The 2012 Heritage Assessment of the Proposed Grand Bend Wind Farm, FIT Contract # F-002178-WIN-130-601, Municipalities of Bluewater, South Huron & Huron East, Huron County, & Municipality of West Perth, Perth County, Ontario

D.R. Poulton & Associates Inc.

The 2011-2012 Stage 1-2 Archaeological Assessment of the Proposed Grand Bend Wind Farm, FIT Contract # F-002178-WIN-130-601, Municipalities of Bluewater, South Huron, & East Huron, Huron County and the Municipality of West Perth, Perth County, Ontario

Submitted to

Neegan Burnside Ltd.,
292 Speedvale Avenue West, Unit 7,
Guelph, Ontario
N1H 1C4
Telephone – 519 823-4995
Facsimile – 519 836-5477

and

The Ontario Ministry of Tourism, Culture and Sport

D.R. Poulton & Associates Inc.
69 Langarth Street West, London, Ontario, N6J 1P5
Telephone – 519 434-0319 Facsimile – 519 434-0517
E-mail - drpoulton@rogers.com

Licencee: Sherri Pearce (Licence #P316)

Report Type: Original

PIF #P316-145-2011

August 14, 2012

TABLE OF CONTENTS

List of Tables

List of Figures

List of Figures (continued)

List of Plates

List of Plates (continued)

List of Plates (continued)

Appendix A

Project Personnel

Project Manager	Dana R. Poulton (Licence #P116)
Project Archaeologist	Sherri H. Pearce (Licence #P316)
Field Supervisors	Chris G.W. Neill (Licence #P242) Lorelyn Giese (Licence #P433)
Field Assistants	Daniella Horley Rob Danter Christine F. Dodd
Photography	Christine F. Dodd Lorelyn Giese Sherri H. Pearce
Report Preparation	Dana R. Poulton Rob Danter Sherri H. Pearce Lorelyn Giese
Draughting	Christine F. Dodd

Acknowledgments

This assessment was facilitated by the following individuals and their agencies:

- ***Lyle Parsons***, Project Manager, Neegan Burnside Ltd.;
- ***Chris Shilton,*** P. Eng., LEED® AP, Project Engineer, Neegan Burnside Ltd.;
- ***Colin MacKenzie***, Senior Partychief Surveyor, Neegan Burnside Ltd.;
- ***Robert von Bitter***, Archaeological Data Coordinator, Culture Services Unit, Ontario Ministry of Tourism, Culture and Sport; and
- ***Shari Prowse***, Archaeological Review Officer, Culture Programs Unit, Ontario Ministry of Tourism, Culture and Sport.

Executive Summary

As stated on page 1 of this report, Grand Bend Wind Limited Partnership c/o Northland Power Inc. is proposing to construct a wind farm north of Grand Bend. It will involve the construction of 48 wind turbines and related access roads, construction areas, turbine pads, collector and transmission lines. The proposed development has been designated FIT Contract # F-002178-WIN-130-601. In 2011, Neegan Burnside Ltd. contracted DPA to conduct a Stage 1-2 assessment of the proposed Grand Bend Wind Farm. The Stage 1 background research was initiated in the fall of 2011. The Stage 2 survey was conducted in the spring and early summer of 2012. This report details the rationale, methods and results of the 2011-2012 Stage 1-2 archaeological assessment of the proposed Grand Bend Wind Farm. As required by the Standards and Guidelines, specific locational data for the sites that were discovered by the Stage 2 survey of the proposed Grand Bend Wind Farm are confined to the Supplementary Documentation that is appended to the end of this report.

As described on page 2 of this report, the proposed wind farm is spread out over a number of lots and concessions within the southern portion of the County of Huron. A short segment of the proposed 230 kV Transmission Line falls within the west edge of Perth County, in Hibbert Township. The proposed development forms part of the Municipalities of South Huron and Bluewater.

The proposed Grand Bend Wind Farm is subject to the Renewable Energy Approval (REA) process (O.Reg. 359/09) and to the provisions of the Ontario Green Energy Act (Government of Ontario 2009). Figure 1 shows the locations of the study area that contains the proposed wind farm. Figures 2-4 inclusive illustrate the soils in the study area. Figures 5-9 inclusive illustrate the proposed facilities relative to the 1879 Historic Atlas maps of the geographic townships within which they are situated.

Figures 10-19 inclusive are ten aerial photographs. They are generally ordered from north to south and show the locations of the proposed wind turbines and related facilities, access roads, work areas and collector/transmission lines. They also show inferred archaeological potential and the extent of the archaeological survey. Finally, they show the location and direction of the photographic plates that are included to illustrate the proposed wind farm. Figures 20-22 inclusive show the locations of the proposed 230 kV Transmission Line. As described on page 3 of this report, it will transmit the power that is generated by the proposed wind farm from the proposed transmission station to the existing Hydro One Networks Inc. 230 kV Transmission Line in the countryside south of the Seaforth Transformer Station. These figures also show inferred archaeological potential and the extent of the archaeological survey. In addition, they show the location and direction of the photographic plates that are included to illustrate conditions on the proposed 230 kV Transmission Line.

As stated in the Section 2.1 of this report (page 19), the results of the background study demonstrated that no past archaeological investigations had been carried out within the subject properties. The study also determined that no archaeological sites had been documented within or in close proximity to any of the lands that will be subject to impact by the construction of the proposed Grand Bend Wind Farm. As stated in the Section 2.2 of this report, the results of the background study further determined that the lands that are involved in the proposed Grand Bend

Wind Farm generally had a low to moderate potential for as-yet undiscovered First Nations and Euro-Canadian archaeological remains (page 20-21).

As detailed in Section 3.0 of this report (page 25-26), the Stage 2 survey was conducted in the spring and early summer of 2012. The Stage 2 assessment of the proposed wind turbines, access roads and related facilities involved a pedestrian survey conducted at an interval of five metres or less. The Stage 2 assessment of the proposed collector lines within the proposed wind farm involved a visual examination, shovel test pit survey and judgmental test pit survey. The Stage 2 assessment of the proposed 230 kV Transmission Line involved a visual examination, shovel test pit survey and judgmental test pit survey. In all cases, the Stage 2 survey covered 100% of the lands that were inferred to retain any archaeological potential and that would be subject to impact from the proposed construction of the Grand Bend Wind Farm. The Stage 1-2 assessment also included Aboriginal engagement. The results are detailed in Supplementary Documentation.

The survey of the proposed wind turbines, access roads and related facilities resulted in the discovery of nine archaeological sites (page 36). Six of the sites consist of isolated pre-contact First Nations find spots of unknown age and cultural affiliation. The remaining three sites consist of diffuse scatters of Euro-Canadian refuse. As detailed in Section 5.0 of this report, none of these sites is considered to have any heritage value or interest (pages 49-50).

Further to the above, Standard 3 of Section 7.8.4 of the Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a: 139) states the following with respect to the reporting on archaeological surveys that did not result in the discovery of archaeological sites that warranted further concern: "If the Stage 2 survey did not identify any archaeological sites requiring further assessment or mitigation of impacts, recommend that no further archaeological assessment of the property be required." As none of the sites discovered by the Stage 2 survey is considered to show any heritage value or interest and none warrants any further investigation or concern. In consequence, it is recommended that no further archaeological assessment is warranted for any of these nine sites (page 51).

The survey of the proposed collector and transmission lines did not result in the discovery of any archaeological remains. However, it did identify a concern for the potential for unmarked graves along a 140 metre long segment of the proposed transmission line that abuts Hensall Union Cemetery. This cemetery is the only potential archaeological planning concern that was identified by the assessment of the proposed Grand Bend Wind Farm and OPA FIT Contract # F-002178-WIN-130-601 (page 51-52). The cemetery is located on the south side of Rodgerville Road, east of Highway 4. Following the formulation of the detailed design for the proposed transformer line, it is recommended that a more detailed Stage 3 assessment of this segment be conducted.

As detailed on page 52 of this report, it is recommended that the Ministry of Tourism, Culture and Sport issue a letter accepting the present report into the Ontario Public Register of Archaeological Reports. It is also recommended that the letter include a statement that the Ministry concurs with the recommendations presented herein. It is requested that the Ministry issue a letter of clearance for the proposed Grand Bend Wind Farm. Finally, it is requested that a copy of the letter be forwarded by e-mail to Lyle Parsons, Project Manager, Neegan Burnside Ltd. His email address is lyle.parsons@neeganburnside.com.

1.0 PROJECT CONTEXT

The 1993 technical guidelines for archaeological assessment formulated by the Ontario Ministry of Culture, Tourism and Recreation (now the Ministry of Tourism, Culture and Sport) (MCTR 1993) define up to four sequential stages in an archaeological assessment. The same applies to the Standards and Guidelines for Consultant Archaeologists (Ministry of Tourism and Culture 2011a); they came into effect on January 1, 2011. Stage 1 consists of background research to identify any past archaeological investigations or known sites. The background study also identifies the potential for as-yet undiscovered sites. Stage 2 consists of a field survey to confirm the presence or absence of archaeological sites. Stage 3 consists of a more detailed assessment of any sites that are of demonstrable or potential significance as heritage resources and planning concerns. Finally, Stage 4 consists of the mitigation of significant sites either by avoidance and preservation or by the implementation of salvage excavations.

Standard 3 of Section 7.2 of the Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a: 115) states the following standard with respect to the reporting requirements for archaeological assessments: "*The final report must be filed in the form and manner as specified by the ministry in Section 7.5.*"

Standard 1 of Section 7.5 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 121) further states the following standard with respect to the reporting requirements for archaeological assessments: "*All project reports must contain the sections listed in the first column of Table 7.1.*" The present report conforms in all respects to the reporting requirements of the 2011 Standards and Guidelines.

Section 7.5.5 of the Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a: 124) requires that the Project Context section of each report include the context for the archaeological investigations and that it cover three basic topics: development context; historical context; and archaeological context. They are covered in the following three subsections presented below.

1.1 Development Context

The information contained in this section of the report is being presented to satisfy Standards 1, 2, and 3 that are set out in Section 7.5.6 of the Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a: 124-125).

Grand Bend Wind Limited Partnership, c/o Northland Power Inc., is proposing to develop, construct and operate a 100 MW wind facility located north of Grand Bend, Ontario. An application for approval for the proposed development is being prepared under Ontario Regulation 39/09 of the *Environmental Protection Act*. The project is classified as a Class 4 Wind facility under the Regulation. The proposed development has been designated FIT Contract # F-002178-WIN-130-601.

The Grand Bend Wind Farm is located in Huron County. It spans portions of the lower tier municipalities of Bluewater and Huron South. Portions of the proposed transmission line also

traverse the Municipality of Huron East in Huron County and the Municipality of West Perth in Perth County.

In 2011, Neegan Burnside Ltd. contracted D.R. Poulton & Associates Inc. to conduct a Stage 1-2 archaeological assessment of the proposed Grand Bend Wind Farm. This report details the rationale, methods and results of the 2011-2012 assessment.

The Stage 1-2 Archaeological assessment also included Aboriginal engagement. Section 7.6.2 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 130) states the following:

> *When background research or archaeological fieldwork includes engagement with Aboriginal communities, the project report should include only the critical information arising from Aboriginal engagement that affected fieldwork decisions, documentation, recommendations or the licensee's ability to comply with the conditions of the licence (e.g., with regard to the care of collections).*

In this case, there was no critical information resulting from the Aboriginal engagement. Accordingly, information on Aboriginal engagement, including supporting documentation is provided in supplementary documentation appended to this report.

The basic project components of the proposed wind farm will include up to 48 turbines (Siemens SWT-2.3-113 direct drive wind turbine generators with a total name plate capacity of 100 MW), turbine access roads, a 36 kV electrical connection system, and a new transmission line within municipal road rights-of-way along Rodgerville Road and Road 183. It will connect to the provincial power grid at the 230 kV Transmission Line south of the Seaforth Transformer Station, in the Municipality of Huron East. During construction, temporary components will include access roads and work/storage areas at the turbine locations and transmission connections.

The actual footprint of each turbine will be 4.2 metres in diametre at the base, and each turbine will be centred on a square measuring 113 metres on each site: these dimensions defined the area of concern for the archaeological survey of each individual turbine. The concrete foundation for each turbine will be 18-22 metres in diametre and 3 metres deep, centred on the turbine tower. The hub height (the distance from the ground to the centre of the rotor) will be 99.5 metres and the rotor diametre will be 113 metres. The access roads will vary in width from 5 to 11 metres depending on crane crawling and passing lane requirements; for purposes of insurance, the archaeological survey covered 12 metres widths for each proposed access road. As required by OReg 359/09, each turbine will be located 550 metres or more from all non-participating noise receptors. The term noise receptor is defined in OReg 359/09.

The proposed wind farm is spread out over a number of lots and concessions within the County of Huron. A short segment of the proposed 230 kV Transmission Line falls within the west edge of Perth County, in Hibbert Township. The specific locational information for each of the proposed turbines is presented in Section 3.0 of this report. The proposed wind farm spans portions of three geographic townships. From south to north, they are Stephen, Hay, and Stanley Townships in Huron County.

The proposed Grand Bend Wind Farm is subject to the Renewable Energy Approval (REA) process (O.Reg. 359/09) and to the provisions of the *Ontario Green Energy Act* (Government of Ontario 2009). Figure 1 shows the locations of the study area that contains the proposed wind farm. Figures 2-4 inclusive illustrate the soils in the study area. Figures 5-9 inclusive illustrate the proposed facilities relative to the 1879 Historic Atlas maps of the geographic townships within which they are situated.

Figures 10-19 inclusive are ten aerial photographs. They are generally ordered from north to south and show the locations of the proposed wind turbines and related facilities, access roads and collector/transformer lines. They also show inferred archaeological potential and the extent of the archaeological survey. Finally, they show the location and direction of the photographic plates that are included to illustrate the proposed wind farm.

Figures 20-22 inclusive show the locations of the proposed 230 kV Transmission Line. It will transmit the power that is generated by the proposed wind farm to the existing Hydro One Networks Inc. 230 kV Transmission Line in the countryside south of the Seaforth Transformer Station. These figures also show inferred archaeological potential and the extent of the archaeological survey. In addition, they show the location and direction of the photographic plates that are included to illustrate the proposed 230 kV Transmission Line.

The standard concerning permission for access that is specified in the Standards and Guidelines is as follows: "*Provide statements that the landowner or landowner's representative (e.g. planner, engineer, lawyer) gave permission for the licensee to access the property to conduct all required archaeological fieldwork activities, including the recovery of artifacts, and state any limits placed on access (e.g. time limits, refusal of access to portions of property)*" (Ministry of Tourism and Culture 2011a, Section 7.5.6 Standard 3, page 125). In the present case, permission for access to conduct the archaeological survey and to remove and curate any artifacts that might be discovered was secured from the respective landowners in advance of the fieldwork.

The Ontario Ministry of Tourism, Culture and Sport designated the assessment as PIF #316-145-2011. The Stage 1 assessment was implemented under Archaeological Consulting License #P316, issued by the Province of Ontario to Sherri H. Pearce of D.R. Poulton and Associates Inc.; it was carried out under the direction of Sherri Pearce (License #P316). The Stage 2 survey of the proposed wind farm and related facilities was directed by Christopher G.W. Neill (License #P242) of D.R. Poulton and Associates Inc. The survey of the proposed 230kV Transmission Line that follow existing road rights-of-way was directed by Lorelyn Giese (Licence #R433).

The assessment was conducted in accordance with the provisions of the *Ontario Heritage Act* (Government of Ontario RSO 1990a) and the *Green Energy Act* (Government of Ontario 2009). Finally, the assessment conformed to the Technical Standards and Guidelines for Consultant Archaeologists formulated by the Ontario Ministry of Culture and Tourism (2011a).

Further to the above, the assessment was also conducted in accordance with the 2005 Provincial Policy Statement 2.6.2, which has provisions for the conservation of archaeological resources, a definition of the same, and provisions for archaeological assessments. Finally, it was conducted in accordance with the Ontario Ministry of Culture's 2006 Heritage Tool Kit, most particularly with respect to Infosheet #3 and Infosheet #6; they detail provisions for the conservation of archaeological resources and provisions for heritage impact statements, respectively.

The artifacts and records pertaining to this project are currently housed in the corporate offices of D.R. Poulton & Associates Inc. The size of the entire packed collection of artifacts measures approximately 17 cm by 20 cm by 10 cm. This information is included herein to satisfy Standard 7 of Section 6.0 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a:98). If the opportunity permits, however, the project archive will be transferred to a suitable long-term repository. Potential repositories include local or other museums and the storage facilities maintained by the London office of the Ontario Ministry of Tourism, Culture and Sport.

1.2 Historical Context

Under the 2011 Standards and Guidelines, a required standard for the Historical Context section of a report is that, in documenting the rationale for the choice of fieldwork strategy or the recommendations that are being made, the report must include references to all other reports containing relevant information, including the title, author and PIF number (Ministry of Tourism and Culture 2011a: Section 7.5.7 Standard 2, page 125). In the present case, there were no past reports that contained information relevant to the assessment.

As for the fieldwork strategy, it followed the Standards and Guidelines and was as simplified by the fact that arable lands were assessed by pedestrian survey while non-arable lands were assessed by shovel test pit survey, as required. The purpose of the survey was to confirm the presence or absence of archaeological sites that could represent possible constraints to the proposed construction of the turbines and related access roads, etc.

This section of the report also provides the historic context for human settlement of the area of the proposed Grand Bend Wind Farm, as required by Standard 1 of Section 7.5.7 of the Standards and Guidelines (Ibid). In the interest of context, brief summaries are included on the major environmental changes through time, and on the characteristics of settlement and subsistence patterns for the relevant time periods and cultures represented in the history of the area. For reference purposes, a cultural chronology of the region is presented in Table 1.

The Paleo-Indian Period (9500-7000 B.C.)

The first known human occupation of the province took place ca. 9500 B.C., following the retreat of the Wisconsin glacier. During this period, the environment in southern Ontario was characterized by a cool climate. The vegetation, in transition from spruce to pine dominated forests, would have resembled the modern sub-arctic.

The initial occupation of southern Ontario by Paleo-Indian peoples took place toward the end of a period of high water levels in the Great Lakes, including Lake Algonquin in the Lake Huron Basin and early Lake Erie to the south. That ended when the North Bay outlet opened ca. 8500-8000 B.C., draining Lake Algonquin eastward. The result created Lake Stanley in the Lake Huron Basin, Lake Hough in the Georgian Bay Basin and what were in effect a series of large ponds in the Lake Erie Basin. During that period what are now Pelee Island and Middle Island were hills in the dry west end of the Lake Erie Basin.

Paleo-Indian sites in the Great Lakes region are presumed to relate to a focal adaptation based primarily upon the communal hunting of seasonally migrating herds of woodland caribou. In general, favourite Paleo-Indian site locations include areas adjacent to glacial spillways and

kettle lakes, often near present-day swamps on loam soils proximal to muck soils representing the margins of relic pro-glacial or post-glacial lakes. The most diagnostic Paleo-Indian artifacts consist of various types of Early Paleo-Indian fluted projectile points (ca. 9500 - 8500 B.C.) and of projectile points of the Late Paleo-Indian Holcombe type (ca. 8400 B.C.) and Hi-Lo type (ca. 8300 - 7000 B.C.).

Table 1 Cultural Chronology for Southwestern Ontario

PERIOD	GROUP	TIME RANGE	COMMENT
PALEO-INDIAN	Fluted Point Hi-Lo	9500 - 8500 B.C. 8300 - 7900 B.C.	Big game hunters; small nomadic groups
ARCHAIC			
Early	Side Notched	8050-7750 B.C.	Nomadic hunters and gatherers.
	Nettling	7900-6900 B.C.	
	Bifurcate Base	6800 - 6000 B.C.	
Middle	Laurentian	3500 - 2500 B.C.	Transition to territorial settlements.
Late	Lamoka	2500 - 1800 B.C.	Polished/ground stone tools
	Broad Point	1800 - 1400 B.C.	
	Crawford Knoll	1500 – 500 B.C.	
	Glacial Kame	*ca.* 1000 B.C.	Burial ceremonialism
WOODLAND			
Early	Meadowood Red Ochre	1000 - 400 B.C. 1000 – 500 B.C.	Introduction of pottery
Middle	Saugeen Princess Point	400 B.C. - 500 A.D. 500 – 800 A.D.	Long distance trade networks. Incipient horticulture
Middle: Western Basin	Couture	300 B.C. –500 A.D.	Long distance trade networks
	Rivière au Vase	500-900 A.D.	Incipient horticulture
Late: Iroquoian	Early Iroquoian	800 – 1280 A.D.	Transition to village life and agriculture
	Uren	1280 - 1330 A.D.	Large village sites
	Middleport	1330 - 1400 A.D.	Widespread stylistic horizon
	Neutral	1400 - 1650 A.D.	Tribal differentiation and warfare
Late: Western Basin	Yonge Phase	900 – 1300 A.D.	Transition to village life and agriculture
	Springwells Phase	1300 – 1400 A.D.	Large village sites
	Wolf Phase	1400 – 1550 A.D.	Tribal differentiation and warfare
HISTORIC			
Early	Odawa, Ojibwa, Potawatomi	1700 - 1875 A.D.	Social displacement
Late	Odawa, Ojibwa, Potawatomi, Six Nations, Euro-Canadian	1800 A.D. - present	European settlement

The Archaic Period (7700-500 B.C.)

Archaeologists divide the Archaic period into three sequential sub-periods: the Early Archaic (ca. 7700 – 6000 B.C.), the Middle Archaic (ca. 6000 – 2500 B.C.) and the Late Archaic (ca.

2500 – 500 B.C.). The Archaic period was characterized by gradually warming temperatures and by the northward migration of modern flora and fauna that were established throughout their current range by around 4000 B.C. Water levels continued to rise throughout this period, but in the earlier millennia vast areas in the Lake Erie and Lake Huron basins were dry and habitable. Indeed, research suggests that these lake plains would have represented the richest environment for prehistoric hunters and gatherers in the entire Lower Great Lakes region, and that they probably contained a wealth of early camp sites and other archaeological resources that were later flooded.

In general, settlement and subsistence patterns of the Archaic Period are characterized by small camps and scattered finds related to a seasonal round of hunting, fishing and the gathering of wild plant foods. A significant development in settlement at the very end of the Late Archaic was the use of communal cemeteries by peoples of the Glacial Kame Culture. These cemeteries date to ca. 1000 B.C. and typically feature rich mortuary ceremonialism.

The Woodland Period (1000 B.C. – 1650 A.D.)

The Woodland Period that follows the Archaic in the lower Great Lakes region spans a series of important changes in culture and adaptation. This period is most commonly divided into three chronological sub-periods: Early, Middle and Late. For the Woodland period archaeologists have recognized a cultural divide between the sites of the central and eastern portions of southwestern Ontario and those of the westernmost portion of the region. Sites in the latter portion of the region pertain to what is termed the Algonquian Western Basin Tradition while sites in the central and eastern portions of the region are ancestral Iroquoian.

Early Woodland (ca. 900 to 400 B.C.)

The Woodland Period is marked by the introduction into Ontario of pottery, the earliest of which dates to the Early Woodland sub-period. Beyond this, there appear to have been no substantial changes in the hunting, fishing and gathering settlement and subsistence patterns followed during the Late Archaic. Burial ceremonialism, however, suggests an increased social or territorial identity with a particular resource area such as a drainage system.

Mortuary ceremonialism is characteristic of this period, as expressed by the inclusion of elaborate grave goods in burials, and it represents the fluorescence of a pattern recorded for the slightly earlier Glacial Kame Culture of the Terminal Archaic. The evidence for the Early Woodland period suggests that it represents an increased social or territorial identity with a particular resource area such as a drainage system.

Middle Woodland (ca. 300 B.C. to 500 A.D.)

The Couture Complex of the Western Basin Tradition, which occupied this region during the Middle Woodland period, is the poorest known of the Middle Woodland cultural complexes of southern Ontario. This complex occupied the area drained by rivers flowing into Lake St. Clair and the northwest shore of Lake Erie.

The Couture Complex subsistence included the hunting of deer as well as the gathering of black walnut, hickory and acorn. There are some indications that mortuary practices of this complex included the use of burial mounds, and burial mounds have certainly been recorded on Pelee Island and on the mainland north of Point Pelee. Another characteristic of this time period is the presence of large caches of exotic artifacts that provide evidence of long distance contacts with peoples of the Hopewellian Interaction Sphere. One example from the Bothwell Sand Plain of Kent County is a cache of over 200 bifaces of Flint Ridge Chalcedony; the source for that material is in central Ohio.

Late Woodland (ca. A.D. 800-1650)

The Late Woodland sub-period in the Western Basin Tradition has been divided into four sequential phases: the Rivière au Vase Phase (ca. 500-900 A.D.); the Younge Phase (ca. 900-1300 A.D.); the Springwells Phase (ca. 1300-1400 A.D.); and the Wolf Phase (ca. 1400-1550 A.D.).

The Rivière au Vase Phase is best known from sites on Point Pelee. Sites of this phase include small camps as well as longer term occupations by larger populations exploiting the rich marsh and lakeshore environment. These sites were occupied during the warm seasons. It is believed that in the winter the population dispersed into a number of small groups to hunt elsewhere within their territory.

Our knowledge of the Rivière au Vase Phase is limited, as sites of that phase are generally rare. In contrast, the succeeding Younge Phase is represented by numerous well documented sites. Subsistence during that phase represented a continuation of the Rivière au Vase Phase, with a seasonal round that included the exploitation of seasonally abundant resources. Corn was grown by Younge Phase peoples, but it only occurs in small quantities on sites of this phase and it is evident that it only represented a supplementary food source. That is in sharp contrast to contemporary Iroquoian sites, where cultigens represented an ever increasingly important part of the diet. It has been hypothesized that the larger number of Younge Phase sites reflects an increase in population during the period ca. 900-1300 A.D; it has further been hypothesized that the people of this region expanded into previously uninhabited areas during this period (Murphy and Ferris 1990:262). The Younge Phase settlements included villages on the Thames River east of Thamesville.

Settlement and subsistence during the succeeding Springwells Phase represented a continuation of earlier patterns, but with an increased emphasis on warm season village sites located in areas with a diversity of natural resources. That pattern evidently reflects an increased reliance of agriculture to supplement the diet of Springwells Phase peoples. Winter camps occur on the Thames River during this period, but not village sites. At the same time, Springwells Phase peoples expanded into the East Dover Plain on the east side of Lake St. Clair. These moves may have been in response to a westward expansion of contemporary Iroquoian peoples into the Western Basin Tradition territory of the Bothwell Sand Plain during the 13th century.

The transition between the Springwells and Wolf Phases and the Wolf Phase itself are both marked by the use of village sites surrounded by protective earthworks. Contemporary villages of the pre-contact Neutral Iroquoians are also protected by earthworks with palisades, providing

evidence of continued warfare and tension between the Iroquoians and Western Basin peoples of southwestern Ontario.

Although the study area fell within the limits of the Western Basin Tradition throughout most of the Late Woodland period, it was in reality part of the frontier that separated Western Basin peoples in extreme southwestern Ontario from the contemporary Iroquoian peoples of the Neutral tribal confederacy in the central and eastern parts of southwestern Ontario. In the late 15th century, during the Wolf Phase of the Western Basin Tradition, there was a westward expansion of Neutral (or Attawandaron) peoples into the Bothwell sand plain and a small number of Iroquoian villages were established in what is now Kent County, as far west as Chatham. This westward expansion reflects warfare between the Iroquoian Neutral peoples and their Algonquian-speaking Western Basin contemporaries. It was a conflict that extended back into the 15th century and that eventually led to the withdrawal of the Neutral to east of the Grand River by the late 16th century. By the time of the European fur trade in the first half of the 17th century, the conflict between the Neutral and the Algonquian Fire Nation who lived around the west end of Lake Erie was still ongoing.

