

407 East Individual Environmental Assessment (IEA) and Preliminary Design Study

Archaeology Existing Conditions Technical Report

August 2009

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1. Introduction

This report provides an overview of the existing archaeological conditions associated with the 407 East Environmental Assessment (EA) analysis area as defined in the EA Terms of Reference. A series of overviews are proposed to identify existing and future social, economic, cultural and natural environment conditions within the EA analysis area for use in generating constraints mapping, assessing alternatives to the undertaking, and refining the EA analysis area. In total, nine overviews are proposed:

1. Socio-Economic (Provincial policy/Official Plan, industrial/commercial/residential, economic base/trade corridors, tourism, and community and recreation)
2. Agriculture
3. Natural Environment (vegetation, wildlife, fish and aquatic habitat, and hydrogeology)
4. Drainage
5. Cultural Heritage
6. Archaeology
7. Air
8. Noise
9. Waste

The results from undertaking each of these overviews will be documented in a stand-alone technical report during the EA. In each case, a draft will be prepared and circulated for comment. Upon finalization, the contents will be summarized along with the other technical reports under one cover as an “Existing and Future Conditions Report” and made available for agencies/public review. The final Existing Conditions Report will form a chapter of the EA Report with each of the stand-alone technical reports becoming appendices to the EA Report.

1.1 Archaeology Study Team

The Archaeology study team consisted of Archaeological Services Inc. (ASI) staff. The actual individuals and their specific roles are provided as follows:

- ***Robert H. Pihl, ASI Project Director for the Archaeological Assessment***
- ***Michael Tetreau, Archaeological Research and Report Preparation***
- ***Brian K. Narhi, Historical Research***

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2. 407 East EA Analysis Area

As part of the approved ToR, an initial 407 East EA analysis area was proposed as within Durham Region based on a preliminary identification of transportation problems and opportunities. For the purposes of providing an overview of existing conditions, the boundaries of the initial 407 East analysis area have been defined as Highway 35/115 to the east, Lake Ontario to the south, Brock Road to the west, and approximately to the CPR Line to the north (see **Figure 1**).

As mentioned, during the EA, the initial analysis area will be reviewed and refined to correspond with the recommended alternative(s) to the undertaking in consultation with agencies/public. The refined analysis area will be used for developing the alternatives methods and undertaking and determining potential effects on the environment.

3. Methodology

3.1 Available Secondary Source Information Collection and Review

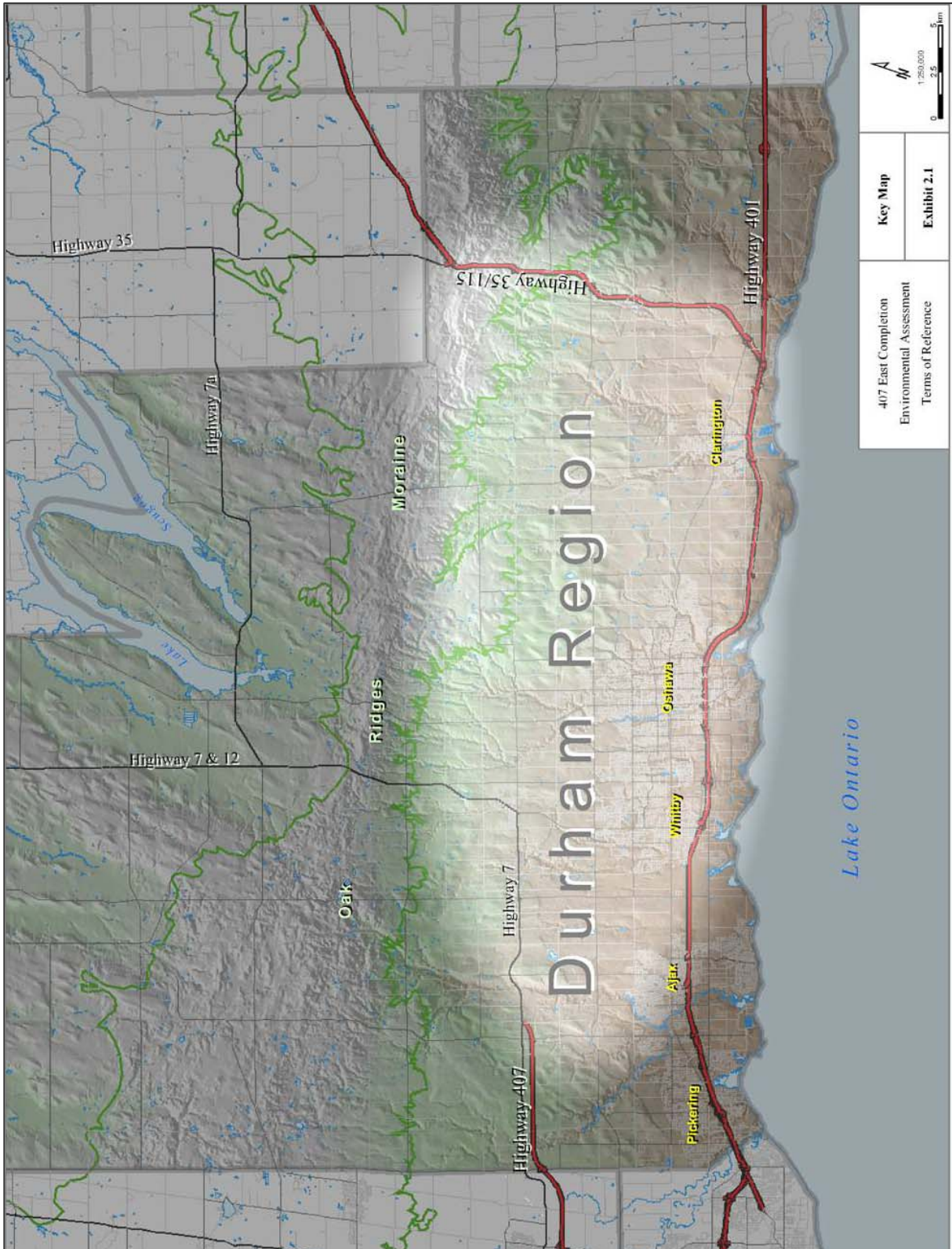
The approved ToR included a list of known available secondary sources of information (see Supporting Document C), which have been collected and reviewed as part of determining existing archaeological conditions. These sources of information are described as follows:

- ***Ontario Archaeological Sites Database (OASD)*** – housed at the Ministry of Culture (MCL), this database is the repository for information on archaeological sites registered in the Province of Ontario;
- ***Ministry of Transportation (MTO) Files*** – the archaeological office at MTO has been contacted with a request to provide the study team with any relevant archaeological site data that would not now be contained in the OASD (to date, no such data has been identified);
- ***Literature Review and the Files of ASI*** – a review of archaeological documentation of particular importance with respect to the analysis area is ongoing and results will be incorporated into the study as appropriate;
- ***Historical Documents and Mapping*** – a summary history of the analysis area has been compiled and a review of relevant historical mapping has been carried out;

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Figure 1. Analysis Area



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- *Physiographic Documentation and Mapping* – a review of the physiography of the analysis area, based on relevant documents and mapping, has been carried out, and GIS data is being imported or generated and used to develop an archaeological potential model.

3.2 Process Undertaken

Archaeological Services Inc. (ASI) was contracted to conduct a Stage 1 archaeological assessment for the 407 East EA, as an integral part of the EA and in accordance with the EA Terms of Reference (ToR). Stage 1 archaeological assessment is being undertaken in several phases, corresponding with the phases of the EA leading to, and including, concept design, i.e., Stage 1 archaeological assessment is being undertaken to consider archaeological resource management concerns during the characterization of the project environment, during route selection and evaluation, and during concept design. This existing conditions report has been prepared to provide an overview of archaeological resources within the project environment. As noted, the initial region being examined for archaeological resources is configured differently than the overall EA analysis area, in order to capture nearby archaeological sites and indicators of potential of relevance when modelling archaeological potential within the analysis area limits. The region to be discussed is shown in Figure 2 and comprises parts of the Regional Municipality of Durham (City of Pickering, Town of Ajax, Town of Whitby, City of Oshawa, and Municipality of Clarington) and the City of Kawartha Lakes (Geographic Township of Manvers).

In accordance with the policies of both Canada and Ontario, archaeological resources are considered to be aspects of the environment, the effects on which must be evaluated in fulfillment of the requirements of the CEAA and the OEAA. The Government of Ontario has also recognized the importance of conserving Ontario's archaeological resources in the Ontario Heritage Act, the Planning Act, the 2005 *Provincial Policy Statement* (providing “policy direction on matters of provincial interest related to land use planning and development” [MMAH 2005: 1] pursuant to the Planning Act), and other documents.

