravel and selected bedrock resource areas as mapped by the Province in the 2009 update report. In 2015, subsequent to the publication of the 2009 ARIP 165 mapping, the Ontario Geological Survey (OGS) released further revisions to the mapping of bedrock resources. The revisions included updated drift thickness data (depth of overburden) in the Caledon Village – Sleswick – Mono Mills area of the Town of Caledon and corresponding revisions to the boundary of selected bedrock resource areas, which were adjusted to reflect the updated drift thickness data.⁵ In the revised mapping, the boundaries of the selected bedrock resource areas have been adjusted to reflect areas having a drift thickness less than 8 m, consistent with the OGS’s criteria for identification of selected bedrock resource areas. Maps showing the revised drift thickness mapping and the revised boundary of the selected bedrock resource areas in Peel are

⁴ ARIP 165 (Revised), 2009, p 7-9.

⁵ Ontario Geological Survey 2015. Drift thickness data (2015 update) for the Caledon Village–Sleswick–Mono Mills area , Regional Municipality of Peel, southern Ontario ; Ontario Geological Survey, Aggregate Resources Inventory Paper 165— Revised , 2015 update to part of Map 165-2–Bedrock Resources, scale 1:50 000.

provided in Figures 3 and 4 below. Figure 4 incorporates the most recent 2020 OGS bedrock mapping data available with coverage to include all of the Town of Caledon.

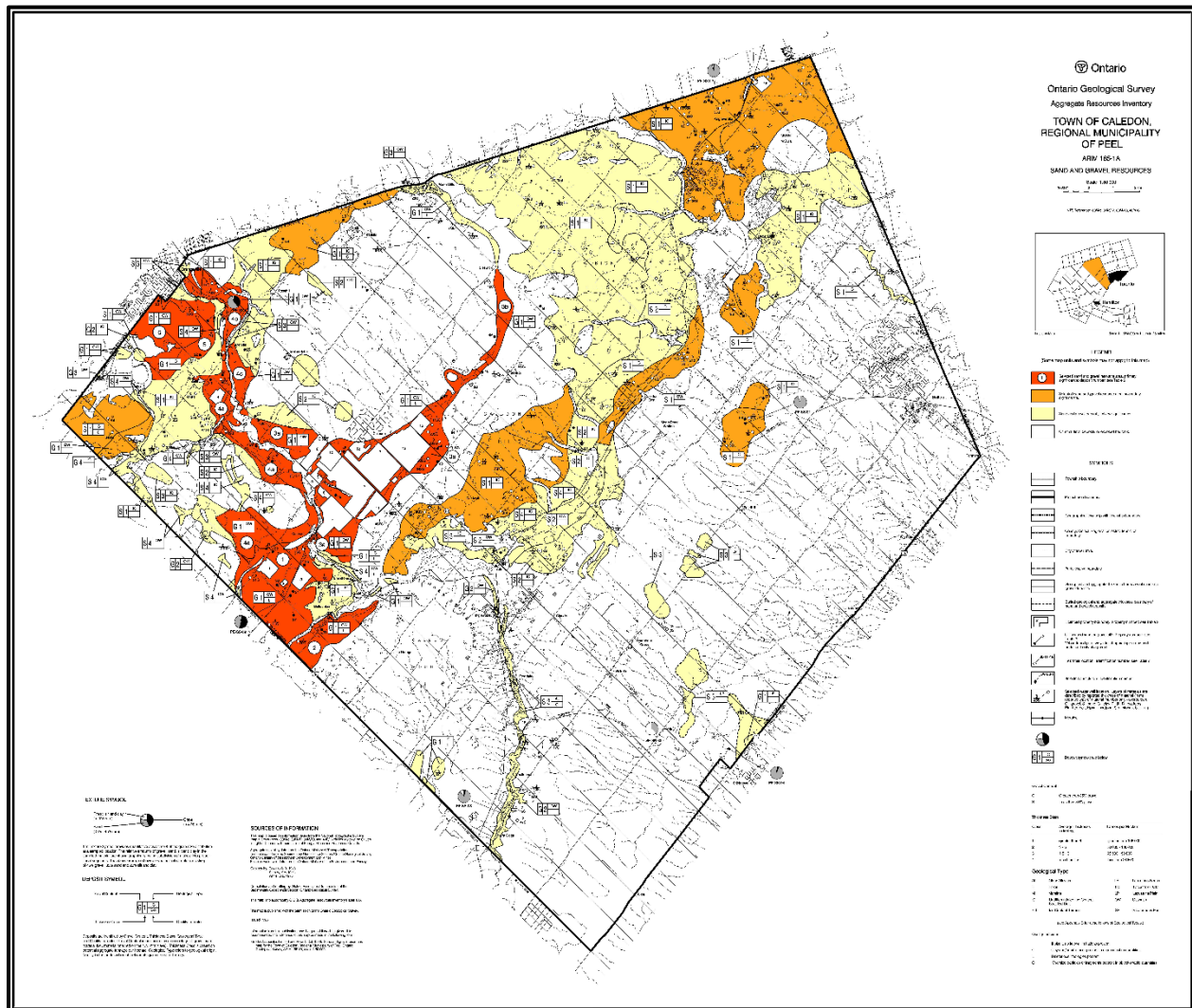
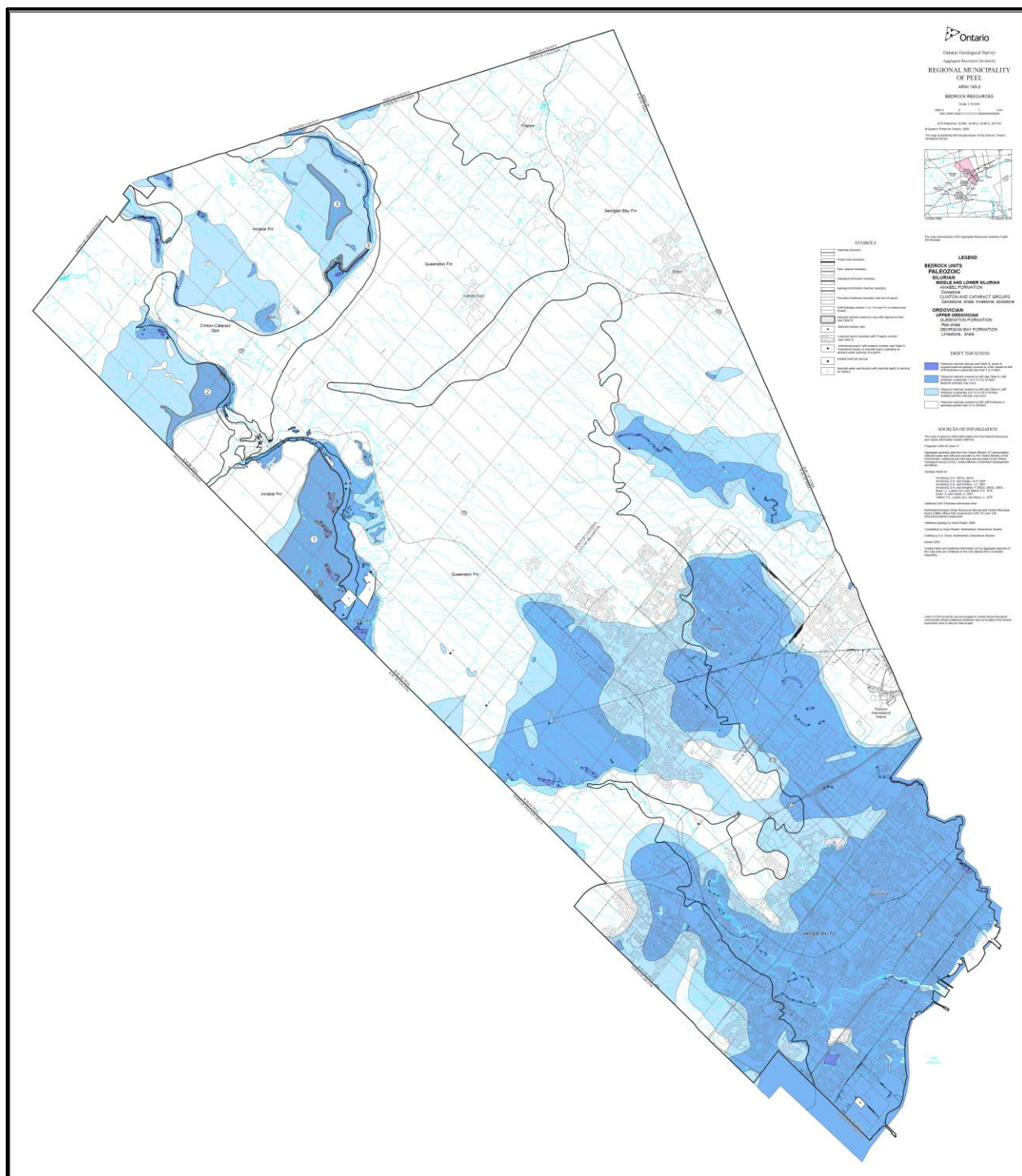


Figure 1: Map of selected sand and gravel resource areas in the Region of Peel (Caledon).



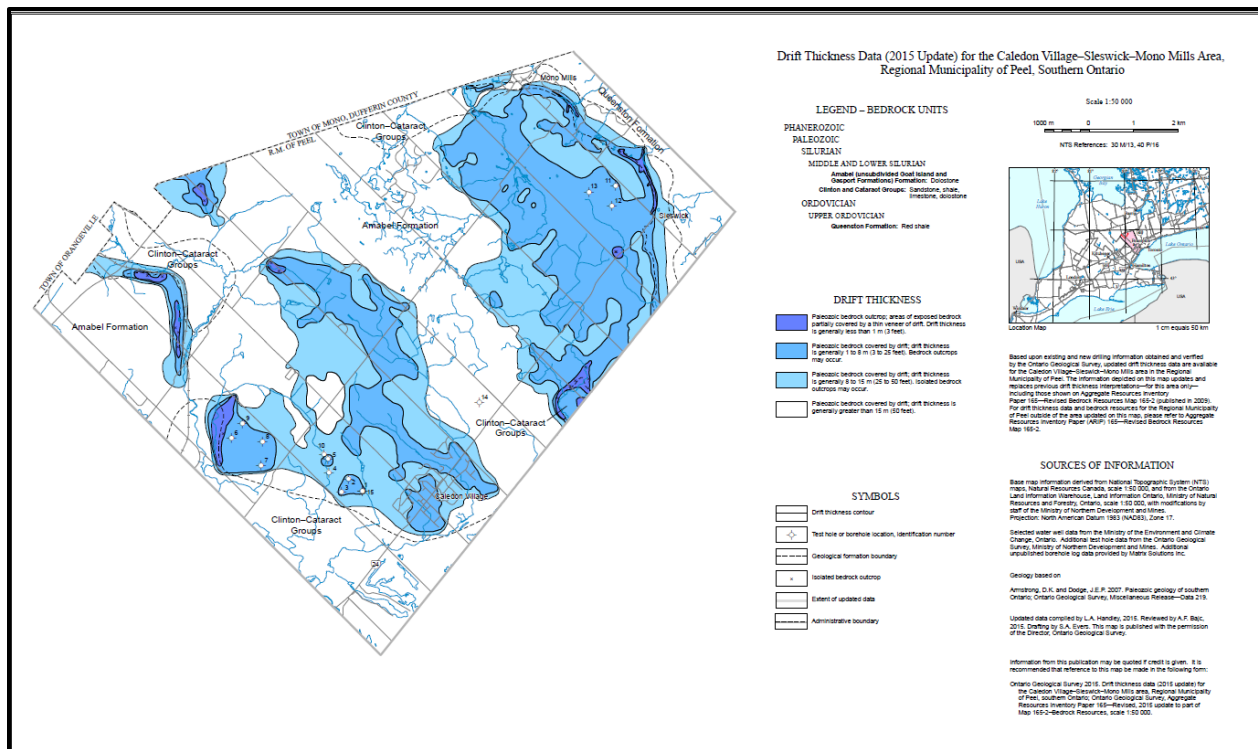


Figure 3: 2015 ARIP map of updated drift thickness data for the Caledon Village-Sleswick-Mono Mills Area.

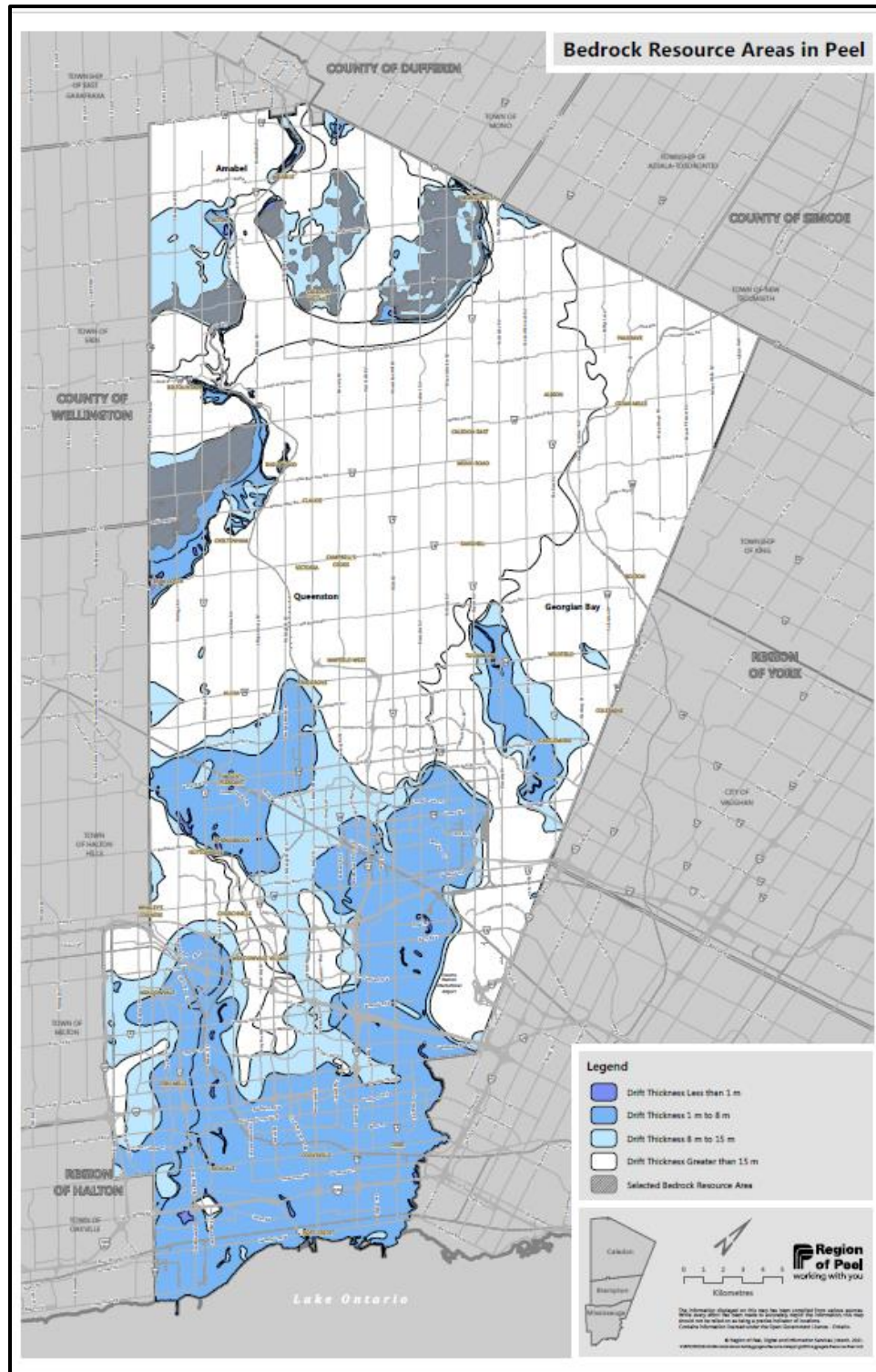


Figure 4: 2020 Map of updated drift thickness and Selected Bedrock data for Peel Region.6

⁶ Ontario Geological Survey. 2020. Aggregate Resources of Ontario—2019; Ontario Geological Survey, Aggregate Resources of Ontario—2019

3.4 Queenston Shale Identification in the Regional Official Plan

The Queenston bedrock formation consists of red to maroon colour shale with interlayers of siltstone and limestone. The Queenston formation forms the base of the Niagara Escarpment. The Queenston formation is a provincially significant resource because it is the single-most important shale formation that is used today to produce brick and tile.