As originally formulated by J.V. Wright (1966), the full sequence of the Ontario Iroquoian Tradition involves three main stages, termed Early, Middle, and Late Ontario Iroquoian. The Iroquoian peoples of southwestern Ontario consisted of the Neutral tribal confederacy and their prehistoric ancestors.

The Early Iroquoian stage in this region spans the period ca. 800-1280 A.D. and comprises the evolution of various communities. They were typically oriented to drainage systems on sand plains in the area of the Thames River and Sydenham River drainages, and on the stream courses that flowed south into Lake Erie and east into Lake Ontario. J.V. Wright (1966) distinguished between the Early Iroquoian peoples of southwestern Ontario and of south-central and southeastern Ontario as the Glen Meyer and Pickering Branches, respectively. However, those terms have fallen out of favour with more recent researchers, who don't accept the construct that two distinct branches existed during the Early Iroquoian stage.

The succeeding Middle Iroquoian stage subsumes the Uren sub-stage (ca. 1280-1330 A.D.) and the Middleport sub-stage (ca. 1330-1400 A.D.). This period was characterized by an increase in village size and, around the beginning of the Middleport substage, by the abandonment of sand plains and a shift into areas with heavier, more drought-resistant soils.

Archaeologists typically divide the Late Iroquoian stage in southwestern Ontario into three successive periods: the prehistoric (or pre-contact) Neutral (ca. 1400-1550 A.D.); the proto-historic Neutral (ca. 1550-1580 A.D.); and the historic Neutral (ca. 1580-1651 A.D.). Of these, the proto-historic Neutral marks the period of indirect contact with European fur traders and missionaries, while the historic Neutral marks the period of direct contact with Europeans.

Each of the Iroquoian villages in the Bothwell sand plain had a population of up to several hundred individuals and was protected by earthworks. The Iroquoian way of life was largely based on a subsistence pattern that involved the cultivation of corn, beans and squash, supplemented by hunting, fishing and the gathering of wild plant foods. Iroquoian villages were typically occupied year-round for some 12-20 years. They moved when the local supply of firewood had been exhausted and the soils in the surrounding agricultural fields were no longer

fertile. Villages may cover from one to several hectares in size and included numerous dwellings known as longhouses. In addition to villages, satellite settlements consisting of smaller, more temporary habitations such as agricultural cabin sites and fishing and hunting camps may occur in the area surrounding the village.

The prehistoric Neutral were widely distributed throughout the southern part of southwestern Ontario, from Lake Ontario and the Niagara Peninsula westward to west of London. In the mid 16th century, however, the communities in the western part of the region moved east of the Grand River. The Neutral and the other Ontario Iroquoian tribal confederacies all met the same fate in the mid 17th century: first devastated by a series of plagues accidentally introduced by the Europeans; and finally dispersed and driven from their homelands by raids from the Iroquois of New York State in 1649-1651 A.D.

The Historic Period (A.D. 1700 to Present)

The history of the First Nations peoples during the second half of the 17th century and the succeeding 18th century was one of wide-scale cultural displacement. The displacement of the Iroquoians from southern Ontario in 1649-51 and the Algonquian-speaking peoples from adjacent Michigan and Ohio resulted in a re-organization of the cultural landscape of southwestern Ontario towards the end of the 17th century. It was during this period that the Ojibwa established themselves in the region. The available natural resources also made the area attractive for hunting, fishing and foraging for plant foods. Maple sugar was also an important product during this period.

The loss of the Thirteen Colonies in the American Revolution provided the British Crown with an incentive to expand settlement into what became Upper Canada in 1791. To that end, the Crown negotiated a series of treaties with the resident First Nations peoples.

The early efforts to settle the Huron Tract are inextricably linked to John Galt and the Canada Company. Galt, a Scottish-born author of some fame in England, had been involved in Canadian affairs since his advocacy for war reparations claimants in the aftermath of the War of 1812. He was instrumental in the formation of the Canada Company in 1824, for the purposes of purchasing Crown and Church land en masse, and then selling it for settlement. As part of the complicated negotiations with Church and Crown involving these lands, the Company received one million acres of land in the Huron Tract, which had been recently acquired from the Ojibwa (Scott 1966: 13-14). Figures 5-9 inclusive are facsimiles of the 1879 Historic Atlas maps of the geographic townships that are involved in the proposed wind farm. They show the locations of the individual proposed wind turbines and the collector and transmission lines in relation to the extent of the settlement as of the third quarter of the 19th century.

The first Euro-Canadian settlers in what would become Huron County arrived in the second half of the 1820s. However, by 1837, there were still less than 400 inhabitants in the county. The building of a major settlement road (the Huron Road) to Goderich in 1827 gradually changed this, and the London Road, another major settlement road, was opened in the fall of 1832 (Scott 1966:53). By 1842 the population of the Huron Tract had exploded to 7,190. Much of this settlement was centred on Goderich and along the London and Huron Roads, but settlement also

began to expand to points north (Scott 1966: 52-57). In 1850 Huron County was created out of the District of Huron.

Goderich and Tuckersmith Geographic Townships were the earliest in the county to be settled, beginning as early as 1828 on a small scale. Stephen Geographic Township was settled beginning in 1832, located as it was to the south of the future county, closer to already existing population centres like London. The first settler in Stephen Township was James Willis, who traveled up the London Road with his wife in 1831 and settled in the eastern part of the township. Much of the early settlement was in this area, as the southern and western parts of the township were low and marshy and were unsuitable for habitation or agriculture. The drainage problems in that area grew even worse when Brewster & Co. constructed a mill on the current site of Grand Bend in 1832. The mill dam caused extensive flooding throughout the area, angering many farmers. The Canada Company launched an unsuccessful suit to have the mill torn down, and it was eventually demolished by a "mob of rioters" from Williams, Biddulph, McGillivray and Stephen Townships, the four townships that were affected by the flooding. Stephen Township was originally annexed to Usborne Township, but by 1845 it had control of its own municipal affairs. It was once again annexed in 1850, but was again independent by 1852. The first school was established by 1848 on the property of George Snell, who resided on Lot 15 along the London Road. In 1871 the township had a population of 4,349 and a surface area of 53,844 acres (21,799 hectares), of which 17,108 acres (6,926 hectares) were 'improved.'

Hay Geographic Township is located to the north of Stephen Geographic Township; it contains the majority of proposed turbine sites. Hay was surveyed in 1835. It has a surface area of approximately 54,527 acres (22,076 hectares); as of 1879, 26,000 acres (10,526 hectares) of the township were improved. The population at that time was 4,119, which was slightly smaller than its southern neighbor: Stephen Township. This is partly due to its later settlement date: the main source of new inhabitants for this part of Huron County was the London Road, which meant that many travelers simply stayed in Stephen Township. The earliest recorded settlers in Hay Township arrived in 1833; as was the case with Stephen Township, they settled along the London Road. The next highest concentration of settlers was along the Lake Road (now Bluewater Highway) (Hay Township Book Committee 1996: 51). Between 1846 and 1851 French Canadians from Quebec settled at St. Joseph. By 1861 new waves of German and Pennsylvania Dutch emigrants had arrived. The population of Hay Township that year was 3,054 (Hay Township Book Committee 1996: 30).

A prominent feature of Hay Township was Hay Swamp, also known as "the Big Marsh;" it extended from Concession 4 to Concession 8 and covered some 8,000 acres, representing 15% of the surface area of the township (Hay Township Book Committee 1996: 12). It was and is very rich in wildlife, including deer.

The northernmost proposed wind turbines are located in Stanley Geographic Township. It was surveyed in 1835 and has a surface area of 53,844 acres (21,799 hectares). The first Euro-Canadian pioneer in Stanley was a Reverend Mr. Cooper, who settled on the Huron Road. A handful of settlers followed over the next few years, then there was a major influx of settlers in 1836. Stanley Township was mainly settled by English Protestants, followed by Scottish Catholics; there were also settlers from Germany of various religious denominations, including Tunkers, Mennonites and Lutherans (Scott 1966: 158).

The 230 kV Transmission Line follows Rodgerville Road, then northeast on Road 183. The portions of the Rodgerville Road segment that lie on the south side of the road fall within Usborne Township, while portions that lie on the north side of Rodgerville Road fall within Tuckersmith Township. The segments that follow Road 183 are primarily on the north side of the road, within the south edge of Tuckersmith Township; the segments that are on the south side of the road are located within the north edge of Hibbert Township, in Perth County.

The first settler in Usborne Township arrived on June 21, 1831. That same year John Balkwell persuaded several of his neighours in the County of Devon, England, to emigrate to Usborne. They settled together at a place they named Devon (H. Belden & Co. 1879a: xx). By the third quarter of the 19th century settlement in Usborne Township had spread. The 1879 Historic Atlas noted that the population of the township was 2,616 as of 1878 (Ibid).

Tuckersmith is the second smallest geographic township in Huron County, with a surface area of 40,880 acres (165, 551 hectares). The 1879 Historic Atlas also describes it as "the most thickly settled and most improved," with almost 31,000 acres (75%) under cultivation. The Historic Atlas ascribed this prosperity to the fact that the Township was readily accessible by two important settlement roads: the London Road, which forms the west edge of the township; and the Huron Road, which forms the northwest edge. The Historic Atlas lists the population of the township as being 3,699 in 1871 and 3,048 in 1879.

A segment of the proposed 230 kV Transmission Line that follows Road 183 is located in the southern portion of the road right-of-way. This places it in Hibbert Township, in Perth County. It has a surface area of 42,306 acres. The portion of the township that borders the London Road between Dublin and Tuckersmith was known as "Irishtown." It was settled in the 1830s and was the first part of Hibbert Township to be settled by Euro-Canadians (H. Belden & Co 1879b: xviii). Settlement in the township became more widespread between 1848 and 1850; it was during this period that Staffa was established. Dublin was the main community in Hibbert Township. As of the 1871 census, 37,546 acres were occupied and 24,240 acres were improved.

1.3 Archaeological Context

This section of the report consists of several distinct elements as defined in Section 7.5.8 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 125-126). They are described below.

Known and Registered Archaeological Sites

Consistent with Standard 1 in Section 7.5.8 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 125), the Stage 1 background study examined data for a study area that encompassed a one kilometre buffer surrounding the proposed Grand Bend Wind Farm. The Ministry of Tourism, Culture and Sport does not maintain a database of properties that have had past archaeological investigations. In consequence, the only way a consulting archaeologist will know that a past assessment has been conducted in a given area is if he or she has personal knowledge of it, or if the assessment resulted in the discovery and registration of one or more archaeological sites.

Two collective sources were examined in the course of the basic background research. One was the Archaeological Sites Database of the Ministry of Tourism, Culture and Sport; it houses site record forms for registered sites as well as published and unpublished reports on past surveys, assessments and excavations. Data on registered sites within the study area were provided by Robert von Bitter, Archaeological Data Coordinator of the Ministry on November 15, 2011. As such, the registered sites data presented in this report satisfy the first bullet of Standard 1, Section 1.1 of the Standards and Guidelines for archaeological resource assessment formulated by the Ministry of Tourism and Culture (2011a: 14).

The second collective source for the assessment was the library/archives of D.R. Poulton & Associates Inc. It includes an extensive inventory of published and unpublished reports on past archaeological assessments in the one kilometre study area, as well as inventories of registered and unregistered archaeological sites in the area. As such, the background research on past investigations within the area satisfies the second bullet of Standard 1 of Section 1.1 of the Standards and Guidelines for archaeological resource assessment formulated by the Ministry of Tourism and Culture (2011a: 14).

Further to the above, the background study also examined published sources on the 19th century Euro-Canadian settlement of the area within which the proposed Grand Bend Wind Farm is located. They included reprints of the 1879 Illustrated Historic Atlas of Huron County and the 1879 Illustrated Historic Atlas of Perth County (H. Beldon & Co. 1879a and 1879b, respectively), the history of Huron County by Scott (1966), the history of Stephen Township by Mack and Gibb (1992), and the history of Hay Township by the Hay Township Book Committee (1996).

Consultation with the Ministry of Tourism, Culture and Sport determined that five sites have been registered within the one-kilometre study area for the proposed development; although, none of the sites is located within or near any of the lands to be impacted. They are AhHk-117 (the M.T. Johnston site), AhHk-118, AhHk-119 (the Simmons Drain site), AiHj-2, and AiHj-3. Summary data on the registered archaeological sites are presented in Table 2. All five sites are First Nations components. Unfortunately, all five sites are of unknown age and cultural affiliation.

Table 2 Summary Data on Registered Archaeological Sites in the Study Area

Borden #	Site Name	Site Type	Cultural Affiliation
AhHk-117	M.T. Johnston	Lithic Scatter	First Nations, indeterminate age & cultural affiliation
AhHk-118	N/A	Lithic Scatter	First Nations, indeterminate age & cultural affiliation
AhHk-119	Simmons Drain	Lithic Scatter	First Nations, indeterminate age & cultural affiliation
AiHj-2	-	Isolated find spot	First Nations, indeterminate age & cultural affiliation
AiHj-3	-	Isolated find spot	First Nations, indeterminate age & cultural affiliation

Two of the sites are isolated find spots; each consists of one or a few chipped lithic artifacts. The other three registered sites are lithic scatters. The term "*lithic scatter*" is used by archaeologists to refer to ploughed-disturbed sites where most or all of the artifacts consist of chipped stone tools and debitage, the waste product of chipped stone tool manufacture and maintenance. In most cases, lithic scatters represent temporary occupations by small groups of people; these are characteristic of sites such as hunting camps.

Previous Archaeological Fieldwork

The authors of this report are not aware that any archaeological investigations were ever carried out within any of the subject properties prior to the 2011-2012 Stage 1-2 assessment of the proposed Grand Bend Wind Farm.

Conditions in the Subject Lands

Figure 1 shows the location of the study area that contains the proposed Grand Bend Wind Farm. As illustrated, it is situated north of Grand Bend and east of the Lake Huron shoreline. The vast majority of the proposed wind farm is situated within the Municipality of Bluewater. The south end of the proposed wind farm is situated within the Municipality of South Huron.

The distributions of the proposed wind turbines span a north-south distance of 15 kilometres. The easternmost wind turbine site is located 4.25 kilometres east of the Lake Huron shoreline; the westernmost turbine is located 800 metres east of Lake Huron. All but a few of the proposed wind turbines are situated in the portion of the study area that is bounded to the west by Bluewater Highway. A few of the proposed wind turbines are located east of Blackbush Line, between Blackbush Line and Bronson Line.

Land use in the study area is agricultural and few settlements are present within the study area. Grand Bend is situated on the southwest edge of the study area, the hamlet of Blake on the northeast edge, and the hamlet of St. Joseph on the northwest edge. Drysdale is situated within the northern portion of the study area and Zurich and Dashwood are situated to the east of the study area.

The study area is drained by some 16 first and second order stream courses. They are termed drains, are partly channelized, and flow west into Lake Huron. The study area is flat to slightly undulating except where stream courses have dissected the landscape.

The high quality aerial photographs illustrated as Figures 10-19 inclusive of this report are generally ordered from north to south and show the locations of the proposed wind turbines and related facilities, access roads, work areas and collector/transformer lines. They also show inferred archaeological potential and the extent of the archaeological survey. In addition, they show the location and direction of the photographic plates of the proposed wind turbines and related facilities that are included in this report.

The proposed wind turbines and the related turn radii, construction pads and access roads are all located within agricultural fields. Buried collector lines will run from the turbines to the road rights-of-way following the proposed access roads. The power that has been generated will then be transmitted by the proposed 230kV Transmission Line; it will connect with the existing power grid at the 230 kV Transmission Line on the north side of Road 183 south of the Seaforth Transformer Station. Figures 20-21 illustrate the route of the proposed 230 kV Transmission Line. They also show the location and direction of the photographic plates that illustrate conditions along the transmission line. More detailed information on all of these proposed facilities are provided in Section 3.0 of this report.

The proposed Grand Bend Wind Farm lies within the Huron Fringe and Huron Slope physiographic regions. The Huron Slope is located between the Algonquin shore cliff and the Wyoming Moraine. Chapman and Putnam describe the area as a clay plain modified by a narrow strip of sand (1984:161). The Huron Slope rises gently from 475 to 700 metres a.s.l. (ibid: 160). The Huron Fringe is a narrow fringe of land, approximately 125 kilometres long, along the eastern shore of Lake Huron from Sarnia to Tobermory. It comprises wave-cut terraces of postglacial Lake Algonquin and Lake Nipissing and is characterized by boulders, gravel bars and sand dunes (Chapman and Putnam 1984:161).

Lakes Algonquin and Nipissing are the youngest of six postglacial lakes once present in the Lake Huron Basin. Both of these lakes maintained a level of approximately 185 metres above sea level. The relic shorelines of Lakes Algonquin and Nipissing can be traced from Sarnia to Grand Bend, but they are not evident between Grand Bend and Point Clark, which is located just south of Kincardine. This is the segment of the east shore of Lake Huron within which the proposed Grand Bend Wind Farm is situated. Chapman and Putnam (1984: 70) infer that the absence of the relic Lake Algonquin and Nipissing beach ridges in this area may mean they were undercut by the present lake.

Two other post-glacial lakes are situated within the study area. They are the twin beaches of Lake Warren and parallel the Wyoming Moraine. These twin beach ridges extend roughly north south, immediately west of Bronson Line. All of the proposed wind turbines are located between the Lake Huron shoreline and these two relic beach ridges.

Land use in the study area is agricultural. Four different soil types are represented in the 48 proposed turbine sites. Figure 2 is a key plan of the soils that occur in the study area for the proposed Grand Bend Wind Farm; Figures 3 and 4 illustrate the soils in the northern and southern portions of the study area, respectively.

Nineteen of the turbine sites are located on Berrien sandy loam (Turbines 1, 2, 4-17 inclusive and Turbines 31-33 inclusive). Part of Turbine 19 is also located on this soil. Berrien sandy loam is part of the Grey-Brown Podzolic Group (Hoffman et al. 1952, South Sheet). The drainage is imperfect, the soil materials of this soil consist of sandy outwash over fine textured till and the soil profile consists of six inches (15 centimetres) of dark brown sandy loam over slightly mottled sand horizons which are usually fairly well defined (Ibid). In this soil type heavy clay usually occurs at depths of three feet (92 centimetres) or less (Ibid).

A further 17 turbine sites are located on Brady sandy loam (Turbines 18, 21-30 inclusive and Turbines 34-39 inclusive). Brady sandy loam is part of the Azonal Alluvial Group (Hoffman et

al. 1952, South Sheet). The soil materials of this soil consist of well sorted sandy outwash and the soil profile consists of six inches (15 centimetres) of dark grey sandy loam over slightly mottled sandy loam; the drainage is imperfect (Ibid).

Nine other turbine sites are located on Brookston clay loam (Turbines 40-48 inclusive). This soil is part of the Dark Grey Gleisolic Group (Hoffman et al. 1952, South Sheet). The soil materials of this soil consist of fine-textured till and the soil profile consists of seven inches (17 centimetres) of dark grey to very dark grey clay loam, silt loam or silty clay loam; the drainage is poor (Ibid).

A portion of the Turbine 19 site is located on another soil; it is Perth clay loam. This soil is part of the Grey-Brown Podzolic Group (Hoffman et al. 1952, South Sheet). The soil materials of this soil consist of fine-textured till and the soil profile consists of six inches (15 centimetres) of dark grey to very dark grey clay loam, silt loam or silty clay loam; the drainage is poor (Ibid).

Three-quarters of the proposed wind turbines (36 of 48) are located on sandy loam soils that are prone to wind deflation. In part for that reason, and in part because of soil conservation practices, almost all of the farmers who work the lands that are involved in 48 proposed wind turbines practice no till agriculture.

Further to the above, three-quarters of the proposed wind turbines (36 of 48) are located on soils that are characterized as having imperfect drainage. Nine others are located on soils that are characterized as having poor drainage and one other turbine site is located on soils that are partly characterized as having imperfect drainage and partly characterized as having poor drainage. The nature of these soils suggests that much of the study area was poorly drained prior to Euro-Canadian settlement in the mid 19th century. In order for the lands to be farmed, the drainage had to be improved. All of the lands within which the proposed turbine sites are located have drainage tiles. Locational data on the locations of the 48 proposed wind turbines are presented in Table 3.

Dates of the 2012 Archaeological Fieldwork

On March 28 and 29, 2012 an initial reconnaissance was conducted to obtain information on current land use and conditions within the 48 proposed wind turbines. The survey of the 48 proposed wind turbines and related facilities that followed spanned 14 weeks in the spring of 2012. It was conducted over the course of 13 days, as follows: April 4-5, April 12, April 18, April 24-25, May 1, May 4, May 14, May 17, May 24, May 28 and June 4. The survey of the proposed 230 kV Transmission Line that follows existing road rights-of-way was conducted over the course of two days in the early summer of 2012. More specifically, it was carried out on June 25 and June 28, 2012. This information is being included herein to satisfy Standard 3 of Section 7.5.8 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 125).

Table 3 Summary Data on the Proposed Wind Turbines

Facilities		Geographic Township	Municipality	Concession	Lot	Land Use
Turbine	Fig. #					
T1	10	Stanley	Bluewater	Southern Boundary	29	ploughed
T2					28	ploughed
T3	12	Hay		14	27	ploughed
T4	11			Northern Boundary	30	ploughed
T5				15	26-27	ploughed
T6				15	27	ploughed
T7				East of Lake Road	5	ploughed
T8				East of Lake Road	6	ploughed
T9				15	25	ploughed
T10				East of Lake Road	6	ploughed
T11	13			15	24	ploughed
T12				East of Lake Road	7	ploughed
T13				15	23	ploughed
T14				East of Lake Road	8	ploughed
T15				15	22	ploughed
T16				East of Lake Road	9	ploughed
T17	15			East of Lake Road	14	ploughed
T18				East of Lake Road	14	ploughed
T19	14			14	14	young corn
T20				13	14	young corn
T21	15			East of Lake Road	16	ploughed
T22	15			East of Lake Road	16	ploughed
T23				East of Lake Road	17	young corn
T24				East of Lake Road	17	young corn
T25				East of Lake Road	17	young corn
T26				East of Lake Road	17	young soya bean
T27				East of Lake Road	18	young soya bean
T28				East of Lake Road	19	ploughed
T29	16			East of Lake Road	21	ploughed
T30				East of Lake Road	22	ploughed
T31				17	6	ploughed
T32	17			East of Lake Road	26	ploughed
T33				East of Lake Road	26	ploughed
T34				East of Lake Road	27	ploughed
T35				East of Lake Road	27	ploughed
T36				East of Lake Road	27-28	ploughed
T37				East of Lake Road	28	ploughed
T38				East of Lake Road	28	ploughed
T39				East of Lake Road	29	ploughed
T40				East of Lake Road	31	ploughed

Facilities		Geographic Township	Municipality	Concession	Lot	Land Use
Turbine	**Fig. #**					
T41	18	Stephen	South Huron	Northern Boundary	37	ploughed
T42				Northern Boundary	37	ploughed
T43				Northern Boundary	36	ploughed
T44	18			A	7	ploughed
T45	19			East of Lake Road	5	ploughed
T46	19			East of Lake Road	5	ploughed
				A	5	
T47				A	5	ploughed
T48				A	5	ploughed

2.0 STAGE 1 ANALYSIS AND CONCLUSIONS

There are two basic categories of possible archaeological planning concerns for any proposed development. The first consists of known sites that are of demonstrable or potential significance as cultural resources and planning concerns. The second consists of the potential for as-yet undiscovered sites. These are considered in turn, below.

2.1 Known Sites of Demonstrable or Potential Significance

The original framework for assigning levels of archaeological significance in Ontario was drawn from Provincial environmental assessment guidelines (Weiler 1980). The information included the identification and evaluation of any site that met one or more of the following criteria:

> *it has the potential through archaeological exploration, survey, or fieldwork to provide answers to substantive questions (i.e. relate to particular times and places) about events and processes that occurred in the past and therefore add to our knowledge and appreciation of history;*
>
> *it has the potential through archaeological exploration, survey, and fieldwork to contribute to testing the validity of general anthropological principles, cultural change and ecological adaptation, and therefore to the understanding and appreciation of our man-made heritage; or*
>
> *it is probable that various technical, methodological, and theoretical advances are likely to occur during archaeological investigation of a feature, alone or in association with other features, and therefore contribute to the development of better scientific means of understanding and appreciating our man-made heritage (Weiler 1980:8).*

The document quoted above was prepared a quarter of a century ago and while the principles it was based upon are still current, some of the language is now dated, including phrases such as "*man-made*". The issue of archaeological site significance is also covered in a more recent publication entitled *Conserving a Future for Our Past: Archaeology, Land Use & Development in Ontario* (Ministry of Citizenship, Culture and Recreation 1997). As stated in that document, the key factors an archaeologist considers in evaluating the significance of an archaeological site include the following:

1. The Integrity of the site (e.g. is it in pristine or near pristine condition; despite past disturbances; can important data still be recovered from it?).

2. The Rarity or Representativeness of the site (e.g. is it one of a kind, locally, regionally or provincially; is it a good comparison to similar sites from other regions, etc?).

3. The Productivity of the site (e.g. does it have the potential to contain large quantities of artifacts or exceptionally detailed data about what occurred there; etc?).

4. The Age of the site.

5. The Potential for Human Remains within the site.

6. The Geographic or Cultural Association (e.g., does the site have a clear and distinct relationship with the surrounding area or to a particular geographic feature, such as a unique rock formation, historic transportation corridor, etc.; is the site associated with a distinctive cultural event, ceremony or festival, etc.?).

7. The Historic Significance of the site (i.e., is the site associated with a renowned event, person or community?).

8. Community Interest (e.g., is the site important to a particular part of the community; does it represent a significant local event; etc.?).

The results of the background study determined that no past archaeological investigations had been carried out within the subject properties. The study also determined that no archaeological sites had been documented within or in close proximity to any of the lands that will be subject to impact by the construction of the proposed Grand Bend Wind Farm.

As detailed in Section 1.3 of this report, a check of the Archaeological Sites Database determined that five sites were recorded within the one-kilometre buffer of the proposed Grand Bend Wind Farm. However, none of these sites is in close proximity to any of the proposed turbines, access roads or related facilities. More specifically, none of the sites is located within 250 metres of the development, as per Part IV, Section 20, subsection 2 – 1 of O. Reg. 359/09. Further, none of the properties involved in the proposed development have been designated as an archaeological resource, as per Part IV, Section 20, subsection 2 – 2 of O. Reg. 359/09. Accordingly, possible archaeological planning concerns for the proposed development were limited to the potential for as-yet undiscovered archaeological remains. That potential is discussed below.

2.2 Potential for as-yet Undiscovered Sites

Since the mid 1980s several models have been generated in an attempt to quantify archaeological potential in southern Ontario (e.g., Peters 1986, Pihl 1986). The results consistently show that distance to water is the single most reliable indicator of pre-contact and historic land use and settlement. The degree of inferred archaeological potential varies somewhat with the significance of the watercourse. Accordingly, the land use primer developed by the Ministry of Citizenship, Culture and Recreation (1997:12-13) identifies a high potential for First Nations sites within 300 meters of a primary water source, including relic shorelines, and within 200 meters of a secondary water source. The primer also includes other site potential criteria, as follows:

- The presence of a known archaeological site within 250 meters of a proposed development;

- the presence of knolls, ridges or other elevated topography within a property;

- the presence of well-drained sandy soils;
- the presence of distinctive or unusual landforms such as waterfalls, rock outcrops, rock faces, caverns, glacial erratics, etc. which often represented special or spiritual places to First Nations peoples;
- the presence of particular resource-specific features that would have attracted past subsistence or extractive land use, such as chert outcrops important to First Nations peoples and of white pine stands that were important to early Euro-Canadian logging;
- the presence of initial non-Aboriginal (primarily but not exclusively Euro-Canadian) military or pioneer settlement;
- the presence of early transportation routes such as a trail, pass, road, rail, portage route or canal;
- the presence of one or more properties designated under the Ontario Heritage Act; and
- the association of the property or site with historic events, activities or occupations.

