Stage 2 Archaeological Assessment for the:
Duffin Creek Water Pollution Control Plant
Outfall Class EA
Within Lots 16 and 17, Range Concession 2
Geographic Township of Pickering
Historical County of Ontario
City of Pickering
Regional Municipality of Durham
Ontario

Project #: 043-225-03
Licensee (#): Nimal Nithiyanantham (P390)
PIF#: P390-0036-2013

Original Report

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**EXECUTIVE SUMMARY**

*Archeoworks Inc.* was retained by *CH2M Hill Canada Ltd.* to conduct a Stage 2 Archaeological Assessment (AA) for the Duffin Creek Water Pollution Control Plant (WPCP) Outfall Class Environmental Assessment (EA) study, located within parts of Lots 16 and 17, Range Concession 2, Geographic Township of Pickering, Historical County of Ontario, City of Pickering, Regional Municipality of Durham, Ontario (the ‘study area’).

Despite careful scrutiny, no archaeological resources were encountered during the Stage 2 AA of the study area. Therefore, it is recommended that the study area be considered free of any further archaeological concern.

No construction activities shall take place within the study area prior to the *MTCS* (Heritage Operations Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.
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PROJECT PERSONNEL

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1.0 PROJECT CONTEXT

1.1 Development Context

Archeoworks Inc. was retained by CH2M Hill Canada Ltd. to conduct a Stage 2 Archaeological Assessment (AA) for the Duffin Creek Water Pollution Control Plant (WPCP) Outfall Class Environmental Assessment (EA) study, located within parts of Lots 16 and 17, Range Concession 2, Geographic Township of Pickering, Historical County of Ontario, City of Pickering, Regional Municipality of Durham, Ontario (the ‘study area’) (see Appendix A – Map 1). The study area is contiguous with the Duffin Creek WPCP at 901 McKay Road. The study was triggered by the Ontario Environmental Assessment Act and is being undertaken as a Schedule C Municipal Class EA.

This Stage 2 AA report was conducted through the EA process, under the project direction of Mr. Nimal Nithiyanantham, under the archaeological consultant licence number P390, in accordance with the Ontario Heritage Act (2009). Fieldwork was conducted under the field direction of Mr. Nimal Nithiyanantham and Ms Katie Mather (R443). Permission to investigate the study area was granted by CH2M Hill Canada Ltd. on June 21, 2013.

1.2 Historical Context

The 2011 Standards and Guidelines for Consultant Archaeologists (‘2011 S&G’), published by the Ministry of Tourism, Culture and Sport (MTCS) considers areas of early Euro-Canadian settlement, including places of early military or pioneer settlement (e.g., pioneer homesteads, isolated cabins, and farmstead complexes), early wharf or dock complexes, and pioneer churches and early cemeteries, to have archaeological potential. There may be commemorative markers of their history, such as local, provincial, or federal monuments or heritage parks. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed in a municipal register or designated under the Ontario Heritage Act or a federal, provincial, or municipal historic landmark or site, and properties that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations are also considered to have archaeological potential.

As part of the Duffin Creek WPCP Expansion, Archeoworks Inc. conducted a Stage 1 AA of the Duffin Creek WPCP site in 2003 and presented the findings in a report titled: “Stage 1 Archaeological Assessment of Duffin Creek Wastewater Treatment Plant Expansion, Class EA, City of Pickering, RM of Durham, Ontario” (Archeoworks Inc., 2004). This report included a review of the registered archaeological sites, the physiography, and the historical land use at the Duffin Creek WPCP site. The study area for the Duffin Creek WPCP Outfall EA is located at the southern part of the plant site, along the lakeshore, where a shaft may be located for a new outfall. Consequently, the Stage 1 AA also helped establish the archaeological potential in the Outfall EA Study Area. Additionally, the report documents the Stage 1 property inspection of the study area.
The results of the Stage 1 AA research, as well as additional research conducted to conform to the 2011 S&G, are provided below.

1.2.1 Stage 1 AA Summary
The Stage 1 background research carried out as part of the initial Duffin Creek Wastewater Treatment Plant Expansion Class EA identified archaeological potential for the recovery of archaeological resources within undisturbed portions of the study area based on its proximity to Lake Ontario, to several historical structures lying both within and adjacent to the study area as depicted in historical maps, and to several registered archaeological sites. Given these findings, the report recommended that a Stage 2 AA of all undisturbed locations be conducted prior to construction activities, to minimize impacts to heritage resources. While a Stage 2 AA was completed as part of the Expansion EA prior to construction in 2005, this report documents the results of the recent Stage 2 AA for the Outfall EA Study Area.

1.2.2 Pre-Contact Period
The region in which the study area is located was first inhabited after the final retreat of the North American Laurentide ice sheet. Glacial meltwater flooded the Ontario Basin forming Lake Iroquois, which expanded against the retreating ice boundary (Larson and Schaetzel, 2001, p. 531). With ice blocking the St. Lawrence River, a drainage outlet formed near Rome, New York which followed the Mohawk Valley to the Hudson Valley and into the ocean (Larson and Schaetzel, 2001, p.531; Karrow and Warner, 1990, p.15). Lake Iroquois' water levels continued to rise to 30 metres higher than modern levels, with a shoreline delineated by well-developed shorecliffs and gravel bars extending from St. Catherine to Belleville (Jackson et al, 2000, p.431; Karrow and Warner, 1990, p.15). The initial vegetation of Southern Ontario was tundra-like. As the average climatic temperate warmed, small groups of Palaeo-Indians entered the region (Karrow and Warren, 1990, p.22).