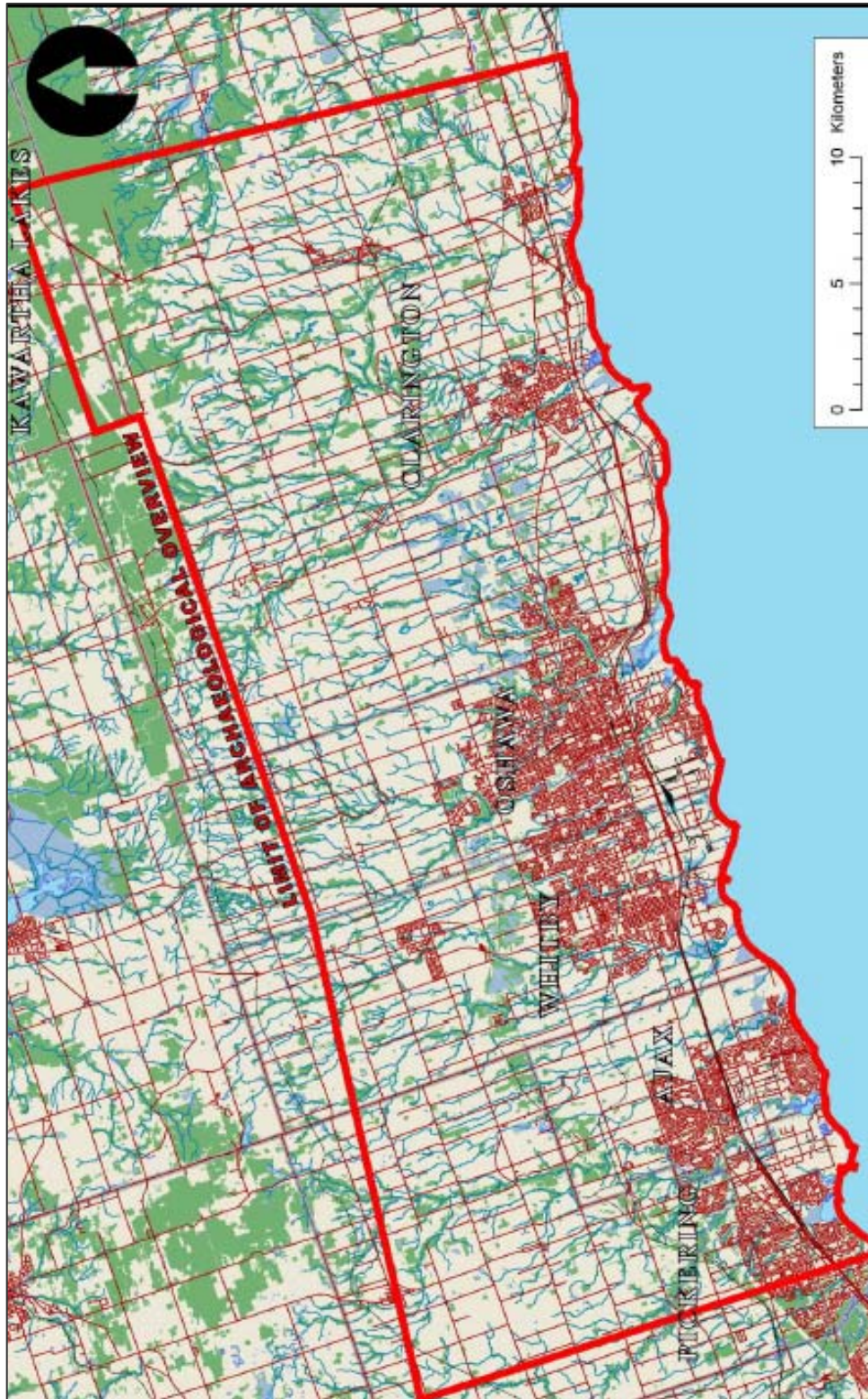
Archaeological assessment activities during planning, design, construction, and operation/maintenance of the 407 East EA must conform to the legislation and policies – provincial and federal, as applicable-governing cultural heritage preservation and archaeological assessment/excavation in Ontario, and must be undertaken in accordance with the technical guidelines and requirements for archaeological assessment set out by the Ministry of Culture (1993 Stages 1–3 Archaeological Assessment Technical Guidelines).

For the purposes of describing existing conditions with respect to archaeological resources, there are two objectives: to identify archaeological sites within the project region and to identify areas that have potential for the presence of archaeological sites. Accordingly, two inter-related data-gathering processes are undertaken. The first of these involves gathering data on known archaeological sites identified during previous archaeological research. This data is available from the secondary sources listed in Section 3.1,

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Figure 2. Limit of Archaeological Assessment for Existing Conditions Overview



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above. As archaeological sites are identified, their locations are plotted on project mapping and the relevant site data is compiled for reference. The second data-gathering process is the collection of information that can be used to model archaeological potential within the analysis area. One of the indicators of potential is the presence of known archaeological sites. Other indicators include, most notably, physiographic factors (such as proximity to water) and mapped historical features. As data with respect to archaeological potential is gathered, mapping is generated to show areas that have potential for the presence of archaeological resources.

Section 4, below, documents the results of previous archaeological research within the area under review and presents the methodology and relevant data for developing the predictive model of archaeological potential.

4. Existing Archaeological Conditions

4.1 Previous Archaeological Research

In order that an inventory of archaeological resources could be compiled for the project region, three sources of information were consulted: the site record forms for registered archaeological sites, housed at the Ontario Ministry of Culture (MCL); published and unpublished documentary sources; and the files of ASI.

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by MCL. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden Block is approximately 13 kilometres east to west, and approximately 18.5 kilometres north to south. Each Borden Block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The region under review is located in the Borden Blocks AkGr, AkGs, AlGp, AlGq, AlGr, AlGs, AlGt, BaGr, BaGp, and BaGq.

Previous archaeological work in the project region includes several large-scale surveys conducted in the 1970s and later, in the westernmost portion of the archaeological assessment study area, in the portion of Pickering north of the more developed part of the City, specifically in the lands designated for the development of the Pickering airport, north of Highway 7 and west of Brock Road, and in the area predominantly south of Highway 7 and west of Brock Road now known as the North Pickering Development Planning Area. A greater density of registered archaeological sites is therefore to be expected in the area west of Brock Road; however, this will be in large part a reflection of the intensity of archaeological scrutiny of those lands.

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The data collected from the Ministry of Culture to date covers 487 registered archaeological sites within the limits of this archaeological assessment, including sites dating to all periods of the Ontario archaeological record and including a wide variety of site types such as isolated artifacts, large and small Aboriginal habitations sites (camps, hamlet and cabin sites, and villages), large and small burial sites, Euro-Canadian farmsteads and houses, a tavern, a grist mill, and a military site. Of special significance for alternatives evaluation are those sites which represent locations of human burial. Such sites will be considered the most significant and sensitive archaeological resources. It should be noted that large Aboriginal habitation sites, especially village sites, present the distinct possibility that burials are present both in close proximity to and within the habitation area, area of artifact concentration, or archaeological site limits. As well, large secondary interment pits known as ossuaries and containing the remains of numerous individuals are known to have been associated with Aboriginal villages in the region, although they are distinct sites located at some distance from village sites. It cannot be assumed that impacts to Aboriginal archaeological sites can be mitigated by archaeological excavation (Stage 3 testing and Stage 4 salvage excavation). The decision to excavate, protect, or avoid Aboriginal archaeological sites within the region should be made in consultation with First Nations.

4.2 Modelling Archaeological Potential

Archaeological potential is the potential for the presence of archaeological remains within a given area, and is determined by the presence of known archaeological sites in combination with predictive modelling based on archaeological site proximity, historic mapping and documentation, environmental factors, and expected behavioural patterns as identified from suitable ethnographic, historical, geographical, ecological, and archaeological analogues. For the purpose of archaeological assessment, the Ontario Ministry of Culture has identified several specific indicators of archaeological potential, including proximity to known archaeological sites, physiographic features, and historic features.

In addition to the difficulties encountered when trying to account for the environments of the past, not all factors that influenced the selection of a site for short-term activity or for long-term use can be addressed by predictive modelling. Accordingly, there remains the possibility that archaeological resources will be encountered outside of areas of archaeological potential.

The determination of archaeological potential according to a predictive model is further complicated by the alteration of land as a result of human activity. Construction, resource extraction, agricultural activity, landscaping, and other land uses may alter, displace, or destroy the remains of previous land use. During the course of environmental assessment, an archaeological field review is therefore useful in order to make a preliminary determination of the integrity of any archaeological resources that may be present in an area predicted to have archaeological potential.

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4.2.1 Known Archaeological Sites

The presence of a known archaeological site is a direct confirmation of archaeological potential, and the locations of archaeological sites in the project area are therefore a primary consideration in the assignment of archaeological potential. As noted in Section 4.1, 487 archaeological sites have been registered within the area of this archaeological assessment.