In 2012 the province released the “Shale Resources of Southern Ontario: An Update” report. The purpose of the report was to identify and delineate potential shale resources that can be used in brick and tile manufacturing in southern Ontario. In addition to identifying these resource areas the report outlined physical (e.g., overburden thickness) and high-level land-use planning constraints that could reduce the potential extraction areas. Historically, only three shale formations have been used extensively to produce brick and tile: the Arkona, Queenston and Georgian Bay formations. Of these three formations, the 2012 report notes that only the Queenston formation remains as a viable source of raw material. Between urban expansion, current land-use planning policies and overburden thickness, the Arkona and Georgian Bay formations have been eliminated from future extractive opportunities.⁷ One of the underlying principles of the Aggregate Resources Inventory Program was the assumption that aggregate producers can strip up to 8 m of overburden and still produce an economically viable product.

Over the last 10 years shale quarries containing up to 14 meters of overburden have been licensed in the Greater Toronto Area. As a resource becomes less available, it potentially becomes more valuable and overburden depth may be less of a factor in determining economic feasibility of extraction. As indicated in the 2012 report, due to the scarcity of the Queenston Shale resource within the Greater Toronto Area and increased production costs, producers may be willing to extract shale resources that have a greater overburden thickness. Therefore, the Ministry of Northern Development and Mines recommends identifying Queenston Shale resources in locations where the resource may be accessible in areas having overburden thickness up to 15 meters.

Based on the provincial information and recommendations, in 2020 the Region of Peel completed a mapping review which resulted in updated identification of accessible and unconstrained Queenston Shale resource deposits in North West Brampton. HPMARA mapping was updated on Schedule D-2 to the Regional Official Plan through this review (See Figure 7 below). The updated mapping identified shale resources with an overburden thickness of up to 15 meters. Further details on the North West Brampton Shale Resources mapping update are provided in Section 4.4. The Peel 2051 aggregate resources mapping review will not re-evaluate this work and will be focused on Queenston Shale formations in Caledon.

⁷ Rowell, D.J. 2012. Shale resources of southern Ontario: An update; Ontario Geological Survey, Open File Report 6278, 46p.

As noted above, HPMARA mapping in the Regional Official Plan, and corresponding CHPMARA mapping in the Town of Caledon Official Plan, is based on older ARIP mapping published in 1996⁸, which has recently been updated by the OGS. The recent OGS mapping includes revisions to the mapping of selected bedrock resource areas in Peel. In some locations deposits previously identified as significant are no longer identified as selected bedrock resource areas. In other locations, deposits that were not previously identified as significant are now identified as selected resource deposits. A comparison of the 1996 and 2009 (as updated in 2015) bedrock mapping is provided below in Figure 5. The ARIP mapping updates in 2009 and 2015 did not identify changes to the mapping of sand and gravel deposits in Peel.

In addition to new mapping of deposits, the environmental constraint areas that prohibit aggregate extraction have also changed in accordance with recent policy revisions in provincial plans and the Provincial Policy Statement, 2020. HPMARA and CHPMARA areas are not mapped in locations that are subject to policy constraints that prohibit extraction.

For these reasons it is necessary that the Region review the mapping methodology that was previously utilized in order to update the HPMARA and CHPMARA in the official plans to reflect current policy and better mapping of the location of resource deposits. The following report section outlines the proposed methodology and approach.

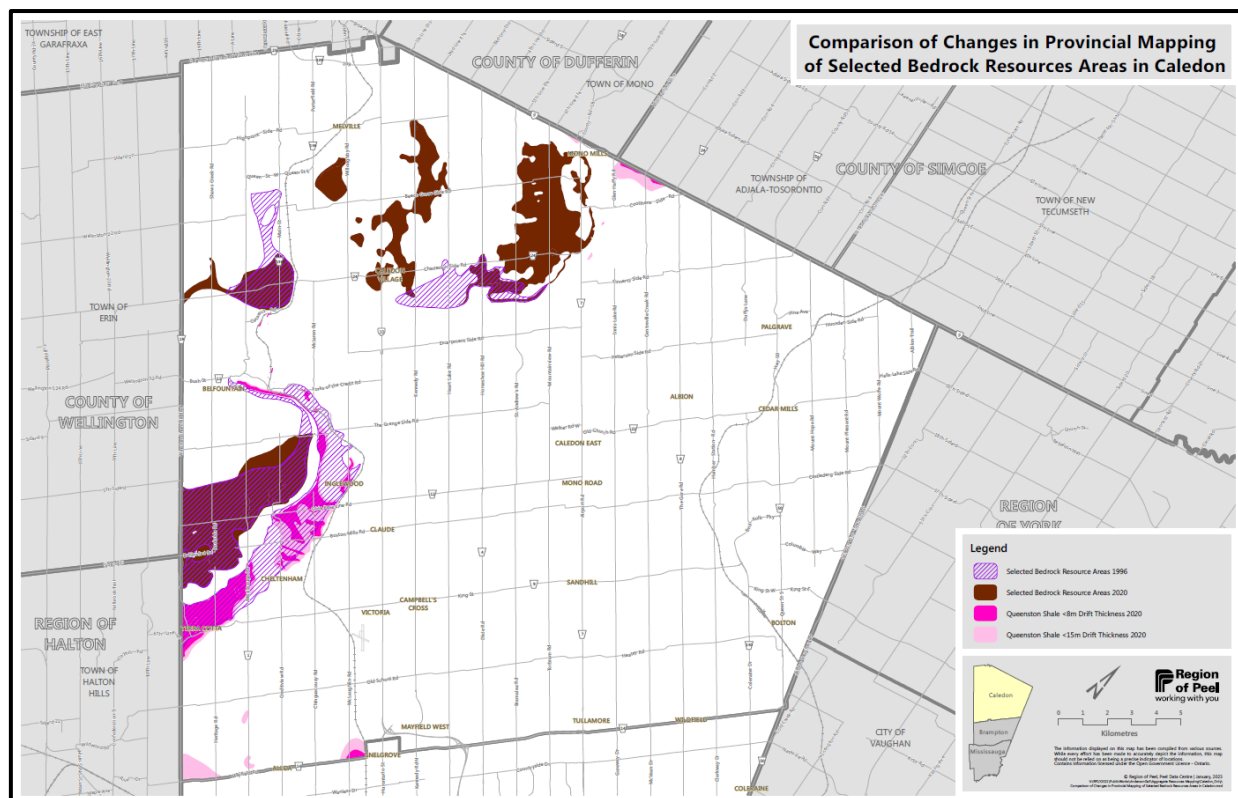


Figure 5: Comparison of Selected Bedrock Resource Areas in Peel Region (1996 and 2020 ARO data).

⁸ Golder Associates Ltd. and Rowell, D.J. 1996. Aggregate resources inventory of the Regional Municipality of Peel, southern Ontario; Ontario Geological Survey, Aggregate Resources Inventory Paper 165, 80p.

4. Updating of Schedule D-2 – High Potential Mineral Aggregate Resource Areas

4.1 Overview of Constraint Mapping Methodology

The proposed mapping methodology to update HPMARA mapping is based on the constraint mapping methodology recommended by the Province in the Provincial Policy Statement Training Manual for Non-Renewable Resources and the previous constraint mapping approach, undertaken jointly by the Region and Town of Caledon through the Caledon Community Resources Study (CCRS). The previous approach, based on direction provided in the Caledon Community Resources Study (CCRS) Phase 2 and 3 Reports⁹^{10 11}, has been updated to reflect current policy direction and requirements.

The CCRS study was undertaken jointly by the Town and the Region to develop an aggregate management strategy with policies and mapping of mineral aggregate resource areas based on recommended constraint criteria. Regional Core Areas of the Greenlands System, specific Caledon Environmental Policy Areas, settlement areas, registered plans of subdivision outside settlement areas, residential clusters and small fragments due to their size, shape or other factors were excluded from the mapping.

The Town of Caledon implemented the CCRS recommendations by inserting updated policies and mapping in the Town's Official Plan through Official Plan Amendment 161 (OPA 161). The CHPMARA, identified on Schedule L in the Caledon Official Plan, was a refinement of the HPMARA mapping that was initially approved in the Region of Peel Official Plan in 1998.

The implementing policy framework in the Town of Caledon Official Plan classifies CHPMARA deposits as "Aggregate Resource Lands" and "Aggregate Reserve Lands". The policies establish a prioritization and preference that new extraction operations are encouraged to locate within "Resource Lands" subject to the requirements of the Plan as Aggregate Resource Lands have been determined to be suitable resources for aggregate extraction. New pits and quarries may also be considered in Aggregate Reserve Lands subject to additional planning justification. While extraction may be permitted on Aggregate Reserve Lands, further study of the potential impacts that affect the broader community is required to ensure that locations are suitable for aggregate extraction.

For the purposes of updating the HPMARA, mapping criteria that were established in the CCRS and OPA 161 are proposed to be retained, with updates as noted below, to ensure consistency with the previous resolution of aggregates policies for the Region including:

- the classification of separate sand and gravel and bedrock resource areas;

⁹ Planning and Engineering Initiatives Ltd. and Associates. 1998. Caledon Community Resources Study. Phase 1 Report: Background Analysis and Synthesis.

¹⁰ Planning and Engineering Initiatives Ltd. and Associates. 1998. Caledon Community Resources Study Phase 2 Report: Resource Analysis and Conceptual Strategy Development for Aggregate Resource Management in the Town of Caledon and Region of Peel.

¹¹ Planning and Engineering Initiatives Ltd. and Associates. 1999. Caledon Community Resources Study Phase 3 Report: Study Findings and Recommendations.

- the consideration of provincial and regional constraints; and
- the consideration of local constraints where mapping data is available.

To update HPMARA mapping the most recent sources of data for sand and gravel and bedrock deposits in Peel was obtained from the Ontario Geological Survey and used as a base layer. Environmental and non-environmental constraints, where aggregate extraction is prohibited, were identified and mapped, based on updated Provincial, Regional and Town of Caledon Official Plan policies.

With the exception of the Queenston Shale deposit in the City of Brampton that was recently updated through Regional Official Plan Amendment 32 (ROPA 32), the review of HPMARA mapping excludes the Cities of Mississauga and Brampton as settlement areas currently extend to the full limit of their jurisdictions. The HPMARA mapping recently updated through ROPA 32 is being included in the Regional Official Plan, as a housekeeping item. Section 4.5 below provides additional background on the mapping of shale resource areas in the City of Brampton.

4.2 Provincial Mapping Data

To develop the HPMARA mapping updates, digital GIS versions of the most recent ARIP sand and gravel and bedrock source data was obtained from the Ontario Geological Survey (OGS) as shown in Figure 6 below. This data is updated annually through the OGS's Aggregate Resources of Ontario Inventory Mapping (ARIM) Program.¹² The 2020 ARO dataset was obtained for the purpose of updating the HPMARA.

Significant sand and gravel resource areas (primary and secondary significance), selected bedrock resource areas and Queenston shale (in areas with <15 overburden thickness) were extracted and mapped separately for the purpose of identifying deposits of mineral aggregate resources. To develop the HPMARA, the Queenston formation, which is used primarily in brick manufacturing was identified separately from selected bedrock deposits used for construction aggregate (e.g., Amabel Formation). As noted previously, the Ministry of Natural Resources and Forestry and the Ministry of Northern Development and Mines recommends mapping Queenston Shale in areas having less than 15 meters of overburden thickness.

¹² Ministry of Energy Northern Development and Mines. Aggregate Resources of Ontario – 2020 (ARO – 2020). (<https://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearch/aggregate-resources-ontario-compilation>).

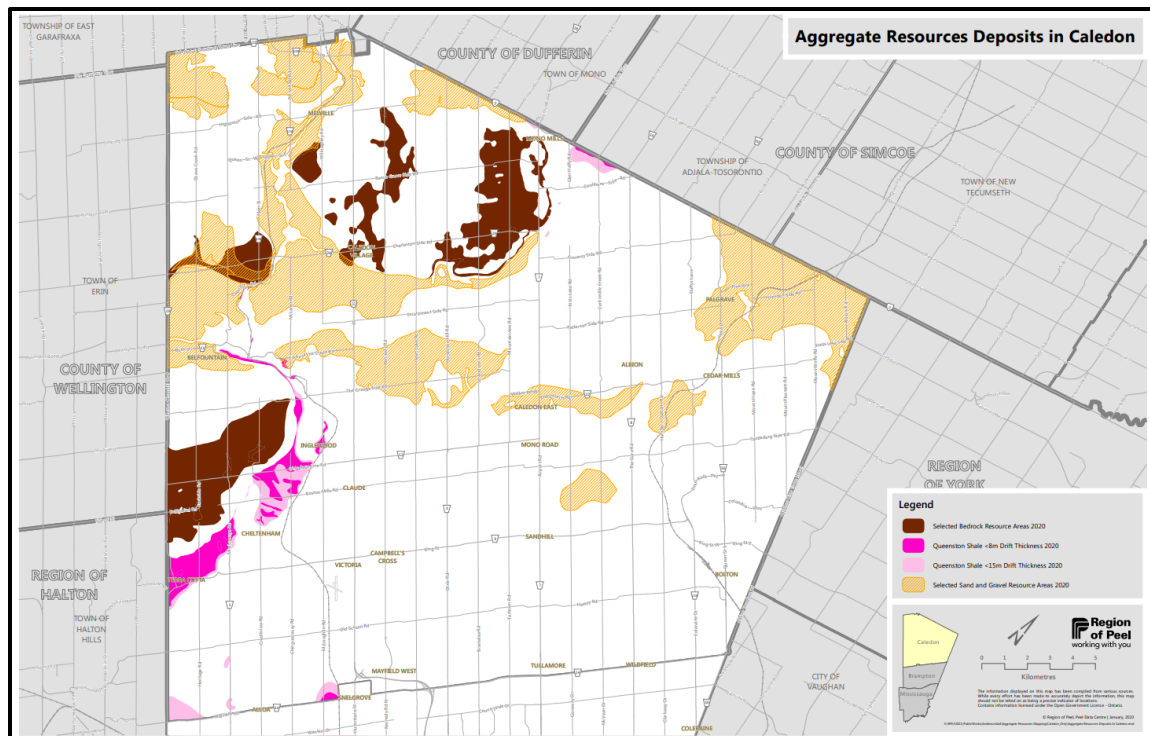


Figure 6: Aggregate Resources Deposits in the Town of Caledon

Constraint layers were then applied to the sand and gravel and bedrock areas separately. Finally, the mapped resource areas remaining, after constraints are excluded, were combined and overlaid to identify HPMARA for the purpose of updating the Region of Peel and Town of Caledon Official Plans.