By 11,000 B.P., or 9000 B.C., the ice that had blocked the St. Lawrence River south of Montreal had retreated, exposing the St. Lawrence River as a glacial outlet into the Champlain Sea (Jackson et al, 2000, p.431). This dramatically lowered the water levels in Lake Iroquois, creating a series of short-lived post-glacial lakes, whose minimum level was more than 100 metres below present lake levels (Larson and Schaetzel, 2001, p.532; Karrow and Warner, 1990, p.15; Jackson et al, 2000, p.431; Coakley and Karrow, 1994, p.1619). This lake plain included 10,000 square kilometres of land, mainly along its north shore. The land was available to small groups of Palaeo-Indians, who likely resided along the now submerged glacial strandlines (Jackson et al, 2000, p.431).

Palaeo-Indians are thought to have been small groups of nomadic hunter-gatherers who depended on naturally available foodstuff such as game or wild plants (Ellis and Deller, 1990, p.38). Sites in Southern Ontario appear to be small campsites used during travel episodes commonly associated with glacial lake strandlines, which represent the boundary between environmentally different areas and therefore provided a wider variety of resources for exploitation from a single location (Ellis and Deller, 1990, p.51; Jackson et al, 2000, p.435). Plentiful aquatic resources and open vegetation allowed for easy hunting of both caribou and
mastodons in low and wet habitats found within lake beds (Jackson et al, 2000, p.434). The artifact assemblage from this period is characterized by fluted and lanceolate stone points, scrapers and small projectile points produced from specific chert types (Ellis and Deller, 1990). These items were created and transported over great distances as a result of following migratory animals.

As the climate steadily warmed, deciduous trees slowly began to permeate throughout southwestern Ontario creating mixed deciduous and coniferous forests (Karrow and Warner, 1990, p.30). The extensive mast forest environment of Western Ontario, with its greater densities of deer and additional other resources, allowed a more dispersed seasonal settlement pattern than those in Eastern Ontario (Wright, 1995, p.238). By 7800 B.C., Archaic Aboriginals resided in Southern Ontario and exploited seasonally abundant resources in a variety of geographic locations as they continued to hunt large game in small bands during summer months, returning to their family groups by the winter (Bursey et al, 2013a). House structures were moveable. Small villages gradually grew in size as populations increased. The artifact assemblages from this period can be characterized by a reliance on a wide range of lithic raw materials in order to make stone artifacts; presence of stone tools shaped by grinding and polishing; an increase in the use of woodworking tools; and the appearance of tools made from native copper (Ellis et al, 1990, p. 65).

As isostatic rebound, the rising of the Earth’s crust, continued, causing all abandoned shorelines to tilt upward to the north, drainage outlets fluctuated and the water levels in Early Lake Ontario rose (Karrow and Warner, 1990, p.15) , forming modern Lake Ontario. The recession of Early Lake Ontario and transgression of Lake Ontario inundated many Palaeo- and Early Archaic sites that were present along the Lake Ontario coastline (Ellis et al, 1990, p.68).

By the Middle Archaic Period (6000-2000 B.C.), Laurentian Archaic Aboriginals were present near the study area (at site AkGs-1; see Table 2), and likely resided along the ancient shoreline located immediately south of the study area. This group “adapted primarily to the transitional ‘Lake-Forest’ zone between the deciduous forests to the south and the more boreal, coniferous forests to the north” (Ellis et al, 1990, p. 85). These Aboriginals continued to hunt, fish, and gather, with less emphasis on plant foods (Bursey et al, 2013a). Unfortunately, few sites from this period have been fully excavated, but based on the available information the sites appear to be small, briefly used camps (Ellis et al, 1990, p.85).

In 800 B.C., the Early Woodland Period began with the Meadowood complex (800 -450 B.C.), which was followed by the Middlesex complex (450-1 B.C.). The Early Woodland Period is marked by increased reliance on domesticated plants, use of both hunting and gathering to procure a larger variety of foods, and the introduction of pottery indicative of a successful subsistence pattern that required long-term storage of abundant resources. Furthermore, graves and grave goods gradually became more exotic and frequent, indicating growing complexity and trade networks between Great Lakes communities. During the Woodland Period, the distinct cultural groups of the post-contact period began to develop (Bursey et al, 2013b; Spence et al, 1990, p.135).
From 200 B.C. to A.D. 900, during the Middle Woodland Period, the Point Peninsula complex was “distributed throughout south-central and eastern Southern Ontario, the southern margins of the Canadian Shield, the St. Lawrence River down river to Quebec City, most of southeastern Quebec, along the Richelieu River into Lake Champlain” (Spence et al, 1990, p. 157; Wright, 1999, p. 633). Subsequently, the Saugeen complex occupied “southwestern Southern Ontario from the Bruce Peninsula on Georgian Bay to the north shore of Lake Erie” (Wright, 1999, p.629). Although borders between complexes are not well defined, the Niagara Escarpment appears to have formed a frontier between the Saugeen and the Point Peninsula complexes (Spence et al, 1990, p.143; Wright, 1999, p.629). Consequently, the dynamics of hunter-gatherer societies shifted territorial boundaries, resulting in regional clusters that have been variously assigned to Saugeen, Point Peninsula, or independent complexes (Spence et al, 1990, p.148; Wright, 1999, p.649).