4.2.2 Physiography

Physiographic factors, especially proximity to water, are key indicators of archaeological potential, especially for predictive modelling of the location of Aboriginal archaeological sites that date from before European contact (pre-contact sites). It is generally accepted that the last glaciation forms the limit of archaeological detection in Ontario, and the landscape of southern Ontario as we know it was in large measure determined by the movement and melting of the last ice sheets in this area, over 10,000 years ago.

The region under review was last glaciated during the Port Huron stade of the Wisconsinan glaciation, approximately 13,000 years ago (Karrow and Warner 1990: 12–14). Shortly thereafter, the ice margins of the Ontario-Erie lobe separated from the Lake Simcoe–Kawartha Lakes Lobe in the vicinity of the Oak Ridges Moraine, damming a narrow interlobate lake (Chapman and Putnam 1984: 28, 32). Afterwards, the ice margins of the Ontario-Erie lobe would continue to retreat southwestward and down slope into the Lake Ontario basin.

As the Lake Ontario ice lobe retreated down the south slope of the Oak Ridges Moraine, water was trapped against its northern margin east of the Niagara Escarpment (Chapman and Putnam 1984: 33–37). This narrow glacial lake, Lake Peel extended along the ice margin within the region under review, covering the area between the Oak Ridges Moraine and the northern margin of ice (well above the current Lake Ontario shoreline). It appears that Lake Peel soon shrank to a much smaller size and then stabilized for a time, leading to the formation of the Peel Plain clays in the extreme northwest corner of the region. At this time, approximately 12,500 years ago, the Oak Ridges Moraine and some of the upper reaches of the South Slope physiographic region of Southern Ontario had therefore dried out.

After the time of Lake Peel, as the ice margin retreated, water remained in the Lake Ontario basin surrounding the ice. For a considerable time, the water level of the Lake Ontario basin remained at a relatively stable height, well above that of the current shoreline. It is during the time of this glacial lake, Lake Iroquois, that the sediments of the Iroquois Plain along the shores of present day Lake Ontario were deposited (Chapman and Putnam 1984: 33-38, 190).

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Eventually, as the ice retreated through the St. Lawrence valley, the lake level in the Lake Ontario basin fell, passing through a series of stages of successively lower water levels (Chapman and Putnam 1984: 38). By approximately 11,500 years ago, the lake level was well below that of today and the shoreline had retreated some distance into areas now submerged (Chapman and Putnam 1984: 21, 35). After a low point between approximately 10,500 and 10,000 years ago (Chapman and Putnam 1984: 21, 35, 36; Karrow and Warner 15–18), the lake level rose again to reach its modern configuration within the last 7,000 years.

The actual position of the shorelines during this long period of adjustment was also affected by the ongoing rise of the land as it continued to rebound from the weight of the retreating ice mass.

It is likely that vegetation began to colonize the region as soon as glacial lake waters receded, beginning between approximately 13,000 and 12,500 years ago on Oak Ridges Moraine and the upper reaches of the slopes immediately to the south. From this time on, as the waters of Lake Peel and Lake Iroquois retreated down into the Lake Ontario basin, the extent of vegetative colonization would follow southward. By approximately 11,500 years ago, when the water level in the Lake Ontario basin was well below its modern level, the region under review would have been completely colonized by flora and fauna and would likely have been characterized, for the most part, as a spruce forest environment similar to the rest of southern Ontario at that time (Karrow and Warner 1990: 14, 26). As such, it appears that environmental barriers to human incursion into the region may have been removed as early as between 13,000 and 12,500 years ago in more northerly areas, and by 11,500 years ago at the latest throughout the entire area. Artifacts believed to date to as early as approximately 10,400 years ago (Ellis and Deller 1990: 54-57) have been found in areas to the north of Lake Ontario.

Today, the area under review comprises parts of four different physiographic regions of southern Ontario: the Oak Ridges Moraine, the South Slope, the Iroquois Plain, and the Peel Plain (Chapman and Putnam 1984).

The Oak Ridges Moraine physiographic region of Southern Ontario (Chapman and Putnam 1984: 166–168) forms the height of land extending from the Niagara Escarpment in the west to the Trent River in the east, dividing the drainage of Lake Ontario from the drainages of Georgian Bay and the Trent River. This ridge-like region covers approximately 1,300 square kilometres and has an average altitude of approximately 300 metres above sea level (approximately 225 metres above the level of Lake Ontario). The width of the region is highly variable and in a few places, such as south of Lake Scugog, it narrows to a width of only one or two kilometres. The surface of the region consists, for the most part, of sand and gravel hills (predominantly sand) with relatively flat basin-like areas between.

It must be noted that the Oak Ridges Moraine physiographic region of Southern Ontario as defined by Chapman and Putnam does not correspond exactly to the Oak Ridges Moraine Area as designated by the Province of Ontario for the purposes of land use, conservation, and planning, pursuant to the Oak Ridges Moraine Conservation Act. Rather, the strict physiographic region as construed by Chapman and Putnam

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is a subset of the larger designated area and forms the core of that area. In this report, for the purposes of physiographic characterization and determination of archaeological potential, the label will be reserved for the more narrowly-defined physiographic region, c.f. Chapman and Putnam.

While the moraine itself is virtually devoid of streams, water draining through the permeable material of the uplands emerges along the north and south slopes of the region, forming numerous streams. Accordingly, the Oak Ridges Moraine is the source for many of the watercourses that drain the plains and slopes on either side of it. The moraine lands are not totally devoid of surface water and numerous kettle lakes are found throughout.

The South Slope physiographic region of Southern Ontario (Chapman and Putnam 1984: 172–174) is the slope descending southwards from the heights of the Oak Ridges Moraine to the lowland Iroquois Plain (the former bed of glacial Lake Iroquois in the Lake Ontario basin). From the highlands of the moraine, at altitudes between approximately 250 and 300 metres above sea level, the South Slope land descends approximately 90 to 120 metres across approximately 9.5 to 11 kilometres. The region is a sloping till plain featuring numerous streams and intermittent drainage gullies running down slope (southward) toward Lake Ontario. Many of the streams have cut steep-sided valleys in the till.

The lowland bed of glacial Lake Iroquois, lying along the shore of present-day Lake Ontario, is known as the Iroquois Plain physiographic region of Southern Ontario (Chapman and Putnam 1984: 190–196). The land of this former lake bottom has been smoothed by wave action and features deltaic and lacustrine deposits of sands and clays. At the interface between the till plains of the South Slope and the bottomlands of the Iroquois Plain, the old shorelines of glacial Lake Iroquois are clearly marked by shorecliffs and relict beach features. In the region under review, the land immediately below this shoreline is a former off-shore terrace featuring, most notably, boulder pavements and sands deposited by wave action (Chapman and Putnam 1984: 79). This portion of the plain is fairly flat and poorly drained, with the exception of a drier area north of Oshawa. Nearer the present-day shoreline of the lake, the plain is of more varied origin, including deposits of till among the outwash sands and lacustrine silts and clays.

North of the Iroquois Plain in the more western portion of the South Slope, lies the Peel Plain physiographic region of Southern Ontario (Chapman and Putnam 1984: 174–176). This till plain region, formed during the time of glacial Lake Peel, is surrounded by the South Slope and extends into the area under review only as far as the land around the community of Atha Road.

Several areas of the South Slope and the Iroquois Plain feature drumlins, elliptical till hills formed with their long axes in the direction of the glacial movement. As well, numerous drumlins are found on the till plains north of the Oak Ridges Moraine, in the Peterborough Drumlin Field physiographic region of Southern Ontario. In the extreme north of the lands being discussed, northeast of the community of New Park, two drumlins of the Peterborough Drumlin field form the north limit of the moraine.

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As has been mentioned, numerous watercourses drain the lands under review in this report, rising at the interface between the Oak Ridges Moraine and the South Slope, and ultimately emptying into Lake Ontario. Among these, the largest include (from west to east) West Duffins Creek, Duffins Creek, Lynde Creek, Oshawa Creek, Farewell Creek, Bowmanville Creek, Soper Creek, Wilmot Creek, Graham Creek, and the Ganaraska River. As well, along the lakeshore are numerous bays, harbours, and near-shore marshes.

4.2.2.1 Physiographic Factors and Archaeological Potential

Water is arguably the single most important resource necessary for any extended human occupation or settlement and proximity to water can be regarded as the primary indicator of archaeological site potential. Accordingly, distance from water is one of the most commonly used variables for predictive modelling of archaeological site location.