4.3 Identifying Constraints to Aggregate Resource Extraction

The tables in Appendix I list policies that are relevant to identifying pre-emptive constraints where aggregates extraction is prohibited or unlikely to occur. The constraints to extraction, the corresponding policy, mapping criteria and associated data source are indicated as a basis for updating and confirming areas where provincially mapped sand and gravel resource areas (primary and secondary significance) and selected bedrock resource areas are to be excluded as HPMARA and CHPMARA.

Policy documents that contain extraction constraints include:

- Provincial Policy Statement, 2020
- A Place to Grow Plan, 2019
- Greenbelt Plan, 2017
- Oak Ridges Moraine Conservation Plan, 2017
- Niagara Escarpment Plan, 2017
- Region of Peel Official Plan
- Town of Caledon Official Plan

Constraints are listed in both provincial policies and plans and local municipal official plans. Legislation such as the *Aggregate Resources Act* and *Cemeteries Act* also contain policies which restrict the siting of new pits and quarries. Provincial land use plans, such as the Greenbelt Plan, contain policies which restrict the siting of new pits and quarries, mainly to protect the most environmentally significant and sensitive features and areas. These areas are depicted on the map found in Appendix II.

The restrictions found in official plans address local environmental, social and other community context considerations. The Region of Peel Official Plan restricts extraction in regionally significant environmental features and areas called “Core Areas of the Greenlands System”, which include Core Woodlands (greater than 30 hectares), designated settlement areas and registered plans of subdivision outside of a settlement area. The areas constrained through Regional Official Plan policies are shown on Appendix III.

Further to these constraints, local constraints were also identified and excluded from the updated Provincial resource area mapping. These constraints included groupings of five or more non-farm residential lots located along existing local or regional roadways; previously redesignated and rezoned lands permitting a non-aggregate extraction land use that would preclude/hinder access to the resource; and previously licenced, rehabilitated and surrendered lands. These areas are shown on Appendix IV.

Once the primary constraints were identified, constraint layers were combined and used to “clip out” or remove sand and gravel areas of primary and secondary significance, selected bedrock areas and selected Queenston shale areas (with overburden <15 m thickness) from the provincial mapping data. Once primary constraints were removed, a final analysis of the mapping was undertaken on a parcel-by-parcel basis to remove small, isolated resource deposit fragments generally considered to be unviable for resource extraction.

Appendix V provides a map of the extraction constraint areas in Caledon combining the provincial, regional and local constraint layers. Appendices VI to VIII provide maps showing the constrained areas of selected bedrock, sand and gravel, and Queenston shale in Caledon which were produced by overlaying the combined extraction constraints with the provincial resource mapping. Appendix IX shows the constraint areas overlayed with the combined provincial aggregate resource layers to provide an integrated illustration of where provincial resources are constrained/unconstrained in Caledon. Appendix X is the map showing the small, isolated fragments that were removed once primary constraints were removed from the base mapping. Appendix XI provides an illustration of the unconstrained provincial resources by type (bedrock, sand/gravel and shale) along with the isolated fragments that were removed.

The unconstrained provincial resources map was then overlayed onto the respective HPMARA and CHPMARA mapping in the Region of Peel and Town of Caledon Official Plans to identify areas to be added, areas to be deleted and existing areas to remain unchanged (see Appendices XII and XIII). In summary, the updated mapping of the HPMARA was undertaken as follows:

- Deposits of selected sand and gravel and bedrock resources were mapped using the most current Aggregate Resources of Ontario data for Peel and Caledon
- Deposits were identified and mapped as:
 - Significant sand and gravel resource areas (primary and secondary significance)
 - Selected bedrock resource areas (as identified by the OGS)
 - Selected Queenston shale (Queenston Shale in areas having less than 15 m overburden drift thickness)
- The aggregate resource deposits mapping was amended to exclude primary constraints.
- Small, isolated resource deposit fragments were then removed after primary constraints were excluded/removed from the resource deposit mapping (Appendices X and XI).

The map in Appendix XIV illustrates the final mapping of provincial resources by resource type on a Region/Town-wide basis after extraction constraint areas and isolated fragments were removed.

4.4 Exclusion of Buffers Adjacent to Settlement Areas

The exclusion of buffers adjacent to settlement areas as a constraint to remove mapped deposits of sand, gravel and bedrock resources as High Potential Mineral Aggregate Resource Areas was considered but not recommended to be applied in the constraint methodology. Although the Provincial Policy Statement provides two-way protection for major facilities and sensitive land uses and requires land use compatibility between major facilities and sensitive land uses to be addressed when considering proposed new land uses, including when buffers, setbacks or other measures are necessary to mitigate adverse effects, the relevant provincial guidelines, standards and procedures do not prescribe specific minimum buffer distances to be applied when mapping HPMARA for protection of resource deposits. With respect to proposed new mineral aggregate operations, buffers and setbacks are appropriately determined through the *Planning Act* and *Aggregate Resources Act* processes administered by municipalities and the Province. Provincial staff were consulted and advised that the application of a pre-determined buffer criterion from settlement areas would not be supported as a pre-emptive constraint for the purposes of updating the Region's HPMARA mapping.

4.5 Mapping of Shale Resource Areas in North West Brampton

North West Brampton is the area bounded by Mississauga Road to the east, Winston Churchill Boulevard to the west, Mayfield road to the north and the Credit River to the south. The HPMARA identification of shale resources, located in North West Brampton was recently updated in 2020 through Regional Official Plan Amendment 32 (ROPA 32). ROPA 32 amended the Regional Official Plan by updating the policies and mapping that apply to the North West Brampton Policy Area. This amendment was appealed to the Local Planning Appeal Tribunal by the Province of Ontario. In September 2020 the LPAT issued a decision approving ROPA 32, including modifications to the policies and mapping, as shown on Figure 7. These modifications and policies implemented the recommended mapping threshold for Queenston Shale resource areas which identify unconstrained shale resources with a drift thickness of up to 15m. The 15m drift thickness was used as the basis to update the HPMARA mapping in the City of Brampton.

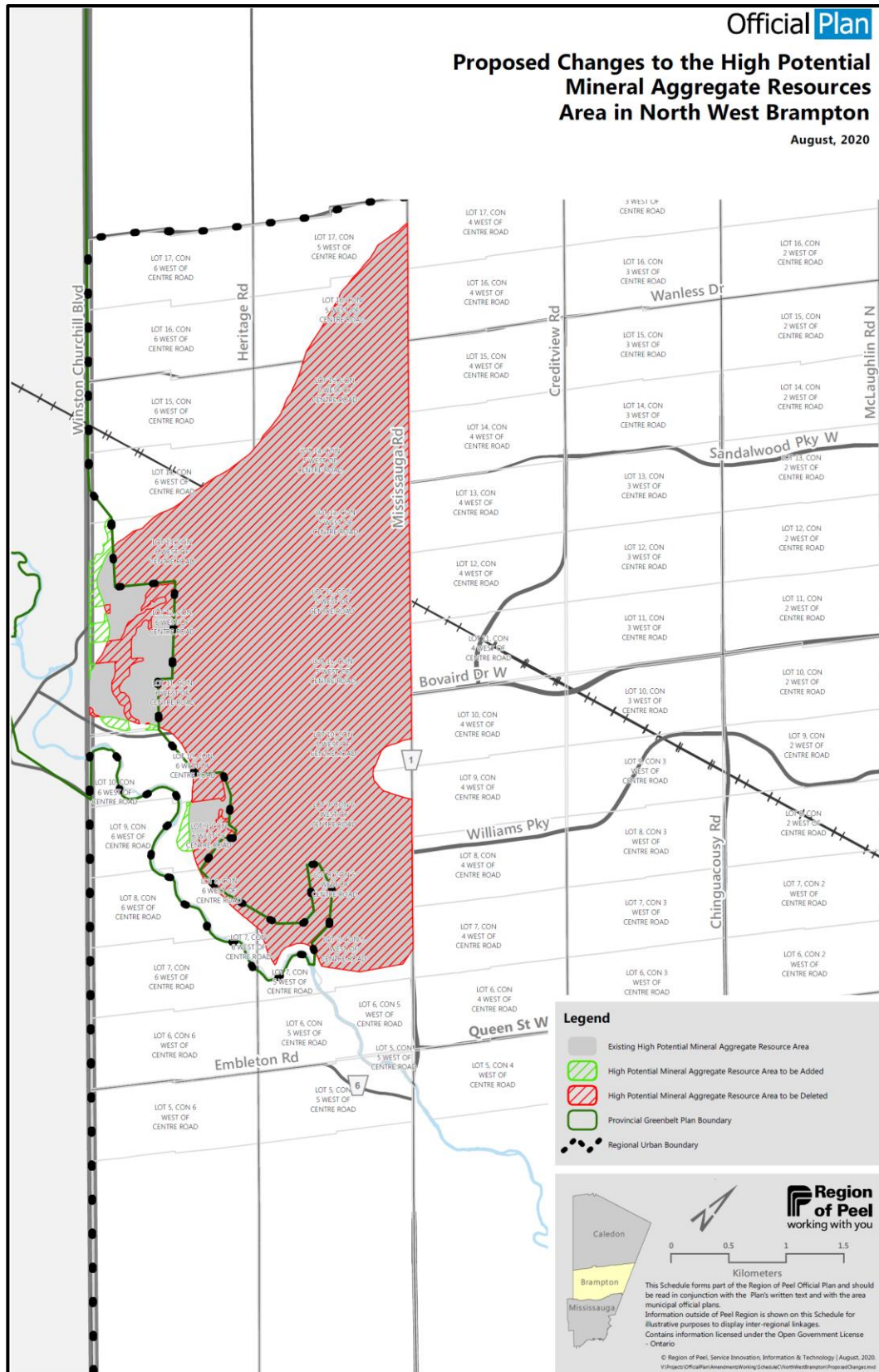


Figure 7: Additions and Deletions to HPMARA in North West Brampton.

5. Mapping Analysis

The Aggregate Resources of Ontario mapping which identifies selected bedrock in Peel Region in the Town of Caledon has changed from the 1996 version to the 2020 version. The most notable change can be found in the area south of Mono Mills where a new selected bedrock resource deposit has been identified. However, there are also locations where selected deposits of bedrock which were indicated in 1996 are no longer identified in 2020. A total of 4,309 ha of selected bedrock resource area and 11,295 ha of selected sand and gravel resource area are now identified in the Town of Caledon based on the updated information received from the Province. After taking into account constraints the total area of unconstrained selected bedrock resource deposits, selected sand and gravel resource deposits and shale resources are 1,922 ha, 5,016 ha and 422 ha respectively. These areas are recommended to be identified as HPMARA and CHPMARA in the Region of Peel and Town of Caledon Official Plans along with the 82 ha of shale deposits that were recently identified as HPMARA in Brampton through ROPA 32.

The proposed revisions to the HPMARA mapping in the Town of Caledon represent a decrease of approximately 830 ha compared to the current in-effect Regional Schedule D-2 which identifies a total HPMARA area of 7,995 ha. The resulting change to the mapping is not unexpected as the HPMARA had not undergone updating or refinement since it was originally mapped in 1998. When comparing to the current mapped CHPMARA in the Caledon Plan, the proposed CHPMARA revisions result in an increase of 1,004 ha. The revised areas of HPMARA and CHPMARA are attributed to changes to the Provincial OGS selected bedrock resource mapping and new policy and mapping of constraints affecting availability of the resource deposits for potential extraction. Changes to the HPMARA and CHPMARA mapping are different as the mapping of CHPMARA in the Town of Caledon Official had previously undergone a refinement through the CCRS Study that had not been reflected in the Regional Official Plan. The total amount of unconstrained resources proposed to be identified as HPMARA/CHPMARA (accounting for overlap) in Caledon is 7,165 ha.

Table 1 provides a summary of the total area of mapped resource deposits in the Town of Caledon.

Table 1: Summary of Resource Areas and Constraints in the Town of Caledon

Resource Area	Total Area Identified in Aggregate Resources of Ontario Mapping in Caledon	Area Subject to Constraint in Caledon	Area Identified as Isolated Fragment in Caledon	Unconstrained Resource Area in Caledon (Not Subject to Constraint or Identified as Isolated Fragment)
Selected Bedrock Area	4,309 ha	2,296.54 ha (53.2%)	90.41 ha (2.1%)	1,922.15 ha (44.6%)
Primary and Secondary Selected Sand and Gravel Area	11,295 ha	6,155.37 (54.5%)	123.70 ha (1.1%)	5,015.83 (44.4%)
Shale Resource Area*	1,487 ha	1,036.56 (69.7%)	28.22 ha (1.9%)	421.85 ha (28.4%)
Provincial Resource Area** (Combined Bedrock, Sand and Gravel, and Shale)	16,807 ha	9,409.13 ha (56.0%)	232.52 ha (1.4%)	7,164.70 ha (42.6%)

Resource Area	Total Area Identified in Aggregate Resources of Ontario Mapping in Caledon	Area Subject to Constraint in Caledon	Area Identified as Isolated Fragment in Caledon	Unconstrained Resource Area in Caledon (Not Subject to Constraint or Identified as Isolated Fragment)
accounting for overlap)				

Notes:

* Excludes 82 ha of Shale Resource Area previously mapped in North West Brampton

** Provincial Resource Area is less than total areas of selected bedrock, sand and gravel and shale as resource areas overlap

The Table 2 below provides a summary of the areas of HPMARA and CHPMARA aggregate resource land which is available for potential extraction.