As Point Peninsula sites have been identified throughout much of Southern Ontario, their distribution suggests a population increase within adaptive capabilities to reside in various environments (Bursey et al, 2013c). Settlement-subsistence patterns include “large macroband sites on the lakeshore in the spring, summer and fall, with an early emphasis on fish and shellfish giving way, in the fall, to the exploitation of wild rice, deer and nuts. By the late fall, the macrobands dispersed into microbands moving into the interior to winter on stored foods” (Spence et al, 1990, p.164). This settlement-subsistence pattern has been conceptualized but lacks solid data (Spence et al, 1990, p.164). By the Late Woodland Period (900 A.D. to 17th century), the Point Peninsula complex had been replaced by the Princess Point complex, whose territory extended around the eastern end of Lake Ontario to the western end of Lake Erie (Bursey et al, 2013d). Some theories suggest that the Princess Point complex reflects an immigrant group who brought corn horticulture with them and ultimately became the Iroquoian people of the Ontario Iroquoian Tradition, while conflicting theories suggest continuity from Middle to Late Woodland Periods (Bursey et al, 2013c). Nevertheless, settlement patterns of macro- to microbands during summer to winter remain consistent from the Middle to Late Woodland with a growing emphasis on village clusters (Fox, 1990, p. 179).

By A.D. 1250, the Ontario Iroquoian Tradition flourished throughout much of Western and Central Ontario (Bursey et al, 2013d). The Iroquoian Tradition refers to a cultural pattern and a linguistic family in North America which includes the Huron (Wendat), Neutral (called Attiawandaron by the Wendat), Petun (Tionnontaté or Khionontateronon) in Ontario and the Five Nations of the Iroquois (Haudenosaunee) of upper New York State (Birch, 2010, p.31). Each group had their distinctive traits but shared in a similar pattern of life already established by the sixteenth century (Trigger, 1994, p.42). Villages developed as horticulture became more important for subsistence patterns, particularly the farming of maize, squash, and beans, which were supplemented by fishing, hunting, and gathering. Each village was comprised of numerous multi-family longhouses whose residence was determined on matrilineal descent (Kapches, 2007, p.176). The longhouses were compacted within a defensive palisade that overlooked cultivated fields. Most Iroquoian sites were occupied for 10-50 years with minimal reoccupation of the same site (Warrick, 2007, p.127). The village was often located near primary and secondary waterways to optimize its economic and trading capabilities. Intertribal trade consisted of small luxury items that could be carried overland (Trigger, 1994, p.44).
1.2.3 Contact Period
From Samuel de Champlain’s visit of the Huron-Wendat territory to the great epidemics of 1630, the Huron-Wendat population was reported to be approximately 30,000 individuals whose territorial homeland, stretched roughly between the Canadian Shield, Lake Ontario and the Niagara Escarpment, known as Wendake (Warrick, 2008, p.12; Heidenreich, 1978, p.369). It is speculated that four tribes, the Attignawantan, Tahontaenrat, Attigneenongnahac, and Arendahronon, amalgamated to form a single Huron-Wendat Confederacy in defense against the continual aggression of the Haudenosaunee (Warrick, 2008, p.11; Trigger, 1994, p.41).

Settlement patterns were complex; village site location was based on proximity to a source of “water, arable soils, available firewood, a young secondary forest, and a defendable position” (Heidenreich, 1978, p.375). Longhouse sizes depended on the size of the extended family that inhabited it; however, archaeological evidence demonstrates that the average longhouse was 25 feet by 100 feet, with heights about the same as widths (Heidenreich, 1978, p.366). Villages consisted of up to 100 longhouses clustered closely together, and only the largest villages on the frontier were fortified (Heidenreich, 1978, p.377). Subsistence patterns reflect a horticultural based diet that was supplemented with fish rather than meat (Heidenreich, 1978, p.377). Farming methods included ‘slash-and-burn’ to quickly and efficiently clear trees. Brushwood and flour and flint corn was consistently cultivated until the fields no longer were productive, at which point the village was abandoned, about every eight to twelve years (Heidenreich, 1978, p.381).

By 1609, Samuel de Champlain had encountered the Huron-Wendat, particularly the Arendahronon. The French concluded a trading relationship with the Huron-Wendat in order to procure greater quantities of fur (Trigger, 1994, p.68; Heidenreich, 1978, p.386). Consequently, the Huron-Wendat became the middlemen for trade goods between the French and its Algonquin, Nippissing, Tionnontaté, and Attiewandaron neighbours. By mid-1620, the Huron-Wendat had exhausted all available pelts in their own hunting territories and opted to trade European goods for tobacco and furs from their neighbours (Trigger, 1994, pp.49-50).

During the 1630s, Jesuit missionaries attempted to convert the entire Huron-Wendat Confederacy to Christianity as the initial phase of all native people in Southern Ontario (Trigger, 1994, p.51). However, the Jesuits’ presence in the region had become precarious after a series of major epidemics of European diseases that killed nearly two-thirds of the Huron-Wendat population, lowering the total population to 10,000 individuals (Warrick 2008, p.245; Heidenreich, 1978, p.369). These epidemics hit children and the elderly most severely, and the death of the elders deprived the Wendat of their experienced political, war and spiritual leaders leaving them more susceptible and vulnerable to Christian conversion (Trigger, 1994, p.52; Heidenreich, 1978, p.371).

By 1645, having grown dependent on European goods and with their territory no longer yielding enough animal pelts, the Haudenosaunee became increasingly aggressive towards the Huron-Wendat Confederacy (Trigger, 1994, p.53). Armed with Dutch guns and ammunition, the Haudenosaunee engaged in brutal warfare with the Huron-Wendat Confederacy and brutally
attacked and destroyed several Huron-Wendat villages throughout Southern Ontario (Trigger, 1994, p.53). After the massacres of 1649-50, the Huron-Wendat Confederacy became widely dispersed throughout the Great Lakes region and the Haudenosaunee controlled most of Southern Ontario occupying at “least half a dozen villages along the north shore of Lake Ontario and into the interior” (Schmalz, 1991, p.17). Ganatsekwyagon, near Frenchman’s Bay to the west of the study area, was established by the Seneca, the westernmost group of the Haudenosaunee Confederation (McKay, 1961, p.16; Abler and Tooker, 1978, p.505). The village marked the beginning of a portage route for French fur traders.