Figures 10-19 inclusive illustrate the inferred archaeological potential for the 48 turbine sites and related facilities that are involved in the privately owned lands that are involved in the proposed Grand Bend Wind Farm. Following Section 1.3.1 of the Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a: 17-18), several factors tend to indicate that the lands that would be subject to impact from the proposed construction of the wind turbines and related facilities had some potential for as-yet undiscovered cultural remains but that the potential varied for First Nations and Euro-Canadian sites.

The inferred potential for First Nations sites was considered to be low to moderate. The reason is that even though numerous stream courses transect the study area and Lake Huron forms the western boundary of the study area, the evidence indicates that much of the area itself was poorly drained prior to improvements that were undertaken following the initial Euro-Canadian settlement that began in the mid 19th century. As such, it is likely that much of the study area was initially uninhabitable.

The potential for Euro-Canadian archaeological remains in the study area would normally be considered to be at least moderate. One reason is that the study area has soils that are suitable for historic agriculture. Another is that the study area is criss-crossed by the network of sideroads and concession lines that form the historic road network of the townships, and historic settlement in the 19th century tended to be closely oriented to the road network, as it does today. Once again, however, portions of Hay, Stephen and Stanley townships, within which the study area is situated, were poorly drained prior to improvements that began in the mid 19th century. In addition, most of the proposed wind turbines are set back a considerable distance from the historic road network. Also, the proposed wind turbines are required to be set back at least 550 metres from residences. As most of those residences are homes or the nuclei of farmsteads, many

of which will be second or third improved residences, this limits the potential that the proposed wind turbines could impact the archaeological remains of 19th century Euro-Canadian homesteads. That and the fact that the area was settled relatively late compared to other parts of Huron County indicates that there is at best a moderate potential for Euro-Canadian sites that would be old enough to be considered to show heritage value and interest.

The foregoing discussion detailed the inferred archaeological potential for the proposed wind turbines and related facilities in general. What remains to be considered is the potential along each route for the below-ground archaeological remains of historically documented 19th century Euro-Canadian structures. Information on that subject is presented below.

As previously stated, Figures 5-9 depict the locations of the proposed wind turbines and related facilities in relation to the 1879 Historic Atlas maps of the geographic townships that are involved in the proposed Grand Bend Wind Farm. They plot existing conditions and the extent of Euro-Canadian settlement in the study area as of the third quarter of the 19th century. In theory, any 19th century cultural features that are depicted on the above maps and are in close proximity to the proposed wind turbines and related facilities could be represented by archaeological remains and could represent potential planning constraints for the proposed Grand Bend Wind Farm. It should be noted that the historic maps do not depict the locations of structures with precision. Granting that, they can be used to identify documented cultural features that could represent archaeological planning concerns for the proposed development.

By convention, historic atlas maps usually depict homesteads or farmsteads as single structures with associated orchards. The same applies to the 1879 maps of Stanley, Hay and Stephen Townships, except that they don't include orchards.

Summary data of the 19th century homesteads and farmsteads and other structures are presented in Table 4. As indicated in the table, a few of the properties within which the proposed wind turbines and related facilities are situated do not have any mapped structures. Most of the properties do have mapped structures, but they are not in proximity to the proposed facilities. The exceptions are seven proposed turbines or related facilities (access roads and turn radii) in which mapped structures from 1879 either appear to coincide with or to be in close proximity to proposed construction impacts. They are Turbines 1, 2, 3, 8, 41, 44 and 48. The structures in question all appear to represent homesteads or farmsteads. They are not institutional structures such as churches or schools or industrial structures such as blacksmith shops as institutional and industrial structures are invariably identified as such in historic atlas maps. Subject to the results of the Stage 2 survey, the loci of the structures in question were identified as potential archaeological planning concerns for the proposed wind farm.

It remains to address the potential for as-yet undiscovered archaeological remains along the proposed collector lines. The electrical power that will be generated by the wind turbines will be channeled through a series of collector lines. They will be located within the edges of municipal road rights-of-way.

The proposed underground collector lines that will be located within the lands that are spanned by the proposed wind turbines are illustrated in Figures 10-19. As illustrated, within the proposed wind farm the collector lines will follow segments of the following road rights-of-way: Gore Road; B Line; Dashwood Road; Turnbull Line; Schadeview Road; Shipka Line, Hendrick Road,

Pepper Road; Sararas Road, Blackbush Line, Danceland Road, Kippen Road and Bluewater Highway. With one exception, these segments all pass through rural lands. The exception is a segment that passes through the intersection of Kippen Road and Bluewater Highway, the intersection on which the community of Drysdale is centred.

Table 4 Summary Data on Land Ownership as Depicted in the 1879 Historic Atlas

Turbine	Township	Landowner	Comments on Mapped Structures
T1	Stanley	Wm. Johnston	Structure on or near proposed access road on north side of Kippen Road
T2		Wm. Johnston	
T3	Hay	H. Happell	Structure on or near proposed turnaround on east side of Blackbush Line
T4		Jas. Pollock	None in proximity
T5		Jos. Oesch	None in proximity
T6		Jos. Oesch	None in proximity
T7		N. Dénomé	None in proximity
T8		Canada Company	Structure southwest of turbine site
T9		Canada Company	None
T10		Canada Company	None in proximity
T11		J. C. Kalbfleish	None
T12		J. Dowson	None in proximity
T13		Canada Company	None
T14		D. Ducharme	None in proximity
T15		Canada Company	None in proximity
T16			None in proximity
T17		Canada Company	None
T18		Canada Company	None
T19		C. Eishler	None in proximity
T20		None	None
T21		Canada Company	None in proximity
T22		Canada Company	None in proximity
T23		Blyche	None in proximity
T24		Blyche	None in proximity
T25		Blyche	None in proximity
T26		Estate	None
T27		Estate	None
T28		Estate of Jno. Jacob	None in proximity
T29		A. Sellers	None in proximity
T30		C. Handford	None in proximity
T31		Canada Company	None
T32		John Shade	None in proximity
T33		John Shade	None in proximity
T34		A. Groff	None in proximity
T35		A. Groff & Geo. Turnbull	None in proximity
T36		T. & R. Turnbull	None in proximity
T37		Wm. Turnbull	None in proximity
T38		Geo. Turnbull	None in proximity
T39		T. & R. Turnbull	None in proximity

Turbine	Township	Landowner	Comments on Mapped Structures
T40		Wm. Turnbull	None in proximity
T41	Stephen	H. Wolper	Structure on or near proposed access road on south side of Dashwood Road
T42	Stephen	H. Wolper	None in proximity
T43		John McArthur Jr.	None in proximity
T44		Jas. Pollock	Structure on or near proposed turnaround on west side of B Line
T45		R. Newell	None in proximity
T46		R. Newell & P. Desjardins	None in proximity
T47		P. Desjardins	None in proximity
T48		Wm. Gamble	Structure on or near proposed turnaround on west side of B Line

Reference to the Historic Atlas maps shows that most of the existing road rights-of-way in the study area were opened as of 1879, when the Historic Atlas of Huron County was published. Exceptions were the alignment of Shipka Line from Pepper Road south to Dashwood Road and the alignment of Pepper Road from Blackbush Line westward to a point halfway between Shipka Line and Bluewater Highway. As illustrated, the Historic Atlas maps depict structures oriented to the road rights-of-way that the proposed collector lines follow on B Line, Dashwood Road, Pepper Road, Sararas Road, Blackbush Line, Kippen Road and Bluewater Highway. All but two of the structures depicted appear to represent homesteads or farmsteads. The assessment did not include a systematic examination to determine which of these structures are still extant and which could be represented by archaeological remains.

The two exceptions noted above are institutional structures. Neither of these structures is extant and both could be represented by archaeological remains. One of the structures is a church; it was situated at the southwest corner of Blackbush Line and Sararas Road, at the northeast corner of Lot 15, Concession 15, Hay Geographic Township. A segment of the proposed collector line system passes along the south edge of the Sararas Road right-of-way, past by the site of this structure. The other exception is a schoolhouse; it was situated on the west side of Blackbush Line north of Sararas Road, in the southeast corner of Lot 18, Concession 15, Hay Geographic Township, on the opposite side of the road from another segment of the collector line system.

From the wind farm the electricity will be conveyed eastward via an overhead transmission line and by an underground transmission line to the existing power grid. Initially, the alignment will extend eastward following Sararas Road from the proposed transformer in Lot 15, Concession 13, Hay Geographic Township (Figure 14). The alignment will continue east on Sararas Road to Goshen Line, then east on Rodgerville Road to McTaggert Line. At that point, the alignment will extend northeast following Road 183. The alignment in part follows the south side of Road 183 and in part the north side; the former segments are located in the Municipality of Bluewater while the latter are located in the Municipality of West Perth. The transmission line will terminate at the Hydro One Networks Inc. 230 kV Transmission Line south of the Seaforth Transformer Station.

There are no communities along the above route. However, there is one cemetery. It is the Hensall Union Cemetery and is situated on the south side of Rodgerville Road east of Highway 4, in Lot 35, Concessions 1 and 2 East of London Road, Usborne Township.

In general, the inherent archaeological potential along the proposed collector lines that will be located within the lands that are spanned by the proposed wind turbines was considered to be low to moderate for First Nations sites and moderate for Euro-Canadian sites. The rationale for this assessment is the same as was cited with respect to the archaeological potential for the turbine sites: that much of the study area was poorly drained until improvements were undertaken to improve the natural drainage beginning in the mid 19th century. The evidence is anecdotal, but it is worth mentioning that one of the farmers who is working extensive lands in Hay Township informed the personnel who were engaged on the archaeological survey of the proposed Grand Bend Wind Farm that he had found "*arrowheads*" elsewhere in Hay Township but not in the lands he worked in the study area.

The inherent archaeological potential in the lands that flank the proposed 230 kV Transmission Line that follows Rodgerville Road east of Bronson Road and Road 183 east to the terminus at the 230 kV transmission corridor is considered to be moderate, as these segments are at a higher elevation and transect better drained lands. In general, they are considered to have a moderate to high potential for First Nations and Euro-Canadian sites. However, the inherent potential is considered to have been degraded by past disturbances within the existing road rights-of-way. As such, the potential of the proposed transmission line along Rodgerville Road east of Bronson Road and along Road 183 was considered to be low to moderate.

3.0 STAGE 2 FIELD METHODS

On March 28 and 29, 2012 an initial reconnaissance was conducted to obtain information on current land use and conditions for the 48 proposed wind turbines. More specifically, the intent was to obtain information on which properties had been cultivated in the fall of 2011 and were ready to be surveyed and which properties were still in crop stubble or would otherwise require ploughing to enable a Stage 2 archaeological assessment by pedestrian survey. As most of the farmers proved to be practicing no till agriculture, it evolved that roughly one-third of the proposed wind turbines were ready to be surveyed as of the end of March, 2012.

During the course of the initial reconnaissance and in the weeks that followed, the personnel of D.R. Poulton & Associates Inc. worked closely with Lyle Parsons and Colin Mackenzie of Neegan Burnside. These two individuals were in almost daily touch with the landowners, farm managers and farmers and assisted in coordinating the archaeological survey with the farmers' schedules for ploughing fields and for planting crops. Mr. Parsons and Mr. Mackenzie also assisted in making arrangements to have fields ploughed, where necessary.

Prior to the survey of each proposed wind turbine, access road and work area, the limits of the lands to be surveyed were staked by Colin Mackenzie of Neegan Burnside Ltd. In doing so, he used a GPS unit. It was a Trimble R8 rover used in conjunction with Cansels CANNET System, which is a series of GPS base stations spread throughout Canada. The proposed turbine sites were calibrated to 17 survey monuments taken from the MNR Cosine website. As most of the proposed turbines and many of the proposed access roads and work areas were far from any field edges or other landmarks, this ensured that the survey covered all lands that were subject to potential impact from the proposed construction.

The mapping used in the survey of the proposed wind turbines consisted of 17 high quality aerial photographs at a scale of 1:10,000. Each measured 28 by 45.5 cm (11 x 17 inches). The keys to these plans shows the participating properties, the primary proposed access roads with collector lines, the primary proposed access roads without collector lines, the 113 metre by 113 metre (1.3 hectare) construction areas for each of the 48 individual wind turbine sites, the parts and storage building and two alternative proposed transformer station locations.

The survey of the proposed wind turbines spanned 14 weeks in the spring and early summer of 2012. The survey of the proposed wind turbines and related access roads etc. was conducted over the course of 13 days, as follows: April 4-5, April 12, April 18, April 24-25, May 1, May 4, May 14, May 17, May 24, May 28 and June 4. As stated in Section 1.1 of this report, the Stage 1-2 archaeological assessment of the proposed wind turbines was conducted under Licence #P316 issued to Sherri Pearce. The Stage 2 field assessment was directed by Chris G.W. Neill (Licence #P242). As the optimal crew size for the archaeological survey of proposed wind turbines and access roads was three, on any given day he was assisted by two field assistants. Depending on the day, they were comprised of two of the following three individuals: Daniella Horley; Rob Danter; Sherri Pearce; and Christine Dodd.

The mapping used in the survey of the proposed 230 kV Transmission Line consisted of 64 high quality aerial photographs at a scale of 1:2,000. The keys to these plans distinguished between proposed overhead and buried lines.

The survey of the proposed collector lines within the wind farm was conducted concurrent with the survey of the proposed wind turbines and access roads etc. The access roads will vary in width from 5 to 11 metres depending on crane crawling and passing lane requirements; for purposes of insurance, the archaeological survey covered 12 metres widths for each proposed access road.

The survey of the proposed 230 kV Transmission Line was conducted over the course of two days in the early summer of 2012. More specifically, it was carried out on June 25 and June 28, 2012. This survey was directed by Lorelyn Giese (Licence #R433) with the assistance of Rob Danter.

Standard 3 of Section 2.1 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 29) states the following:

> Survey the property when weather and lighting conditions permit good visibility of land features. Do not survey when weather and lighting conditions (e.g. now cover, frozen ground, conditions of excessive rain or drought, heavy fog) reduce the chance of finding evidence of archaeological resources.

The requirements concerning weather that is permissible for archaeological surveys are reiterated in Standard 1 of Section 7.9.1 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 143), and in Standard 1a of Section 7.11.1 (Ibid: 153). Table 5 presents summary data on the basic activities that were conducted during each day of the survey, including the weather on each day.

Table 5 Summary Data on the 2012 Archaeological Survey of the Proposed Turbines

Date (2012)	Activity	Weather
March 28	Check of conditions	Warm; sunny with cloudy periods in the morning; overcast in the afternoon
March 29	Check of conditions	Cool and overcast
April 4	Survey of turbines	Sunny with cloudy periods, 10-12° C
April 5	Survey of turbines	Sunny with cloudy periods, 10-12° C
April 12	Survey of turbines	Sunny and cool
April 18	Survey of turbines	Sunny and cool
April 24	Survey of turbines	Overcast and windy, 2-5° C
April 25	Survey of turbines	Sunny with light breeze, 2-12° C
May 1	Survey of turbines	Overcast and cool, warming in the afternoon
May 4	Survey of turbines	Sunny, humid and warm
May 14	Survey of turbines	Sunny with light clouds, 17° C
May 17	Survey of turbines	Sunny
May 24	Survey of turbines	Sunny with cloudy periods, 24° C
May 28	Survey of turbines	Sunny, hot and hazy, 33° C
June 4	Survey of turbines	Cloudy with sunny breaks, 9-12° C
June 25	Survey of Transmission Lines	Sunny & warm
June 28	Survey of Transmission Lines	Sunny, hot & humid

As the survey was conducted over a period of 14 weeks and spanned four months, the weather on the 15 days of survey varied. Regardless, the survey was only conducted when the weather was adequate for the observation of cultural remains. In general, the weather on the days of survey was seasonal and the lighting conditions ranged from good to excellent for all days of survey.

Standard 2a of Section 7.8.1 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 137) requires that this section of Stage 1-2 or Stage 2 reports provide detailed and explicit descriptions of how each standard was addressed for the property survey generally. The following information is intended to satisfy this standard.

Standard 1 of Section 2.1 of the Standards and Guidelines (Ibid: 28) requires that the entire property be included in the survey. In the present case, all of the lands that will be subject to potential impact from the construction of the proposed Grand Bend Wind Farm were surveyed. As such, the 2012 survey satisfied Standard 1 of Section 2.1 of the Standards and Guidelines.

Standard 2b of Section 7.8.1 of the Standards and Guidelines (Ibid: 137) requires that this section of Stage 2 reports provide detailed and explicit descriptions of how each standard was addressed for the pedestrian survey. The information required for this standard is provided below.

Standard 1 of Section 2.1.1 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 30) requires that cultivated agricultural lands must be subjected to pedestrian survey. Standard 2 of Section 2.1.1 of the Standards and Guidelines (MTC 2011a: 30) requires that lands to be surveyed must be recently ploughed and that the use of chisel ploughs is not acceptable. Further, the contractor must be made aware that the ploughing should expose the topsoil but not extend beyond the previous depth of ploughing (Standard 4, Section 2.1.1; MTC 2011a: 30). Standard 3 of Section 2.1.1 of the Standards and Guidelines (MTC 2011a: 30) requires that lands to be assessed by pedestrian survey must be weathered by one heavy rainfall or several light rains to improve visibility of archaeological resources. In addition, Standard 5 of Section 2.1.1 of the Standards and Guidelines (MTC 2011a: 30) requires that lands to be assessed by pedestrian survey have at least 80% ground visibility. Finally, Standard 6 of Section 2.1.1 (MTC 2011a: 30) requires that survey transects should be spaced at a five metre interval.

Further to the above, and as previously described, virtually all of the lands that are involved in the construction of the proposed 48 wind turbines, access roads and turn radii, which are privately owned, are arable. In addition, in some cases ploughing extended into the edges of segments of the proposed 230 kV Transmission Line that is located within municipal road rights-of-way. In all cases, the 2012 survey of the arable lands that will be subject to impact by the construction of the proposed Grand Bend Wind Farm satisfied Standards 1 to 6 of Section 2.1 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 30-31) in that all arable lands were assessed by pedestrian survey, all pedestrian survey was conducted at an interval of five metres or less, all ploughing complied with the requirements of the pertinent standards, and that all lands that were assessed by pedestrian survey were adequately weathered.

The systematic five metre interval pedestrian survey covered 99% of the 48 proposed wind turbines and the related access roads and work areas. Of the exceptions, 0.3% consisted of non-arable drains that are transected by alignments; they consisted of excavated drainage channels or low and wet areas. These areas had no archaeological potential and were omitted from the survey. The remaining 0.7% consisted of existing gravel lanes; they were disturbed, had no

potential for archaeological remains and were only visually examined. Inferred site potential, survey coverage and conditions for the 48 proposed wind turbines and the related facilities, access roads and work areas are illustrated in Figures 10-19 inclusive.

In each instance, when the first artifact was observed in the course of the five-metre interval pedestrian survey it was marked by a coloured survey flag and left *in situ*. An intensified controlled surface collection was then conducted at a one metre transect surrounding the discovery that extended for a distance of up to 20 metres beyond the outermost artifact or until the edge of the alignment was reached. The intensified controlled surface collection succeeded in defining the full extent of find location within the alignment, in accordance with Standard 7 of Section 2.1.1 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 58). Artifact locations were then recorded using a Garmin eTrex GPS unit and the artifacts were sequentially numbered, bagged, and collected. The GPS coordinates for the artifact locations or limits are presented in the supplementary documentation that accompanies this report, as are the mapping of the find locations.

The Stage 2 investigations resulted in the discovery of nine find locations. Each of these locations was the subject of a thorough intensive controlled surface collection. For isolated First Nations find spots, all material was collected. For the Euro-Canadian sites, a representative sample of diagnostic material was collected in order to accurately date the sites. Small specimens and non-diagnostic artifacts were left in the field. Standard 9 of Section 2.1.1 of the Ministry's Standards and Guidelines requires that enough material be left in the field to assist in relocating sites. In the present case, it is considered that this end was accomplished.

The requirements for shovel test pit survey are detailed in Standards 1-9 of Section 2.1.2 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 31-32). Standard 1a-e of Section 2.1.2 requires that test pit survey be limited to lands where ploughing is not possible or viable (Ibid: 31) and Standard 1f of Section 2.1.2 permits the test pit survey of linear corridors with widths of 10 m or less (Ibid: 32). Standard 2 of Section 2.1.2 requires that test pit survey be conducted at a five metre interval (Ibid: 32). Standards 5, 6 and 7 of Section 2.1.2 require that test pits be 30 cm in diametre, that they be excavated 5 cm into subsoil, and that the soils be screened through mesh no greater than 6 mm (Ibid). Finally, Standard 9 of Section 2.1.2 requires that all test pits be backfilled unless the landowner instructs otherwise (Ibid).

Further to the above, the requirements for confirming previous disturbance are detailed in Standards 1 and 2 of Section 2.1.8 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 38). Standard 1 of this section states that if the disturbed areas were not covered by an optional property inspection as part of the Stage 1 study they should be examined according to the standards for Stage 1 property inspections (c.f. Standards 1-6 of Section 1.2, Ministry of Tourism and Culture 2011a: 15-17). Standard 2 of Section 2.1.8 states that Stage 2 test pits should be placed throughout the disturbed areas according to professional judgment (where physically viable) so as to confirm that these areas have been completely disturbed.

The assessment of the proposed underground collector lines and of the proposed 230 kV Transmission Line followed the standards that are cited in the above two paragraphs. In assessing them the survey personnel conducted a visually inspection of the proposed alignments. Beyond that, the specifics of the survey varied.

As illustrated in Figures 10-19, within the proposed wind farm, the collector lines will follow segments of the following road rights-of-way: Gore Road; B Line; Dashwood Road; Turnbull Drive; Schadeview Road; Shipka Line, Hendrick Road, Pepper Road; Sararas Road, Blackbush Line, Danceland Road and Kippen Road. Figures 10-19 also show the locations and directions of the photographs that illustrate the proposed collector and transmission lines that fall within the proposed wind farm. All of these segments pass through rural lands; there are no communities along these routes.

The road rights-of-way in the study area consist of raised road beds flanked by graded slopes and ditches. The visual inspection determined that the proposed collector and transmission lines that fall within the proposed wind farm have been impacted by past road grading, road construction and ditching to the extent that they do not retain a potential for extant archaeological resources and did not warrant survey.

As previously stated, the electrical power that will be generated by the wind turbines will be channeled through the proposed 230 kV Transmission Line. It will extend east from the proposed transformer station its terminus at the Hydro One Networks Inc. The route is illustrated in Figures 20-22. It initially follows Sararas Road east to Rodgerville Road, then northeast on Road 183 to the 230 kV Transmission Line south of the Seaforth Transformer Station. For most of the alignment, the power will be generated through lines on overhead hydro poles. New hydro poles will be erected for this purpose. Shorter segments of the alignment of the proposed 230 kV Transmission Line will have buried cables instead of overhead poles. Regardless, the specifics of the proposed construction, the alignments of the proposed 230 kV Transmission Line will be located within the pertinent municipal road rights-of-way.

The proposed alignment of the 230 kV Transmission Line passes through rural lands. There are no communities along this route, although the community of Rodgerville was located on the London Road south of Rodgerville Road; it is no longer extant. Figures 20-22 illustrate conditions along the proposed 230 kV Transmission Line. They also show the locations and directions of Plates 39 to 48 inclusive; the plates illustrate conditions along the proposed 230 kV Transmission Line.

Photographs of the archaeological survey are presented in Plates 1-48 inclusive. The captions that accompany these plates are self explanatory. Plates 1-31 and Plate 33 inclusive are of proposed turbines, access roads and work areas, all of which are situated in agricultural fields. Plate 31 illustrates a short segment of the proposed access road between Turbines 32 and 35 that transects Kading Drain; this segment was disturbed and was not test pitted. Plate 33 illustrates a segment of the proposed access road for Turbines 41 and 42. It follows an existing gravel laneway that is flanked by ploughed fields. The laneway was disturbed and was not surveyed; the widths of the proposed access road flanking it were assessed by pedestrian survey.

Plate 32 and Plates 34-38 inclusive illustrate select segments of the collector lines within the proposed wind farm. Plate 34 shows the proposed collector line to Turbines 41-43 inclusive. It follows an existing dirt lane and was assessed by judgmental test pitting. Plate 35 shows the segment of the proposed collector line between Turbines 21 and 22 that passes over the slope of Charente Drain, and Plate 36 shows a view of the poorly-drained bottom of this drain; neither the slope nor the bottom of the drain were surveyed. Finally, Plates 37 and 38 show two views of collector line segments that follow existing municipal road rights-of-way within the proposed

wind farm. They illustrate the raised road beds flanked by ditches that typify the study area. The assessment of segments such as these was limited to a visual examination.

The proposed 230 kV Transmission Line has an approximate length of 31 kilometres. It extends from the proposed transformer station south of Sararas Road and crosses Bronson Line eastward to the terminus at the Hydro One Networks Inc. 230 kV Transmission Line south of the Seaforth Transformer Station, in the Municipality of Huron East. Of the 31 kilometre length, 90% was found to be disturbed based on a visual examination, with judgmental test pitting where it was not immediately evident that a segment was disturbed. The remaining 10% were assessed either by a single line of pedestrian survey (where the ploughing of adjacent agricultural fields extended into the edge of the road right-of-way and the transformer line alignment) or by judgmental test pitting (where the transformer line alignment was in grass). However, the assessment determined that even the segments that were assessed by pedestrian survey and by judgmental test pitting had been disturbed by past road grading and/or ditching. Examples are illustrated in Plates 39-41 inclusive and in Plates 43-48 inclusive. Plates 40 and 48 show the judgmental test pitting in progress, Plate 47 shows the pedestrian survey in progress and Plate 44 is a close-up of the disturbed soils encountered in the surface examination. Inferred site potential, survey coverage and conditions for the 48 proposed wind turbines and the related facilities, access roads and work areas are illustrated in Figures 10-19 inclusive.

Further data on the survey of the 48 proposed wind turbines and the related access roads and work areas are presented below. They are ordered by the aerial photographs that show their respective locations.

Figure 10

Turbines 1 and 2 are located in adjacent agricultural fields east of Bluewater Highway. They are accessed by a proposed access road that extends north from Kippen Road to Turbine 2, then west to Turbine 1. Both turbines are located just south of an unnamed creek. Plates 1 and 2 are two views that relate to these turbines.

Turbines 1 and 2 and the related proposed access road were surveyed on May 4, 2012. The ground visibility was 85-90%, the ground surface was very well weathered and survey conditions were excellent. The survey of the proposed access road to Turbines 1 and 2 resulted in the discovery of a scatter of Euro-Canadian domestic refuse.

Figure 11

Turbines 4-10 inclusive are located in agricultural fields between Bluewater Highway and Blackbush Line, south of Kippen Road. All of these turbine sites are located between a series of west-flowing unnamed creeks.

Turbine 4 is accessed by a proposed access road that extends east from Bluewater Highway. Turbine 4 was surveyed on June 4, 2012. The ground visibility was 80-90%, the ground surface was very well weathered and survey conditions were excellent. No sites were found.