Table 2: Summary of Changes to HPMARA and CHPMARA by Resource Type in the Town of Caledon

Aggregate Resource Type	Total Area of Current HPMARA	Total Area of Updated HPMARA	Total Areas of Current CHPMARA	Total Areas of Updated CHPMARA
Total Area	7,994.52 ha	7,164.70 ha*	6,160.63ha	7,164.70 ha
Selected Bedrock	N/A	1,922.15ha	1,275.56 ha	1,922.15ha
Sand and Gravel (primary and secondary)	N/A	5,015.83ha	4,885.07 ha	5,015.83ha
Queenston Shale (up to 15m)**	N/A	421.85ha	N/A	421.85ha

Notes:

*Combined sand and gravel, bedrock and shale HPMARA area with overlap.

**Queenston Shale areas are currently mapped and included in the HPMARA and CHPMARA identification without a separate classification.

***The total area of updated HPMARA in Peel including the mapped shale deposits recently identified in the City of Brampton is 7,247 ha.

The mapping approach has had regard for environmental, cultural and social planning considerations. In total, 9, 509 ha or 56% of the mineral aggregate resource deposits in Caledon as mapped by the Province are subject to one or more of the recommended pre-emptive constraint categories included in the mapping methodology, details of which are provided in Appendices I and V and Table 3 below. Small fragments and isolated areas where aggregates extraction is unlikely to be feasible have also been removed from the mapping.

The table below identifies the land area of each type of major constraint category. With respect to bedrock and sand and gravel deposits, 55% of sand and gravel and 53% of bedrock deposits in Caledon are subject to constraints. The details of each type of pre-emptive constraint are provided in the appendices.

Table 3: Summary of Constraint Areas

Primary Constraint	Within Selected Sand and Gravel Resource Area (ha)	Within Selected Bedrock Resource Area (ha)	% of Total Constraint Area
Provincially Significant Wetlands (Class 1 to 3) <i>(outside of the ORM and Greenbelt Plan Area)</i>	0.00	0.00	N/A
Provincially Significant Wetlands within the Greenbelt Plan Area	417.84	435.96	5%
Natural Core Areas on the Oak Ridges Moraine	904.70	0.00	5%
Key Natural Heritage Features and Key Hydrologic Features on the Oak Ridges Moraine	2,012.64	0.00	11%
Niagara Escarpment – Escarpment Natural Area	383.09	514.31	5%
Niagara Escarpment – Escarpment Protection Area	746.44	510.63	7%
Key Hydrologic Features and Key Natural Heritage Features Within the NEP Area	1,041.22	1,204.61	12%
Core Area of the Greenland System - Woodlands (>30 ha in size)	1,845.18	1,445.64	18%
Environmentally Sensitive or Significant Areas	641.39	1,167.56	10%
Provincial Life Science Areas of Natural and Scientific Interest	71.85	344.50	2%
Valley and Stream Corridors having Drainage Area of >125 h	592.94	8.73	3%
Settlement Areas	2,631.87	180.62	15%
New Urban Area 2051	0.04	0	0%
Registered Plans of Subdivision outside of settlement areas	185.00	129.58	2%
Residential Clusters	184.71	44.45	1%
Site Specific Planning Approvals for Non-aggregate Land Uses	2.41	216.58	1%
Previously Licensed, Rehabilitated, and Cancelled Lands	127.49	1.83	1%
Isolated Fragments	123.7	90.41	1%

The proposed changes to the HPMARA mapping on Schedule D-2 to the Regional Official plan showing HPMARA areas to be added and deleted are shown in Appendix XII.

The proposed changes to the CHPMARA mapping on Schedule L to the Town of Caledon Official Plan showing CHPMARA areas to be added and deleted are shown in Appendix XIII.

The combined changes as proposed to be mapped separately in the Region of Peel and Town of Caledon Official Plans as HPMARA (Selected Bedrock Areas), HPMARA (Primary Sand and Gravel), HPMARA (Secondary Sand and Gravel) and HPMARA (Queenston Shale) are shown on Appendix XIV.

6. Conclusion

The High Potential Mineral Aggregate Resource Areas Mapping Methodology report is intended to document the process and datasets that will be used to produce revised map schedules in the Region of Peel Official Plan (Schedule D-2 – HPMARA) and Town of Caledon Official Plan (Schedule L – CHPMARA). This document has provided the methodology used to complete this mapping update. The updated mapping will provide information to support the implementation of the aggregate resources policies in the Region of Peel and Town of Caledon Official Plans.

The aggregate resources policies in the Regional Official Plan will continue to be operative in conjunction with the policies in the Town of Caledon Official Plan. The Caledon High Potential Mineral Aggregate Resources Areas (CHPMARA) mapping in the Caledon Official Plan may further refine the HPMARA at the local level to reflect the Town's local environmental, cultural, social and other planning considerations.

It is an objective of the Region to identify high potential mineral aggregate resource areas in order to protect the resource for possible use and support the implementation of policies that allow as much of the resource as is realistically possible to be made available for extraction to supply resource needs. Schedule D-2 – High Potential Mineral Aggregate Resource Areas and Schedule L – Caledon High Potential Mineral Aggregate Resource Areas provide this identification. The schedules must reflect current information, particularly updated provincial studies and current local and provincial policy direction. The schedules are proposed to be updated to reflect the most recent provincial identification of mineral aggregate resource deposits in Peel Region which are not constrained by provincial or local policy restrictions.

7. References

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APPENDICES

Appendix I

Aggregate Resources Extraction Policy Constraints (Draft)

Table 1 – Constraints Identified in the Aggregate Resources Act

Constraint to Extraction	Corresponding Policy	Mapping Data Source and Criteria for Exclusion of HPMARA/CHPMARA
Provincial Legislation		
Aggregate Resources Act (Amended 2019)		
Quarry Operations' Distance from Niagara Escarpment Edge	72(1) Subject to subsection (2), despite the fact that a licence or permit has been issued, no person shall operate a quarry nearer to the natural edge of the Niagara escarpment than 200 metres measured horizontally AND (2) No person holding a licence for a quarry under the Pits and Quarries Control Act, being chapter 378 of the RSO, 1980, on January 1, 1990 and who is issued a licence for the quarry under this Act shall operate the quarry nearer to the natural edge of the Niagara escarpment than 90 metres measured horizontally	<p>Name of Data File: N/A</p> <ul style="list-style-type: none"> - the Aggregate Resources Act (ARA) and the Niagara Escarpment Plan do not provide a mapped boundary delineating the natural edge of the Niagara Escarpment - extraction is prohibited in accordance with the ARA - exclusion areas are mapped on a site specific basis during review of aggregate applications - this ARA criterion applies to quarries and would apply to refinements of selected bedrock resource areas if and when mapping data becomes available <p>Source of Information: Data is not currently available.</p>

Table 2 – Constraints Identified in the Provincial Policy Statement and Provincial Plans

Provincial Plans		
Provincial Policy Statement, 2020		
Provincially Significant Wetlands and Significant Coastal Wetlands (Class 1 to 3)	2.1.4 Development and site alteration shall not be permitted in: a) significant wetlands in Ecoregions 5E, 6E and 7E; and b) significant coastal wetlands.	Name of Data File: i) Wetlands - provincially significant wetlands and provincially significant coastal wetlands - criteria and mapping applies Region wide Source of Information: MNRF, Land Information Ontario, Ontario GeoHub Website
Habitat of Endangered and Threatened Species	2.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.	Not mapped and subject to site specific approval requirements
A Place to Grow Plan, 2019		
Significant Wetlands Habitat of Endangered and threatened species Significant Woodlands	Within the Natural Heritage System for the Growth Plan, 4.2.8.2 a) no new mineral aggregate operation and no new wayside pits and quarries, or any ancillary or accessory use thereto, will be permitted in the following key natural heritage features and key hydrologic features: i. significant wetlands; ii. habitat of endangered species and threatened species; and ii. significant woodlands unless the woodland is occupied by young plantation or early successional habitat, as defined by the Province; 4.2.8.2 c) An application requiring a new approval under the Aggregate Resources Act to expand an existing mineral aggregate operation may be permitted in the Natural Heritage System for the Growth Plan, including in key natural heritage features, key hydrologic features and in any associated vegetation protection zones, only if the related decision is consistent with the PPS and satisfies the rehabilitation requirements of this subsection.	Name of Data File: i) Provincially significant wetlands - Applies within Natural Heritage System for the Growth Plan Source of Information: MNRF, Ontario GeoHub Peel Data Centre

	<p>Although the policies preclude new mineral aggregate operations in the specified key natural heritage and key hydrologic features, the policies do not preclude the expansion of operations in key natural heritage features and key hydrologic features, including the habitat of endangered and threatened species and significant woodlands, except within significant wetlands in accordance with the PPS.</p> <p>On the basis of the above policies, it is recommended that provincially significant wetlands and their associated 30 m minimum vegetation protection zones be included as a pre-emptive constraint for the purposes of identifying HPMARA within the Natural Heritage System for the Growth Plan.</p>	
Greenbelt Plan 2017		
Key Natural Heritage Features and Key Hydrologic Features	<p>Section 4.3.2 (Non-Renewable Resource Policies)</p> <p>Within the Greenbelt Plan Natural Heritage System, 4.3.2.3. a) No new mineral aggregate operation and no new wayside pits and quarries, or any ancillary or accessory use thereto will be permitted in the following key natural heritage features and key hydrologic features:</p> <ul style="list-style-type: none"> i. Significant wetlands; ii. Habitat of endangered species and threatened species, and iii. Significant woodlands unless the woodland is occupied by young plantation or early successional habitat (as defined by the Ministry of Natural Resources and Forestry). In this case, the application must demonstrate that sections 4.3.2.6 (b), (c) and 4.3.2.7 (c) have been addressed and that they will be met by the operation <p>4.3.2.3 c) An application requiring a new approval under the Aggregate Resources Act to expand an existing mineral aggregate operation may be permitted in the Natural Heritage System, including in key natural heritage features, key hydrologic features and in any associated vegetation protection zones, only if the related decision is consistent with the PPS and satisfies the rehabilitation requirements of this Plan.</p> <p>Although the policies preclude new mineral aggregate operations in the specified key natural heritage and key hydrologic features, the policies do not preclude the expansion of operations in key natural heritage features</p>	<p>Name of Data File:</p> <p>i) Provincially significant wetlands</p> <p>- applies within the Greenbelt Plan Natural Heritage System</p> <p>Source of Information:</p> <p>MNRF, Ontario GeoHub</p> <p>Town of Caledon</p> <p>EXP Services Inc, 2017. Delineation of Greenbelt Plan Key Natural Heritage and Hydrologic Features in the Town of Caledon – Draft Technical Report, prepared for the Town of Caledon.</p>

	<p>and key hydrologic features, including the habitat of endangered and threatened species and significant woodlands, except within significant wetlands in accordance with the PPS.</p> <p>On the basis of the above policies, it is recommended that provincially significant wetlands and their associated 30 m minimum vegetation protection zones be included as a pre-emptive constraint for the purposes of identifying HPMARA within the Greenbelt Natural Heritage System overlay and Protected Countryside designation.</p>	
Oak Ridges Moraine Conservation Plan, 2017		
Natural Core Areas	Section 11 (3) No new aggregate resource extraction is permitted in Natural Core Areas	<p>Name of Data File: i) Oak Ridges Moraine Natural Core Areas</p> <p>Source of Information: MNR, Ontario GeoHub</p>
Key Natural Heritage Features	<p>Section 22 – Key Natural Heritage Features</p> <p>22.2 All development and site alteration with respect to land within a key natural heritage feature or the related minimum vegetation protection zone is prohibited, except the following:</p> <ol style="list-style-type: none"> 1. Forest, fish and wildlife management; 2. Conservation and flood or erosion control projects, but only if they have been demonstrated to be necessary in the public interest after all alternatives have been considered; 3. Development of infrastructure in accordance with the requirements set out in section 41; 4. Low-intensity recreational uses as described in section 37; 5. Any development and site alteration in Countryside Areas or Settlement Areas that is within the habitat of an endangered or threatened species, but only if <ol style="list-style-type: none"> i. it is not prohibited under the Endangered Species Act, 2007 and it complies with any requirements or restrictions under that Act, and ii. it is not within any other key natural heritage feature or the related minimum vegetation protection zone; 6. Agricultural uses other than uses associated with on-farm buildings and structures, but only with respect to land in the minimum vegetation protection zone related 	<p>Name of Data File: i) ORMCP Key Natural Heritage Features and their related minimum vegetation protection zones. KNHFs include:</p> <ul style="list-style-type: none"> - Wetlands (All MNR PSW, evaluated non-PSW and unevaluated wetlands) - Habitat of endangered and threatened species (not mapped) - Areas of natural and scientific interest (life science) - Significant valleylands - Significant woodlands (excluding

	to a key natural heritage feature and not in the key natural heritage feature itself	<p>woodlands occupied by young plantations or early successional habitat)</p> <ul style="list-style-type: none"> - Significant wildlife habitat (not mapped) - Sand barrens, savannahs and tallgrass prairies <p>- Applies within Oak Ridges Moraine Conservation Plan Area</p> <p>- KNHFs are mapped in accordance with the definitions and criteria of the ORMCP and ORMCP Technical Papers</p> <p>Source of Information: MNRF, Ontario GeoHub</p> <p>Town of Caledon</p>
Key Hydrologic Features (no longer hydrologically sensitive features) and Minimum Vegetation Protection Zone	<p>26.2 All development and site alteration with respect to land within a key hydrologic feature or the related minimum vegetation protection zone is prohibited, except the following:</p> <ol style="list-style-type: none"> 1. Forest, fish and wildlife management; 2. Conservation and flood or erosion control projects, but only if they are determined to be necessary in the public interest after all alternatives have been considered; 3. Development of infrastructure in accordance with the requirements set out in section 41; 4. Low-intensity recreational uses as described in section 37; 5. Agricultural uses other than uses associated with on-farm buildings and structures, but only with respect to land in the minimum vegetation protection zone related to a key hydrologic feature and not in the key hydrologic feature itself 	<p>Name of Data File:</p> <p>i) ORMCP Key hydrologic Features and their related minimum vegetation protection zones.</p> <p>KHFs include:</p> <ul style="list-style-type: none"> - Permanent and intermittent streams - Wetlands (All MNRF PSW, evaluated non-PSW and unevaluated wetlands) - Kettle lakes - Seepage areas and springs (not mapped) <p>- Applies within Oak Ridges Moraine</p>