Francois de Salignac de Fenelon of the Order of St. Sulpice was the first missionary in the Township of Pickering (McKay, 1961, p.10). After arriving in Montreal in 1669, a number of Seneca, from Ganatsekwyagon, travelled down Lake Ontario “to ask that a missionary might visit them” (McKay, 1961, p.10). Fenelon went with the Seneca. He returned to France after surviving the winter and never returned to Canada, although he obtained lands for his service (McKay, 1961, p.12).

As early as 1653, the Ojibwa of the Anishinaabeg, an Algonquin-speaking linguistic group, wanted control of the land between Lake Huron and Lake Ontario in order to further their role in the fur trade (Johnston, 2004). After a major smallpox epidemic in 1662, the capture of New Netherland by the English in 1664 which curtailed access to guns and powder, and a series of successful attacks against the Haudenosaunee by the Ojibwa from 1653 to 1662, Haudenosaunee dominance in the region began to fail (Warrick, 2008, p.242; Schmalz, 1991, p.20). By 1680, the Ojibwa had begun to settle just north of the evacuated Huron-Wendat territory and, with the English entering the fur trade, the Ojibwa began to expand into southern Ontario (Gibson, 2006, p. 36; Schmalz, 1991, p.18). When the English entered the fur trade, Ganatsekwyagon declined in importance and was abandoned in favour of the western edge of Lake Ontario around the mouth of the Humber River (McKay, 1961, p. 13). The Mississauga, a tribe within the Ojibwa nation, moved southward against the Haudenosaunee utilizing Toronto Carrying Place Trail to defeat the Haudenosaunee at the mouth of the Humber River (Gibson, 2006, p. 37; Schmalz, 1991, p.27). In 1701, representatives of several bands of the Ojibwa Nation and the Haudenosaunee assembled in Montreal to participate in Great Peace negotiations, sponsored by the French (Johnston, 2004; Trigger, 2004, p.58).

From 1701 to the fall of New France in 1759, the Ojibwa experienced a “golden age” of trade, holding no conclusive alliance with either the British or the French while maintaining their middle-man position between native groups to the north and in southwestern Ontario (Schmalz, 1991, p. 35). As the Seven Years War between the French and British continued in North America, by 1758 famine, lack of supplies, and disease weakened the Ojibwa bands as well as the French (Schmalz, 1991, p.53). In 1763, the Royal Proclamation declared the Seven Years War over, giving the British control of New France and creating a western boundary for British colonization. The British failed to gain respect in the eyes of several Ojibwa bands, leading to the Pontiac Uprising that same year (Schmalz, 1991, p.70). Pontiac, an Ottawa-Ojibwa, rallied several bands against British occupation of New France, but many groups sought to avoid military action, such as chief Wabbicommicot, a powerful chief in the Toronto area, who prevented most Toronto-area bands from joining Pontiac’s struggle (Schmalz, 1991, p.71).
By 1766, after numerous battles, the Pontiac War was over when Pontiac concluded a peace agreement with Sir William Johnson, the Superintendent of Indian Affairs (Douglas, 2001, p.2).

1.2.4 Euro-Canadian Settlement History

By the end of the 1700s, the Mississaugas of the Ojibwa nation claimed portions of the County of Ontario. After the American War of Independence in the late 1700s, a large number of United Empire Loyalists and American immigrants moved into southern Ontario, putting greater demand on the quantity of available lands of settlement within Upper Canada.

In 1787, senior officials from the Indian Department met with the Mississaugas of the Carrying Place on the Bay of Quinte and Toronto to acquire land along the northern shores of Lake Ontario extending northward to Lake Simcoe, known as the Johnston-Butler Purchase (Surtees, 1994, p.107). As a result of this meeting, officials believed that they had successfully obtained and paid for a large portion of land on the north shore of Lake Ontario that would allow settlers to acquire the land from the Crown and settle (Surtees, 1994, p.107). However, the document formalizing the transaction omitted a statement of land ceded and the matter of land cession within Ontario County remained a legal issue until 1923 (Surtees, 1994, p.107). After the Anishinaabe continually pressured the Federal government to review the land cessation documents for lands south of Lake Simcoe, it became apparent land had not been correctly purchased by the British (Surtees, 1994, p.107; Surtees, 1986, p.19). The William’s Treaty provided for the last surrender of the last substantial portion of the territory that had not been given up to government (Surtees, 1986, p.19).

The Township of Pickering was first surveyed in 1791 by Augustus Jones (Farewell, 1907, p.11; Wood, n.d., p.16). Initially, Pickering was listed as Township No. 9, later given the name Edinburgh (Farewell, 1907, p.11). In 1796, Asa Danforth obtained the contract to construct “Governor Simcoe’s roads for opening up communication through the country” which began in Ancaster to Kingston (Farewell, 1907, p.11). This road was to be constructed a safe distance from the lakeshore as tensions between the United States and the British were growing (Farewell, 1907, p.12).