The other turbines are on interconnecting access roads that connect with Danceland Road. Turbine 5 was surveyed on April 24, 2012. Ground visibility was 80-90%, the ground surface

was very well weathered and survey conditions were excellent. Survey of Turbine 6 started on the 4th of April. At this time, the access road for Turbine 6 was winter weathered and conditions were excellent at 90 to 95% visibility. However, the pad was in crop stubble and required ploughing. The Turbine 6 pad was surveyed following several rainfalls, on April 24th. Turbines 7 and Turbine 9 were surveyed on May 14, 2012. The ground visibility was 85% for Turbine 7 and 80-90% for Turbine 9; in both cases the ground surface was very well weathered and survey conditions were excellent. Turbines 8 and 10 were surveyed on April 4, 2012. The fields containing these turbines were winter weathered and survey conditions were excellent. Ground visibility was 85-90%. No artifacts were recovered during the course of these surveys.

Plates 5 and 6 are two views that relate to Turbines 4 and 5, respectively. Plates 7 and 8 are two views that relate to Turbines 6 and 10, respectively.

Figure 12

Turbine 3 is located in the northeast corner of an agricultural field, just south of a west-flowing unnamed creek. It is accessed by a proposed access road that extends east from Blackbush Line, then north.

Turbine 3 and the related proposed access road and work area were surveyed on April 5, 2012. The field was winter weathered and survey conditions were excellent. Ground visibility was 90 to 95. Survey resulted in the discovery of a scatter of Euro-Canadian domestic refuse. Plates 3 and 4 are two views of the survey of Turbine 3.

Figure 13

Turbines 11-16 inclusive are located in a series of agricultural fields north of Zurich Hensall Road and south of Danceland Road, between Bluewater Highway and Blackbush Line. They are accessed by a proposed access road that extends west from Blackbush Line, then north. Turbines 11-13 inclusive and Turbines 14-16 inclusive are separated by the west-flowing St. Joseph Airport South drain. The drain is low and wet and was not surveyed.

With one exception, Turbines 11-16 inclusive and the proposed work area and access road were surveyed on May 14, 2012. In all cases, the ground visibility was 80-90%, the ground surface was very well weathered and survey conditions were excellent. Nothing was found.

A small portion, the south one-quarter of Turbine 14 pad and access road was in crop stubble on May 14th and could not be surveyed at this time. This area was surveyed on the 4th of June. Conditions at this time were excellent; ground visibility was 90 to 95%. Nothing was found.

Plates 9 and 10 are two views that relate to Turbines 12 and 14, respectively. Plate 11 is a view of the survey of the proposed access road for Turbines 11-16 inclusive.

Figure 14

Turbines 19 and 20 are located in agricultural fields south of Sararas Road, between Blackbush Line and Bronson Road. They are accessed by a proposed access road that extends east from Blackbush Line, then north. A proposed parts storage building is located in the same field as

Turbine 19. A proposed transformer station is situated west of Turbine 20. Lastly, an electrical transformer line extends north to Sararas Road. These turbine sites are bounded to the south by a tributary of Charette Drain and to the northeast by Treumner Drain and Masse Drain.

Turbines 19 and 20 were surveyed on May 17, 2012. The fields had been planted in corn, which had just sprouted. In both cases, the ground visibility was 85-90%, the ground surface was very well weathered and survey conditions were very good. Nothing was found.

Plate 12 is a view east of the location for the proposed storage building and Turbine 19 beyond. Plate 13 is a view east of the area of the transformer station and Turbine 20 beyond.

Figure 15

Turbines 17 and 18 and Turbines 21-28 inclusive are located in agricultural fields between Bluewater Highway and Blackbush Line. Turbines 17 and 18 are located north of Sararas Road; Turbines 21-28 are located south of Sararas Road. Turbines 21 and 22 will be accessed by access roads that extend south from Sararas Road; they are located north of Charette Drain. Turbines 23-28 inclusive are located between Charette Drain and an unnamed drain or tributary. They will be accessed by an access road that extends east from Bluewater Highway.

Turbines 17 and 18 and the proposed access road that links them to Bluewater Highway were surveyed on April 24, 2012. Conditions for the observance of cultural remains were very good. The fields were ploughed, with ground visibility at approximately 85-90%. The survey of Turbine 18 resulted in the discovery of two isolated First Nations find spots of unknown age and cultural affiliation. They were situated 39 metres apart. Each of the isolated find spots consists of a single piece of non-diagnostic chipping detritus. Plate 14 is a view of the survey of Turbine 18 in progress.

Turbines 21 and 22 were surveyed on April 5, 2012. These fields were winter weathered and conditions for the observance of cultural remains were excellent. Ground visibility was approximately 85-90%. Plate 15 is a view south of the access road leading to Turbine 21. This survey included that portion of the transmission line connecting Turbine 21 to Turbine 23 that was in the same field as Turbine 21. The remainder of the transmission line was surveyed on May 17th after the fields had been ploughed and weathered. No artifacts were recovered during the course of this survey.

Survey of the transmission line excluded that portion of the alignment passing through Charette Drain. This area was low and wet. Plates 35 and 36 are views of the transmission alignment in the area of Charette Drain.

Survey of Turbines 23-25 was initiated on May 1. At this time, the ploughed fields that were winter weathered and that had ground visibility of 90 to 95% were surveyed. The survey was completed on June 4 2012. At this time the fields were planted in corn. The conditions were very good and ground visibility was 80 to 90%. No artifacts were recovered during the course of the survey on either date. Plate 16 is a view of the pad for Turbine 25.

The southern half of the access road for Turbines 23-25 and the access roads and turbine pads for Turbines 26 through 28 were in corn stubble on May 1st. These areas were ploughed and well

weathered by the time of the June 4th survey. The fields containing Turbines 26 and 27 had been planted in soya, which had just sprouted. Turbine 28 been ploughed but was not seeded. The fields were well weathered. Field conditions for Turbines 26 and 27 were very good and ground visibility ranged from 85 to 90%. Field conditions for Turbine 28 were excellent and ground visibility approached 100%. Plates 17 and Plate 18 are views of the pads for Turbines 27 and 28, respectively.

Figure 16

Turbines 29, 30 and 31 are located in agricultural fields south of Hendrick Road, between Bluewater Highway and Shipka Line. Turbine 29 is located north of an unnamed drain and Turbine 30 is located between that drain and Datars Millers Drain. The two turbine sites will be accessed by an access road that extends east from Bluewater Highway, then north.

Turbines 29 and 30 and the related proposed access road were surveyed on May 4, 2012. The ground visibility was 85-90%, the ground surface was very well weathered and survey conditions were excellent. The survey of Turbine 30 resulted in the discovery of two isolated First Nations find spots of unknown age and cultural affiliation. They were situated 91 metres apart. Each of the isolated find spots consists of undiagnostic chipped lithics. Plates 19 and 20 are two views of Turbines 29 and 30, respectively.

Turbine 31 is located to the south, within the confluence of two unnamed drains. It will be accessed by an access road that extends west from Shipka Line. Turbine 31 and the work area for the same were surveyed on May 4, 2012. The ground visibility was 85-90%, the ground surface was very well weathered and survey conditions were good. Nothing was found. Plate 21 is a view of Turbine 31.

Figure 17

Turbines 32-39 inclusive are bounded to the west by Bluewater Highway and to the north and south by Schadeview Road and Turnbulls Drive, respectively. The proposed collector line for these turbines extends from Schadeview Road south to Turnbulls Drive; the access to these turbines is off of Schadeview Road.

Turbines 37 through 39 were surveyed April 12 2012. At this time, the fields were winter weathered. Survey conditions were excellent and ground visibility ranged from 85 to 95%. The fields containing Turbines 32 through 36 were in winter wheat in March. These fields were ploughed and weathered prior to the April 25 survey. Ground visibility ranged from 85-95%. The access road for these turbines crossed two drains, Kading Drain and an unnamed drain. These drains are low and wet and were not surveyed. Plate 31 is a view west of Kading Drain.

The survey of Turbine 32 resulted in the discovery of two isolated First Nations find spots of unknown age and cultural affiliation. They were situated 37 metres apart. Each of the isolated find spots consists of undiagnostic chipped lithics. Plate 22 is a view of Turbine 32, Plate 23 is a view of proposed access road between Turbines 34 and 35 and Plate 24 is a view of the proposed access road and temporary work area for Turbine 36. Plate 25 is a view of the survey of Turbine 39 in progress.

Turbine 40 is located north of Dashwood Road and west of Turnbulls Drive. The field was ploughed and weathered. Ground visibility ranged from 90 to 100%. The turbine, access road and temporary work area were surveyed on April 25 2012. No artifacts were found. Plate 26 is a view of the survey of the proposed access road for Turbine 40 in progress.

Figure 18

Turbines 41-43 inclusive are located in a triangle of land bounded by Gore Road, Dashwood Road and Corbett Line. Turbines 41 and 42 will be accessed by an access road that will extend south from Dashwood Road. Turbine 43 will be accessed by an access road that will extend west from Corbett Line.

Turbines 41 and 42 and the related proposed access road were surveyed on April 12, 2012. The ground visibility was 85-95%, the ground surface was very well weathered and survey conditions were excellent. A portion of the access road follows and existing gravel drive. This area was disturbed and was not surveyed, although both sides of the drive were subjected to a pedestrian survey. The survey resulted in the discovery of a diffuse scatter of Euro-Canadian domestic refuse. Plate 27 is a view of the survey of the proposed access road for Turbine 41 in progress. Plate 33 is a view of the gravel drive.

Turbine 43 was surveyed on April 5th. The field containing Turbine 43 was winter weathered. Field conditions were very good and ground visibility ranged from 85 to 95%. A transmission line that connects to Turbine 42 and Turbine 43 parallels Turnbull Drain at the edge of a cultivated field and connects to a transmission line in the Gore Road right-of-way. The southern half to the proposed transmission line was ploughed and pedestrian surveyed. The northern half was in use as a laneway and appeared disturbed. Judgmental test pits confirmed that the area was disturbed; the area was built up and may comprise soil dredged from the drain. The transmission line traverses Turnbull Drain at two locations. These two areas are low and wet and were not surveyed. Plate 28 is a view of the survey of the Turbine 43 pad in progress. Plate 34 is a view east of the transmission line east of Gore Road.

Turbine 44 is west of B Line and north of Maple Grove Brook. Most of the area that comprises Turbine 44, the associated access road and the temporary work area was surveyed April 4 2012. At this time the fields were winter weathered and survey conditions were excellent. Ground visibility was 90 to 95%. A small field in close crop cover was ploughed shortly after the initial survey. This field and minor changes to the access road were surveyed April 25th, after several rainfalls. Conditions for the second survey were very good and ground visibility ranged from 90 to 95%. A portion of the access road follows an existing gravel drive. This area was disturbed and was not surveyed. Plate 29 is a view of the survey of the proposed access road for Turbine 44.

Figure 19

Turbines 45-48 inclusive are located south of the Gore Road, west of B Line and east of Bluewater Highway. These turbines are situated between Maple Grove Brook and Municipal Drain 1999. They will be accessed by access roads that will extend northwest from B Line.

Turbines 44-48 inclusive and the related proposed access roads were surveyed on April 5, 2012. The ground visibility was 85 to 95%, the ground surface was very well weathered and survey conditions were excellent. No artifacts were found during the course of the survey of these proposed facilities. Plate 30 is a view of Turbine 47.

4.0 RECORDS OF FINDS

According to Standard 2 of Section 7.8.2 of the Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a: 138), the Record of Finds section of the document requires that archaeological assessment reports include an inventory of the documentary record that was generated by the fieldwork. The documentary record that has been generated by the fieldwork documented in this report includes hand-made notations on printouts of digital aerial photographs of the proposed wind farm. It also includes field notes in a bound fieldnote book. Finally, it includes digital photographs of the fieldwork.

As stated in Section 1.0, the present report documents the Stage 1 background research and the Stage 2 survey of the proposed Grand Bend Wind Farm. The survey was carried out over a 14 week period in the spring and early summer of 2012. It covered all of the lands that will be subject to potential impact from the construction of the proposed wind farm.

As stated in Section 3.0, the Stage 2 survey of the proposed Grand Bend Wind Farm resulted in the discovery of nine archaeological sites. They comprise six First Nations isolated find spots and three late 19th to 20th century Euro-Canadian sites. Three of the turbines produced two isolated finds each, all consisting of undiagnostic First Nations chipped lithic material. The other three turbines each produced a single Euro-Canadian site. The locations and GPS coordinates for each site can be found in the Supplementary Documentation that is appended to this report.

Standards 1c and 1d of Section 7.8.2 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 138) require that reports include a catalogue of the artifacts that were recovered as well as a description of artifacts and features that were left in the field. The catalogues of the artifacts that were recovered from the nine sites are presented in Appendix A.

Section 7.5.11 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 128), which concerns images in Stage 2 survey reports, requires that reports include images of a representative sample of artifacts. The photographs that are presented in this report satisfy this standard.

Further to the above, the Stage 2 survey of the proposed overhead transmission lines and the proposed underground transmission/collector lines noted the presence of a cemetery that abuts a segment of the proposed alignment for the overhead transmission lines. Concerns regarding the segment in question are documented in the Stage 2 Analysis and Conclusions (see Section 5.0). Information on the cemetery is included in this section of the report. Descriptions of the nine archaeological sites follow the description of the cemetery.

4.1 Hensall Union Cemetery

As stated above, the Stage 2 survey determined that a segment of the proposed overhead transmission line route abuts a cemetery. It is the Hensall Union Cemetery, which is situated on the north edge of Lot 35, Concessions 1 and 2 East of London Road, Usborne Geographic Township, Municipality of South Huron. The cemetery is located on the south side of Rodgerville Road east of Highway 4. The proposed transformer line through this area will extend

east-west within the south edge of the road right-of-way, directly adjacent to the north edge of the cemetery.

The Hensall Union Cemetery was established in the mid 19th century and is still in use. The original cemetery is located to the west; most of it is in Concession 2 East of London Road but it also extends a short distance into Concession 1 East of London Road. The newer part of the cemetery is directly east; it is entirely located within Concession 2 East of London Road. Based on the aerial photography, the internments are dense in the old part of the cemetery and far less dense in the new part of the cemetery. There is an existing line of hydro poles along the north edge of the cemetery, within the south side of the road right-of-way; it includes five poles adjacent to the north edge of the cemetery.

As determined from an examination of the aerial photography, the segment of the proposed transmission line that abuts the cemetery has an approximate length of 140 metres. Current plans identify this segment as an overhead transmission line. However, these plans could be subject to change, and it is possible that this segment will be constructed using a buried electrical line.

As illustrated in Plate 42, the Stage 2 survey determined that the segment of the alignment that abuts the north edge of the cemetery has been graded. It does not retain a potential for cultural remains above the subsoil. As visible in Plate 42, however, the headstones extend close to the limit of the property, which is defined by a guard rail. In addition, unmarked graves frequently occur within road rights-of-way adjacent to cemeteries that were established in the 19th century. As such, unmarked graves could represent a potential planning concern for this segment of the proposed 230 kV Transmission Line.

4.2 The Turbine 1 Site

A scatter of Euro-Canadian artifacts was discovered in the May 4, 2012 survey of the proposed access road to Turbines 1 and 2. The site is situated in the south-central portion of Lot 28 Southern Boundary, Stanley Geographic Township, Huron County. It is located in a ploughed field and covers an area measuring 41 metres by 25 metres in size. The site corresponds to the location of a structure on the north side of Kippen Road that is depicted on the 1879 Historic Atlas map of Stanley Township and may represent a refuse scatter associated with the homestead off corridor. At that time, the property was owned by an individual who is identified on the Historic Atlas township map as "*Wm. Johnston*".

The surface collection of this site recovered 38 specimens. An effort was made to recover a representative sample of diagnostic artifacts. Based on the field observations, it is estimated that the amount of material that was left *in situ* by the Stage 2 surface collection of the site was triple the amount of the material that was collected. The material that was not collected mainly consists of glass and ceramic sherds, with some metal fragments.

The Stage 2 site assemblage consists of late 19th and early 20th century domestic refuse. The majority of the material is tableware (n=30) with the remainder divided between utilitarian ware (n=7) and apparel (n=1). A representative sample of the artifacts from this site is illustrated in Plate 49. An analysis of these artifacts follows.

Table 6 Frequency of Cultural Remains from the Turbine 1 Site

CATEGORY	CLASS	TYPE	f
Apparel	Button	Shell	1
Tableware	Ceramic	White ware	7
		Ironstone	18
		Porcelain	3
		Semi-Porcelain	1
		Subtotal	*29*
	Glass	Tumbler	1
	Subtotal		***30***
Utilitarian Ware	Glass	Bottle	7
TOTAL			**38**

Apparel

One item of apparel was recovered from the Turbine 1 site. It is a complete two-hole shell button with a diameter of 10.2 mm. It is appears to be plain. This button has a small shallow circular well and a flat, plain rim. It is difficult to assign a date range for shell buttons given the long history of shell button manufacture. However, those with smooth backs generally post-date 1900; those intricate carved designs and cameo details will generally pre-date 1880.

Tableware

Tableware consists of glass and ceramic items that were used at the table. With one exception, the tableware sample from the Turbine 1 Site consists of ceramic wares. The exception is a sherd from a colourless moulded tumbler with panelled sides. This classic design dates from the 19th century onward; it is still being produced on glass tumblers today.

One piece of ironstone has a partial maker's mark printed in black on the base of the sherd. It belongs to Baker & Co of England. Although the company was manufacturing earthenwares from 1839 to 1932, this mark identifies the piece as being produced between 1893 and 1928 (Godden 1964:51).

Ware Type

Ironstone (n=18) dominates the tableware sample, with the remainder divided between whiteware (n=7), porcelain (n=3) and semi-porcelain (n=1). Refined white earthenware with a clear glaze is known as whiteware. By the 1830s, whiteware had replaced creamware and pearlware as the most common refined white earthenware (Kenyon 1983:13, 1986:2; Miller 1991:25). Whiteware is still in production today (Brown 1982: 19; Miller et al. 2000: 13). Plain white earthenware ceramics were the least expensive tableware to produce which partially explains their popularity (Kenyon 1983; Sussman 1997). The small amount of whiteware is primarily identified as transfer print (n=5) although a single piece each of plain and dipt or

industrial slipware decoration was also recovered. Two pieces of whiteware are illustrated in Plate 49: a dipt sherd (Plate 49h) and a transfer print sherd (Plate 49i).

Ironstone, also known as white graniteware, was introduced into the Ontario market place in the 1840s (Sussman 1985:7). It was originally manufactured specifically for the North American market and was not sold in Britain (Sussman 1985:7). An early mention of ironstone in Ontario occurs in an invoice of 1847 (Kenyon 1991:6). Ten years later white ironstone comprised approximately 10% of storekeepers stocks (Kenyon 1991:7). By the last quarter of the 19th century, white granite ware had saturated the market (Kenyon 1991:8). Ironstone continued to be produced until the 1930s (Miller et al. 2000: 13). Four pieces of ironstone with varying decorative techniques are illustrated in Plate 49, including polychrome stamped (Plate 49d), moulded (Plate 49e), plain (Plate 49f) and blue stamped (Plate 49g).

Porcelain is a hard paste ceramic fired at an extremely high temperature. Collard (1983: 163) argues that porcelain was never as important in the Canadian market as earthenware. In the early 19th century porcelain was expensive and available in limited quantities; and, therefore, it is not surprising that porcelain rarely is recovered from sites that predate the 1850s (Miller 1991). By the end of the 19th century cheap porcelain wares imported from Britain, continental Europe and Japan were readily available (Majewski and O'Brien 1987:129). The small sample of porcelain recovered from the Turbine 1 Site include two moulded and one decal print.

Semi-porcelain first appears in the 1890s (Kenyon 1991:12) and is referenced in mail-order catalogues in the years between 1895 and 1927 (Majewski and O'Brien 1987:123). The single piece of semi-porcelain from the Turbine 1 Site has a decal printed decoration.

Styles of Decoration

The majority of sherds from the Turbine 1 ceramic tableware assemblage lack decoration (n=12). The plain ironstone sample includes three plate rims and two cup rims. The plain plate rim is illustrated in Plate 49f. The remaining six ironstone pieces are all sherds. The single piece of whiteware is a sherd.

Five pieces of moulded ceramic tableware were recovered from the Turbine 1 Site. This is divided between ironstone (n=3) and porcelain (n=2). The moulded ironstone sample contains two cup rims and a saucer rim. The two pieces of porcelain are both identified as sherds although one is part of the base with pedestal foot and the other piece is part of a handle. The moulded decoration on the ironstone saucer rim has been identified as the wheat pattern. The Wheat Pattern was the most popular pattern found on ironstone wares from the 1860s through the 1890s (Kenyon 1985c: 18) and continued to be produced well into the 20th century (Sussman 1985:10). The moulded ironstone saucer featuring the Wheat pattern is illustrated in Plate 49g.

Transfer printing derives its name from the transfer paper used to put designs on ceramics (Collard 1983). Printed ceramics was one of the most expensive wares to purchase in the 19th century. For example, in 1850, printed plates were 50% more expensive than plain plates (Miller and Hunter 1990). Transfer printed ceramics were not commonly available at the beginning of the 19th century (Kenyon 1983, 1991; Miller and Hunter 1990). By 1828, printed ceramics were being produced in a variety of colours, such as red, green, brown and black, in addition to the standard blue printed wares (Majewski and O'Brien 1987: 143; Miller et al. 2000: 13). Transfer

printed wares began to decline in popularity in the 1850s but picked up again in the 1870s (Miller 1991: 9).

There were five pieces of transfer printed ceramic tableware recovered from the Turbine 1 Site. All are identified as whiteware and a decorated with the Blue Willow pattern. Blue Willow was the most commonly occurring design found on printed wares in the 19th century and it is still produced today (Miller 1991:8). The small sample includes one plate rim and four sherds. One of the transfer print decorated sherds is illustrated in Plate 49i.

Two pieces of polychrome coloured decal printed ceramics were recovered from the Turbine 1 Site. One is a saucer rim of semi-porcelain and the other piece is a sherd of porcelain. The decal print porcelain sherd is illustrated in Plate 49c. Decal printing began in the late 19th century (Miller et al. 2000: 13), but decal printed wares were not commonly available prior to 1900 (Majewski and O'Brien 1987:147). The decal print decorated porcelain piece is illustrated in Plate 49c.

A cut sponge is used to decorate stamped motifs. This decorative technique has a relatively long period of use, from 1845 to 1930 (Miller et al. 2000: 13). The three pieces of stamped ceramic from the Turbine 1 Site are all ironstone. One is a bowl rim decorated in blue. The other two pieces are both sherds, one decorated in blue (Plate 49g) and the other in a polychrome palette of purple with red and blue accents (Plate 49d).

The only piece of dipt decorated ceramic recovered from the Turbine 1 Site is a single sherd of whiteware (Plate 49h). Dipt or industrial slipware decorated ceramics normally comprise a small percentage of tableware found on domestic sites. This inexpensive utilitarian ware was used for a multitude of functions, from the preparation of meals to the serving, eating and drinking of foodstuffs (Sussman 1997: 54). Dipt designs were most frequently found on bowls, jugs and mugs (Sussman 1997: 51). Aside from simple banded or striped varieties, dipt wares were not common after the 1840s (Miller 1991:7). The banded varieties, such as the piece recovered from Turbine 1, however, had a long life span and continued to be produced into the 20th century (Sussman 1997: 97).

Utilitarian Ware

This category consists of items used primarily in the kitchen and relate primarily to the preparation and storage of food. The seven pieces of utilitarian ware recovered from the Turbine 1 Site are all bottle glass. The colour of the glass in the sample includes aqua (n=3), solarized (n=2) and colourless (n=2). They include two bottles represented by the lip and neck portion. The solarized bottle has a prescription lip finish (Plate 49a) while the aqua bottle has a patent lip finish (Plate 49b).

Prescription lips evolved out of the similar patent lip so that the top of the lip slopes downward to the bore of the bottle to encourage any liquids left on the bottle lip to return back into the bottle. The upper edge of the bottle lip is also shaped to allow for liquid to be measured out in drops. Consequently they are the usual form for medicine bottles from the late 19th to early 20th century (Jones and Sullivan: 1989:81). Bottles with a flat top Patent lip were commonly used for extract and medicine bottles from the late 19th and early 20th centuries.

Solarized glass was intended to be colourless when it was manufactured. However, an additive to the glass, manganese dioxide, created a chemical reaction when exposed to prolonged sunlight that resulted in the glass having a slight purple hue. Solarized glass generally dates from the final quarter of the 1800s to World War I (Jones & Sullivan 1985:13).

Summary

Artifacts recovered from the Turbine 1 Site suggest that it is a refuse scatter that was deposited primarily in the 20th century. This assessment is based on the predominance of ironstone and the presence of porcelain and semi-porcelain. Further, the decorative techniques that are identified in the ceramic sample, transfer printed, decals printed, stamped and moulded, all continued to be produced in the 20th century or were only available starting in the last decade of the 19th century. Lastly, ceramic motifs that were found primarily on 19th century sites, such as edged and sponged were not recovered.

Although the Turbine 1 Site correlates roughly with the location of structure that is depicted on the 1879 Historic Atlas map, none of the artifacts, either observed in the field or collected, suggest a date to the 1870s or 1880s. It is likely that this site represents a refuse deposit from a later occupation of the property.

4.3 The Turbine 3 Site

As detailed in Table 7, a scatter of Euro-Canadian domestic refuse was discovered on Turbine 3 when it was surveyed on April 5, 2012. The site is located in a ploughed field and covers an area measuring 30 metres north-south by 52 metres east-west.

The Turbine 3 Site is situated in the west-central portion of Lot 27, Concession 14, Hay Geographic Township, Huron County. The location of the site roughly matches that of a structure that is depicted on the 1879 Historic Atlas map of Hay Township. At that time, the property was owned by an individual who is identified on the Historic Atlas township map as "*H. Happell*."

The surface collection of this site recovered a representative sample of 11 specimens. Granting that roughly three quarters of the material was left *in situ*, this is a very modest sample of Euro-Canadian artifacts to be recovered from an area 30 metres by 52 metres in size. This fact suggests that the Turbine 3 Site does not represent the H. Happell homestead itself, but rather a minor refuse deposit that was associated with the homestead. Most likely, the site of the homestead itself is situated north or south of the proposed access road to Turbine 3, outside of the limits of the survey. The material that was left in the field consists of primarily of bottle glass with some ceramic pieces.

As indicated in Table 7, the Stage 2 site assemblage consists of early to mid 20th century domestic refuse. The sample consists of tableware (n=7), utilitarian ware (n=2), personal item (n=1) and apparel (n=1). A representative sample of the artifacts is illustrated in Plate 50. An analysis of these artifacts follows.

Table 7 Frequency of Cultural Remains from the Turbine 3 Site

CATEGORY	CLASS	TYPE	f
Apparel	Button	Shell	1
Personal Item	Smoking	Pipe	1
Tableware	Ceramic	Ironstone	6
		Semi-Porcelain	1
		Subtotal	***7***
Utilitarian Ware	Glass	Bottle	2
TOTAL			**11**

Apparel

One item of apparel was recovered from the Turbine 3 Site. It is a complete two-hole plain shell button with a diameter of 9.8 mm. This button has a small shallow circular well and a flat, plain rim but has split into two pieces.

Personal Item

The only personal item is a small piece the stem from a smoking pipe made from white ball clay. Smoking pipes frequently recovered from Euro-Canadian homestead sites while pieces of the stem are often discovered as isolated finds. This stem portion is from close to the bowl; it is unmarked. Smoking pipes such as are common on 19th century sites; they continued to be manufactured until 1967 (Bradley 2000: 117).

Tableware

The tableware sample from the Turbine 3 Site consists entirely of ceramic material. Six pieces of ironstone and one piece of semi-porcelain were recovered.