		<p>Conservation Plan Area</p> <p>- KNHFs are mapped in accordance with the definitions and criteria of the ORMCP and ORMCP Technical Papers</p> <p>Source of Information: MNRF, Ontario GeoHub</p> <p>Town of Caledon (KNHF and KHF mapping data)</p> <p>TRCA (Kettle lakes)</p>
Niagara Escarpment Plan (2017)		
Escarpment Natural Area	Section 1.3.3 aggregate extraction not permitted in Escarpment Natural Areas	<p>Name of Data File: i) Niagara Escarpment Plan Escarpment Natural Area Designation</p> <p>Source of Information: MNRF, Ontario GeoHub</p>
Escarpment Protection Area	Section 1.4.3 aggregate extraction not permitted in Escarpment Protection Areas	<p>Name of Data File: Escarpment Protection Area Designation</p> <p>Source of Information: MNRF, Ontario GeoHub</p>
Key Hydrologic Features and Key Natural Heritage Features (Permanent and Intermittent Streams, Lakes, Seepage Areas and Springs, Wetlands)	<p>2.6.2. Development is not permitted in key hydrologic features with the exception of the following, which may be permitted subject to compliance with all other relevant policies of this Plan:</p> <p>a) accessory facilities to a single dwelling outside of a wetland on an existing lot of record, provided that the disturbance is minimal and where possible</p>	<p>Name of Data File: i) Permanent and intermittent streams (Regional Watercourse polyline and River polygon datasets) ii) Lakes (Regional Waterbodies)</p>

<p>and Significant Woodlands)</p>	<p>temporary; b) forest, fisheries and wildlife management to maintain or enhance the feature; c) conservation and flood or erosion control projects, after all alternatives have been considered; d) the Bruce Trail, and other trails, boardwalks and docks on parks and open space lands that are part of the Niagara Escarpment Parks and Open Space System; and, e) infrastructure, where the project has been deemed necessary to the public interest after all other alternatives have been considered.</p> <p>2.7.2. Development is not permitted in key hydrologic features with the exception of the following, which may be permitted subject to compliance with all other relevant policies of this Plan: a) accessory facilities to a single dwelling outside of a wetland on an existing lot of record, provided that the disturbance is minimal and where possible temporary; b) forest, fisheries and wildlife management to maintain or enhance the feature; c) conservation and flood or erosion control projects, after all alternatives have been considered; d) the Bruce Trail, and other trails, boardwalks and docks on parks and open space lands that are part of the Niagara Escarpment Parks and Open Space System; and, e) infrastructure, where the project has been deemed necessary to the public interest after all other alternatives have been considered.</p> <p>2.9 1. Notwithstanding Part 2.7.2 and subject to compliance with all other relevant policies of this Plan, mineral aggregate operations, wayside pits and quarries, and any accessory use and accessory facility thereto, may be permitted in key natural heritage features and any</p>	<p>including natural lakes >5 ha in size, excluding off-line artificial reservoirs, industrial ponds, sewage lagoons and stormwater management ponds) iii) Wetlands (All MNRF PSW, evaluated non-PSW and unevaluated wetlands) ii) Core Area Woodlands > 30 ha in size</p> <p>- In the absence of provincial criteria to identify significant woodlands in the Niagara Escarpment Plan Area, the Regional Core Areas of the Greenlands System criterion for Core Woodlands is recommended for the purpose of refining HPMARA/CHPMARA boundaries - Seepage areas and springs are not mapped</p> <p>Source of Information: MNRF, Ontario GeoHub Peel Data Centre</p>
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	vegetation protection zone associated therewith, except for: a) wetlands; b) significant woodlands, that are not young plantation or early successional habitat (as defined by MNRF)	
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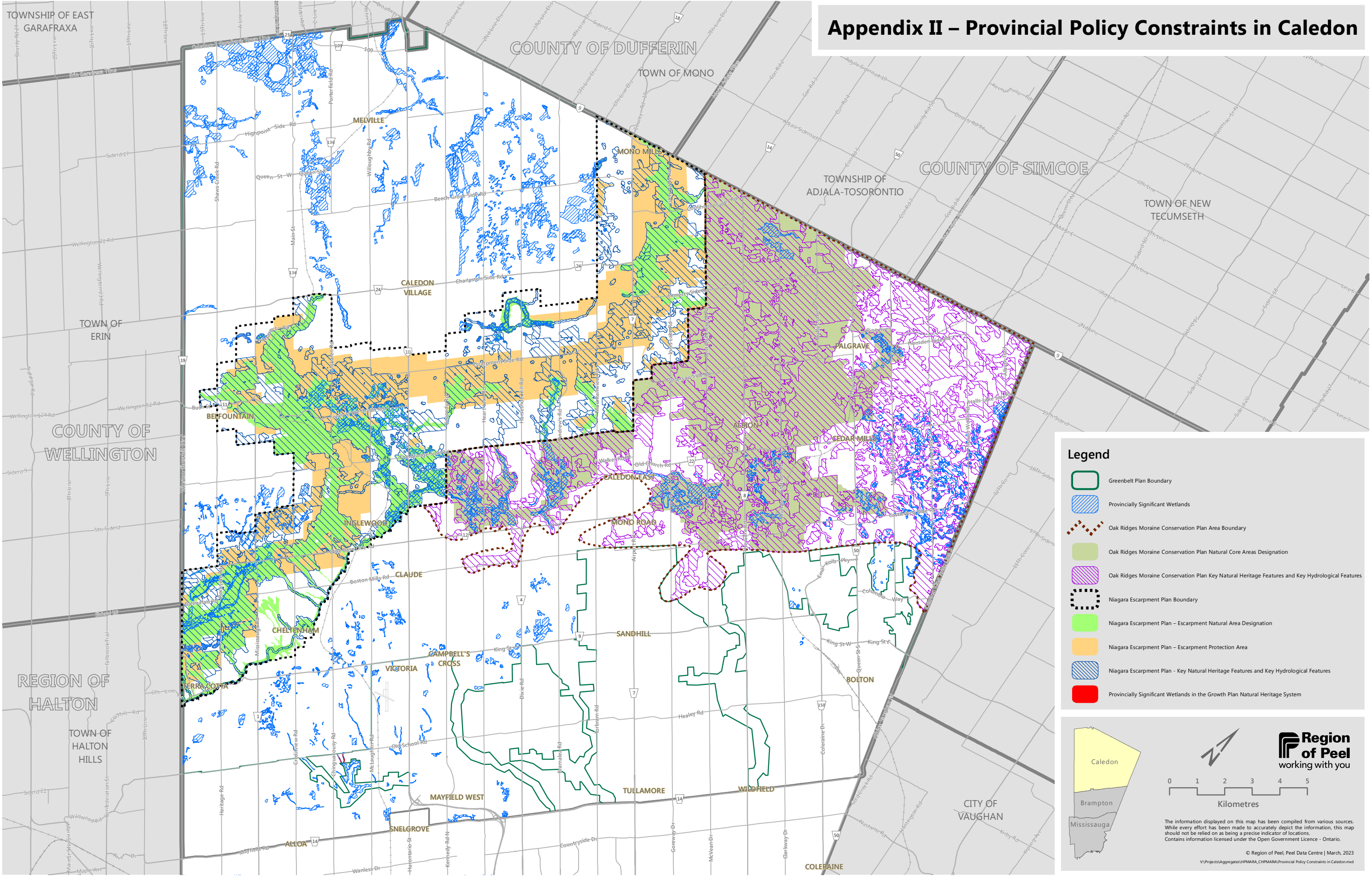
Table 3 – Constraints Identified in Regional and Local Official Plans

Local Official Plans and Guidance Materials		
Regional Official Plan – Core Areas of the Greenland System		
Areas where aggregates extraction is prohibited in the Region of Peel Official Plan.	<p>Policy 3.3.2.3 Prohibit new or expanded mineral aggregate sites and wayside pits and quarries or any ancillary or accessory uses thereto, in the following areas:</p> <ul style="list-style-type: none"> a) Core Areas of the Greenlands System b) Escarpment Protection Area of the Niagara Escarpment Plan c) Natural Core Areas as designated within the Oak Ridges Moraine Conservation Plan Area d) Key natural heritage features and hydrologically sensitive features and the associated minimum vegetation protection zones, as defined by the Oak Ridges Moraine Conservation Plan Area, except as permitted by the Oak Ridges Moraine Conservation Plan e) Significant woodlands within the Greenbelt Natural Heritage System unless the woodland is occupied by early successional habitat or young plantation. The prohibition within significant woodlands within the Greenbelt Natural Heritage System applies only to new mineral aggregate extraction sites and wayside pits and quarries and their ancillary or accessory uses. f) Approved settlement areas as designated in area municipal official plans in the Rural System, and registered plans of subdivision, unless permitted by the area municipality pursuant to policy 3.3.2.2 	<p>Name of Data File:</p> <ul style="list-style-type: none"> i) Core Areas of the Greenlands System as defined for aggregate extraction uses. Includes provincially significant wetlands, provincially significant coastal wetlands, Regional Core Area Woodlands > 30 ha in size, Environmentally Sensitive or Significant Areas, Provincial Life Science Areas of Natural and Scientific Interest, NEP Escarpment Natural Areas and Valley and Stream Corridors with Drainage Area > 125 Hectares. ii) Settlement areas including Rural Settlements, Villages and Hamlets) iii) Registered plans of subdivision outside settlement areas <p>- applies Region-wide</p> <p>Source of Information: Peel Data Centre</p>

Caledon Official Plan/CCRS Study – Environmental Constraints		
Core Fishery Resource Areas	<p>Core Fishery Resource Areas were included in the Caledon Community Resource Study (CCRS) as an exclusion for the purpose of mapping CHPMARA. Core Fishery Resource Areas are those areas which can potentially sustain healthy game fish, forage, or fish populations including bait fish as defined by the Ministry of Natural Resources. Analysis of available mapping at the time indicated that most of these areas are located within cold and warm water streams. It was felt that the likelihood of extraction occurring in such areas was minimal, and consequently, it was agreed by CAG members that they be excluded from HPMARA.</p> <p>It is recommended that the Core Fishery Resource Areas be retained as an exclusion for the purpose of refining HPMARA/CHPMARA provided that data is available and the areas are reviewed to confirm their ecological function as areas that sustain healthy fish populations.</p> <p>This mapping criterion is no longer required as any core fisheries habitat will be included in other constraint layers (e.g. ORMCP KNHFs and KHF, aquatic habitat/watercourses that are classified as Core Valley/Core Areas of the Greenlands System). The data for Core Fishery Resource Areas is no longer available.</p>	N/A – areas mapped subject to availability of mapping data
Woodland Core Areas in Caledon Official Plan, adjacent to Regional Core Area Woodlands	This mapping criterion is no longer applicable as the Core Areas of the Greenlands System Core Woodland boundaries were recently updated through ROPA 21B and Caledon OPA 226 and refined to include all adjacent joining woodland communities that were not separated by gaps or artificial breaks (e.g. road allowances).	N/A – mapping included as a Regional constraint
Designated Settlement Areas	<p>5.11.2.2.5 New or expanded mineral aggregate extraction is prohibited in the following areas:</p> <p>a) Designated Settlement Areas;</p> <p>Through the CCRS it was determined that all designated settlement areas and registered plans of subdivision outside settlements were viewed as constraints as the long term land use decision had already been made for a non-aggregate use.</p>	<p>Name of Data File:</p> <p>i) Settlement areas including Rural Settlements, Villages and Hamlets)</p> <p>- applies Region-wide</p> <p>Source of Information: Peel Data Centre</p>
Registered and Draft Plans of Subdivision	5.11.2.2.5 New or expanded mineral aggregate extraction	<p>Name of Data File:</p> <p>i) Registered Plans of</p>

outside settlement area	<p>is prohibited in the following areas:</p> <p>b) Registered and Draft Approved Plans of Subdivision, located outside designated Settlement Areas;</p>	<p>Subdivision</p> <p>Source of Information: Peel Data Centre</p>
Residential Clusters	<p>Residential Clusters were included in the CCRS as an exclusion for the purpose of mapping CHPMARA. The intent was to minimize both existing and future land use conflicts and provide a balance between the identification of aggregate resource for protection and the presence of existing rural non-farm residential uses that would potentially be constraints to extraction.</p> <p>Residential Clusters were defined as a grouping of five or more small non-farm residential lots (generally less than 2 ha in size) located along existing local or regional roadways.</p>	<p>Source of Information: Peel Data Centre</p>
Areas of Class 4 to 7 wetlands outside licences found within the HPMARA area not also associated with any other constraints	<p>This exclusion is not defined in the Region of Peel or Town of Caledon Official Plans and in some cases has been superseded by more recent policies in the Provincial Greenbelt Plans that have introduced more restrictive policy for key natural heritage and key hydrologic features generally including the Oak Ridges Moraine Conservation Plan and Niagara Escarpment Plan that now prohibit aggregate extraction in all wetlands in their respective plan areas. It is recommended that the exclusion be retained where applicable provincial plan policies prohibit development in all wetlands.</p>	<p>N/A – see wetland exclusion criteria for the ORMCP and NEP above</p>
Small Isolated Fragments	<p>Small isolated fragments generally less than 5 hectares in size were included in the CCRS as an exclusion for the purpose of mapping CHPMARA. Small isolated fragments are created when deposits are orphaned after constraints are applied to remove HPMARA/CHPMARA or are created as a result of HPMARA/CHPMARA deposits overlapping opened road allowances severing off small, isolated or narrow fragments on one side of the road allowance. The previous criterion “small isolated fragments” from the CCRS study was used to update the HPMARA and CHPMARA mapping with modifications as indicated below.</p> <p>Fragmented deposits have been excluded from the updated HPMARA and CHPMARA mapping based on the following criteria:</p> <p>i) small in size (generally less than 5 ha in size); ii) isolated from other areas;</p>	<p>Data Source: Peel Data Centre</p>

	<p>iii) long and narrow deposits; and</p> <p>iv) deposits straddling existing opened road allowances and/or rail rights-of-way.</p> <p>The following additional criteria, described in the previous CCRS study, were not included as criteria as all small fragments (less than 5 ha) meeting the above criteria were excluded regardless of their proximity to settlement areas, residential clusters or groupings of non-farm rural residential units, or required setback constraints.</p> <p>i) Close proximity or adjacent to settlement area, residential clusters, or grouping of non-farm rural residential units; and</p> <p>ii) Not viable to be extracted given setback requirements of 15 to 30 metres.</p>	
Other Constraints		
Cemeteries and other Human Burial Sites	<p>5.11.2.2.5 New or expanded mineral aggregate extraction is prohibited in the following areas:</p> <p>g) Cemeteries and other human burial sites;</p> <p>Extraction prohibited in accordance with the <i>Cemeteries Act</i>. Although aggregate extraction is not permitted within cemeteries and other human burial sites, they were not removed from the map. In the case of aboriginal burial sites, publication of such information is not permitted.</p>	Data Source: Not applicable
Previously Licensed, Rehabilitated, and Cancelled Lands	5.11.2.1.8 Lands which have been previously licenced, which have been substantially mined out, which have been rehabilitated, and for which the license has been surrendered shall be excluded from the CHPMARA through an Amendment to Schedule L	Data Source: MNRF – pits and quarries online data is used to produced a regional dataset which shows the location of previous licences sites
Site Specific Planning Approvals	Previously redesignated and rezoned lands permitting a non-aggregate extraction land use that would preclude/hinder access to the resource.	Data Source: Town of Caledon Official Plan and Zoning Bylaw