The first settler in Pickering was William Peck, an Indian trader and interpreter who settled at the mouth of Duffins Creek (Farewell, 1907, p.12; McKay, 1961, p. 23). The first influx of settlers into Pickering Township occurred in the 1910s, when the southeastern portion of the township was settled by Quakers from the Eastern states, specifically those that came with Timothy Rogers (Wood, n.d., p.18) After helping settle numerous Quakers in Newmarket, Rogers returned to Vermont and brought over several more Quaker families and helped settle them south and east of Duffins Creek (Wood, n.d., p.18; Farewell, 1907, p.13).

By 1820, the total population of the Township of Pickering was 375 individuals and the population quickly grew as many Quakers and immigrants from the British Isles moved into the township and established small hamlets throughout (Farewell, 1907, p.13). These hamlets serviced the agricultural communities of the Township of Pickering. The harbours of the Rouge
River and Frenchman’s Bay proved to be successful for shipping grain, lumber, and potash, “while Duffins Creek was navigable for small ships as far up as Kingston Road” (McKay, 1961, p. 36).

By 1842, the Township of Pickering’s population had grown to 3,752 individuals as Kingston Road was planked to the Rouge River and hills were graded allowing for better internal travel (McKay, 1961, p. 81). In 1855, the Grand Trunk Railway crossed Pickering and the following year, the first passenger train running from Toronto to Oshawa passed through Pickering (McKay, 1961, p. 111). The Township of Pickering continued to flourish socially, politically and economically throughout the remainder of the nineteenth century.

1.2.5 Past Land Use
To assess the study area’s potential for the recovery of historic pre-1900 remains, several documents were reviewed, namely the 1860 *Tremaine’s Map of the County of Ontario* and the 1877 *Illustrated Historical Atlas of the County of Ontario* (see Maps 2-3 and Table 1). The study area encompasses Lots 16 and 17, Range Concession 2, in the Historic Township of Pickering, County of Ontario. In 1860, no historic structures lay within the study area, and the majority of the study area appears to be agricultural lands. By 1878, the study area encompassed one historic homestead.

<table>
<thead>
<tr>
<th>1860 <em>Tremaine’s Map of the County of Ontario</em></th>
<th>Range Concession</th>
<th>Lot</th>
<th>Portion</th>
<th>Occupant/Owner</th>
<th>Structure(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>16</td>
<td>West half</td>
<td>John Clark</td>
<td>No structure(s)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td>East half</td>
<td>Herbert Linton</td>
<td>No structure(s)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>East part</td>
<td>Wm. Forceter (?)*</td>
<td>No structure(s)</td>
<td></td>
</tr>
<tr>
<td>1877 <em>Illustrated Atlas of the County of Ontario</em></td>
<td>2</td>
<td>16</td>
<td>West half</td>
<td>J. O’Connor</td>
<td>No structure(s)</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td>East half</td>
<td>R. Linton</td>
<td>No structure(s)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>East part</td>
<td>J. Gormley Est.</td>
<td>One structure</td>
<td></td>
</tr>
</tbody>
</table>

*resolution of the map prevents accurate determination of the name of the occupant/owner.

The study area is not bounded by any historic roads that were among the regular road allowances laid down during the survey of the Township of Pickering for the purpose of facilitating access to each 200-acre lot. Transportation routes such as early settlement roads (buffered by zones of 100 metres either side) also contain potential for heritage features adjacent to their rights-of-way.

No historic structures were depicted on maps in 1860, and by 1877, one historic structure was depicted within the study area. Therefore, based on the study area encompassing one historic structure, we find archaeological potential for the location of historic archaeological resources within 300 metres of this feature.

1.2.6 Designated and Listed Cultural Heritage Resources
Consultation of the Ontario Heritage Properties Database which records heritage resources that have been designated for their Provincial cultural value or interest under the Ontario Heritage Act (O.Reg. 10/06), confirmed the absence of Provincially designated heritage properties within the study area. Additionally, consultation of the records of designated and listed heritage properties within the document entitled “City of Pickering Official List of Properties of Cultural Heritage Value or Interest to the City of Pickering” (City of Pickering, 2008), confirmed the absence of both designated and listed heritage properties either within the study area or within 300 metres of the study area.

1.3 Archaeological Context

1.3.1 Registered Archaeological Sites

In order that an inventory of archaeological resources could be compiled for this study area, the Ontario Archaeological Sites Database (OASD) maintained by the MTCS was consulted. Each site is registered according to the Borden System, which is an archaeological numbering system used throughout Canada to track archaeological sites and the artifacts that come from them. The study area is located within Borden Block AkGs. According to the MTCS (2013), five archaeological sites are located within a one-kilometre radius of the study area (see Table 2).

One registered archaeological site, AkGs-1, falls within 300 metres of the study area. The 2011 S&G considers undisturbed lands within 300 metres of a registered archaeological site to be of elevated archaeological potential. Therefore, the potential for the recovery of archaeological resources within the study area can be confirmed.

Table 2: Sites within One Kilometre of the Study Area

<table>
<thead>
<tr>
<th>Borden #</th>
<th>Name</th>
<th>Cultural Affiliation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AkGs-1</td>
<td>Squires Beach</td>
<td>Archaic, Laurentian</td>
<td>Campsite</td>
</tr>
<tr>
<td>AkGs-13</td>
<td>Natrail</td>
<td>Aboriginal</td>
<td>Undetermined</td>
</tr>
<tr>
<td>AkGs-14</td>
<td>Condtrail</td>
<td>Prehistoric</td>
<td>Undetermined</td>
</tr>
<tr>
<td>AkGs-15</td>
<td>Harrier</td>
<td>Prehistoric</td>
<td>Hearth</td>
</tr>
<tr>
<td>AkGs-7</td>
<td>Brown</td>
<td>Archaic, late</td>
<td>*</td>
</tr>
</tbody>
</table>

*indicates information not available

Having noted the presence of these sites in relation to the study area, it is useful to place them in the proper context by reviewing the cultural history of occupation in Southern Ontario provided in Table 3. This data provides an understanding of the potential cultural activity that may have occurred within the study area.