Ware Type

Four pieces of ironstone with varying decorative techniques are illustrated in Plate 50, including transfer printed (Plate 50a, Plate 50e), and moulded (Plate 50b, Plate 50d). The single piece of semi-porcelain from the Turbine 3 Site has decal printed decoration and gold gilt.

Styles of Decoration

In total, three pieces of moulded ironstone tableware were recovered from the Turbine 3 Site. The moulded ironstone sample contains one saucer rim (Plate 50b) and two sherds. One of the sherds is a handle from pitcher (Plate 50d). The moulded decoration on the ironstone saucer rim appears to be an ivy or grape leaf but the pattern could not be identified. It was also not possible to identify the pattern on the other two pieces of moulded ceramic.

There were three pieces of transfer printed ceramic tableware recovered from the Turbine 3 Site. All are identified as ironstone plate rims and two different patterns are represented. Plate 50a illustrates the pattern that is used on two of the plate rims while Plate 50e illustrates the transfer print pattern on the other.

A single piece of decal printed semi-porcelain was recovered from the Turbine 3 Site. It is the lid from a serving vessel or similar container. In addition to the over glaze decal print design, the piece has an underlying moulded design and is further embellished with gold gilt. Much of the gold gilt has worn away and the decal print design is less distinct than when it was originally produced. This semi porcelain lid is illustrated in Plate 50c.

Utilitarian Ware

The two pieces of utilitarian ware recovered from the Turbine 3 site are all bottle glass (n=2). The colour of the glass in the sample includes brown (n=1) and cobalt blue (n=1). Both are illustrated in Plate 50. The addition of cobalt produces a rich blue colour that was favoured in the late 18th and throughout the 19th century for salt dishes, decanters, medicine and cosmetic containers (Jones & Sullivan 1989: 14). Until replaced by plastic containers in the late 20th century, cobalt blue glass containers were used for a range of pharmaceuticals such as Vick's Vapour Rub and Milk of Magnesia.

The brown glass fragment is the base from a larger bottle, possibly a liquor bottle. As can be seen from the photograph, the base has a detailed mould printed manufacturing mark. Not readily visible is a small diamond with an upper case D. This identifies the piece as made by Dominion Glass. The relation of a small dot to the diamond identifies that the piece was made in the Burnaby, British Columbia factory sometime in the 1960s. The shape of the small design to the left indicates that it came off the line sometime in September or October of that year (Miller and Jorgensen 1986:4).

Summary

Despite the fact the location of the Turbine 3 Site correlates with the location of a homestead on the 1879 Historical Atlas map, the artifacts indicate that this site is a small refuse scatter that was deposited in the 20th century. This assessment is based on the predominance of ironstone and the presence of semi-porcelain. The decorative techniques that are identified in the ceramic sample, transfer printed, decal printed, and moulded are all motifs that were readily available in the 20th century. In the case of the decal print, it likely was not available prior to the 20th century. The bottle glass sample also supports a 20th century date for the deposit.

4.4 Turbine 18 Isolated Finds

On April 24, 2012, two isolated First Nations find spots of unknown age and cultural affiliation were discovered in the course of the Stage 2 pedestrian survey of the area proposed for Turbine 18. They were found in a ploughed field.

Isolated Find #1 and Isolated Find #2 represent single examples of chipping detritus located 39 metres apart. Both specimens are very small and made of Onondaga chert. Isolated Find #1 of Turbine 18 is a biface thinning flake. Isolated Find #2 is a flake fragment. The two find locations were revisited one month later and a second intensive surface examination was conducted; no other artifacts were discovered. Both artifacts are illustrated in Plate 52. Isolated Find #1 (Turbine 18) is Plate 52a and Isolated Find #2 (Turbine 18) is Plate 52b.

4.5 Turbine 30 Isolated Finds

Two isolated First Nations find spots were discovered on May 4, 2012 in the survey of the proposed work area for Turbine 30. Both are located in a ploughed field. One consisted of a two specimens. The other consisted of three specimens. The distance between the two isolated find spots, at its closest point, is 91 metres.

Isolated Find #1

Isolated Find #1 consists of two pieces of chipped lithics found six metres apart in a ploughed field. One of the pieces of chipped lithics is represented by the tip of a drill and the other is represented by a lateral edge fragment of a biface. The drill is made of Kettle Point chert and measures more than 26 mm in length, at least 17 mm in width, and 10 mm in thickness. This drill tip is illustrated in Plate 52c. The biface fragment is made of Onondaga chert and appears to be burnt. This specimen has a length of more than 18 mm, a width of more than 19 mm and a thickness of at least 6 mm. The biface fragment is illustrated in Plate 52d. Neither artifact is diagnostic. Isolated Find #1 is considered an indeterminate First Nations find spot of unknown age and cultural affiliation.

Isolated Find #2

The second find spot location consists of three First Nations artifacts: a biface fragment and two pieces of chipping detritus. The biface was found four metres from one of the flakes and 12 metres from the other flake.

The biface is represented by a tip fragment and is made of Kettle Point chert. The specimen appears to be burnt. It measures 26+mm, 18+mm, and 4 mm in length, width and thickness, respectively. This biface fragment is illustrated in Plate 52f. Of the two pieces of chipping detritus, one is a flake fragment of Kettle Point chert (Plate 52g) and the other is a biface thinning flake of Onondaga chert (Plate 52e). The flake typology used in this report is based on Pearce (2005).

None of the artifacts associated with this location are diagnostic. As such, Isolated Find #2 represents an indeterminate First Nations find spot of unknown age and cultural affiliation. Both isolated find spots are illustrated in Plate 52.

4.6 Turbine 32 Isolated Finds

Two isolated First Nations find spots were discovered on April 25, 2012 in the survey of the area of proposed Turbine 32. Isolated Find #1 is separated from Isolated Find #2 by 37 metres. Both finds are non-diagnostic. The Turbine 32 artifact locations are considered isolated First Nations find spots of unknown age and cultural affiliation.

Isolated Find #1

Isolated Find 1 of Turbine 32 is a side scraper on a large tertiary flake of unidentified chert. The tertiary flake measures 49 mm, 27 mm and 8 mm, in maximum length, width and thickness, respectively. Both dorsal lateral edges of the scraper display evidence of retouch. The one scraping edge has a concave shape and measures 42 mm and the other scraping edge has a denticulate shape and extends for 32 mm. This rudimentary scraper is illustrated in Plate 52i.

Isolated Find #2

Isolated Find #2 of Turbine 32 is a biface thinning flake made of Colborne chert. This piece of chipping detritus is illustrated in Plate 52h.

4.7 The Turbine 41 Site

The Turbine 41 site consists of a 20th century Euro-Canadian domestic refuse. The site is located in an agricultural field on the south side of Dashwood Road. It measures 36 metres north-south by 65 metres east-west and straddles the proposed access road that will connect Turbine 41 to Dashwood Road.

The Turbine 41 site is situated in the north-central portion of Lot 37 Northern Boundary, Stanley Geographic Township, Huron County. The location of the site roughly matches that of a structure that is depicted on the 1879 Historic Atlas map of Stephen Township. At that time, the property was owned by an individual who is identified on the Historic Atlas township map as "*W. Wolper*."

The surface collection of this site recovered 24 representative specimens (Table 8). This total included a sample of diagnostic ceramic tablewares . Roughly a third of the aritfacts observed on the surface were collected. The sample that was left in the field consisted primarily of bottle glass, with some window glass, nails and small ceramic sherds. The sample appears to be a refuse deposit rather than the site of a homestead.

The majority of the material recovered is tableware (n=18) with the remainder divided between utilitarian ware (n=5) and personal items (n=1). The analysis of these artifacts follows.

Personal Item

The only personal item is a substantial rim sherd from an ironstone chamber pot. The piece has a blue transfer print design applied to the interior of the piece. The interior surface is also moulded although details of the pattern could not be identified. The chamber pot rim is illustrated in Plate 51a.

Tableware

Tableware consists of glass and ceramic items that were used at the table. The tableware sample from the Turbine 41 Site 1 consists almost entirely of ceramic material (n=17). A single glass handle from an unknown type of vessel was also recovered. It is a partial moulded handle made of colourless glass. This piece is most likely from a shallow open serving dish.

Ware Type

The majority of ceramic tableware sample is divided between of ironstone (n=7) and semi-porcelain (n=7) with the remainder composed of porcelain (n=3). Most of the ironstone from this site is plain (n=4). The remainder of the sample includes two pieces of moulded and one sherd with a black printed mark but is too small to identify any other decorative treatment. The partial marker's mark features a lion and the initials "J & ..." An ironstone saucer rim with moulded decoration is illustrated in Plate 51b.

Table 8 Frequency of Cultural Remains from the Turbine 41 Site

CATEGORY	CLASS	TYPE	f
Personal Item	Hygiene	Chamber Pot	1
Tableware	Ceramic	Ironstone	7
		Porcelain	3
		Semi-Porcelain	7
		Subtotal	*17*
	Glass		1
	Subtotal		***18***
Utilitarian Ware	Glass	Bottle	4
		Vessel	1
	Subtotal		***5***
TOTAL			**24**

A sample of three sherds of porcelain was recovered from the Stage 2 pedestrian survey of the Turbine 41 site. Aside from the two plain porcelain sherds, one small painted porcelain rim from a saucer was also recovered (Plate 51c). The sample of semi-porcelain from the Turbine 41 Site consists of flow printed, transfer printed, moulded and decal printed designs.

Styles of Decoration

Most of the ceramic pieces recovered from the Turbine 41 Site lack decoration (n=6). The sample consists of ironstone (n=4) and porcelain (n=2) pieces. The plain ironstone includes three sherds and one indeterminate rim. The porcelain sample consists of two sherds.

Only three pieces of moulded ceramic tableware were identified from the Turbine 41 Site. Only one of the three pieces could be identified. It is a saucer rim of with the Wheat Pattern. This saucer rim is illustrated in Plate 51b.

A single saucer rim of porcelain is the only example of painted ceramics recovered from the Turbine 41 Site. The blue decoration was applied over the surface of the glaze. This rim is illustrated in Plate 51c.

Flow printed wares were first introduced to North America in 1845 (Kenyon 1991:4; Miller et al. 2000:13). By allowing the pigment of the decoration to weep or flow into the glaze, a slightly blurred flow printed image was created. Flow decorated wares began to decline in popularity in the 1860s (Kenyon 1991:7); however, flow printed wares were still being produced into the 20th century (Gaston 1994). A single plate rim on semi-porcelain is the only example of flow printed ceramic tableware recovered from the Turbine 41 site. The flow design is blue and is applied over a subtle moulded pattern typical of semi-porcelain vessels. It is illustrated in Plate 51d.

Only three pieces of transfer printed decorated ceramic tableware were recovered from the Turbine 41 Site. All are semi-porcelain and include a saucer rim and two sherds. Both the rim and one of the sherds also have an underlying moulded decoration. The saucer rim is illustrated in Plate 51e. Both examples of transfer printed semi-porcelain are green and are representative of "*revival transfer-printed*" vessels, which favour monochrome floral motifs (Majewski and O'Brien 1987: 145). Three pieces of semi-porcelain with varying decorative techniques are illustrated in Plate 51, including flow printed (Plate 51d), transfer printed (Plate 51e), and decal printed (Plate 51f).

There are three pieces of decal print ceramic, all on semi-porcelain. Two are plate rims with the same pattern featuring a vine with leaves and a single sherd. Most of the decoration is worn away on the sherd but it likely features the same pattern. It also has a partial maker's mark on the base. This mark features a crest with the end of the word "…LITY" while directly above is the last portion of the word "…TOR". One of the plate rims is shown in Plate 51f. As previously stated, decal printed ceramics could date to the very late 19th century but are more likely to date to the early decades of the 20th century.

Utilitarian Wares

A small sample of bottle glass was recovered from the Turbine 41 Site (n=5). These pieces range in colour from brown, aqua, solarized and opaque white or are colourless.

The largest piece is the base of a kidney shaped bottle made of brown glass. It has been mould printed, revealing a considerable amount of information. On the convex side close to the base is "25 OZS.," indicating that the volume of the complete bottle was 25 ounces. On the base is the identifying diamond containing an upper case "D" indicating that the bottle was made by

DOMINION GLASS COMPANY. Other marks in association with the company logo indicate that this bottle was made in Point St. Charles, Quebec during May or June of 1942 or 1952 (Miller and Jorgensen 1986: 3-4). The bottle reads "CANADIAN / SCHENLEY / VALLEYFIELD, QUE". Schenley is a Canadian distillery that produces whiskey. It was first established in 1945 and is still in existence. Schenley could not have ordered the bottle until after 1945, therefore, the bottle was produced in 1952. This bottle base is illustrated in Plate 51g.

The small piece of solarized glass is a small fragment from the lip and is threaded. This indicates a commercial food storage jar. The small piece is illustrated in Plate 51i. Solarized glass was intended to be colourless when it was manufactured. However, an additive to the glass, manganese dioxide, created a chemical reaction when exposed to prolonged sunlight that resulted in the glass having a slight purple hue. Solarized glass generally dates from the 1890s to World War I (Jones & Sullivan 1985:13).

The final piece of utilitarian glass is a sherd from the base of a vessel made from opaque white or milk glass. The base of the piece has moulded design featuring a sunburst radiating out from the manufacture's logo of an anchor in a large upper case "H". This identifies the piece as made by the ANCHOR HOCKING CORPORATION of Lancaster, Ohio. The company was in existence from 1937 to 1977. This piece is illustrated in Plate 51i

Summary

In summary, the Turbine 41 Site dates to the early to mid 20th century. This is based on the quantity of ironstone and semi-porcelain and the presence of porcelain. Further, the predominance of decal and transfer print and the absence of decorative techniques associated exclusively with the 19th century support this conclusion. A date to the mid 20th century is suggested by the bottle glass sample.

Given that and the fact that the material dates to the 20th century, the Turbine 41 site clearly doesn't represent the W. Wolper homestead, although it is possible that it relates to the later occupation of that structure.

5.0 STAGE 2 ANALYSIS AND CONCLUSIONS

Standard 1 of Section 7.8.3 of the Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a: 138) requires that the Analysis and Conclusions section of reports on Stage 2 fieldwork address the following statement: "*Summarize all findings from the Stage 2 survey, or state that no archaeological sites were identified*." As detailed in Section 4.0, the Stage 2 survey of the proposed Grand Bend Wind Farm resulted in the discovery of nine archaeological sites.

Three of the sites consist of Euro-Canadian refuse scatters. The remaining six sites consist of isolated First Nations find spots of unknown age and cultural affiliation. In all cases, the latter sites consist of one or a few undiagnostic chipped lithic artifacts. All nine sites are located on privately-owned lands and were discovered during the course of the survey of the proposed wind turbines and access roads. In addition, the survey of the proposed transmission line identified potential archaeological planning concerns for a segment of the corridor that abuts a cemetery. This report presents the analysis and conclusions for the nine sites and for the cemetery.

Standard 2b of Section 7.8.3 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 139) requires that this section of the report include a comparison against the criteria in the Stage 2 *Property Assessment* to determine whether further assessment is required. This element of the standard is addressed below.

Standard 1 of Section 2.2 states (2011a: 40), in part, the following:

> *Artifacts, groups of artifacts or archaeological sites meeting the following criteria require Stage 3 assessment:*
>
> *a. precontact diagnostic artifacts or concentration of artifacts (or both):*
>
> *i. within a 10 by 10 m pedestrian survey area:*
> *(1) at least one diagnostic artifact or fire cracked rock in addition to two or more or more non-diagnostic artifacts.*
> *(2) in areas east or north of the Niagara Escarpmen,t at least Five non-diagnostic artifacs*
> *(3) in areas on or west of the Niagara Escarpment, at least 10 non-diagnostic artifacts.*
>
> *b. Single examples of artifacts of special interest:*
>
> *i. Aboriginal ceramics*
> *ii. exotic or period-specific cherts*
> *iii. an isolated Paleo-Indian or Early Archaic diagnostic artifact.*

In the case of the pre-contact isolated finds discovered during the course of the Stage 2 pedestrian survey of the proposed Grand Bend Wind Farm, none of the six isolated finds of First Nations

sites meets the requirements of Standard 1ai (1) or (3). Further, no aboriginal ceramics, exotic or period-specific cherts were recovered. All First Nations artifacts recovered were indeterminate and cannot be assigned to a particular period. Therefore, IF #1 and IF #2 of Turbine 18, IF #1 and IF#2 of Turbine 30 and IF #1 and IF #2 of Turbine 32 do not meet the criteria of Standard 1bii or 1biii. As such, these six sites do not have cultural heritage value or interest and will not require a Stage 3 level of assessment.

Standard 1c of Section 2.2 requires "post-contact sites containing at least 20 artifacts that date the period of use to before 1900" (Ministry of Tourism and Culture 2011a: 41) to proceed to a Stage 3 level of investigation. Two of the Euro-Canadian sites, Turbine 3 and Turbine 41, clearly date to the 20th century. Both of these sites have artifacts that are associated with the 20th century and neither has aritfacts that can be exclusively assigned to a pre-1890 date. The other site, the Turbine 1 site, may have material that dates to the 1890s but the occupation extends into the 20th century. In addition, any material that may date to before 1900, such as stamped, flow and transfer print decorated ceramic tablewares, are also associated with sites that post-date 1900 and therefore cannot be used to meet the criteria of 20% of artifacts that would exclusively date to before 1900. As such, these three sites do not have cultural heritage value or interest and will not require a Stage 3 level of assessment.

The only potential archaeological concern that was identified by the Stage 2 survey is for the segment of the proposed 230 kV Transmission Line that extends along the north edge of the Hensall Union Cemetery on the south side of Rodgerville Road east of Highway 4. The concern for that segment is the potential for unmarked graves within the portion of the road right-of-way that is transected by proposed 230 kV Transmission Line.

6.0 RECOMMENDATIONS

As stated in the Sections 1.3 and 2.1 of this report, the results of the background study demonstrated that no past archaeological investigations had been carried out within the subject properties. The study also determined that no archaeological sites had been documented within or in close proximity to any of the lands that will be subject to impact by the construction of the proposed Grand Bend Wind Farm. As stated in the Section 2.2 of this report, the results of the background study further determined that the lands that are involved in the proposed Grand Bend Wind Farm generally had a low to moderate potential for as-yet undiscovered First Nations and Euro-Canadian archaeological remains.

As detailed in Section 3.0, the Stage 2 survey was conducted over the course of 14 weeks in the spring and early summer of 2012. The Stage 2 assessment of the proposed wind turbines, access roads and related facilities involved a pedestrian survey conducted at an interval of five metres or less. The Stage 2 survey of the proposed collector and transmission lines involved a visual examination, shovel test pit survey and judgmental test pit survey. In both cases, the Stage 2 survey covered 100% of the lands that were inferred to retain any archaeological potential and that would be subject to impact from the proposed construction of the Grand Bend Wind Farm.

The survey of the proposed wind turbines, access roads and related facilities resulted in the discovery of nine archaeological sites. Six of the sites consist of isolated pre-contact First Nations find spots of unknown age and cultural affiliation. The remaining three sites consist of diffuse scatters of Euro-Canadian refuse.

Further to the above, Standard 3 of Section 7.8.4 of the Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a: 139) states the following with respect to the reporting on archaeological surveys that did not result in the discovery of archaeological sites that warranted further concern: "*If the Stage 2 survey did not identify any archaeological sites requiring further assessment or mitigation of impacts, recommend that no further archaeological assessment of the property be required*." As detailed in Section 5.0 of this report, none of the nine archaeological sites discovered by the Stage 2 survey is considered to show any heritage value or interest and none warrants any further investigation or concern. In consequence, it is recommended that no further archaeological assessment is warranted for any of these nine sites.

The survey of the proposed collector and transmission lines did not result in the discovery of any archaeological remains. However, it did identify a concern for the potential for unmarked graves along a 140 metre long segment of the proposed transmission line that abuts Hensall Union Cemetery. This cemetery is the only potential archaeological planning concern that was identified by the assessment of the proposed Grand Bend Wind Farm and OPA FIT Contract # F-002178-WIN-130-601.

The cemetery is located on the south side of Rodgerville Road, east of Highway 4. Following the formulation of the detailed design for the proposed transmission line, it is recommended that a more detailed Stage 3 assessment of this segment of the line be conducted. One element of the assessment will consist of archival research on the history of the cemetery. The other element of the assessment will consist of fieldwork. The nature of the fieldwork will depend on whether the proposed construction will involve a buried cable or above ground hydro poles. If it will involve

a buried cable, the fieldwork will consist of the archaeological monitoring of a one-metre wide trench. The trench will be excavated by a backhoe, excavator or Gradall with a straight-edged ditching bucket. If the construction will involve above ground hydro poles, the fieldwork will consist of the excavation of a block of four one-metre units for each proposed hydro pole location. In both cases, the objective of the fieldwork would be to identify the presence or absence of stains in the subsoil that could represent unmarked grave shafts. If any such features were identified, they would be fully exposed and recorded, then excavated to determine their nature.

Under the *Ontario Heritage Act* (1990a), it is a requirement of archaeological consulting licences that consultants prepare and submit assessment reports to the Ontario Ministry of Tourism, Culture and Sport. Archaeological Review Officers of the Ministry then review each report to ensure that the assessment and the report satisfy consulting licence requirements under the Act and other pertinent legislation and that they conform to current archaeological standards and guidelines. If the report and the assessment do so conform, the pertinent Archaeological Review Officer then issues a letter confirming that and accepting the report into the Ontario Public Register of Archaeological Reports.

In the present case, it is recommended that the Ministry of Tourism, Culture and Sport issue a letter accepting the present report into the Ontario Public Register of Archaeological Reports. It is also requested that the letter include a statement of concurrence with the findings of the Stage 1-2 archaeological assessment that are documented in this report. Finally, it is requested that a copy of the Ministry's letter be forwarded to Lyle Parsons, Project Manager, Neegan Burnside Inc. His e-mail address is lyle.parsons@neeganburnside.com.

The above comments conclude the general and site-specific recommendations of this report. Nevertheless, it should be emphasized that no archaeological survey can be considered to totally negate the potential for deeply buried cultural remains, including human burials. In recognition of that fact, the 1993 archaeological assessment technical guidelines formulated by the Province of Ontario require that all reports on archaeological assessments include recommendations to address the possibility that deeply buried remains may be encountered during construction (MCTR 1993: 12).

The 2011 Standards and Guidelines do not include a requirement that assessment reports contain statements to address the fact that no archaeological survey can be considered to totally negate the potential for deeply buried cultural remains, including human burials. However, the Advice on Compliance with Legislation section of the Standards and Guidelines does effectively provide for the contingency that human remains and archaeological sites can be missed by an archaeological survey and could represent ongoing concerns for a proposed development. More specifically, Standard 1c of Section 7.5.9 of the Standards and Guidelines provides for the contingency that previously undocumented archaeological resources may be discovered and what must be done in that eventuality (Ministry of Tourism and Culture 2011a: 127). Similarly, Standard 1d of Section 7.5.9 of the Standards and Guidelines provides for what must be done in the event that human remains should be discovered (Ibid). Matters concerning advice on compliance with legislation are detailed in Section 7.0 of this report.

Further to the above, it is recommended that archaeological staff of the Ontario Ministry of Tourism, Culture and Sport be notified immediately if any deeply buried archaeological remains

should be discovered during earthmoving or construction related to the proposed Grand Bend Wind Farm. The pertinent contact person at the Ministry is Shari Prowse. She is the Archaeological Review Officer of the Culture Programs Unit of the Ministry who is responsible for the South West Region, within which the proposed Grand Bend Wind Farm is situated. Her telephone number is 519 675-6898 and her e-mail address is Shari.Prowse@ontario.ca.

In the event that human remains should be encountered during earthmoving or construction related to the proposed development, it is similarly recommended that the proponent immediately contact the aforementioned Shari Prowse as well as the police, the coroner and Michael D'Mello. Mr. D'Mello is the Registrar of the Cemeteries Regulation Unit of the Ontario Ministry of Consumer Services. His telephone number is 416 326-8404 and his e-mail address is Michael.D'Mello@ontario.ca. Section 6.0 of this report provides a more explicit discussion of legislative provisions that apply to the discovery of human remains.

7.0 ADVICE ON COMPLIANCE WITH LEGISLATION

The Standards and Guidelines formulated by the Ministry of Tourism and Culture (2011a) that came into effect on January 1, 2011 have requirements that archaeological assessment reports must include statements that concern compliance with pertinent legislation. Those statements were draughted by the Ministry's legal department. Furthermore, it is understood that in order for reports to conform to the current Standards and Guidelines the pertinent statements regarding compliance legislation must not only be cited but must also be quoted verbatim.

The pertinent standards in the Standards and Guidelines are as follows:

1. Advice on compliance with legislation is not part of the archaeological record. However, for the benefit of the proponent and approval authority in the land use planning and development process, the report must include the following standard statements.

a. This report is submitted to the Minister of Tourism and Culture 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 Ministry of Tourism and Culture, 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.

b. 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 complete 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 Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

c. 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*.

d. The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

2. Reports recommending further archaeological fieldwork or protection for one or more archaeological sites must include the following statement: "Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence."

The above standards are quoted verbatim from Section 7.5.9 of the Standards and Guidelines (Ministry of Tourism and Culture 2011a: 126-127). All of them apply to the present report.

8.0 REFERENCES CITED

H. Belden & Co.
1879a Illustrated Historical Atlas of Huron County, Ontario. Mika Silk Screening Limited Reprint, Belleville, Ontario, 1972.
1879b Illustrated Historical Atlas of Perth County, Ontario. Mika Silk Screening Limited Reprint, Belleville, Ontario, 1972.

Bradley, Charles S.
2000 Smoking Pipes for the Archaeologist. **Studies in Material Tourism and Culture Research** 2000: 104-133.

Brown, Ann R.
1982 Historic Ceramic Typology with Principal Dates of Manufacture and Descriptive Characteristics for Identification. Delaware Department of Transportation. Division of Highway, Location and Environmental Studies Office.

Chapman, Lyman John and Donald F. Putnam
1984 **The Physiography of Southern Ontario (Third Edition).** Ontario Geological Survey Special Volume 2. Ontario Ministry of Natural Resources, Toronto.

Collard, Elizabeth
1983 **Nineteenth Century Pottery and Porcelain in Canada.** McGill-Queen's University Press, Kingston and Montreal. (Second edition).

Eley, B.E. and P.H. von Bitter
1989 **Cherts of Southern Ontario**. Royal Ontario Museum, Toronto, Canada.

Gaston, M. F.
1994 **Collector's Encyclopedia of Flow Blue China**. Second Series. Paducah, Kentucky.

Godden, Geoffrey A.
1964 **Encyclopedia of British Pottery and Porcelain Marks**. Bonanza Books, New York.

Government of Ontario
1990a **The Ontario Heritage Act (R.S.O. 1990)**. Queen's Printer, Toronto.
1990b **The Cemeteries Act (R.S.O. 1990)**. Queen's Printer, Toronto.
2002 **The Funeral, Burial and Cremation Services Act**. Queen's Printer, Toronto.
2009 **The Green Energy Act.** Queen's Printer, Toronto.
2012 **Environmental Protection Act**. Ontario Regulation 359/09, Renewable Energy Approvals Under Part V.0.1 of the Act.

Hay Township Book Committee
1996 **Hay Township Highlights: 150 Years of Diversified Progress**. Compiled by the Hay Township Book Committee under the auspices of Hay Township Council.

Hoffman, D.W., N.R. Richards and F.F. Morwick
1952 **Soils of Huron County, Ontario. Soil Survey Report No. 13.** Experimental Farms Service, Canadian Department of Agriculture and Ontario Agriculture, Guelph.