Appendix II – Provincial Policy Constraints in Caledon

Greenbelt Plan Boundary

Provincially Significant Wetlands

Oak Ridges Moraine Conservation Plan Area Boundary

Oak Ridges Moraine Conservation Plan Natural Core Areas Designation

Oak Ridges Moraine Conservation Plan Key Natural Heritage Features and Key Hydrological Features

Niagara Escarpment Plan Boundary

Niagara Escarpment Plan – Escarpment Natural Area Designation

Niagara Escarpment Plan – Escarpment Protection Area

Niagara Escarpment Plan - Key Natural Heritage Features and Key Hydrological Features

Provincially Significant Wetlands in the Growth Plan Natural Heritage System

Caledon

Brampton

Mississauga

012345

Kilometres

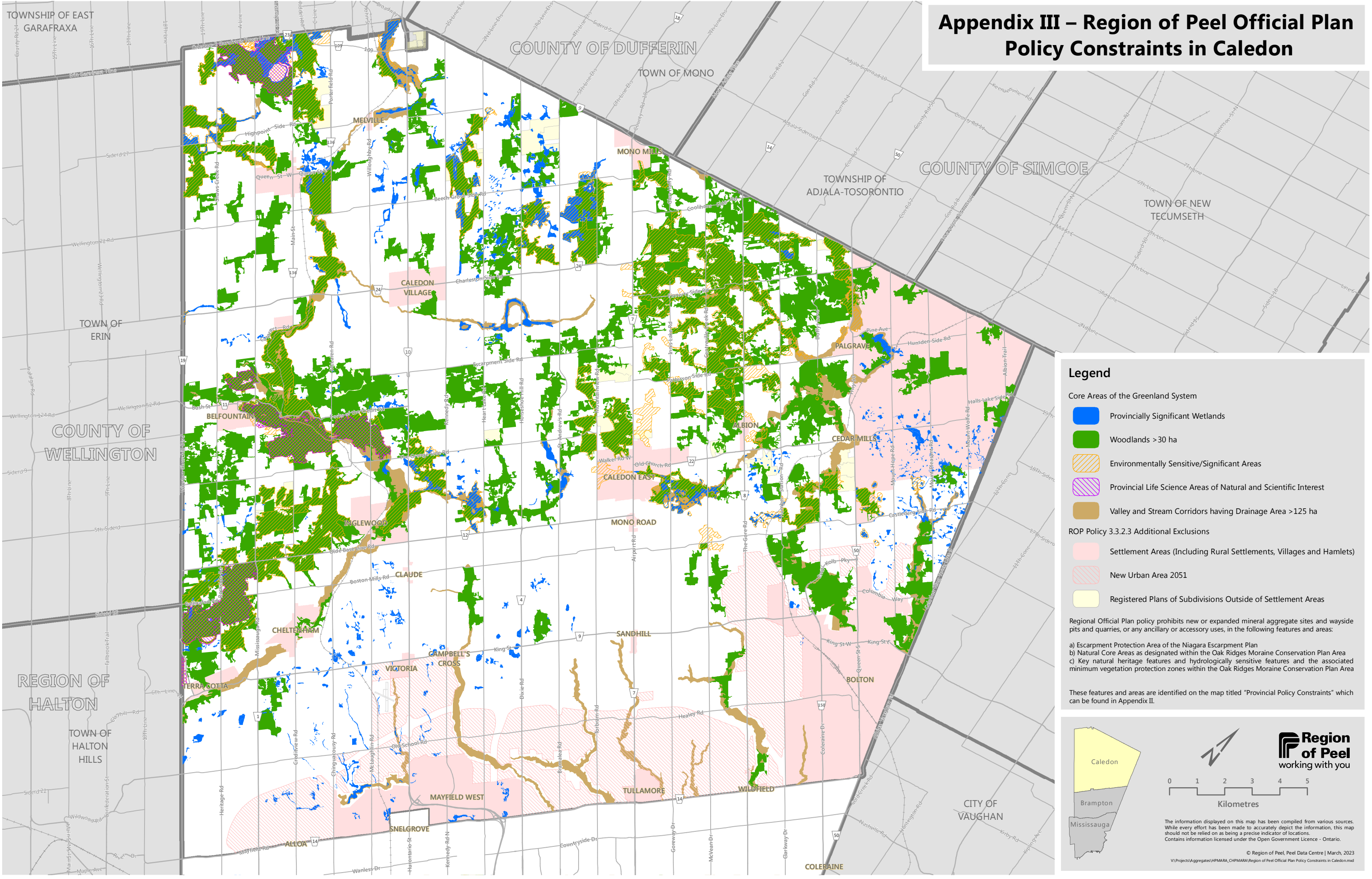
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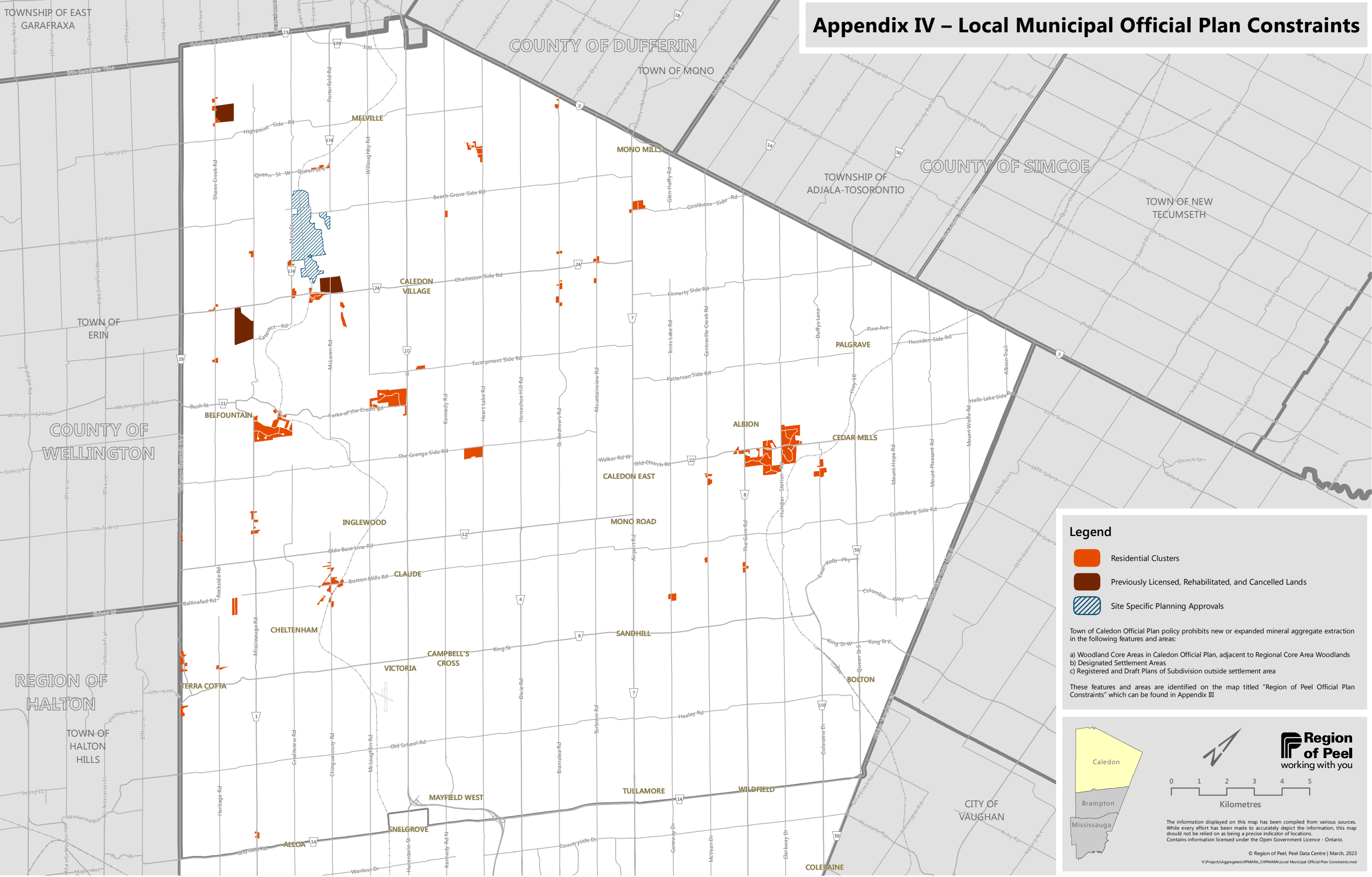
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Region of Peel