Table 3: History of Occupation in Southern Ontario

<table>
<thead>
<tr>
<th>Period</th>
<th>Archaeological Culture</th>
<th>Date Range</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PALEO-INDIAN</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Clarification: As of 2005, the Ontario Heritage Properties Database is no longer being updated. The Ministry of Tourism, Culture and Sport is currently updating a new system which will provide much greater detail to users and will become publicly accessible in the future. (http://www.hpd.mcl.gov.on.ca)
### Archeological Culture

<table>
<thead>
<tr>
<th>Period</th>
<th>Archaeological Culture</th>
<th>Date Range</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Gainey, Barnes, Crowfield</td>
<td>9000-8500 BC</td>
<td>Big game hunters. Fluted projectile points</td>
</tr>
<tr>
<td>Late</td>
<td>Holcombe, Hi-Lo, Lanceolate</td>
<td>8500-7500 BC</td>
<td>Small nomadic hunter-gatherer bands. Lanceolate projectile points</td>
</tr>
</tbody>
</table>

### ARCHAIC

<table>
<thead>
<tr>
<th>Period</th>
<th>Archaeological Culture</th>
<th>Date Range</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Side-notched, corner notched, bifurcate-base</td>
<td>7800-6000 BC</td>
<td>Small nomadic hunter-gatherer bands; first notched and stemmed points, and ground stone cels.</td>
</tr>
<tr>
<td>Middle</td>
<td>Otter Creek, Brewerton</td>
<td>6000-2000 BC</td>
<td>Transition to territorial settlements</td>
</tr>
<tr>
<td>Late</td>
<td>Narrow, Broad and Small Points Normanskil, Lamoka, Genesee, Adder Orchard etc.</td>
<td>2500-500 BC</td>
<td>More numerous territorial hunter-gatherer bands; increasing use of exotic materials and artistic items for grave offerings; regional trade networks</td>
</tr>
</tbody>
</table>

### WOODLAND

<table>
<thead>
<tr>
<th>Period</th>
<th>Archaeological Culture</th>
<th>Date Range</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Meadowood, Middlesex</td>
<td>800BC-0BC</td>
<td>Introduction of pottery, burial ceremonialism; panregional trade networks</td>
</tr>
<tr>
<td>Middle</td>
<td>Point Peninsula, Saugeen, Jack’s Reef Corner Notched</td>
<td>200 BC-AD 900</td>
<td>Cultural and ideological influences from Ohio Valley complex societies; incipient horticulture</td>
</tr>
<tr>
<td>Late</td>
<td>Algonquian, Iroquoian</td>
<td>AD 900-1250</td>
<td>Transition to village life and agriculture</td>
</tr>
<tr>
<td></td>
<td>Algonquian, Iroquoian</td>
<td>AD 1250-1400</td>
<td>Establishment of large palisaded villages</td>
</tr>
<tr>
<td></td>
<td>Algonquian, Iroquoian</td>
<td>AD 1400-1600</td>
<td>Tribal differentiation and warfare</td>
</tr>
</tbody>
</table>

### HISTORIC

<table>
<thead>
<tr>
<th>Period</th>
<th>Archaeological Culture</th>
<th>Date Range</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Huron, Neutral, Petun, Odawa, Ojibwa</td>
<td>AD 1600 – 1650</td>
<td>Tribal displacements</td>
</tr>
<tr>
<td>Late</td>
<td>Six Nations Iroquois, Ojibwa, Mississauga</td>
<td>AD 1650 – 1800s</td>
<td>Migrations and resettlement</td>
</tr>
<tr>
<td></td>
<td>Euro-Canadian</td>
<td>AD 1780 - present</td>
<td>European immigrant settlements</td>
</tr>
</tbody>
</table>

### 1.3.2 Previous Archaeological Assessments

In order to further establish the archaeological context of the project area, descriptions of previous archaeological fieldwork carried out within the limits of, or immediately adjacent (i.e., within 50 metres) to the project area, as documented by all available reports that include archaeological fieldwork carried out on the lands to be impacted by this project are presented below and in within Map 4. Three reports were identified:

1. Stage 1 Archaeological Assessment of Duffin Creek Wastewater Treatment Plant Expansion Class EA, City of Pickering, RM of Durham, Ontario (Archeoworks Inc., 2004).

In 2004, Archeoworks Inc. conducted a Stage 1 AA of an area bounded to the west by Montgomery and McKay Roads, to the north by McKay Road, to the east by Jodrel and Frisco Roads and to the south by Lake Ontario, which included the current study area. The Stage 1 AA identified high potential for the recovery of historic Euro-Canadian and Aboriginal archaeological resources within undisturbed portions of the study area based on the location of nine registered archaeological sites within two kilometres of the study area, suitable physiographic features, and historical documentation of early settlement and a historically
surveyed roadway in close proximity. A field review was conducted, and a Stage 2 AA was recommended on all undisturbed portions of the study area which includes the proposed expansion areas.


In 2005, Archeoworks Inc. conducted a Stage 2 AA of four areas totalling just over 11 acres identified in the Stage 1 AA report as requiring Stage 2 AA. During the Stage 2 investigations, two historic sites, H1 and H2, were located. However, these sites were widespread, low-yielding, late-dating Euro-Canadian clusters of artifacts. Due to the insignificant nature and little heritage value represented by both H1 and H2, it was recommended both H1 and H2 be cleared of further archaeological concern.