Jones, Olive and Catherine Sullivan, with contributions by G. L. Miller, E.A. Smith, J.E Harris and K. Lunn

1989 **The Parks Canada GLASS GLOSSARY** for the description of containers, tableware, flat glass, and closures. Revised Edition. Studies in Archaeology, Architecture & History. National Historic Parks & Sites. Canada Parks Services, Environment Canada. Minister of Supply and Services Canada.

Kenyon, Ian

1983 *Plates and Dishes in Early 19th Century Ontario*. **KEWA** 83-1:13-16.

1985 *A History of Ceramic Tablewares in Ontario, 1870-1890*. **Arch Notes** Nov/Dec 15-21.

1986 The Consulting Archaeologist and the Analysis of 19th Century Ceramic Tablewares. Archaeology Unit, Ontario Ministry of Tourism and Culture.

1991 A History of Ceramic Tableware in Ontario: 1780-1890. Paper prepared for distribution at ***"An Introduction to English Ceramics for Archaeologists Workshop"***, sponsored by the Association of Professional Archaeologists, and held in Toronto.

Mack, Susan Muriel and Alice Gibb

1992 **The History of Stephen Township**. Corporation of the Township of Stephen.

Majewski, Teresita and Michael J. O'Brien

1987 *The Use and Misuse of Nineteenth-Century English and American Ceramics in Archaeological Analysis*. **Advances in Archaeological Method and Theory**, Volume 11: 97-207.

Miller, George L.

1991 A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880. ***Historical Archaeology*** Volume 25 No. 1:1-25.

Miller , George L. and Robert R. Hunter

1990 English Shell Edged earthenware: Alias Leeds Ware, Alias Feather Edge. **35th Annual Wedgwood International Seminar** 107 to 136.

Miller, George L., and Elizabeth A. Jorgensen

1986 **Some Notes on Bottle Mould Numbers from the Dominion Glass Company and its Predecessors**. National Historic Parks and Sites Branch, Parks Canada, Environment Canada.

Miller, George L., with contributions by P. Samford, E. Shlasko and A. Madsen

2000 Telling Time for Archaeologists. ***Northeast Historical Archaeology*** 29:1-22.

Murphy, Carl and Neal Ferris

1990 The Late Woodland Western Basin Tradition of Southwestern Ontario. In **The Archaeology of Southern Ontario to A.S. 1650**, edited by C.J. Ellis and N. Ferris. Occasional Publication of the London Chapter, OAS No. 5: 189-278.

Ontario Ministry of Citizenship, Culture and Recreation

1997 **Conserving a Future for Our Past: Archaeology, Land Use Planning & Development In Ontario. An Educational Primer and Comprehensive Guide for Non-Specialists.** 1997 (Revised March 1998). Ministry of Citizenship, Culture and Recreation, Cultural Programs Branch, Archaeology and Heritage Planning Unit.

Ontario Ministry of Culture, Tourism and Recreation (MCTR)

1993 **Archaeological Assessment Technical Guidelines (Stages 1-3 and Reporting Format)**. Ministry of Culture, Tourism and Recreation, Cultural Programs Branch, Archaeology and Heritage Planning Unit.

Ontario Ministry of Tourism and Culture
2011a **Standards and Guidelines for Consultant Archaeologists.**
2011b **Engaging Aboriginal Communities in Archaeology. Draft Technical Bulletin for Consultant Archaeologists in Ontario.**

Peters, John
1986 Transmission Line Planning and Archaeological Resources: A Model of Archaeological Potential for Southwestern Ontario. Archaeological Consulting in Ontario: Papers of the London Conference 1985. **Occasional Papers of the London Chapter, Ontario Archaeological Society, Inc.** No. 2.

Pihl, Robert
1986 Site Potential Modelling in Archaeological Consulting. Archaeological Consulting in Ontario: Papers of the London Conference 1985. **Occasional Papers of the London Chapter, Ontario Archaeological Society Inc.** No. 2.

Scott, James
1966 **The Settlement of Huron County**. The Ryerson Press, Toronto.

Pearce, Sherri
2005 A Comparison of Lithic Debitage Analytical Techniques as Applied to an Early Archaic Bifurcate Base Point Assemblage. **KEWA** 2005:7-8: 1-201.

Sussman, Lynne
1985 **The Wheat Pattern: An Illustrated Survey.** Studies in Archaeology, Architecture and History. National Historic Parks and Sites Branch, Parks Canada, Environment Canada.

1997 *Mocha, Banded, Cat's Eye, and Other Factory-Made Slipware*. **Studies in Northeast Historical Archaeology**, No.1.

Weiler, John
1980 **Guidelines on the Man-Made Heritage Component of Environmental Assessments**. Historical Planning and Research Branch, Ministry of Tourism, Culture and Recreation, Toronto.

Wright, J.V.
1966 The Ontario Iroquois Tradition. National Museum of Canada**,** Bulletin No. 210.

FIGURES

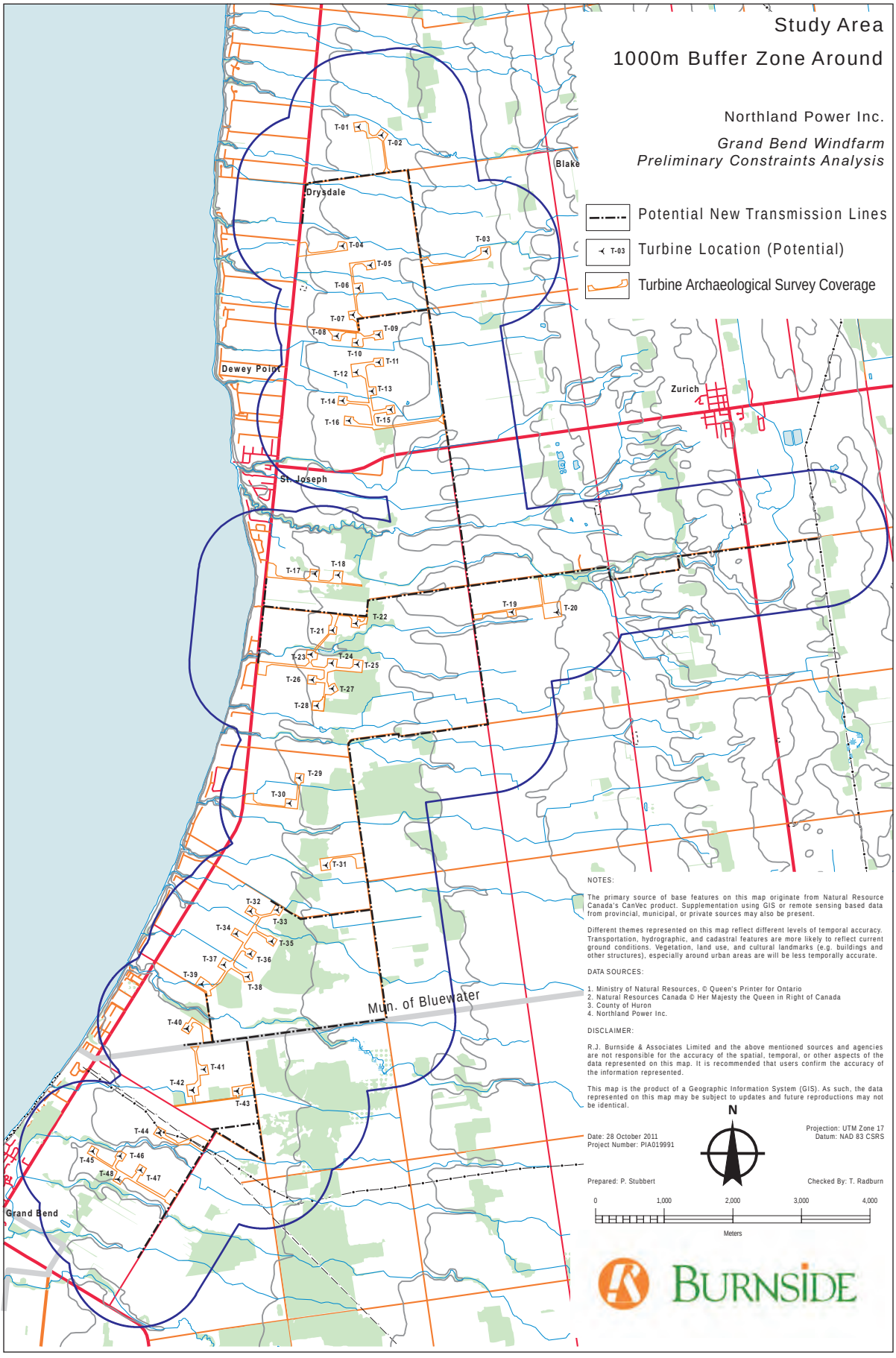


Figure 1 Location of the Proposed Grand Bend Wind Farm

COLOUR AND MAP SYMBOL	SERIES AND SURFACE TEXTURE		GREAT GROUP	SOIL MATERIALS	SOIL PROFILE	DRAINAGE	TOPOGRAPHY AND SURFACE STONINESS
Bes	BERRIEN	Bes sandy loam	Grey-Brown Podzolic	Sandy outwash over fine-textured till	6" dark brown sandy loam over slightly mottled sand horizons which are usually fairly well defined; heavy clay till usually occurs at depths of 3 feet and less.	Imperfect	Undulating Stonefree
Bos	BOOKTON	Bos sandy loam	Grey-Brown Podzolic	Sandy outwash over fine-textured till	5" greyish brown sandy loam over yellow brown sandy loam over dark brown loam; heavy clay till appears at depths of 3 feet or less.	Good	Strongly undulating to rolling Stonefree
*BL	BOTTOMLAND	B L variable	Azonal Alluvial	Alluvial	Low lying land along stream courses; subject to flooding; profile immature and horizons poorly defined.	Variable	Variable
Brs	BRADY	Brs sandy loam	Grey-Brown Podzolic	Well sorted sandy outwash	6" very dark grey sandy loam surface over slightly mottled sandy loam; A_2 horizon mottled; B horizon less well defined than in Fox series.	Imperfect	Undulating Stonefree
Brl	BRISBANE	Brl loam	Grey-Brown Podzolic	Well sorted gravelly outwash	6" dark grey gravelly loam over slightly mottled yellowish brown loam over mottled brown clay loam; A_2 and B horizons less well differentiated than in the Burford series.	Imperfect	Level to slightly undulating Slightly to moderately stony
Bc, Bsc, Bs	BROOKSTON	Bc clay loam Bsc silty clay loam Bs silt loam	Dark Grey Gleisolic	Fine-textured till	7" dark grey to very dark grey clay loam, silt loam or silty clay loam, highly mottled; poorly defined lower horizons; profile usually gritty throughout.	Poor	Slightly undulating to level Slightly stony
Bg	BURFORD	Bg loam	Grey-Brown Podzolic	Well sorted gravelly outwash	5" dark grey gravelly loam surface soil; horizons well defined; parent material consists of gravelly material, usually well sorted.	Good	Undulating to slightly rolling Slightly to moderately stony
Dos	DONNYBROOK	Dos sandy loam	Grey-Brown Podzolic	Poorly sorted gravelly outwash	6" brown sandy loan underlain by well defined sandy loam A_2 and loamy B horizons; parent material dominantly gravel and cobby and occurs in association with pockets of sand and till; horizons well developed.	Good	Strongly rolling to hilly Moderately to very stony
Ds, Dl	DUMFRIES	Ds sandy loam Dl loam	Grey-Brown Podzolic	Coarse to medium-textured till	6" dark greyish brown loam surface; well defined horizons; stony through-out; parent material contains a large proportion of coarse fragments.	Good	Strongly rolling to hilly Moderately stony
Fs	FOX	Fs sandy loam	Grey-Brown Podzolic	Well sorted sandy outwash	5" dark grey sandy loam surface over well-developed A_2 and B horizons; parent material is well sorted, grey calcareous sand.	Good	Undulating to rolling Stonefree
Gil	GILFORD	Gil loam	Dark Grey Gleisolic	Well sorted gravelly outwash	8" very dark grey loam over mottled lower horizons; horizons indistinct.	Poor	Level to slightly depressional Slightly stony
Gs	GRANBY	Gs sandy loam	Dark Grey Gleisolic	Well sorted sandy outwash	8" black sandy loam over mottled grey sand; surface deep and dark; sharp contrast between dark surface and drab grey glei horizon.	Poor	Level to depressional Stonefree
Gul	GUERIN	Gul loam	Grey-Brown Podzolic	Coarse to medium-textured till	6" dark grey loam surface soil over slightly mottled A_2 and B horizons; underlain by coarse stony till; stony throughout.	Imperfect	Level to undulating Moderately stoney
Hl, Hs	HARRISTON	Hl loam Hs silt loam	Grey-Brown Podzolic	Medium-textured till	6" dark grey brown loam or silt loam surface soil; well defined horizons; parent material pale yellowish brown loam; stony throughout.	Good	Strongly undulating to rolling Usually slightly stony
Huc, Hus	HURON	Huc clay loam Hus silt loam	Grey-Brown Podzolic	Fine-textured till	6" dark grey clay loam or silt loam surface soil; well developed profile; gritty clay parent material.	Good	Rolling to undulating Slightly stony
Ll, Ls	LISTOWEL	Ll loam Ls silt loam	Grey-Brown Podzolic	Medium-textured till	6" dark brown loam or silt loam surface soil over slightly mottled lower horizons; A_2 and B horizons less well defined than in Harriston; stony throughout.	Imperfect	Undulating Usually slightly stony
Lyl	LYONS	Lyl loam	Dark Grey Gleisolic	Coarse to medium-textured till	8" very dark grey surface soil over drab grey mottled loam; horizons poorly defined; occasional shallow muck on surface, stony throughout.	Poor	Level to depressional Moderately stony
M	MUCK	M variable	Bog	Organic	Black, well-decomposed organic material of varying depths over sand, clay or marl; organic material usually exceeds 18 inches.	Poor	Depressional Stonefree
Pal, Pas	PARKHILL	Pal loam Pas silt loam	Dark Grey Gleisolic	Medium-textured till	7" dark brown loam or silt loam surface over grey highly mottled layers; horizons poorly defined.	Poor	Level Usually slightly stony
Pc, Psc, Ps	PERTH	Pc clay loam Psc silty clay loam Ps silt loam	Grey-Brown Podzolic	Fine-textured till	6" dark grey clay loam, silt loam or silty clay loam surface soil; lower A_2 and B horizons mottled; profile gritty throughout.	Imperfect	Undulating Slightly stony
Tes	TEESWATER	Tes silt loam	Grey-Brown Podzolic	Well sorted gravelly outwash	5" brown silt loam; profile well developed; concentration of stones in B horizon; parent material contains a large proportion of very pale brown coloured stones; well sorted.	Good	Undulating Usually stonefree
Ts, Tc	TOLEDO	Ts silt loam Tc clay loam	Dark Grey Gleisolic	Lacustrine	7" very dark grey silt loam or clay loam over drab grey mottled materials; horizons poorly defined.	Poor	Level to undulating Stonefree
Was	WAUSEON	Was sandy loam	Dark Grey Gleisolic	Sandy outwash over fine-textured till	8" black sandy loam surface over mottled sand over mottled clay till; horizons poorly developed; clay till usually at depths of 3 feet and less.	Poor	Level to slightly depressional Stonefree

*Note: The new base used for this republication has improved hydrographic information which does not fit the soil boundaries originally drawn to fit streams and rivers. The user is warned to regard the location of boundaries for bottom land units (symbol B.L.) and associated soils with reservation.

Soil Survey by the Department of Soils, Ontario Agricultural College, Guelph,in co-operation with the Experimental Farms Service, Dominion Department of Agriculture (now Land Resource Research Institute, Research Branch, Agriculture Canada), Ottawa. Surveyed in 1947.

Recompiled, drawn and published by the Cartography Section, Land Resource Research Institute, Research Branch, Agriculture Canada 1979. Revised topographic base information and printing supplied by the Reproduction and Distribution Division, Surveys and Mapping Branch, Energy, Mines and Resources, Canada.

Figure 2 Key Plan to the 1952 Soils Survey of Huron County, South Sheet

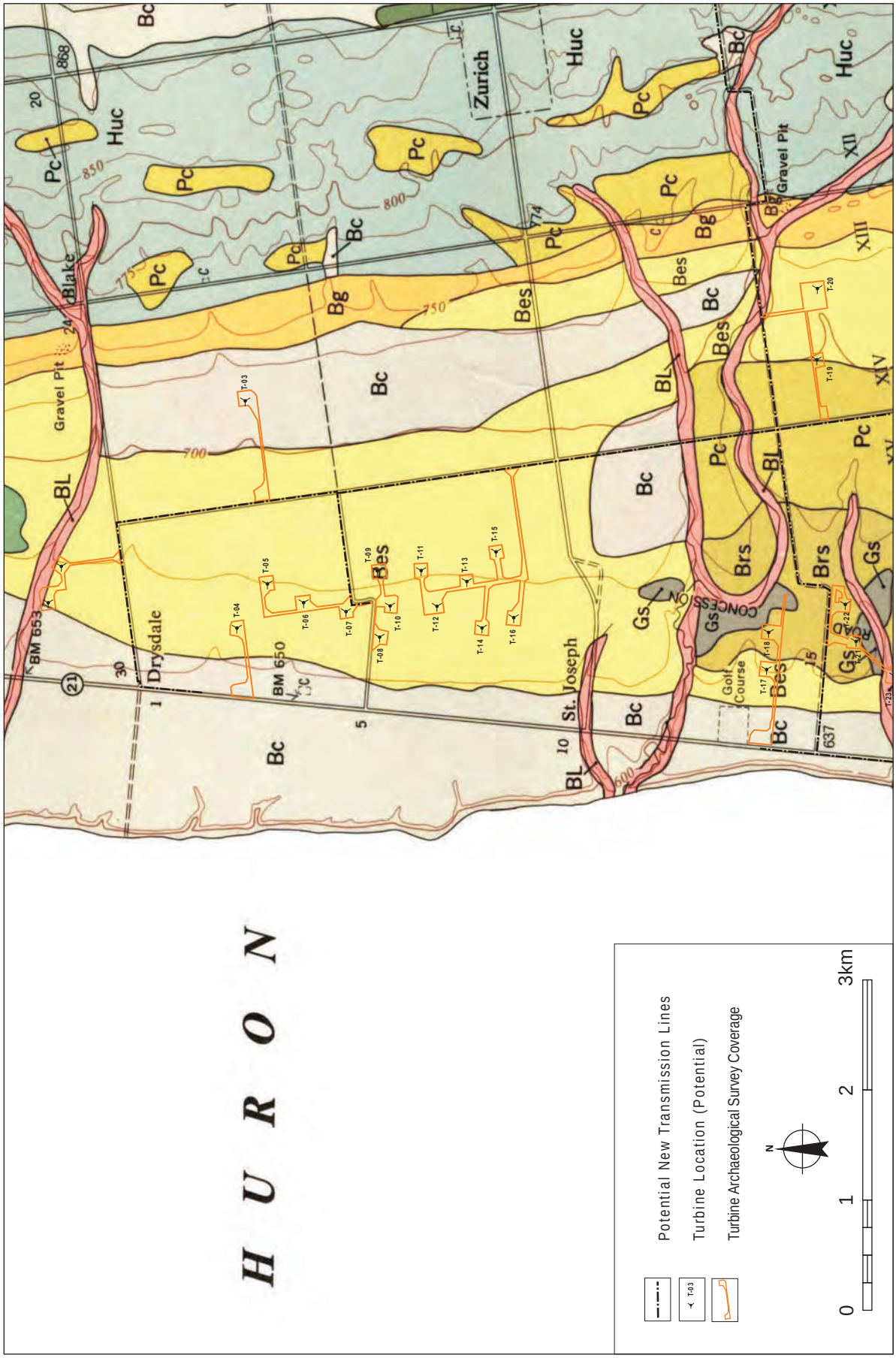


Figure 3 Soils in the Northern Portion of the Study Area

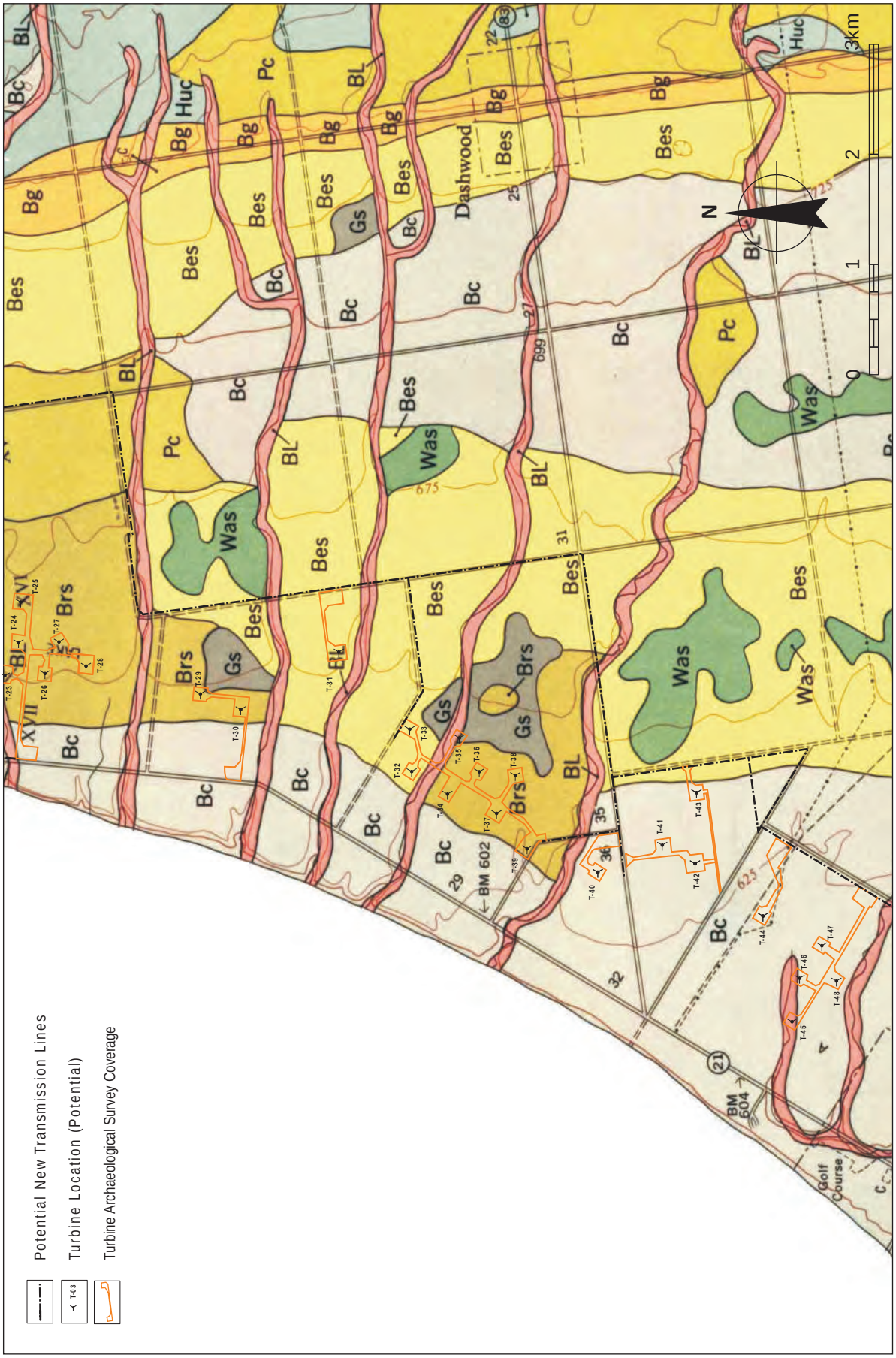


Figure 4 Soils in the Southern Portion of the Study Area

Figure 5 1879 Historic Atlas Map of the Northern Portion of the Study Area

Figure 6 Historic Atlas Map of the Southern Portion of the Study Area

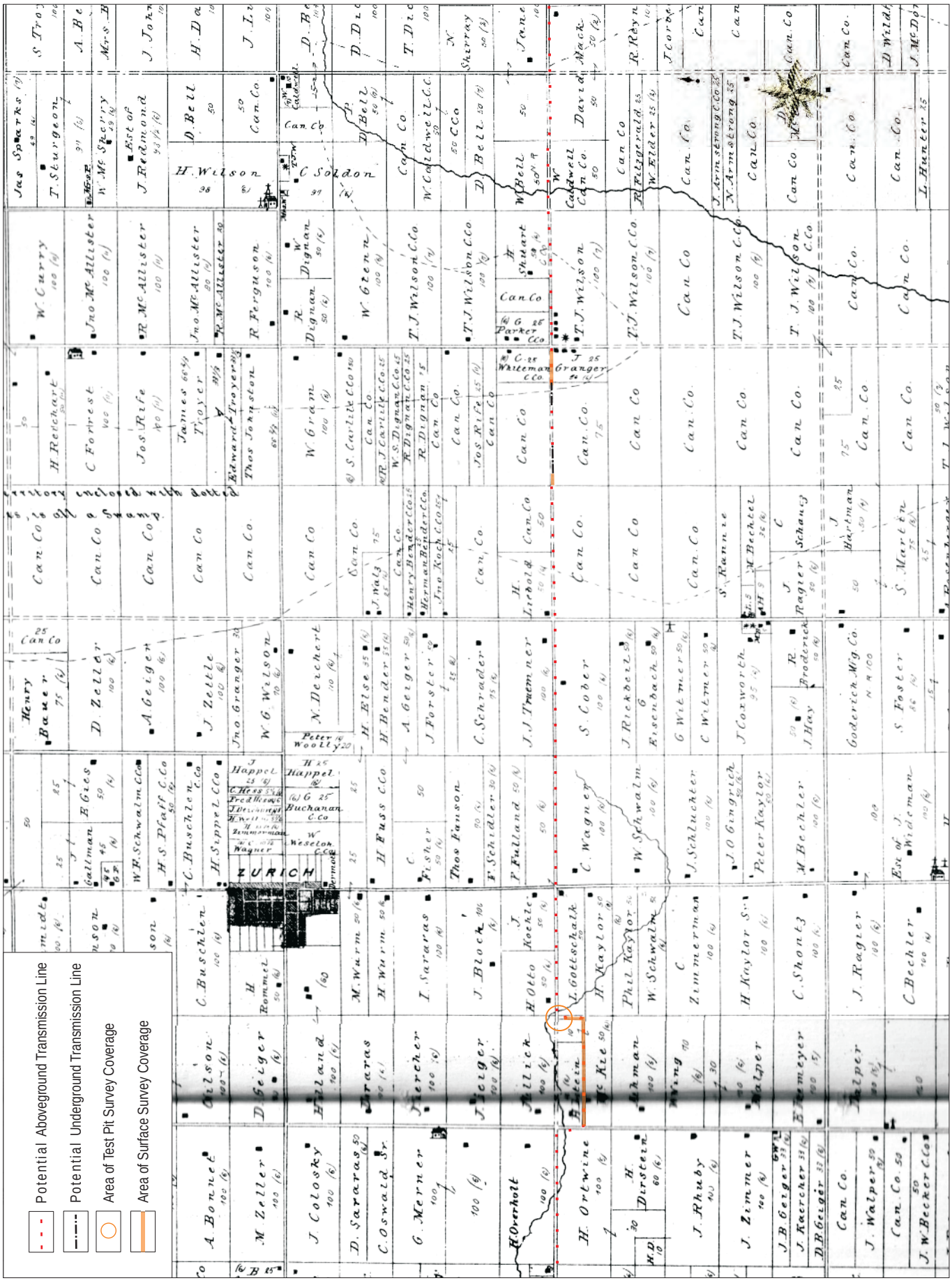


Figure 7 1879 Historic Atlas Map of Hay Township

Figure 8 1879 Historical Atlas Map of Hay, Usborne, Hibbert and Tuckersmith Townships