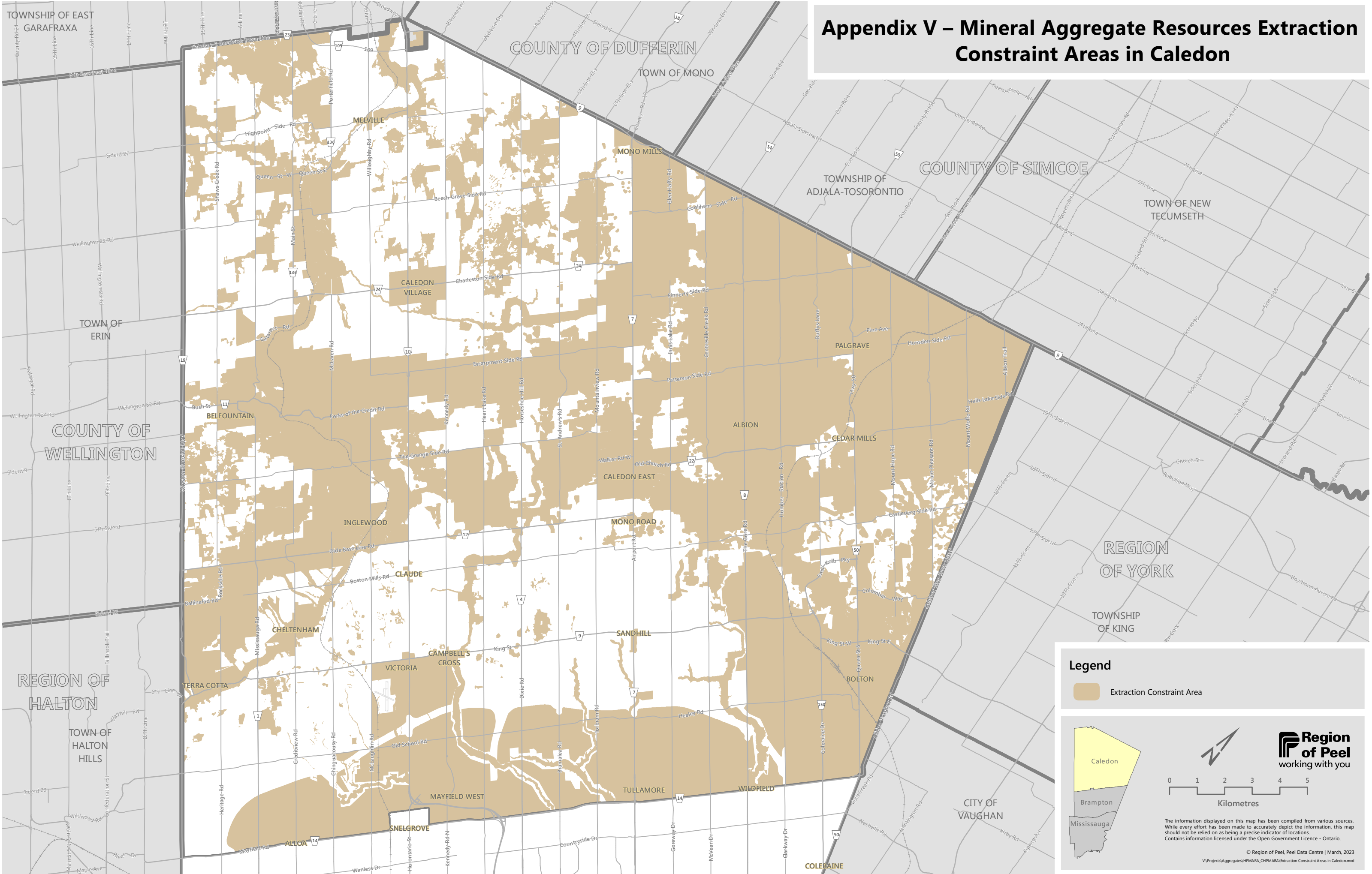
working with you



Appendix IV – Local Municipal Official Plan Constraints



Appendix V – Mineral Aggregate Resources Extraction Constraint Areas in Caledon



Legend

Extraction Constraint Area

Caledon

Brampton

Mississauga

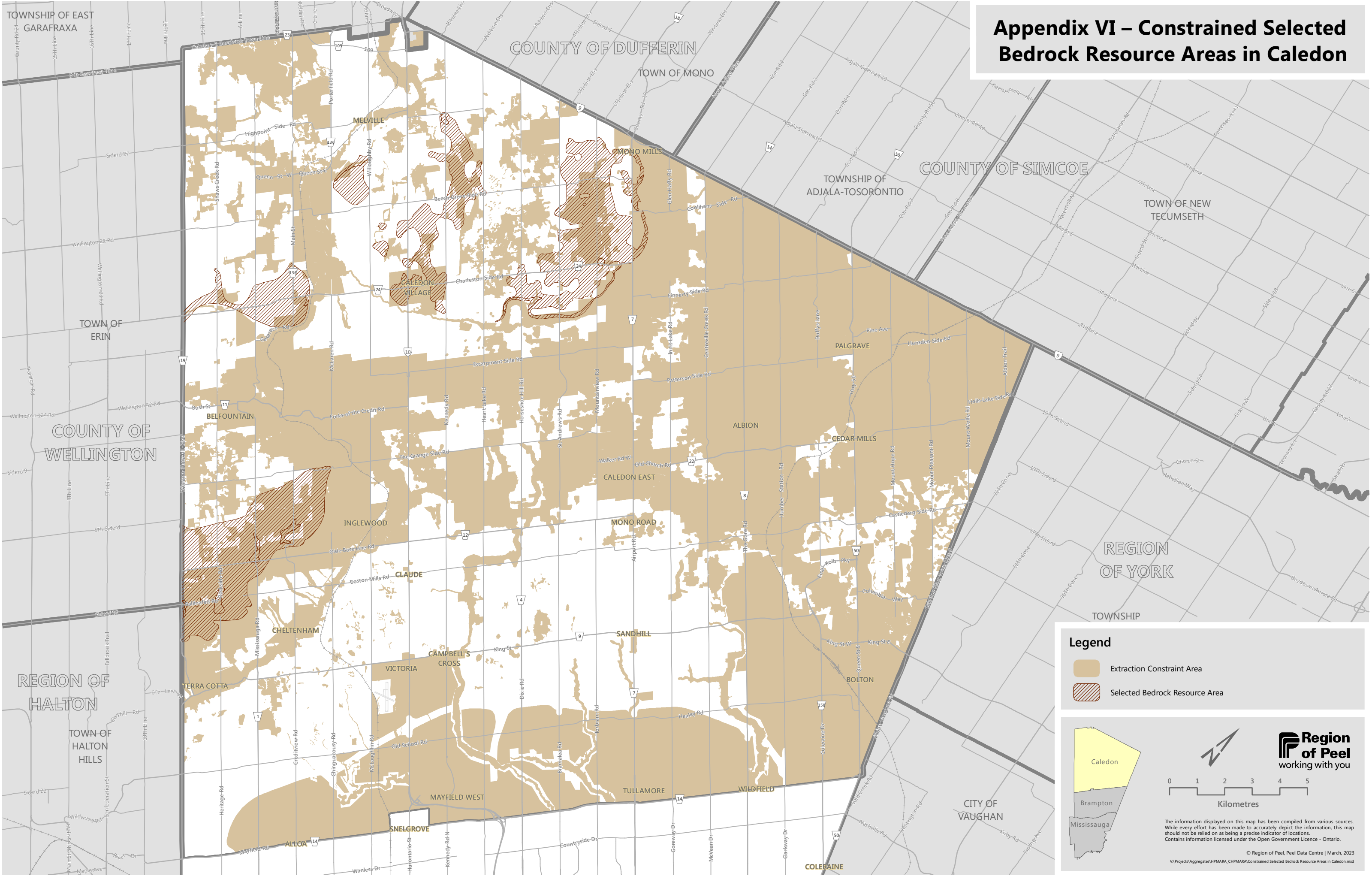
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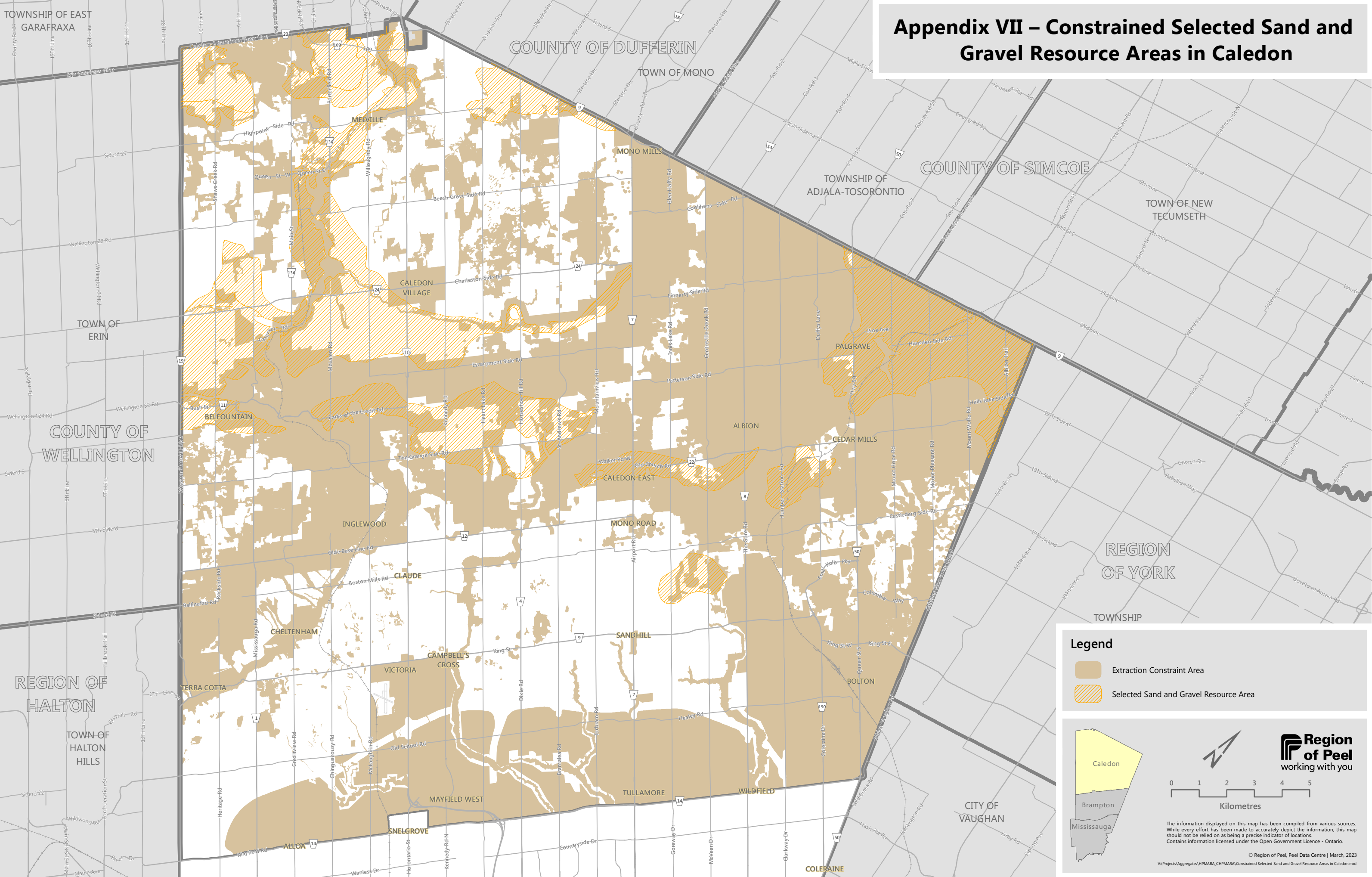
Region of Peel
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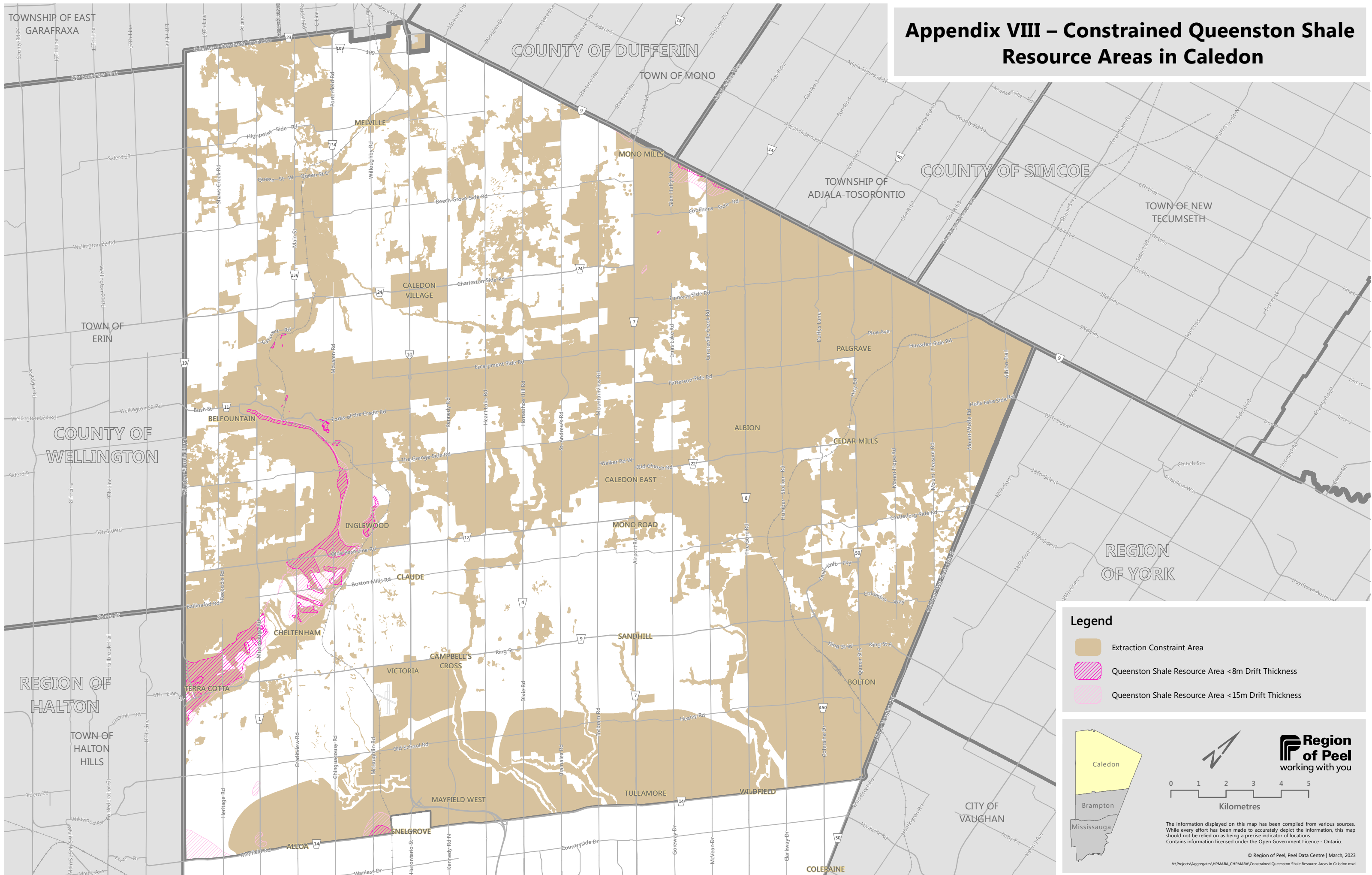
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V:\Projects\Aggregates\HPMARA_CHPMARA\Extraction Constraint Areas in Caledon.mxd



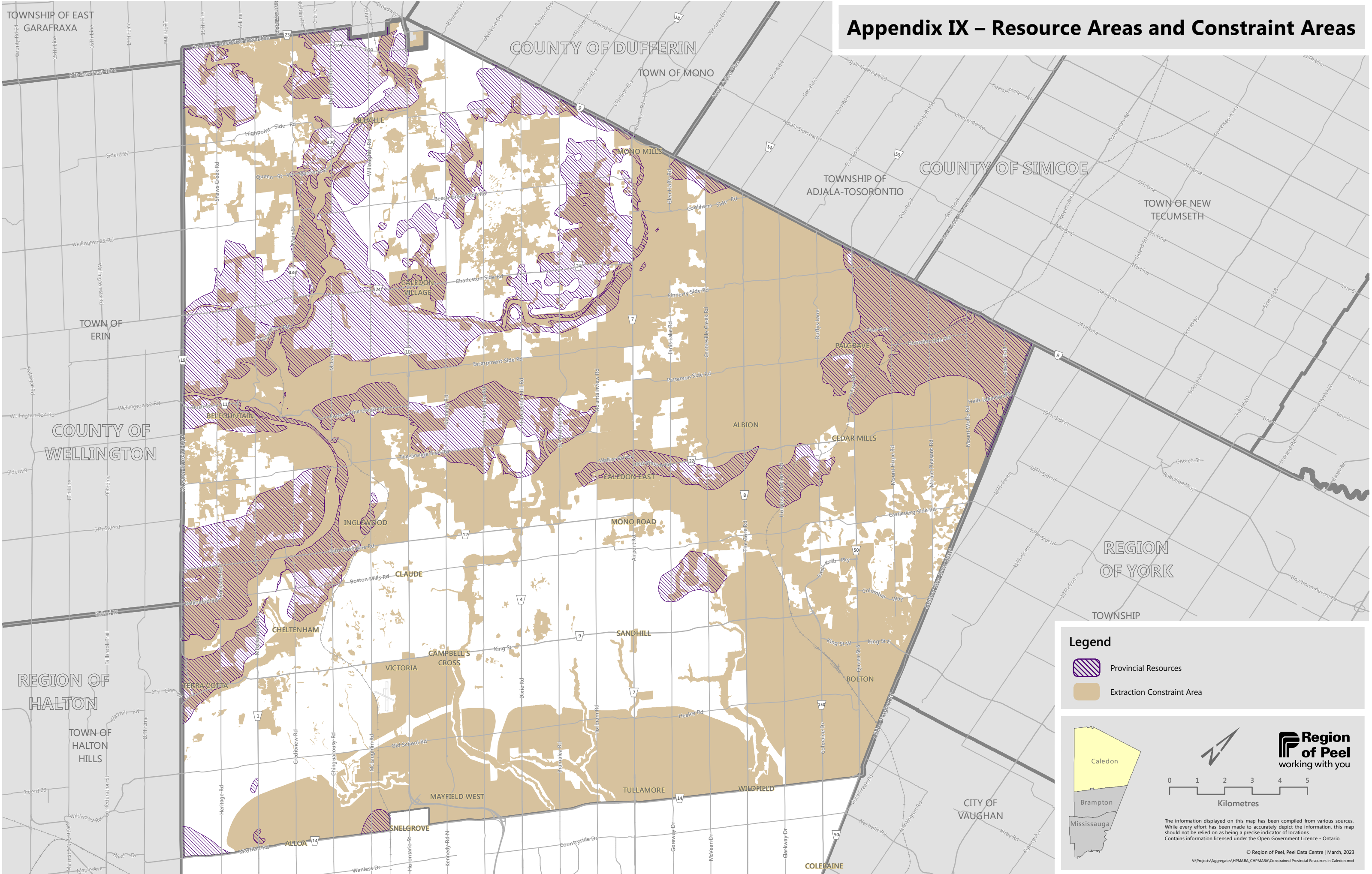
Appendix VII – Constrained Selected Sand and Gravel Resource Areas in Caledon