The Ministry of Culture (former Ministry of Citizenship, Culture and Recreation [MCzCR]) primer on archaeology, land use planning and development in Ontario (MCzCR 1997: 12–13) stipulates that undisturbed land within 300 metres of a primary water source (lakeshore, river, large creek, etc.), and undisturbed land within 200 metres of a secondary water source (stream, spring, marsh, swamp, etc.), as well as undisturbed land within 300 metres of an ancient water source (as indicated by remnant beaches, shorecliffs, terraces, abandoned river channel features, etc.), are considered to have archaeological potential.

When evaluating archaeological potential in the region under review, both current and ancient shorelines must be considered. As previously noted, the shorelines of the Lake Ontario basin have been both higher and lower than at present. The areas formerly inundated by glacial Lake Iroquois are marked by the landforms of the Iroquois Plain, and the shoreline of that lake is clearly marked by shorecliffs and relict beaches.

In addition, the Ministry of Culture has listed elevated topography such as drumlins as indicators of archaeological potential. As has been noted, numerous drumlins are found within the region under review.

4.2.3 Historical Review

At the most general level of description, archaeological sites in Ontario are often grouped according to a two-part division relating to the time of European arrival in the area and the beginning of written historical records. The time before direct European contact with the Aboriginal inhabitants of an area is termed “pre-contact” and the time after the beginning of written histories for an area is called “historic.” Often, it is useful to distinguish a third period which forms a transition between these two: the “contact period.” This period begins when the first sustained effects of European arrival in the New World are felt

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in any given area, prior to the actual arrival of Europeans in that area, and it ends, for any given area, when relatively continuous historical record-keeping for that area begins. Euro-Canadian archaeological sites are generally considered “historic” sites; however, Aboriginal archaeological sites may be “pre-contact,” “contact period,” or “historic,” depending on their age. Aboriginal sites that have not been positively dated to the historic period by material culture, the presence of European trade goods, or other means, are typically considered pre-contact sites. Contact-period sites are typically identified by the presence of certain early European trade goods.

4.2.3.1 Before European Contact—The Pre-Contact Period

As noted in Section 3.2 of this report, environmental barriers to human incursion into the project region may have been removed as early as between 13,000 and 12,500 years ago in more northerly areas, and by 11,500 years ago at the latest throughout the entire area. Artifacts believed to date to as early as approximately 10,400 years ago (Ellis and Deller 1990: 54-57) have been found in areas to the north of Lake Ontario. In general, the arrival of the first bands of Aboriginal hunters in southern Ontario is thought to have occurred sometime between approximately 11,000 and 10,500 years ago. Populations during this period were small and highly mobile, traversing vast areas as they followed herds of caribou. Archaeological sites dating to this period are called Paleo-Indian sites.

During what is known as the Archaic period, between approximately 9,000 and 3,000 years ago, and throughout the Early and Middle Woodland periods, from approximately 3,000 years ago until 1,500 years ago, people continued to live in small, highly mobile bands. However, in certain areas it would appear that, by about 5,000 years ago, there is evidence for increased population levels within smaller areas exploited during the course of the annual round. Sites were larger and occupied for longer periods of time. By about 4,000 years ago, these hunter-gatherer bands had likely settled into familiar hunting territories and there is some evidence that, at this time if not earlier, the majority of people spoke some form of Algonquian language. Ceramic technology first appears in Ontario at the start of Woodland times, beginning approximately 3,000 years ago.

The period between approximately A.D. 500 and 1600, known as the Late Woodland period, saw the gradual appearance of agriculture in many parts of south-central Ontario. By approximately 1300, agriculture represented the main subsistence pursuit of all those groups who lived in areas of suitable farm land, while groups in more marginal areas might either have traded for domesticated food crops or produced small quantities of their own, as circumstances allowed. The agriculturalists, for the most part, inhabited large semi-permanent villages and spoke some form of Iroquoian language. Precisely how this language emerged as dominant in the region is not known. Neither is the distinction between Iroquoian- and Algonquian-speakers in southern Ontario at this time clear-cut, as relationships between groups were complex and dynamic, and individual communities often had close ties with both their immediate neighbours and much more distant groups.

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Potential for the presence of pre-contact archaeological sites, excepting burial sites and any other sites for which unknown cultural considerations may have been of paramount importance, is primarily modelled on physiographic indicators as discussed in Section 3.2.1 and Section 3.5 of this report.

4.2.3.2 The Contact Period

With the exception of failed colonizing attempts several centuries earlier, European incursion into the North American continent began in the early years of the sixteenth century (Heidenreich 1990: 478). While direct contact between Europeans and the Aboriginal people of the North American continent was largely confined to the east coast until the mid-century, the effects of European contact fanned out from these encounters in advance of the presence of the Europeans themselves. At the same time, some knowledge about the Aboriginal peoples of the interior, however inaccurate or fanciful, began to be transmitted to Europe. It must be stated that the effects of the European arrival included deadly diseases that resulted in great loss of life.

Contact with the Aboriginal peoples of northeastern North America west of the Atlantic coastal region began in 1534, with the first voyage of Jacques Cartier (Heidenreich 1990: 478-9), when he sailed up the lower reaches of the St. Lawrence River. After this time, however, the rate of European exploration in the vicinity was very slow and very few expeditions travelled the St. Lawrence the last decades of the sixteenth century. In the 1580s, the Europeans began to trade for furs with the Aboriginal people of the St. Lawrence area (Heidenreich 1990: 481) and, in 1600, the first trading post was established on the river, at Tadoussac. From that time, the French began to move along the St. Lawrence as necessary for trading and exploration and, in 1634, the first French agricultural settlers arrived to settle around what is now Quebec City. At this time, the Dutch were also establishing a trading base around the Hudson River (Heidenreich 1990: 485). Also by 1634, the French Jesuits had penetrated as far as Central Ontario, to an area known as Huronia, west of Lake Simcoe between that lake and Georgian Bay (Heidenreich 1990: 487; Ramsden 1990). It is not known at what time sustained effects of European contact prior to direct contact with Europeans began with respect to Aboriginal people in the project region; however, it must have begun in advance of the earliest direct contacts with the French in the early seventeenth century. European trade goods have been found on Aboriginal archaeological sites dating to as early as the 1580s. Certainly, from the seventeenth century onward, trade and political relations with European colonial powers would play a role in the lives of the Aboriginal people of the region.

In the 1600s, intertribal warfare with the Five Nations Iroquois of New York State (the Seneca, Cayuga, Onondaga, Oneida and Mohawk), combined with the spread of European epidemic diseases, resulted in the dispersal of the Huron, Petun and Neutral Iroquoian confederacies in Ontario and many of their Algonquian-speaking allies of the southern Canadian Shield by circa 1650. In the 1670s, the Five Nations Iroquois established a series of short-lived settlements at strategic locations along the routes inland from the north shore of Lake Ontario. At about the same time, the Mississauga and other Ojibwa groups began expanding southward from their homelands in the upper Great Lakes, coming into occasional conflict with the New York Iroquois, although alliances between the two groups were established as well.

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With respect to the archaeology of the project region, the contact period can be said to have begun sometime around 1600 or shortly before and to extend up to the 1780s when, after the “Gun Shot Treaty” of 1783, British survey and settlement of the area began.

As with the pre-contact period, potential for the presence of contact-period sites, excepting burial sites and any other sites for which unknown cultural considerations may have been of paramount importance, is primarily modelled on physiographic indicators as discussed in Section 3.2.1 and Section 3.5 of this report.

4.2.3.3 Written History—The Historic Period

The British first began to assert claim to the region under review in 1783. In that year, a treaty was concluded between the British and chiefs of the Mississauga - the “Gun Shot Treaty” - to establish British land rights within an area approximately ten or twelve miles in depth from the lakeshore and extending from the Etobicoke Creek to the Bay of Quinte. British land rights within the westerly portion of this territory were subsequently re-established by the “Toronto Purchase” treaties of 1787 and 1805. Euro-Canadian record keeping for the area has been relatively thorough and continuous since that time. It is also primarily from the 1780s onward that archaeological sites in the area are most likely the remains of Euro-Canadian land use and habitation.

Today, the project region comprises parts of the Regional Municipality of Durham and the Municipality of Clarington, roughly corresponding to the southern sections of the former historical Counties of Ontario and Durham, including significant portions of the geographic townships of Pickering, Whitby, East Whitby, Darlington, and Clarke, and part of Concession 1 in Manvers. These townships contained a number of historical settlements, towns, villages, and crossroads communities that developed during the nineteenth century, several of which remain to the present day.

In 1787, the region being examined formed part of the District of Nassau, which was governed from Niagara. This was superseded in 1792 when the name was changed to the Home District, with York (now Toronto) selected as the county seat and provincial capital in 1796. The eastern part of this district, containing Durham and Clarington, was transferred to the Newcastle District, which was created in 1802. Pickering and Whitby remained under the jurisdiction of the Home District until 1849 (Armstrong 1985: 172, 184). The land lying to the north of this first tier of townships adjacent to Lake Ontario was acquired by the British in November 1818 (Johnson 1973: 23–26).