Figure 9 1879 Historical Atlas Map of Hibbert and Tuckersmith Townships

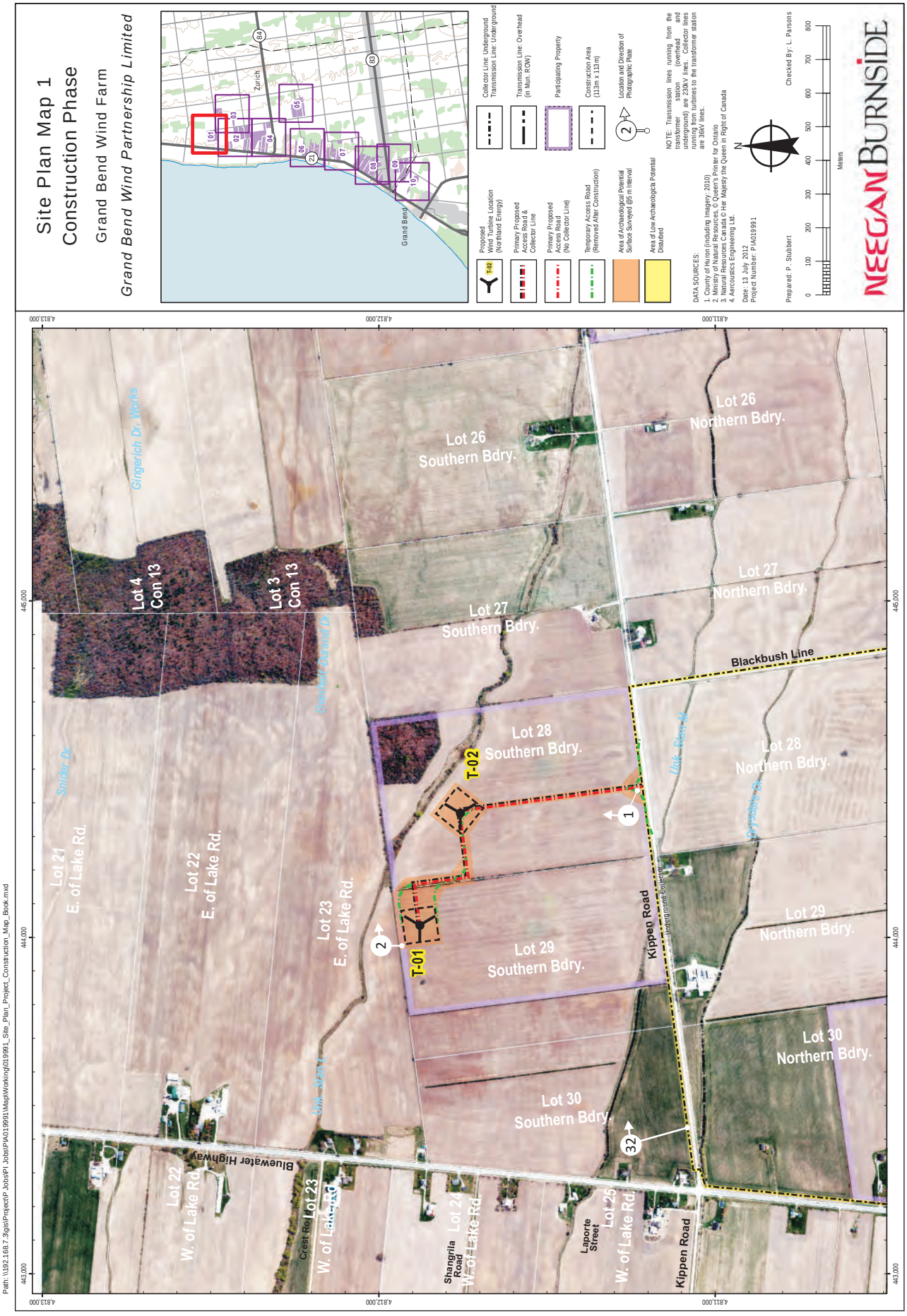


Figure 10 Grand Bend Wind Farm: Segment 1 Survey Coverage

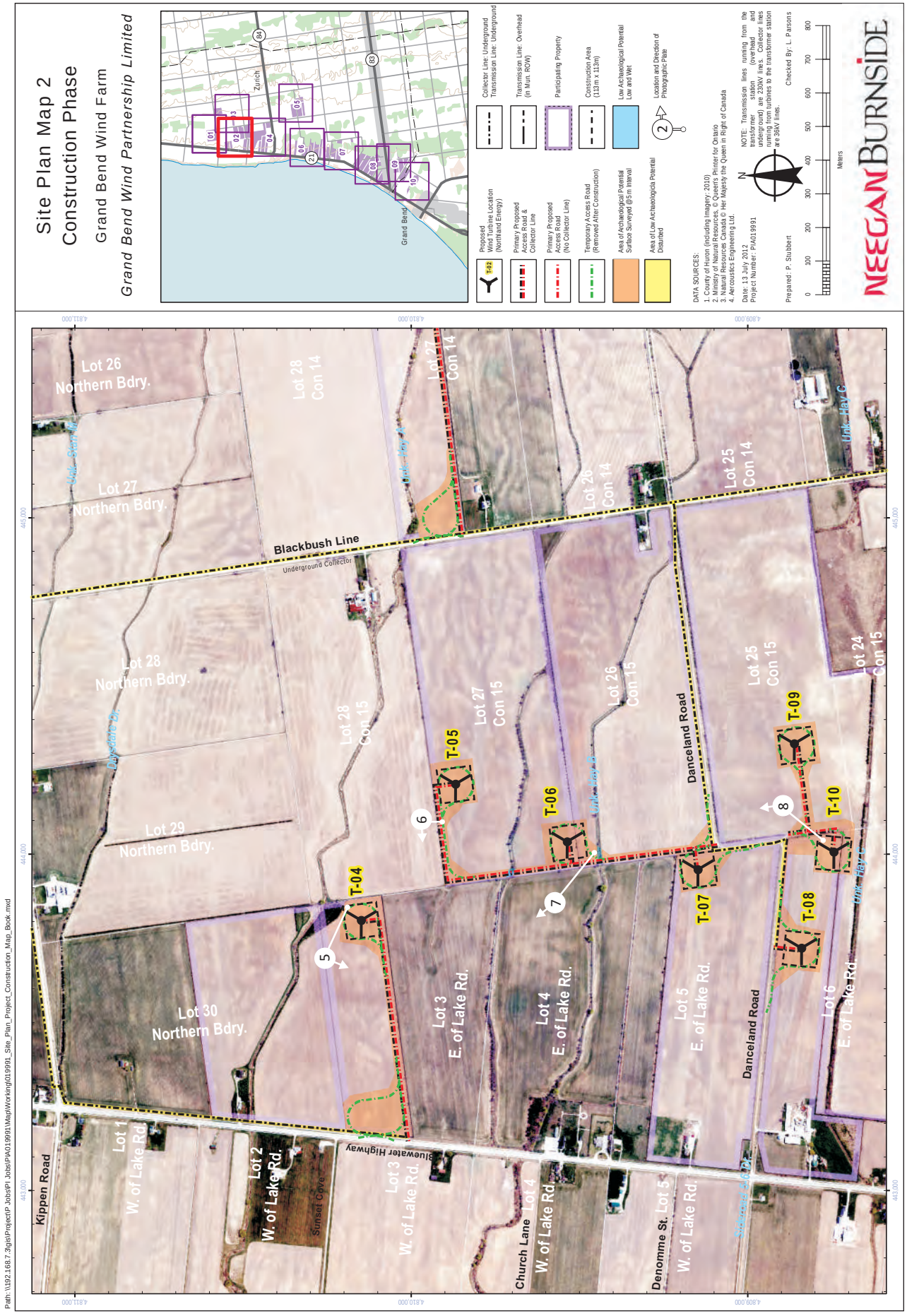


Figure 11 Grand Bend Wind Farm: Segment 2 Survey Coverage

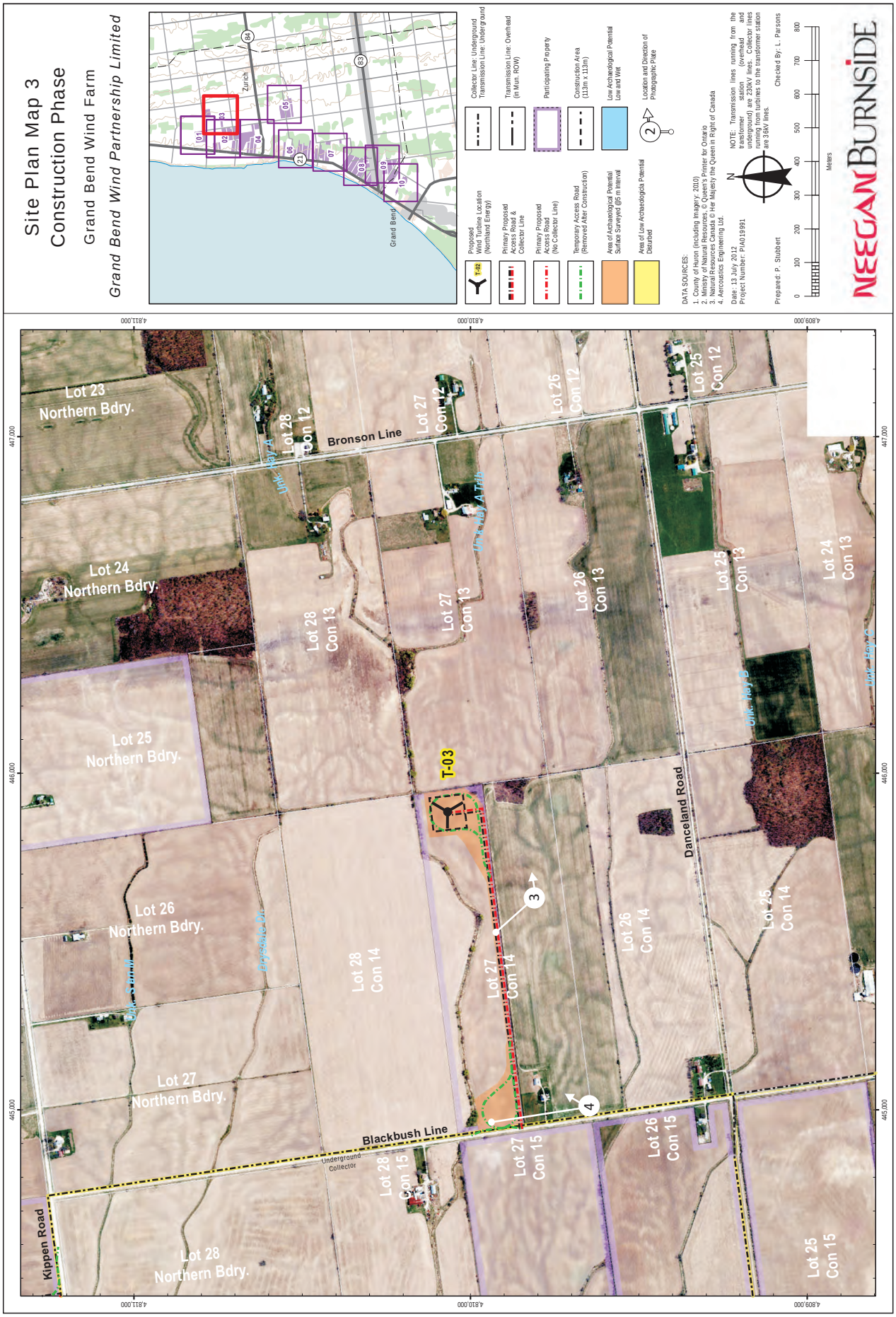


Figure 12 Grand Bend Wind Farm: Segment 3 Survey Coverage

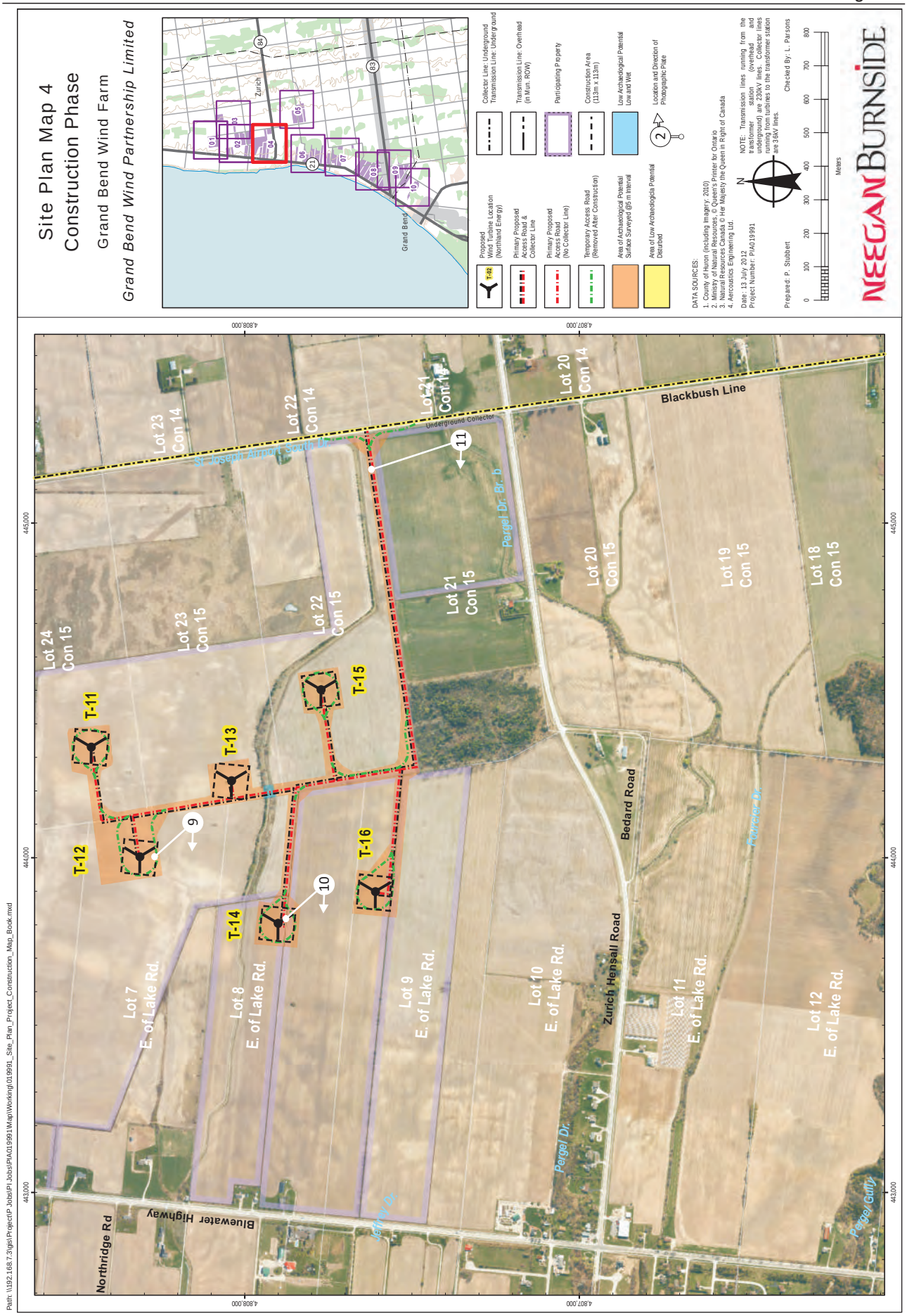


Figure 13 Grand Bend Wind Farm: Segment 4 Survey Coverage

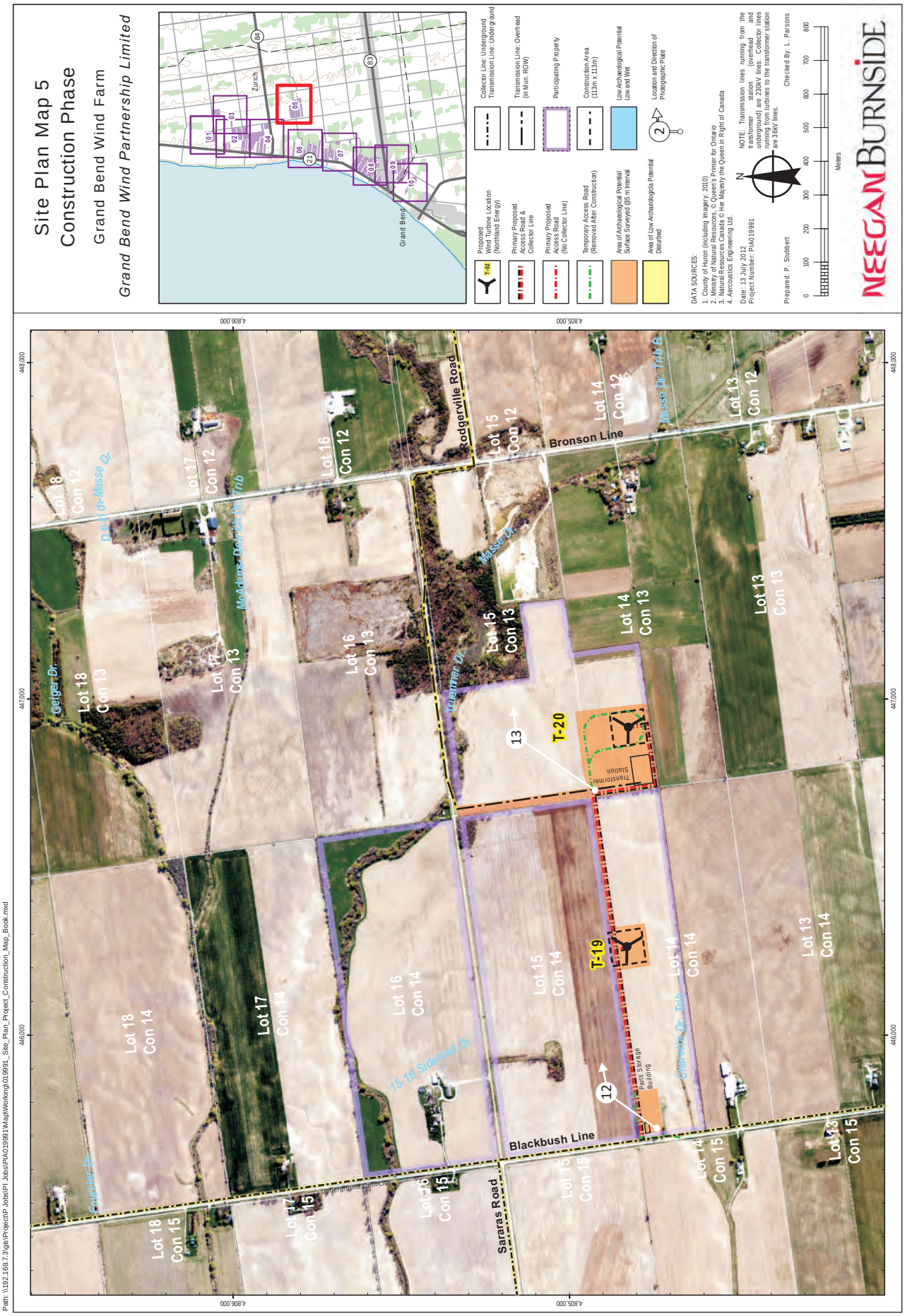
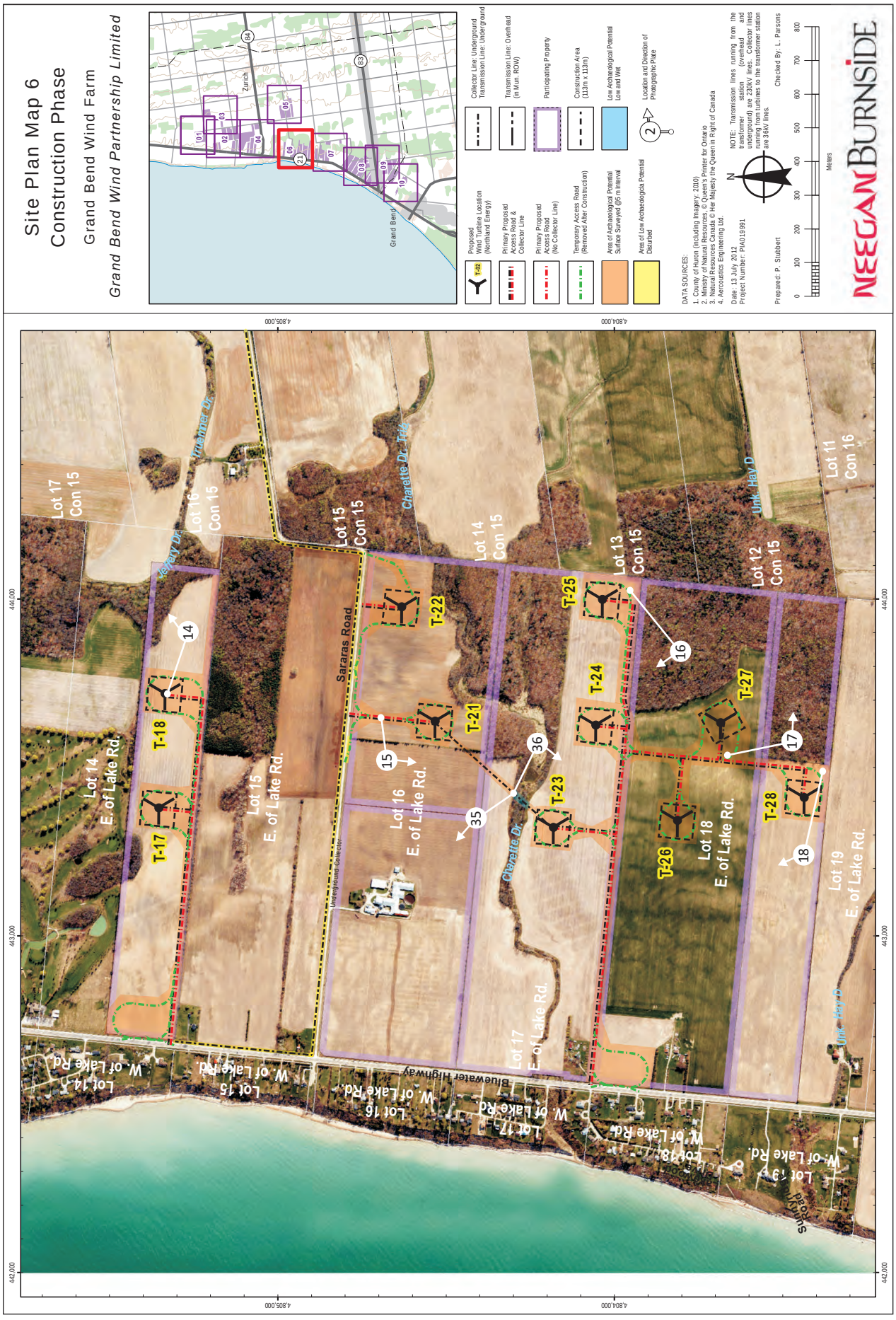


Figure 14 Grand Bend Wind Farm: Segment 5 Survey Coverage



Path: \\192.168.7.3\gis\Project\P Jobs\PI Jobs\PIA0119991\Map\Working\019991_Site_Plan_Project_Construction_Map_Book.mxd