Appendix VIII – Constrained Queenston Shale Resource Areas in Caledon

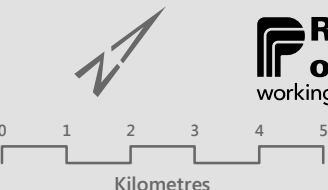


Appendix IX – Resource Areas and Constraint Areas



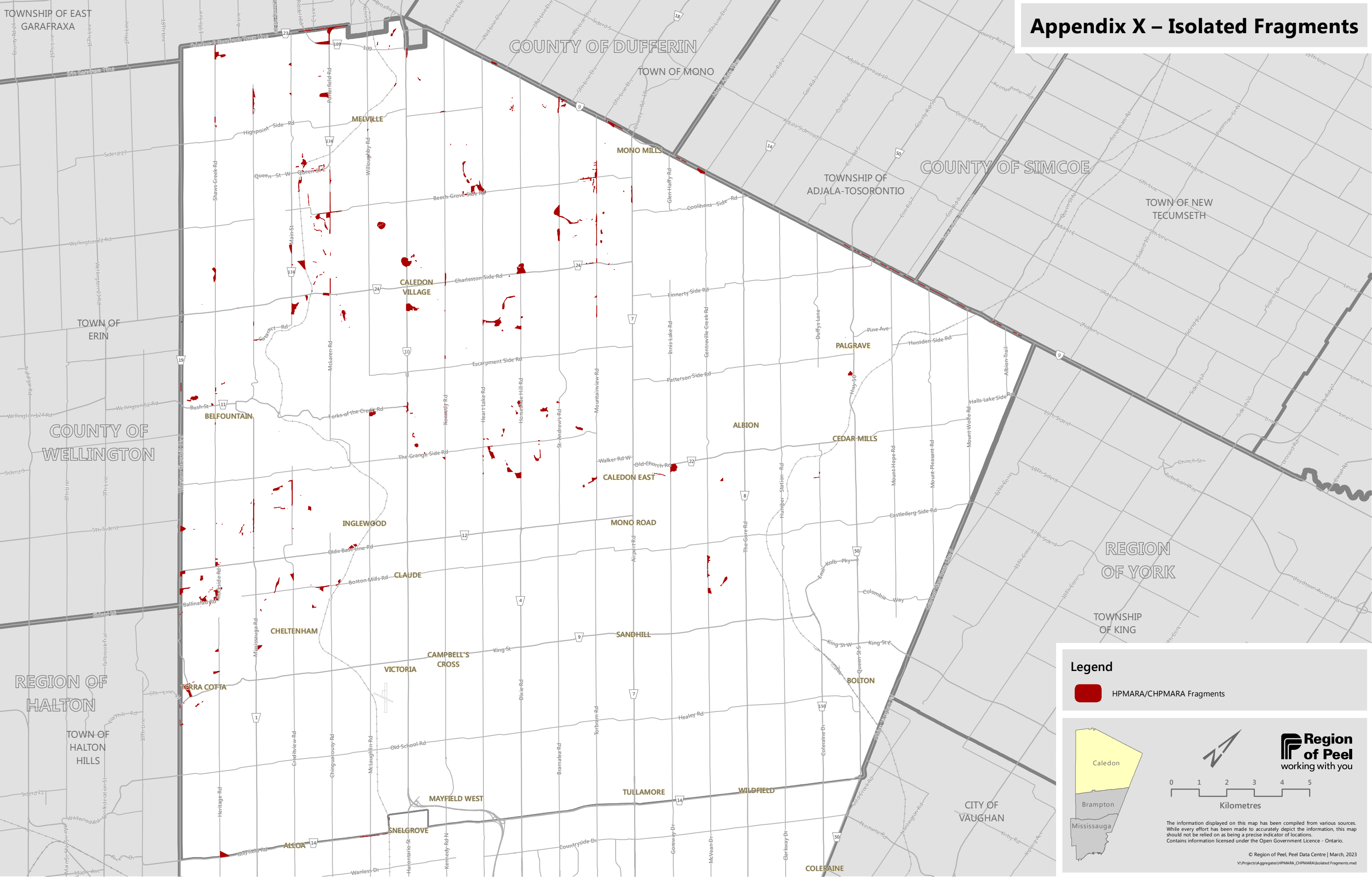
Legend

-  Provincial Resources
-  Extraction Constraint Area



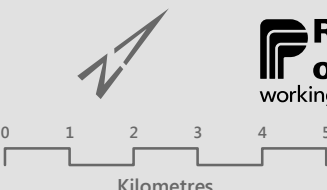
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Appendix X – Isolated Fragments

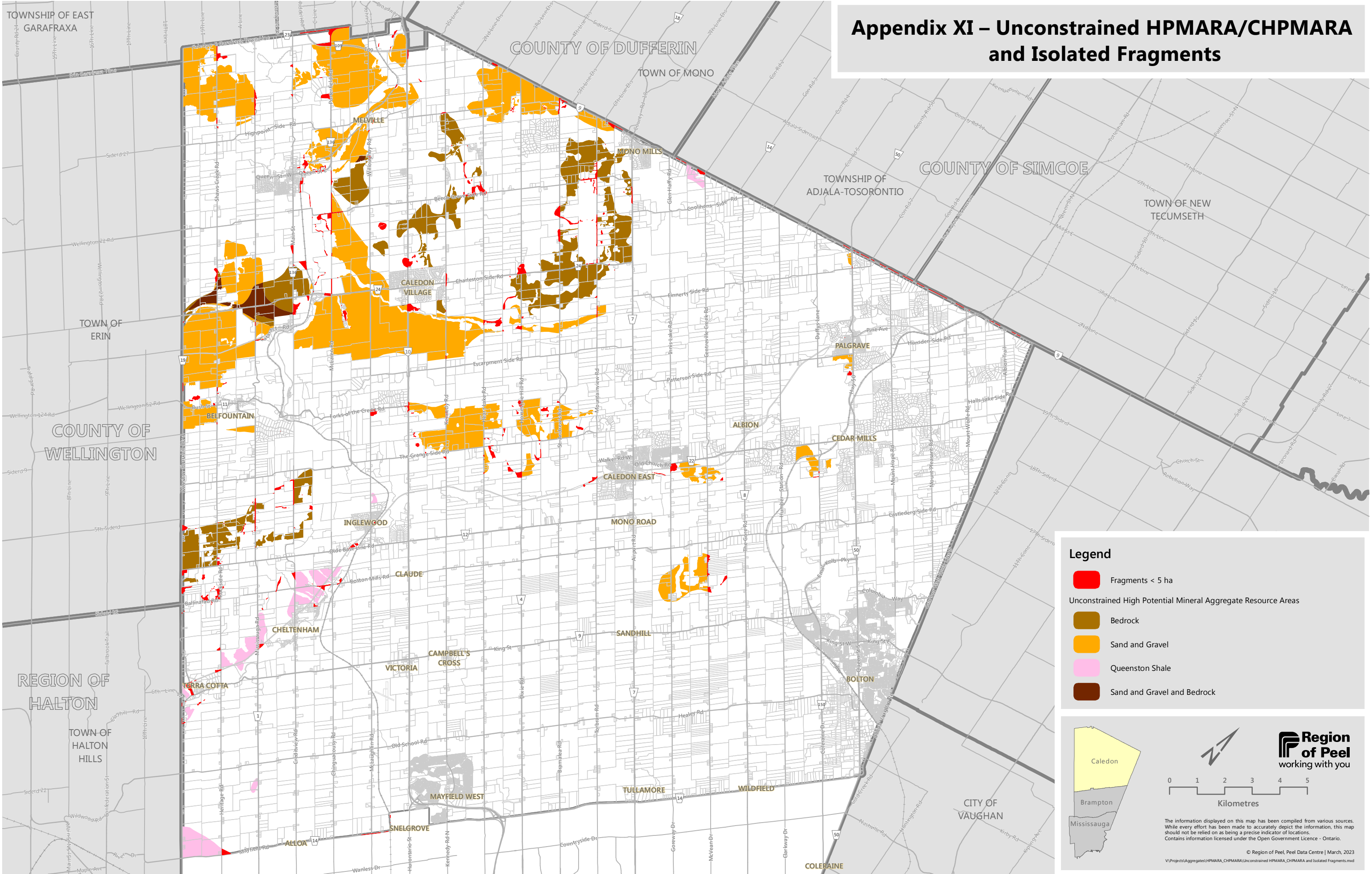


Legend

HPMARA/CHPMARA Fragments





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Appendix XI – Unconstrained HPMARA/CHPMARA and Isolated Fragments

Legend

- Fragments < 5 ha
- Unconstrained High Potential Mineral Aggregate Resource Areas
 - Bedrock
 - Sand and Gravel
 - Queenston Shale
 - Sand and Gravel and Bedrock



Region of Peel
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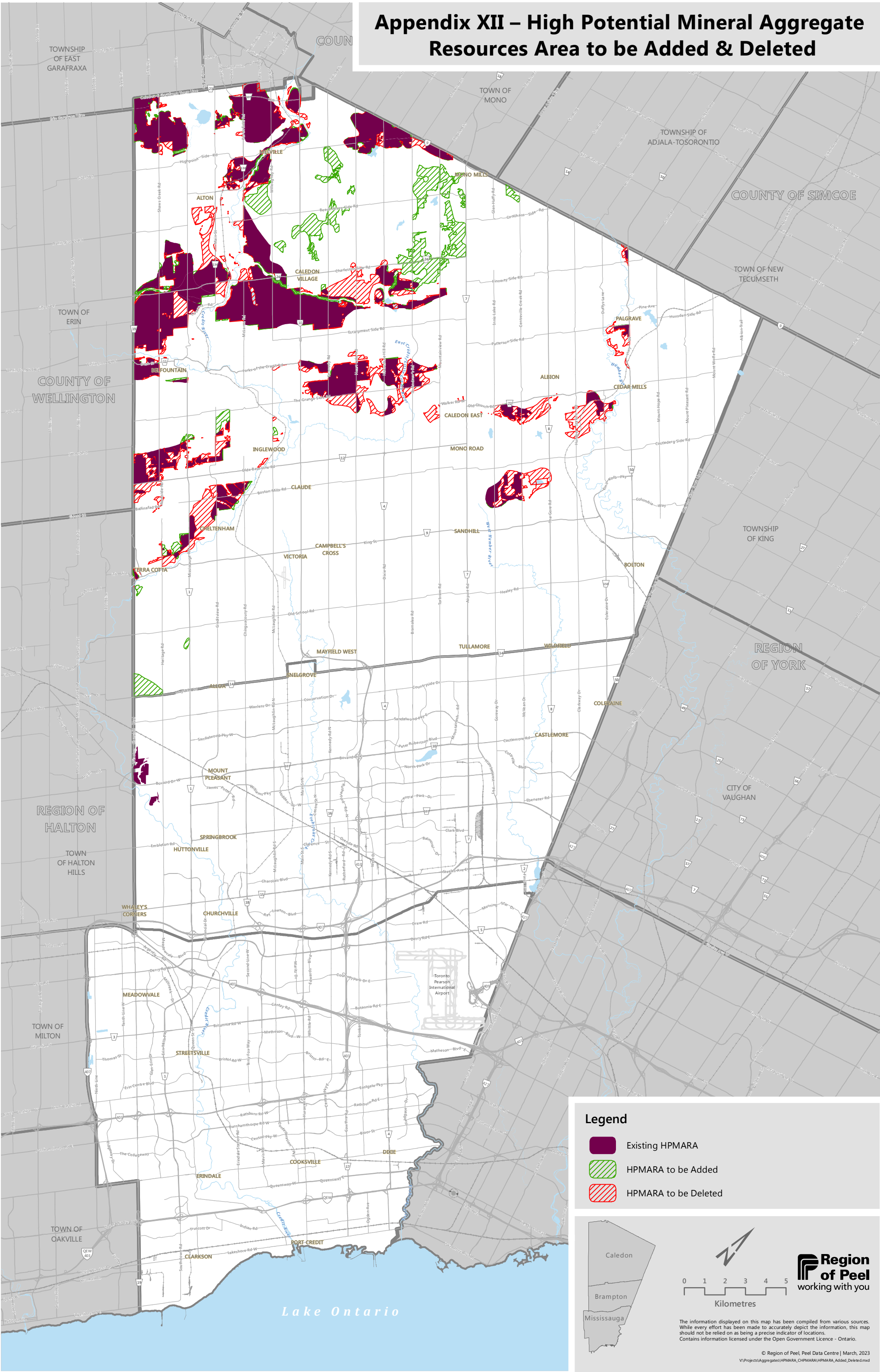
012345

Kilometres

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Appendix XII – High Potential Mineral Aggregate Resources Area to be Added & Deleted



Legend

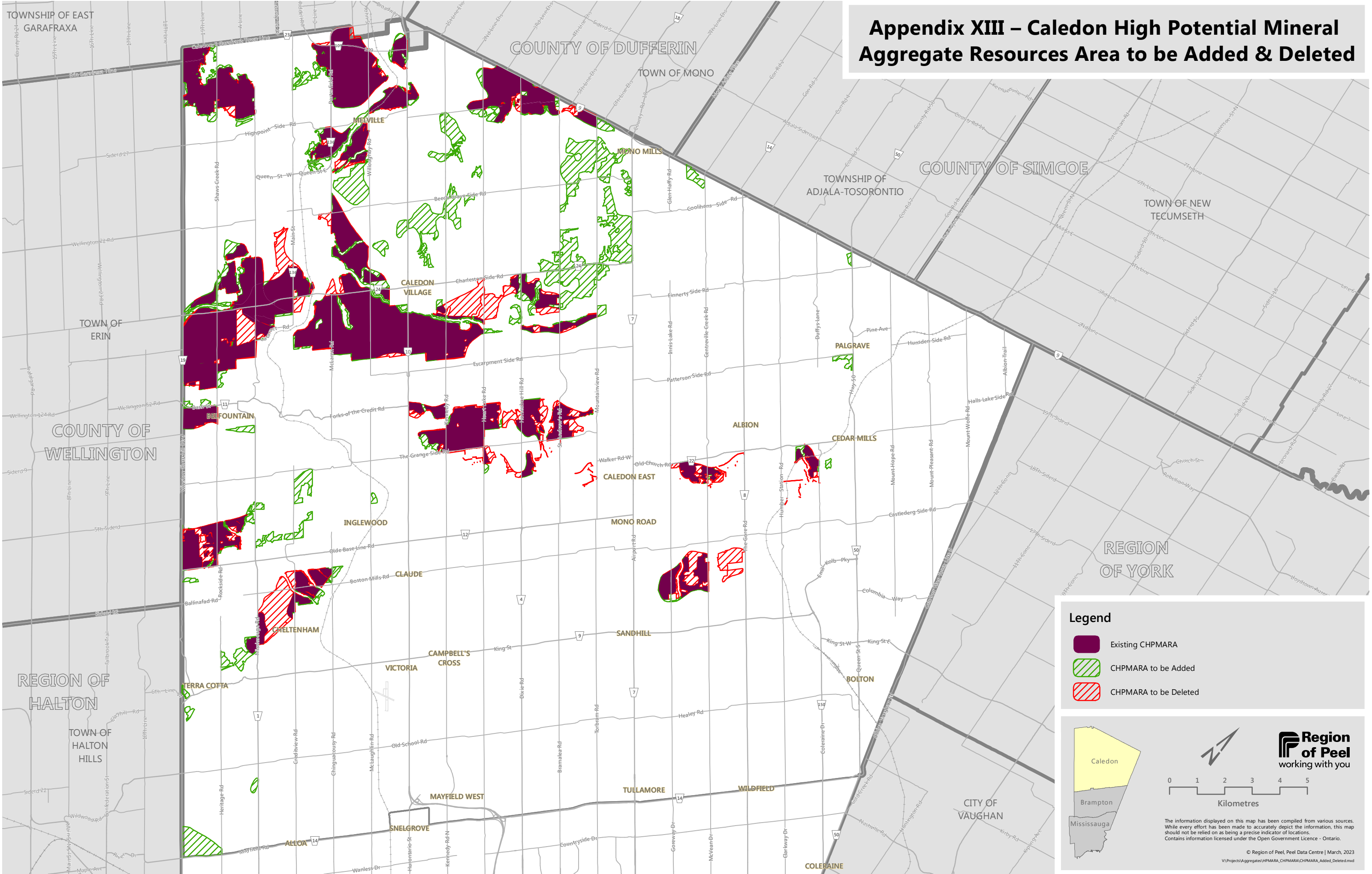
- Existing HPMARA
- HPMARA to be Added
- HPMARA to be Deleted



A horizontal number line with tick marks at 0, 1, 2, 3, and 4. The word "Kilometres" is written below the line.



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Appendix XIV – High Potential Mineral Aggregate Resource Areas in Peel