The first tier of townships in Ontario and Durham Counties were surveyed in the early 1790s, beginning with the “baseline.” This was surveyed in 1791 between York and Murray Township on the Bay of Quinte, and was intended to establish a township line set back far enough from the lakeshore to avoid large bays or indentations, and which was similar in nature to the “Windmill Line” along Toronto

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Harbour. The land lying between the baseline and the lakeshore was described as a “Broken Front,” and where the broken front was sufficiently deep it was divided into lots in “Ranges” or numbered Broken Front Concessions. When the townships were surveyed for settlement, development was initially slowed by the fact that one seventh of the area was reserved for the use or support of the Protestant Clergy, while another seventh, part of which contained timber reserves, was reserved for the Crown.

ONTARIO COUNTY

Ontario County comprised part of the Third Riding of York in the Home District but was elevated to independent County status in 1851.

Pickering Township

Pickering Township, when first laid out in the 1790s, was designated Township 8 although the name was changed shortly thereafter to Edinburgh. The first survey of this township was made in 1791. The first legal settler in Pickering, said to have been William Peak, arrived in 1798 (Armstrong 1985: 146). Peak was reputed to have been an Indian trader and interpreter who settled along the lakeshore at the mouth of Duffins Creek (Farewell 1907: 12). The westerly portion of the township was settled in part by German settlers attracted to the area through the settlement proposal of William Berczy (Farewell 1907: 11). The remainder of the township was settled by Loyalists, disbanded soldiers, emigrants from the United Kingdom, and a large number of Quakers from both Ireland and the United States (Farewell 1907: 13-14). The township population stood at 187 in 1809, at 375 in 1820, at 1,042 in 1828, at 3,752 in 1842, and at 5,285 in 1901.

In 1805, D’Arcy Boulton predicted that Pickering would become a township of some importance due to its proximity to York, “though at present no great advantage exists, at a future period it must be beneficial.” (Boulton 1805: 86). By 1851, Smith notes that Pickering is “one of the best settled townships in the County, and contains a number of fine farms, and has increased rapidly in both population and prosperity, within the last few years” (Smith 1851: 22). Maps produced later in the nineteenth century, such as the 1860 Tremaine map (Shier 1860) and the Beers atlas (Beers 1877), show the township to be heavily settled and period census returns show that the township contained a wide variety of industries and small businesses as well as husbandmen engaged in mixed agriculture. The main settlements which were established in Pickering were located along Duffins Creek where early mills and various industries utilized the available hydraulic power of this watershed. One of the earliest roads constructed across Pickering was the Kingston Road, built by Asa Danforth in 1796 along the south end of the township near the lake. This road was illustrated on several early township maps. The road network in Pickering developed slowly, and by 1850 the De Rottenburg map showed just three major north-south arteries between the Kingston Road and Highway 7.

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- *Ajax* – This community was established near the lakeshore between the towns of Pickering and Whitby. It had its beginnings as an armed forces munitions centre in 1941, and was patriotically named after the British cruiser HMS Ajax. It was elevated to town status in 1955 (Rayburn 1997: 5).
- *Audley* – This community was established at the crossroads between Lots 2 and 3 in Concessions 3 and 4 (Pickering Township). The community was named Brown’s Corners when a post office was opened in April 1853, but the name was changed to Audley in January 1857. The post office closed in October 1914.
- *Balsam* – This community was established as a post office in July 1857 at the north-west corner of Lot 5, Concession 8 (Pickering Township). The office closed in March 1970. The name of the town was formerly Mount Zion (Mika 1977: 127).
- *Brougham* – This community was laid on part Lots 18 and 19 in Concession 5 and 6 (Pickering Township). The post office was opened here in 1836. The first settlers in Brougham were Thomas Hubbard and John Major in 1807. The settlement was known as Bentley’s Corners prior to the opening of the post office, and the community contained a number of small businesses and industries. In addition to a few churches, a town hall was built here in 1854, and there are a number of mid-nineteenth-century homes which survive there to this day (Mika 1977: 281–282).
- *Claremont* – This community was established on part Lots 18 and 19 in Concessions 8 and 9 (Pickering Township) and was first settled by the Wixson family. A post office was established here in April 1851, said to have been named after Clermont in France although other authorities state it was named after an estate cottage located in Surrey, England. The community was previously known as Noble’s Corners during the 1840s. It was incorporated as a police village in 1907 (Mika 1977: 426–428; Rayburn 1997: 70).
- *Greenwood* – This village was laid out on part Lots 10 and 11 in Concessions 5 and 6 (Pickering Township). The post office opened here in February 1852. The first name of the village was Norwood, but it was renamed in honour of miller and distillery owner Frederick Green who settled here in 1843 (Rayburn 1997: 144). Green had bought the “Lower Mill” built by Matthew Cockerline in 1840. The first settlers included, among others, the McKittrick, Byers, Sabler, and Adamson families. A number of small businesses and industries were established here and the village contained a Methodist Church. The most famous scion of this community was John Diefenbaker, former prime minister of Canada, who attended Greenwood School as a boy (Mika 1981: 171–172).

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- *Kinsale* – This village was established on Lot 3 in Concessions 5 and 6 (Pickering Township). A post office operated here between May 1856 and October 1915.
- *Pickering Village* – This picturesque town was laid out on either side of the Kingston Road on Lots 13 through 16 in Concessions 1 and 2 (Pickering Township). A post office was in operation in Pickering by 1829. The town was first named Canton or Duffins Creek. It was renamed Pickering Village in 1987 to differentiate it from the Town of Pickering (Rayburn 1997: 270; Mika 1983: 213–214; Mackay 1851: 73).

Whitby Township

Whitby Township, when first laid out in the 1790s, was designated Township 9 although the name was changed shortly thereafter to Norwich. The first survey of this township was made in 1791 and the first settler arrived in 1794 (Armstrong 1985: 148). The first settler was said to have been Benjamin Wilson, a Loyalist from Vermont, who settled along the lakeshore east of Oshawa (Farewell 1907: 18). Wilson's house, built on Lot 4 in the Broken Front, was an early landmark that was depicted on several early township surveys and patent plans. Whitby was quickly settled by a mixture of Loyalists, disbanded troops, and emigrants from the United States, the United Kingdom, and Ireland. Boulton (1805: 90) noted that Whitby would command "particular advantages" due to its proximity to the seat of government, and by 1846 Smith described it as a "well settled township ... [where] farms are generally well cleared and cultivated, and in good order." The timber was a mixture of hardwood and pine (Smith 1846: 218). In 1851, Smith described it as "an exceedingly fine township...considered in point of value of property and agricultural productions, the first township in the County" (Smith 1851: 26). This statement is substantiated by an examination of extant census and assessment records for the township.

Two major settlements were soon established in the southern half of the township, Whitby and Oshawa. These communities were advantageously located where watersheds (such as that of Lynde Creek) were crossed by the Kingston Road. Whitby further benefited from its harbour and from the construction of the Grand Trunk Railway in the 1850s. The 1850 De Rottenburg map shows that Whitby contained a much heavier concentration of roads than did neighbouring Pickering, some of the roads having been planked or gravelled. An early patent plan for Whitby (Chewett 1795) showed a road which originated at Wilson's on Lot 4 in the Broken Front and which extended northwards to Lot 12 in Concession 9. This road forked at Lot 5, Concession 1, and the easterly branch extended up as far as Lot 1, Concession 8. It appears to have followed the high ground between the East Oshawa Creek and Harmony Creek watersheds and does not correspond to any later roads shown on the De Rottenburg (1850), Tremaine (Shier 1860), or Beers atlas (Beers 1877) maps. This early patent plan also showed minor road deviations from Lots 16 to 20 between Concessions 1 and 2, as well as from Lots 1 to 4 in Concession 1.