3. A report licenced to Robert O’Brien with no title provided in the Ontario Archaeological Sites Database (OASD). A map was provided and the report and fieldwork was conducted under Robert O’Brien’s licence.

In an attempt to adhere to Section 7.5.8, Standard 4 of the 2011 S&G, the MTCS had been contacted in order to obtain a copy of the report referenced above. No response was received at the time of report completion.

1.3.3 Physical Features
An investigation of the study area’s physical features was conducted to aid in the development of an argument for archaeological potential based on the environmental conditions of the study area. Environmental factors such as close proximity to water, soil type, and nature of the terrain, for example, can be used as predictors to determine where human occupation may have occurred in the past.

The study area is situated within the clay plains landform of the Iroquois Plain physiographic region of Southern Ontario. The Iroquois Plain was formed when the area occupied by the last glacier in the St. Lawrence Valley was inundated with water from the prehistoric Lake Iroquois after the glacier’s retreat. The Plain’s large area allows it to be subdivided into different regions. The region of the Iroquois Plain within the Regional Municipality of Durham, within which the study area is found, is fairly constant. It is relatively level and poorly drained, and the soil is not very productive. The most important soil types in the region are Darlington and Newcastle loam (Chapman and Putnam, 1984, pp. 190-194). Within the study area itself, the soil types are Darlington loam to the east and Smithfield clay loam to the west (Dominion Department of Agriculture, 1956).

In terms of archaeological potential, potable water is a highly important resource necessary for any extended human occupation or settlement. As water sources have remained relatively stable in Southern Ontario since post-glacial times, proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has
been one of the most commonly used variables for predictive modelling of site location. In Southern Ontario, the 2011 S&G considers undisturbed lands in proximity to a water source to be of elevated archaeological potential. Hydrological features such as lakes, rivers, creeks, swamps, and marshes would have helped supply plant and food resources to the surrounding area, and consequently support high potential for locating archaeological resources within 300 metres of their limits. The study area closely follows the shore of Lake Ontario, with its entirety within 300 metres from the water’s edge. Therefore, the study area is considered to have potential for the recovery of archaeological remains.

1.3.4 Current Land Condition and Uses
The study area is situated near the north shore of Lake Ontario in the south end of the city of Pickering, in an area known as Squires Beach, east of Frenchman’s Bay. It is directly south of the existing Duffin Creek WPCP at 901 McKay Road, the Pickering Nuclear Generating Station is located to the west, and a grassed, wooded area around Frisco Road is located to the east. The southern extent of the study area is bounded by the Waterfront Trail, a pedestrian and bicycle trail that runs close to the shore of Lake Ontario. The study area slopes gently downward from west (approximately 79 metres above sea level) to east (approximately 76 metres above sea level) over a distance of approximately 500 metres, but slopes much more steeply from north (approximately 80 metres above sea level) to south (approximately 76 metres above sea level) over a distance of approximately 150 metres, as it approaches the Lake Ontario shore. The land is not currently in use, and lies fallow with tall grass and woods growing throughout it. A storm water pond is present within a disturbed portion of the study area. No buildings are currently found within the study area.

Two aerial photographs taken in 1954 (see Maps 5-6) reveal that at that time the study area consisted largely of agricultural land, with a small wooded pocket, a road, and a few structures. Since the photograph was taken, most of the land surrounding the study area has been developed in connection with the water and electric facilities in the region.

An aerial photograph taken in 1978 (see Map 7) shows that extensive grading and development activities had taken place study area between 1954 and that year, likely removing the archaeological potential of these areas. Additionally, the aerial illustrates the water treatment facility has begun to be in use.

A satellite image from August 31st, 2009 (see Map 8), shows the study area as it appears today. It is heavily grasses and sparsely wooded, with a few paved areas in connection with the water treatment plant. The storm water pond is also visible.

1.3.5 Dates of Fieldwork
The fieldwork for the Stage 2 AA of the study area was undertaken on June 25th, 2013. The weather during the Stage 2 investigation ranged from partly cloudy to overcast with light rain, with a mean temperature of 22.9° Celsius in Oshawa. The weather and lighting conditions during the Stage 2 investigation permitted good visibility of all parts of the study area and were conducive to the identification and recovery of archaeological resources.
2.0 FIELD METHODS

This field assessment was conducted in compliance with the 2011 S&G published by the MTCS. Photographic images of the study area are presented within Appendix B. Location and orientation information associated with all photographs taken in the field is provided within Map 9.

2.1 Identified Disturbances

The study area was evaluated for extensive disturbances that have removed archaeological potential. Disturbances may include but are not limited to: grading below topsoil, quarrying, building footprints or sewage and infrastructure development. Areas that have been subjected to extensive disturbance were observed and include: a driveway leading from the existing water treatment facility (see Image 1), Waterfront Trail (a paved walking and cycling path that constitutes the southern boundary of the study area (see Image 2), and much of the eastern portion of the study area, which consists of a storm water pond, large berms, and otherwise disturbed soil (see Images 3-4).

Background research has revealed that possible disturbance had already occurred within the eastern portion of study area. In accordance with Section 2.1.8, Standard 2 of the 2011 S&G, given that complete soil disturbance was not apparent, test pits were placed according to professional judgment within the areas north and east of the storm water pond (see Map 7). Upon examination, all test pits contained disturbances in the form of asphalt fragments, fill, compact soil, and/ or in some instances shallow profiles (see Images 5-8). This activity confirmed the area north and east of the storm water pond to be disturbed.