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- Brooklin – This community was established on part Lots 22 through 24 in Concession 6 (Whitby). A post office was opened here in August 1847, prior to which time the community was known as Winchester. Impetus for the growth of the settlement came during the 1840s when the Campbell family built saw, grist, and flour mills along Lynde Creek. The community contained churches, a library, and several industries and manufactories. The population was approximately 550 in 1850 (Mika 1977: 279; Rayburn 1997: 45; Smith 1851: 32; Mackay 1851: 42).
- Columbus – This community was established on part Lots 12 and 13 in Concessions 6 and 7 (Whitby). A post office was opened in the community in August 1847, prior to which the place had been known as English Corners (Rayburn 1997: 77). In 1851, it contained about 300 inhabitants but it was noted that although it was “a tolerably thriving settlement” it would not do a “large business” due to its proximity to Oshawa. It was said that “it appears to have remained nearly stationary for the last three or four years” (Smith 1851: 30; Mackay 1851: 66).
- Foley – This small community was located on Lots 4 and 5 in Concession 4 (East Whitby). In 1874, farmers in East Whitby formed a club described as the “Foley Farm Club.” Members met at various locations in the township in order to discuss topics of interest to farmers and to engage in debates (Johnson 1973: 337–338). The community was also known as Williamson and contained approximately 150 inhabitants in 1873 (Crossby 1873: 117). Foley was shown on the 1877 Beers atlas map of East Whitby. A post office was in operation here between July 1863 and December 1909.
- Harmony – This community was located east of Oshawa on part Lots 4 and 5, Concessions 1 and 2 (East Whitby). It contained about 20 building lots set out along four streets. This settlement was in existence before 1850 and was shown on the 1877 Beers atlas map of Whitby. Harmony today forms part of the city of Oshawa and is commemorated by Harmony Road (Durham Road 33) and the Harmony Golf Centre.
- Oshawa – This city was established on part Lots 7 through 12 in Concessions 1 and 2 (East Whitby). Early settlers here included Benjamin Wilson around 1794 and Jabez Lynde in 1809. The community was known as Skae’s Corners until 1840 when a post office was opened. The first name selected for the office was Sydenham, but was changed in 1842 to Oshawa, which is a native word said to mean “crossing between the waters.” The settlement increased in importance during the 1840s when harbour facilities were constructed, and the community achieved village status in 1850. The town grew further in 1856 when the Grand Trunk Railway was opened. An iron foundry (The Ontario Malleable Iron Company) was opened here in 1871, which induced Robert McLaughlin to relocate his carriage works here from nearby

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Enniskillen in 1876. The first McLaughlin-Buick car, designed in 1907, was produced here in 1908. Oshawa achieved town status in 1879 and incorporation as a city in 1924 (Mika 1983: 129–132; Smith 1851: 25–26; Mackay 1851: 262).

- *Taunton* – This community was located on part Lot 1 in Concessions 3 and 4 (East Whitby) on the townline road between Durham Region and Clarington. A post office existed here between July 1871 and October 1972.

- *Whitby* – This town was established on part Lots 24 to 29 in the Broken Front, and part Lots 22 to 31 in Concessions 1 and 2 (Whitby). A post office had been opened here as early as 1823. The first settlers here were Jabez Lynde and Samuel Cochrane in 1804. In 1835, the community was known as Hamer’s Corners, named after merchant John Hamer. The harbour was utilized and improved during the 1830s, at which time it was known as Windsor Bay or Windsor Harbour. During the 1840s and 1850s, the north part of the community was known as Perry’s Corners, named in honour of a leading citizen, Peter Perry. Due to confusion with the town of Windsor in the Western District of the province, the name of this town was officially changed to Whitby, which was a seaside resort in Yorkshire. Whitby achieved town status in 1855 and became the seat for Ontario County in 1852. The town grew somewhat following the construction of the Grand Trunk Railway in 1856. The town is also known as the site for an institute for the mentally ill which was opened here in 1913 (Mika 1983: 642–643; Smith 1851: 23–24; Mackay 1851: 467).

DURHAM COUNTY

Durham County was one of the original counties established by a Proclamation issued by John Graves Simcoe, first Lieutenant Governor of Upper Canada (Ontario) in July 1792.

Darlington Township

Darlington Township, when first laid out in the 1790s, was designated Township 7, although the name was changed shortly thereafter to Bristol. The township was first surveyed in 1793 and the first permanent settler arrived in the township in 1784 (Armstrong 1985: 142). Despite fertile conditions, its development was slow and it was optimistically predicted that it “promises a more than commonly quick settlement” on account of its vicinity to York (Boulton 1805: 77.) In 1846 it was described as “an old, well-settled township, containing good farms, many of which are rented out” and in 1851 it was thought to be the “best settled” township in Durham County (Smith 1846: 42; 1851: 200). The major highway across the township was the Kingston Road, constructed in 1796. The 1850 De Rottenburg map showed three other north-south roads, two of which were constructed on the east side of the township leading towards Bowmanville.

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- *Bowmanville* – A post office opened at Bowmanville in 1826 or 1827 and was originally named Darlington, but changed to Bowmanville in March 1854. The community was known at the earliest period as Barber’s Creek, named after Loyalist settler Augustus Barber. Other early settlers in the vicinity of the town were Loyalists named John Burk, John Trull, and Roger Conant around 1794. Saw and grist mills were established along Barber’s and Soper’s Creeks during the 1820s and 1830s. One of the early names for the town was Darlington Mills, but the lasting name was selected to honour Charles Bowman, a Montreal Scottish merchant who had purchased much of the land upon which the town was built. The community was of sufficient importance that it was incorporated as a town in 1858. The town contained a number of industries including the Goodyear Tire and Rubber Company. Port Darlington, established in 1839, was an important port for shipping wheat and other goods (Rayburn 1997: 40; Mika 1977: 241–243; Smith 1851: 200; Mackay 1851: 33). Bowmanville is situated upon part Lots 9 to 11 in the Broken Front and part Lots 8 to 13 in Concessions 1 and 2 (Darlington).
- *Courtice* – This community was originally called Short’s Corners after blacksmith George Short. James Courtice, whose parents had settled in the township in 1831, operated a carpentry shop in the village during the 1870s. A post office named after the family operated in the village between May 1882 and August 1963 (Rayburn 1997: 82). Courtice is located west of Bowmanville on part Lots 28 and 29 in Concession 2 (Darlington).
- *Enfield* – A post office operated here between November 1866 and September 1914. This community was located on part Lot 31 in Concessions 8 and 9 (Darlington).
- *Enniskillen* – A post office was opened here in November 1851, at which time the village contained about 100 inhabitants (Smith 1851: 201; Mackay 1851: 80). The village was located on part Lots 18 and 19 in Concessions 7 and 8 (Darlington).
- *Gaud Corners* – This small community was located on part Lots 14 and 15, Concession 3 (Darlington) and was named after the family of Jacob Gaud who owned the surrounding lands. There are few records concerning this crossroads community.
- *Hampton* – This community grew up around a mill built by Henry Elliott in 1840 and was therefore first named Elliott’s Mills. In 1848, it was renamed Millville, but that was changed to Hampton when the post office opened in September 1851. The name is said to be an abbreviation of the name Kirkhampton, a village in Cornwall, England where Henry Elliott was born (Rayburn 1997: 149–150). This village was located on Lots 17, 18, and 19 in Concession 5 (Darlington).

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- *Haydon* – A post office operated here between January 1866 and January 1915. This community was located on part Lot 14, Concession 8 (Darlington).
- *Kilmarnock* – This post office village was shown on the 1877 Beers atlas map on the townline road between Darlington and East Whitby at the Concession Road between Whitby and Darlington. It was located on Lot 35, Concession 9. Kilmarnock is not found in the National Archives database of post offices.
- *Salem* – This small community was located at Lot 14, Concession 4 in the vicinity of present day Martin Road (Durham Road 57) and the 4th Concession Road. The village contained a school during the 1870s and 1880s and the Salem School Section covered the area between Lots 6 and 15 in Concessions 3 and 4. An overview of the residents of Salem was compiled by Squair in 1927 (pp. 123–132).
- *Solina* – This community had three previous names before the present one was adopted: Toole’s Corners, Pilchardtown, and Eldad. The village assumed its present name when the post office opened here in April 1869. It operated until January 1916. It is said that schoolmaster John Hughes came to the meeting with the letters A, I, O, L, N and S and invited the others to create a name from those letters. The three choices thus formed were Linosa, Sinola, and Solina (Rayburn 1997: 321). The village is located on part of Lots 24 and 25, Concessions 5 and 6 (Darlington).
- *Tyrone* – A post office briefly operated in this village between February 1852 and November 1869. The main claim to fame for this village is that it was the birth place of Robert McLaughlin whose carriage works, later relocated to Oshawa, later became part of General Motors. Inhabitants wanted to name their post office Mount Hope which was rejected since that name was in use at a post office near Hamilton. Two other possibilities were put forth: Tyrone and Devon. The issue was settled in favour of the name selected by the winning team in a cricket match held especially to decide on the name of the post office (Rayburn 1997: 351; Smith 1851: xxii; Mackay 1851: 458). The village was located on part Lots 8 to 11 in Concessions 6 and 7 (Darlington).

Clarke Township

Clarke Township, when first laid out in the 1790s, was designated Township 6. Its name was soon changed to Clarke, the name being in use as early as February 1791 in instructions issued by the Surveyor General of Quebec to Deputy Surveyor John Collins (Fraser 1906: cxvii, 389). Clarke was first surveyed in 1793 and the first settlement took place in 1795 or 1796 (Armstrong 1985: 142) when land was taken up by Richard Lovekin, an Irish emigrant. Boulton noted that the “front” of the township along the

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lakeshore was “thickly inhabited,” and that, due to the richness of the soil, Clarke “will in time be a valuable township” (Boulton 1805: 76). The township was described as an “old settled township” containing “good farms” many of which were rented out. The township was noted for its excellent wheat (Smith 1846: 34–35). The main highway across Clarke Township was the Kingston Road, constructed in 1796. The De Rottenburg map of 1850 showed two other major north-south roads at either end of the township. Clarke and Manvers had the least developed road networks of any of the townships within this county in 1850. A landmark feature shown on an early survey of Clarke (circa 1820) was a “fulling machine” which was situated on Lot 32 in either Concession 2 or 3 (Wilmot 1817). This same map shows a few roads which extended from the Kingston Road, described as a “Publick Road,” southerly through Concessions 1, 2, and 3 towards the lakeshore. Early patent plans for Clarke show deviations in the route of Kingston Road in Concessions 1 and 2 between Lots 11 and 17 and 22 and 23. The road must have been constructed around physical barriers at these points which were later overcome, since the road followed a straight course across these lots by the time of the 1878 Belden atlas map.

- *Kirby* – This community was located on part Lots 24 and 25, Concessions 6 and 7 (Clarke). It was first settled in 1832 by an American named Nathaniel Powers and was first named Powers Corners. Many families from Yorkshire settled here during the later 1830s. The settlement contained a church, school, blacksmith shop, two sawmills, and a shingle mill. It was later known as Jackson’s Corners. The name was changed to Kirby in 1864. A post office existed here between March 1864 and November 1915 (Mika 1983: 452; Rayburn 1997: 183).
- *Leskard* – This community was located on Wilmot Creek on part Lots 31 and 32 in Concessions 7 and 8 (Clarke). A post office existed here between March 1856 and January 1970, prior to which the community’s name was Rochester. The first settlers in the vicinity of the village took up land in the early 1830s and included families such as Brisbin, Wylie, Nay, Purdy, Livingston, Gibson, and others. Leskard was a mill town during the nineteenth century, with a number of saw, grist, and flour mills. The village plot was formally surveyed in 1850 and rapidly developed thereafter. The population was approximately 250 in 1855 (Mika 1983: 531–532).
- *Newcastle* – A post office was opened in this community in April 1845, and the settlement was incorporated as a village in 1856. The community boundaries included the lakefront settlement called Bond Head, established by Charles Clarke in 1837 and formally surveyed as a town site in 1841. The first name for Bond Head, in 1833, was Crandell’s Corners, named after Stephen Crandell’s inn. This village may boast that Daniel Massey first opened his shop here in 1847. This firm later expanded to become Massey-Ferguson, although the relocation of the company to Toronto contributed towards the decline of the community’s growth. Several businesses were established in the town, and the community expanded due to the construction of a harbour in the 1840s and the Grand Trunk Railway in 1856. Fires destroyed parts of the business district of Newcastle in 1877 and 1896 (Mika 1983: 27–29; Smith 1851: 202; Mackay 1851: 256–257).

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- *Orono* – Described as a “small community” in 1846, nevertheless a post office was opened at Orono in July 1852, when the village contained about 200 residents (Smith 1851: 202). The population contained farmers as well as a number of professional men and was a mixture of Canadians, Americans, English, Irish, and Scottish residents (Squair 1927: 104-105). The village was listed in the *Canada Directory* of 1851 (Mackay 1851: 262). The name for the post office is said to have been selected in 1852 when a visitor from Maine suggested Orono—the name of a town near Bangor—as a possibility. The town in Maine commemorated a Penobscot Indian chief named Orono (?1688-1801) who espoused the Colonial cause during the Revolutionary War (Rayburn 1997: 257). The village was located on part Lots 28 and 29, Concession 5 (Clarke).

Manvers Township

Manvers Township was not surveyed until somewhat later due to the fact that it formed part of the second tier of townships removed from the lakeshore. The first surveys were undertaken by Samuel Wilmot between September 1816 and February 1817, for which survey diaries and field notes are extant (Survey Diaries and Field Notes, RG1-59 [formerly RG1 CB-1]). The first legal settlement took place in Manvers in 1830 (Armstrong 1985: 145). Due to its location away from the lake, it was only “moderately settled” by 1851, although the farms which were cleared were noted as productive with good quality land and timbered with a mixture of hardwood and pine (Smith 1851: 203). There were no towns or villages established in Manvers within the region discussed in this report. There was only one major north-south road within the region as shown on the De Rottenburg map of 1850. The patent plan for this township indicated mining rights were reserved on the south half of Lot 4 and the north half of Lot 11, Concession 1 (*Township of Manvers, County of Victoria, Map 28*). Lots 2, 4, 9, 11, and 16 in Concession 1 were shown on the Chewett Patent Plan (Chewett 1831) as Crown or Clergy reserve lots, while the Parke survey of 1843 indicated that only Lots 2, 9, and 15 were reserves.

4.2.3.4 Historical Factors and Archaeological Potential

As noted in Sections 3.1 and 3.2 of this report, potential for the presence of archaeological sites prior to approximately the 1780s is primarily based on physiographic factors, most notably proximity to water sources. The availability of historic maps provides a valuable resource for refining the archaeological potential model for the late eighteenth century and later. These maps often allow for the determination of relatively precise locations for core settlement areas such as towns and crossroads communities, i.e., areas throughout which there is generally potential for the presence of public, commercial, industrial, religious, and other institutional remains in addition to the remains of domestic and agricultural activity.

Outside of the settlement centres, the majority of late-eighteenth-century and early-nineteenth-century farmsteads, whose locations are rarely recorded on contemporary maps, are likely to be captured by the basic physiographic model discussed in Section 3.2.1 of this report; however, in addition to

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environmental considerations, settlement was guided by the developing network of roads and railways. These transportation corridors frequently influenced the siting of farmsteads. The Ontario Ministry of Culture has specified that mapped historic features, designated heritage properties, and historic transportation corridors should be considered indicators of potential for the presence of archaeological resources.

4.2.4 Cemeteries and Burials

While cemeteries and burials are often associated with areas of archaeological potential, predictive modelling for the pre-contact period and for rural areas as late as the nineteenth century cannot reliably account for all possible burial locations, due to the complex cultural and ideological considerations that may be involved in the selection of burial sites. As well, the formerly-mapped limits or present-day, existing limits of cemeteries dating to the nineteenth century or earlier may not reflect the actual limits of the interment area.

4.2.5 Archaeological Potential Model for the Highway 407 East Completion

Based on the discussion of the preceding sections, and on the Ontario Ministry of Culture's checklist for determining archaeological potential (MCzCR 1997: 42), the following areas are considered to have archaeological site potential, pending a determination of the likely integrity of any archaeological resources:

For Pre-Contact and Contact-Period Archaeological Sites:

- areas within 250 metres of a known archaeological site;
- areas within 300 meters of a lakeshore, river, large creek, ancient lakeshore, or ancient watercourse;
- areas within 200 metres of a stream, spring, or wetland;
- relict beach features; and
- drumlins shown on physiographic mapping that are distinctly identifiable on project contour mapping;

For Historic Archaeological Sites:

- areas within 250 metres of a known archaeological site;
- designated heritage properties and easements;
- core settlement areas (towns, villages) where it is possible to make a reliable determination based on analysis of period maps;
- areas within 100 metres of the centreline of existing roadways that follow the approximate alignment of historic roadways, or within 100 metres of the approximate alignment of no-longer-extant roadway corridors as determined by period map examination;

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- areas within 50 m of the centreline of existing railways that follow the approximate alignment of historic railways, or within 50 metres of the approximate alignment of no-longer-extant rail corridors as determined by period map examination; and
- areas within 250 m of the likely location of historic features (dwellings, mills, churches, cemeteries, etc.) as shown on more precise period maps.

5. Conclusions

In order to create an existing conditions overview of archaeological resources complete with preliminary mapping of archaeological potential, a simplified predictive model was employed. The model was developed as follows.