Disturbed areas constitute 2.92 hectares, or 40.6% of the study area.

2.2 Areas of Low Archaeological Potential

The study area was also evaluated for physical features of no or low archaeological potential, as defined by the 2011 S&G, section 2.1, standard 2. Two permanently wet areas, one on the western edge and the other bordering the Waterfront Trail to the north, fit these criteria (see Image 9). Because of their low archaeological potential, systematic survey was not warranted nor undertaken in these areas.

Areas of low archaeological potential constituted 0.14 hectares, or 2.0% of the study area.
2.3 Test Pit Survey

The remainder of the study area consisted of areas of heavy vegetation, overgrown grass and a small woodlot, on which ploughing in preparation for pedestrian survey was not viable. These lands were subjected to shovel test pit archaeological survey, which is defined as excavating 30x30 centimetre pits at set intervals on a grid pattern in areas requiring this form of assessment. Similar to the eastern portion of the study area, background research has revealed that possible disturbance had already occurred within the western portion of study area (see Map 7). In accordance with Section 2.1.8, Standard 2 of the 2011 S&G, given that complete soil disturbance was not apparent, test pits were placed according to professional judgment. Similarly, upon examination, some test pits contained asphalt fragments, fill, compact soil, and/or in some instances shallow profiles (see Images 10-11); therefore, test pit survey intervals were increased to ten metres (see Image 12). When undisturbed soil conditions were consistently encountered, test pit survey intervals were decreased to five metres (see Image 13). The woodlot located at the southern extent of the study area was surveyed at intervals of five metres (see Image 14).

A total of 4.13 hectares of the study area was subjected to test pit survey (0.58 hectares at intervals of five metres and 3.55 hectares at intervals of ten metres). A total of approximately 600 test pits were excavated to depths of between 10-50 centimetres and the topsoil was screened through six-millimetre mesh in order to facilitate the recovery of artifacts. All test pits were examined for stratigraphy, cultural features and evidence of fill, and were excavated into the first five centimetres of subsoil. All test pits were backfilled.

3.0 RECORD OF FINDS

Despite careful scrutiny, no archaeological resources were encountered within the areas subjected to Stage 2 AA.

4.0 ANALYSIS AND CONCLUSIONS

No archaeological sites were identified within the areas subjected to Stage 2 AA.
5.0 RECOMMENDATIONS

In light of the findings detailed in preceding sections, the following recommendations are presented:

1. The entire study area, having been subjected to Stage 2 AA and yielded no archaeological resources, is therefore recommended to be cleared of further archaeological concern.

No construction activities shall take place within the study area prior to the MTCS (Heritage Operations Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

1. This report is submitted to the MTCS as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c.0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the MTSC, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

2. It is an offence under Sections 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the Ontario Heritage Act.

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

7.0 BIBLIOGRAPHY AND SOURCES


Archeoworks Inc. (2004). Stage 1 Archaeological Assessment of Duffin Creek Wastewater Treatment Plant Expansion Class EA, City of Pickering, RM of Durham, Ontario (CIF# P029-109).


Ontario Ministry of Tourism, Culture and Sport (2013). *Sites within a One Kilometre Radius of the Project Area*, provided from the Ontario Archaeological Sites Database, June 27, 2013.


APPENDIX A: MAPS
Map 1: National Topographical System Map (Energy, Mines and Resources Canada, 1994) identifying the study area location.

Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Map 4: Study area with study areas of previous AAs indicated.

Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Map 5: Study area within a 1954 aerial photograph (Hunting Survey Corporation Ltd., 1954).

Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Map 6: Study area within a 1954 aerial photograph (Ontario County, Pickering Township Forest Resource Inventory, 1954).

Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Map 7: Study area within a 1978 aerial photograph (Ontario County, Pickering Township Forest Resource Inventory, 1978).

Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Map 8: Satellite image of the study area and surroundings (Google, 2013).
Map 9: Stage 2 AA of the study area.

Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
APPENDIX B: IMAGES
Image 1: Looking south at driveway leading from water treatment facility.

Image 2: Looking east along Waterfront Trail.

Image 3: Looking southwest at storm water pond.

Image 4: Looking west at disturbance associated with a large berm.

Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Image 5: Looking southwest at test pit survey to confirm disturbance

Image 6: Looking at disturbed soil (gravel fill, asphalt fragments, mottled soil) encountered north of the existing storm water pond.

Image 7: Looking at shallow profile, compacted, and mottled soil confirming disturbance.

Image 8: Looking at shallow profile and mottled soil confirming disturbance.
Looking at low-lying wet ground

Looking at disturbed soil confirming disturbance.

Looking at shallow profile, compacted, and mottled soil confirming disturbance.

Looking west at test pitting at ten metre intervals.

Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario
Stage 2 AA for the Duffin Creek WPCP Outfall Class EA within Lots 16 and 17, Range Concession 2, City of Pickering, Regional Municipality of Durham, Ontario

Image 13: Looking west at test pitting at five metre intervals.

Image 14: Looking south at test pitting at five metre intervals within the woodlot at the southern extent of the study area.
APPENDIX E: INVENTORY OF DOCUMENTARY AND MATERIAL RECORD
Under Section 6 of Regulation 881 of the *Ontario Heritage Act*, Archeoworks Inc. will, “keep in safekeeping all objects of archaeological significance that are found under the authority of the licence and all field records that are made in the course of the work authorized by the licence, except where the objects and records are donated to Her Majesty the Queen in right of Ontario or are directed to be deposited in a public institution under subsection 66 (1) of the Act.”