Preliminary Potential for the Presence of Archaeological Sites:

- areas within 250 m of a registered archaeological site, based on the mapped location of 487 sites recorded in the Ontario Archaeological Sites Database (OASD) housed at MCL;
- areas within 300 meters of a lakeshore, river, or large creek, based on available project GIS mapping;
- areas within 300 metres of relict Lake Iroquois shoreline features, based on examination of physiographic mapping (*Physiography of the South Central Portion of Southern Ontario*, Ontario Department of Mines and Northern Affairs, Ontario Research Foundation, Map 2226);
- areas within 200 metres of a stream, spring, or wetland, based on available project GIS mapping and calculated from flood limits where such data was available;
- core settlement areas (towns, villages) where it is possible to make a reliable determination based on analysis of the 1877 *Illustrated Historical Atlas of the County of Ontario, Ont.* (Beers 1877) and the 1878 *Illustrated Historical Atlas of the Counties of Northumberland and Durham, Ont.* (Belden & Co. 1878);
- areas within 100 metres of historic roadways outside of settlement centres as shown in the 1877 *Illustrated Historical Atlas of the County of Ontario, Ont.* (Beers 1877) and the 1878 *Illustrated Historical Atlas of the Counties of Northumberland and Durham, Ont.* (Belden & Co. 1878);
- areas within 50 metres of historic railways as shown in the 1877 *Illustrated Historical Atlas of the County of Ontario, Ont.* (Beers 1877) and the 1878 *Illustrated Historical Atlas of the Counties of Northumberland and Durham, Ont.* (Belden & Co. 1878);
- possible areas of historic cemeteries as shown in the 1877 *Illustrated Historical Atlas of the County of Ontario, Ont.* (Beers 1877) and the 1878 *Illustrated Historical Atlas of the Counties of Northumberland and Durham, Ont.* (Belden & Co. 1878).

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The results of data collection and preliminary modelling of archaeological potential are presented as Figure 3.

As demonstrated by the presence of in excess of 487 registered archaeological sites within the project region, and in relation to the numerous water sources, relict shoreline features, historic transportation corridors, and historic communities throughout the area, it is evident that a considerable portion of the region has potential for the presence of archaeological resources. Areas of archaeological potential account for approximately 80% of the lands covered by this overview of existing archaeological conditions. Furthermore, this potential is scattered throughout the region such that no significant area without archaeological potential has been identified relative to the current scale of analysis. An examination of the physiography and history of the project region has indicated that archaeological resources may include known or potential sites from all periods of human occupation since the last glaciation and that numerous site types, including isolated artifacts, large and small habitations, and burials (including large ossuaries) may be present.

Of the 487 registered archaeological sites identified during this assessment, 29 are either burial sites or large-scale Aboriginal habitations site that may be associated with burials. These 29 sites include large and small burial sites, villages, and cabin and hamlet sites. In addition, at least 31 possible historic Euro-Canadian cemeteries have been identified based on examination of nineteenth-century maps.

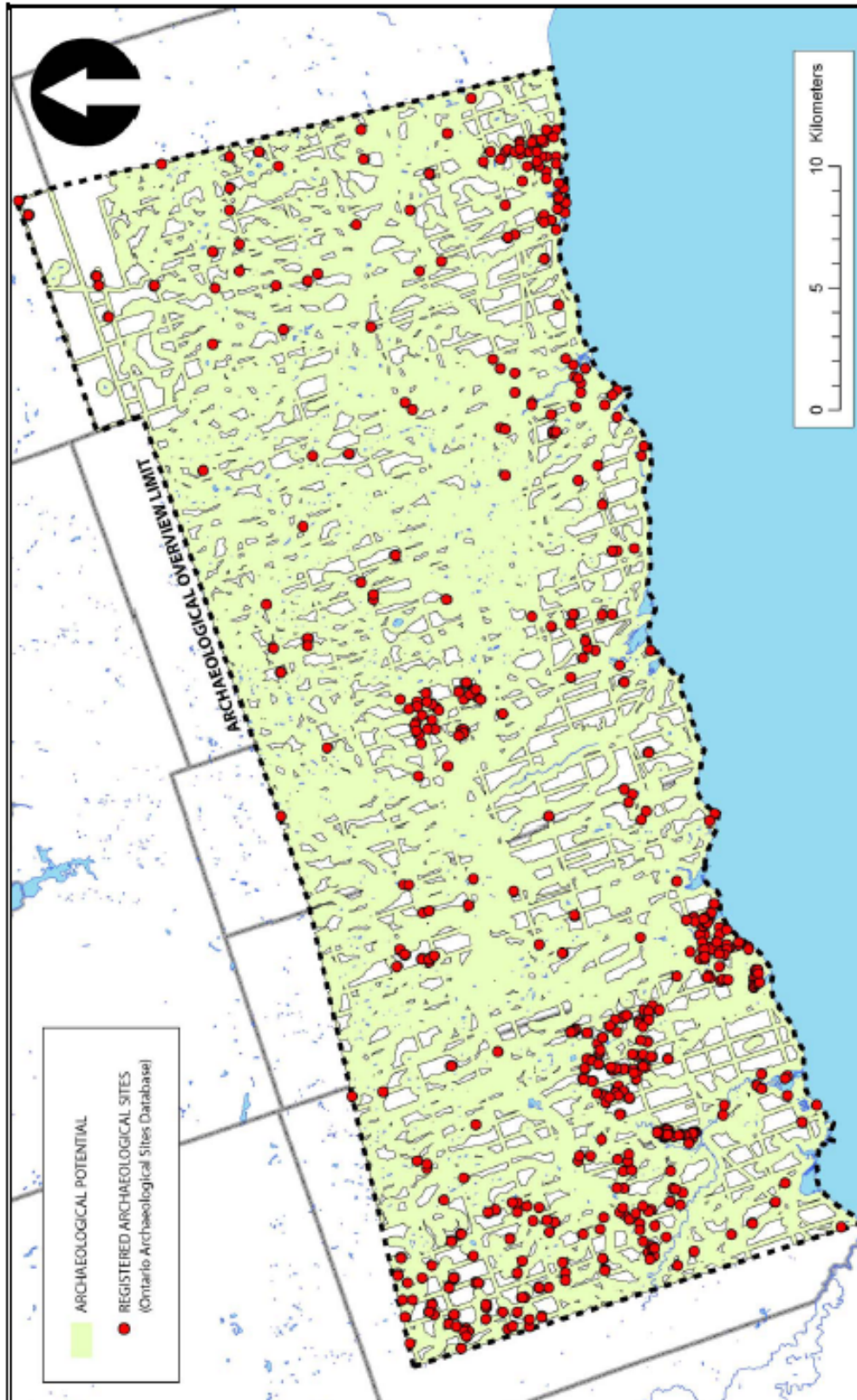
Archaeological sites have been recognized as a significant component of our cultural heritage and disturbance, displacement, or destruction of sites is to be avoided where possible or mitigated appropriately in accordance with Ontario Ministry of Culture (MCL) guidelines and recommendations, and any official municipal policies or recommendations. Furthermore, in areas of proposed project impact, that have been identified as having high potential for the presence of archaeological resources (known or yet-to-be-discovered), appropriate archaeological research and field work must be carried out in accordance with MCL guidelines in order to identify any resources that may be present. Of special significance and sensitivity are sites of human burial. These sites must be treated in accordance with the Ontario Cemeteries Act. As well, as has been noted, it cannot be assumed that impacts to Aboriginal archaeological sites can be mitigated by archaeological excavation (Stage 3 testing and Stage 4 salvage excavation). The decision to excavate, protect, or avoid Aboriginal archaeological sites within the region should be made in consultation with First Nations.

Archaeological sites and areas of archaeological potential are vulnerable to disturbance, displacement, or destruction by any proposed or future construction or other alteration of the land. During the course of this EA, as the scope of analysis becomes more focused and the number of alternatives more limited, Stage 1 archaeological assessment of selected alternatives or smaller study areas will be completed, incorporating collected data, archaeological potential modelling, and field review, to allow for the avoidance or mitigation of impacts to archaeological resources.

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Figure 3. Location of Registered Archaeological Sites and Preliminary Archaeological Potential



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6. Recommendations / Further Work

Disturbance to archaeological sites may represent a significant cultural loss, and it is therefore recommended that proposed alternatives for the Highway 407 East Completion be generated with the intention to avoid archaeological sites and minimize effects on areas of archaeological potential. Where possible, the locations of known archaeological sites should be avoided. Of special significance and sensitivity are sites of human burial. Twenty-nine registered archaeological sites have either been identified as burial sites or as large-scale Aboriginal habitation sites that indicate a heightened potential for the presence or close proximity of burial sites.

Subsequent to the generation of route alternatives for the Highway 407 East Completion, the collected archaeological data will contribute to alternatives evaluation and selection. During the process of assessing and evaluating route alternatives, a Stage 1 archaeological assessment (reconnaissance study), including field review as appropriate, will be undertaken to document known archaeological sites and archaeological potential within the short-listed route alternative areas or selected study corridor, in order to provide the consultant team with the necessary data for selection of a preferred alternative. Subsequent Stage 1 archaeological assessment work will provide more detail as necessary during the concept design stage of this EA.

During the course of the EA, data gaps will be addressed and the level of detail of archaeological assessment will be increased as the study area becomes more focused. The list of known archaeological sites and the model of archaeological potential will be updated as the configuration of the study area is changed or refined. In addition to mapping, a list of the known sites will be compiled to present relevant site data and the preliminary model of archaeological potential will be augmented by additional data collection and analysis as appropriate.

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