Figure 15 Grand Bend Wind Farm: Segment 6 Survey Coverage

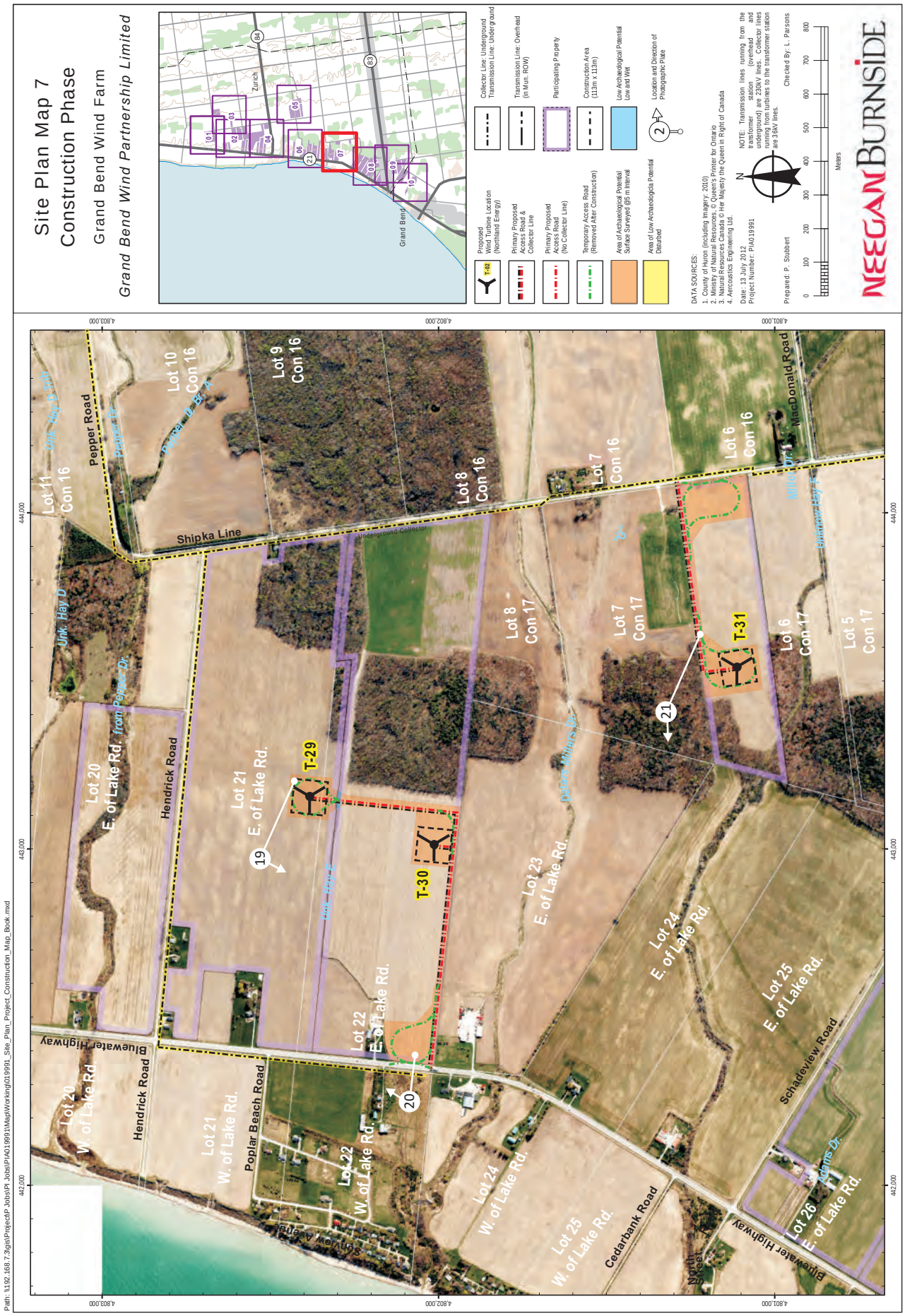


Figure 16 Grand Bend Wind Farm: Segment 7 Survey Coverage

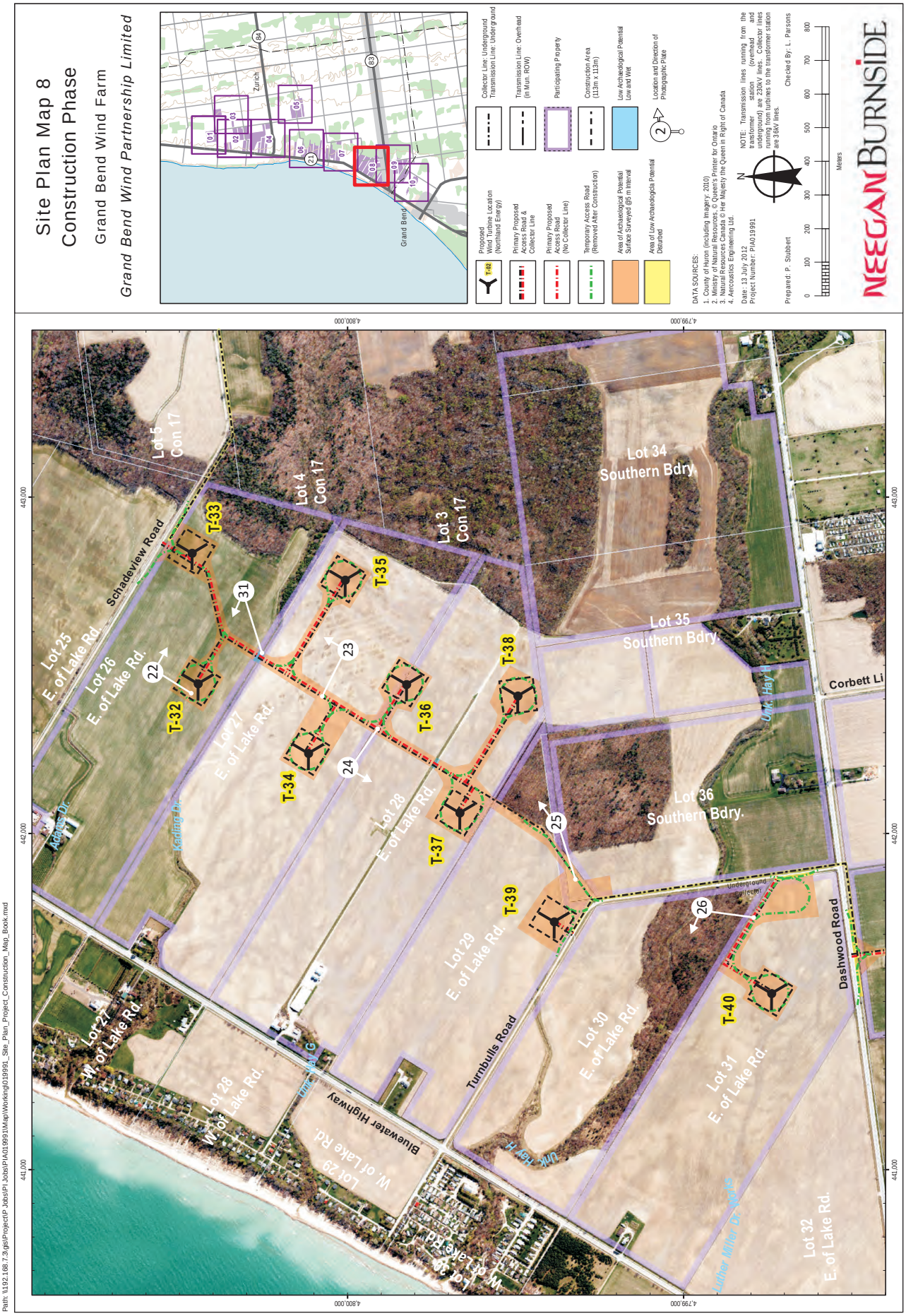
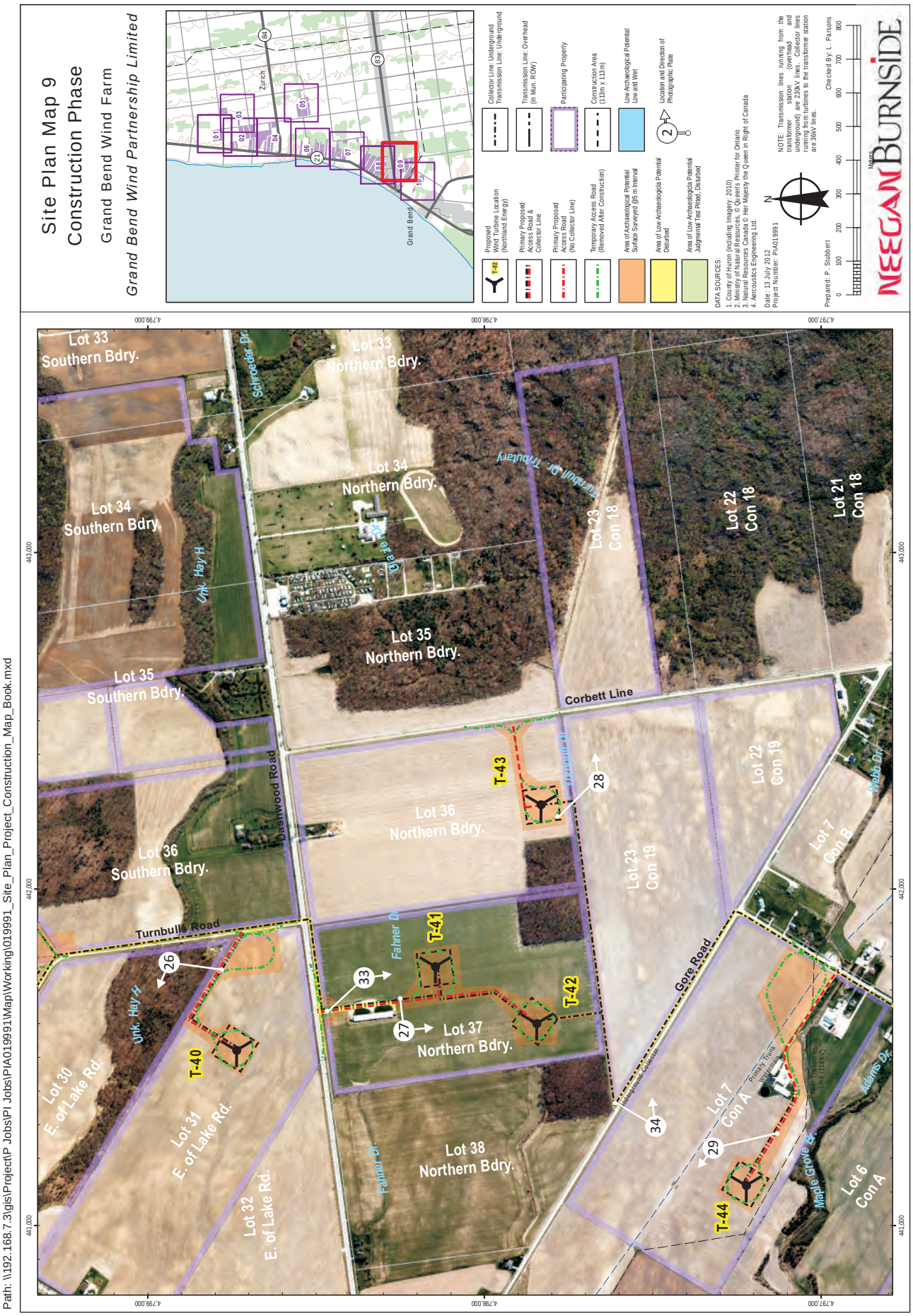
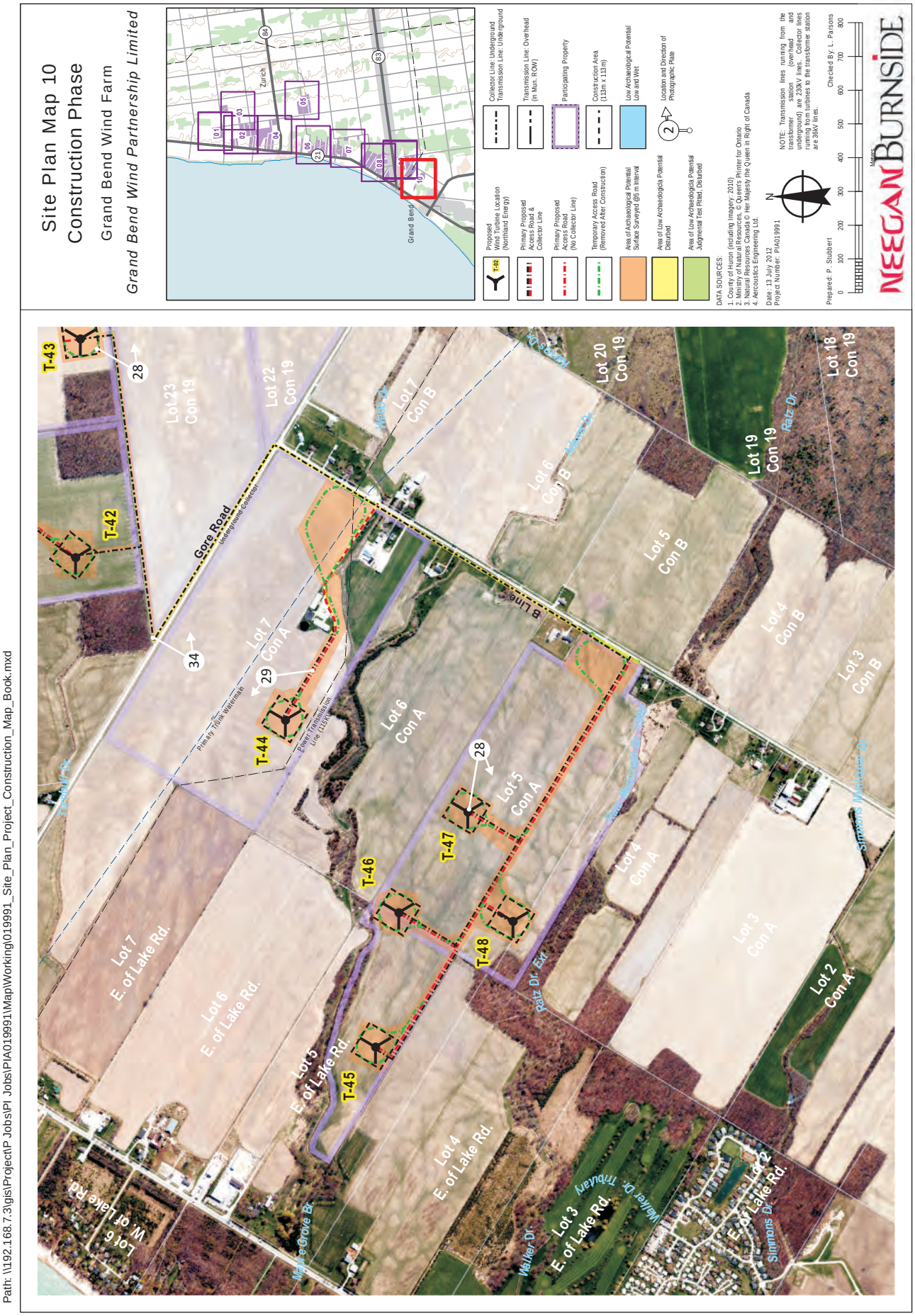


Figure 17 Grand Bend Wind Farm: Segment 8 Survey Coverage



Path: \\192.168.7.3\gis\ProjectP Jobs\PI Jobs\PIA019991Map\Working\019991_Site_Plan_Project_Construction_Map_Book.mxd

Figure 18 Grand Bend Wind Farm: Segment 9 Survey Coverage



Path: \\192.168.7.3\gis\Project\P Jobs\PIA019991\MapWorking\019991_Site_Plan_Project_Construction_Map_Book.mxd

Figure 19 Grand Bend Wind Farm: Segment 10 Survey Coverage

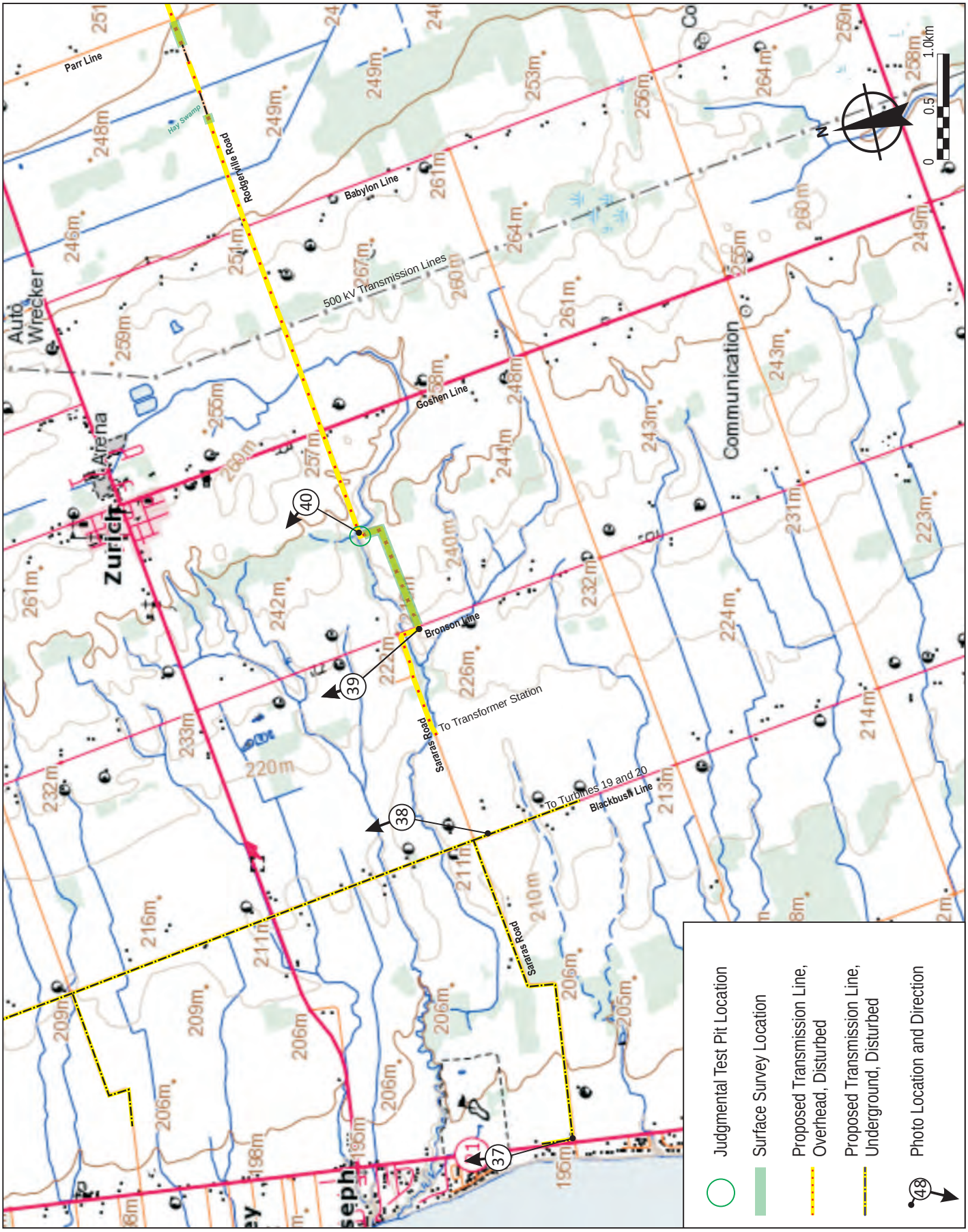


Figure 20 Western Portion of the Proposed 230kV Transmission Line

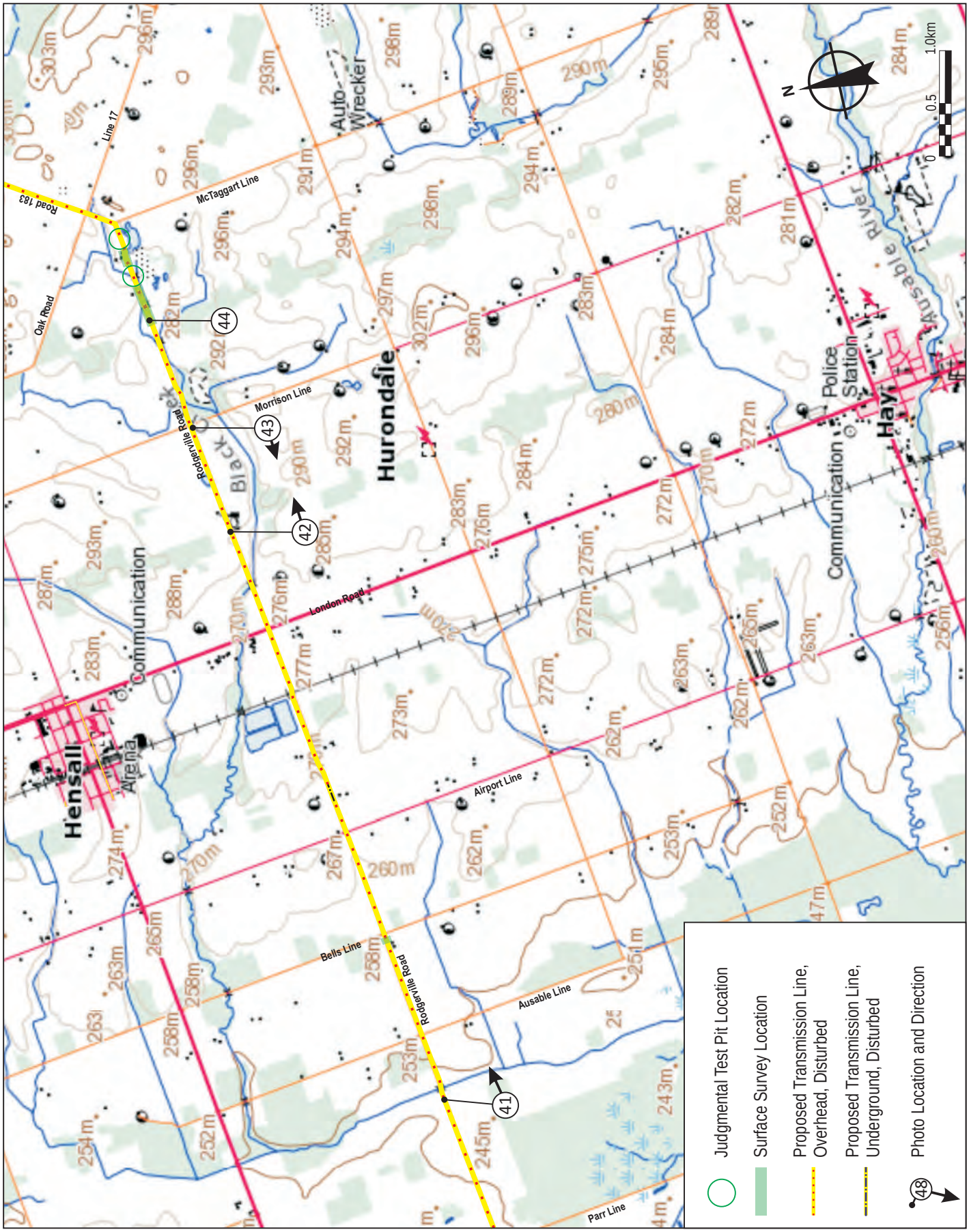


Figure 21 Central Portion of the Proposed 230kV Transmission Line

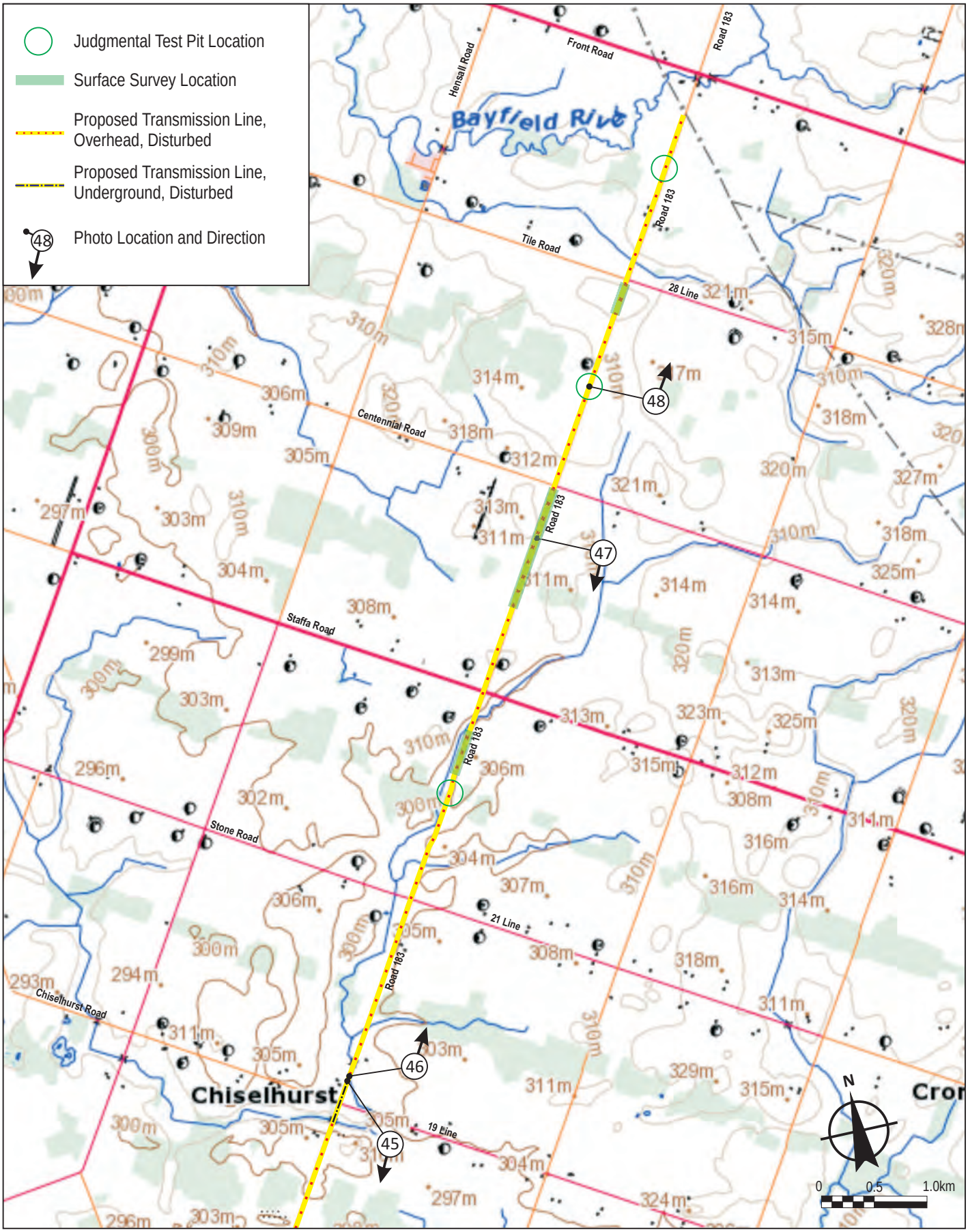


Figure 22 Eastern Portion of the Proposed 230kV Transmission Line

PLATES

Plate 1 Turning Radius for Turbines 1 and 2, View North (May 4 2012)

Plate 2 Turbine 1 Pad, View East (May 4 2012)

Plate 3 Turbine 3 Access Road, View East to Turbine Pad (April 5 2012)

Plate 4 Turbine 3 Temporary Work Space, View Northeast (April 5 2012)

Plate 5 Turbine 4 Pedestrian Survey of Pad in Progress, View Southwest (June 4 2012)

Plate 6 Turbine 5, Pedestrian Survey of Access Road in Progress, View West (April 24 2012)

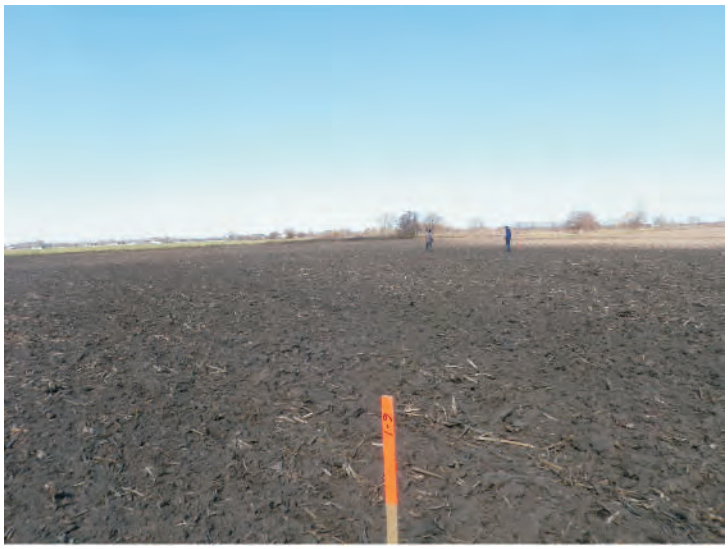


Plate 7 Turbines 6, View Northwest (April 4 2012)

Plate 8 Turbine 10 Pad, View North (April 4 2012)

Plate 9 Turbine 12 Pad Pedestrian Survey in Progress, View West (May 14 2012)

Plate 10 Turbine 14 Pad, View West of Property Fencerow (May 14 2012)

Plate 11 Pedestrian Survey of Access Road to Turbines 11 to 16 View West (May 14 2012)

Plate 12 Turbine 19 , View East to the Proposed Parts Storage Building (May 17 2012)

Plate 13 Turbine 20, View East (May 17 2012)

Plate 14 Turbine 18 Pad Pedestrian Survey in Progress, View Northeast (April 24 2012)

Plate 15 Turbine 21 Access Road Pedestrian Survey in Progress, View Southeast (April 5 2012)

Plate 16 Turbine 25 Pad, View Northwest (May 1 2012)

Plate 17 Turbine 27 View East to Pad (June 4 2012)

Plate 18 Turbine 28 Pad View Northwest (June 4 2012)

Plate 19 Turbines 29 Pad, View Southwest (May 4 2012)

Plate 20 Turbine 30 Temporary Work Space, View Northeast (May 4 2012)

Plate 21 Turbine 31 Pedestrian Survey in Progress, View West to Pad (May 14 2012)

Plate 22 Turbine 32 Pad Pedestrian Survey in Progress, View Southeast (April 25 2012)

Plate 23 Access Road Between Turbines 34 and 35, View North (April 25 2012)

Plate 24 Turbine 36 Access Road and Temporary Work Area, View Southwest (April 25, 2012)

Plate 25 Turbine 39 Pedestrian Survey in Progress, View Northeast (April 12 2012)

Plate 26 Turbine 40 Access Road Pedestrian Survey in Progress, View Northwest (April 25 2012)

Plate 27 Turbine 41 Access Road Pedestrian Survey in Progress, View South (April 12 2012)

Plate 28 Turbine 43 Pad Pedestrian Survey in Progress, View East (April 5 2012)

Plate 29 Turbine 44 Access Road , View Northwest (April 4 2012)

Plate 30 Turbine 47, View Southwest (April 5 2012)

Plate 31 Kading Drain in Access Road Between Turbines 32 and 35, View West Southwest (April 25 2012)

Plate 32 Proposed Collector Line, North Side of Kippen Road, View East (June 28 2012)

Plate 33 Proposed Access Road for Turbines 41 and 42, View West of Gravel Lane (April 5 2012)

Plate 34 Proposed Underground Collector Line, Area of Judgmental Test Pitting, View East (April 17 2012)

Plate 35 Proposed Underground Collector Line, View Northwest of Slope of Charette Drain (May 17 2012)

Plate 36 Proposed Underground Collector Line, View Southwest of Low and Wet Area of Charette Drain (May 17 2012)

Plate 37 Proposed Collector Line East Side of the Bluewater Highway, ViewNorth

Plate 38 Proposed Collector Line, East Side of Blackbush Line, View North

Plate 39 Proposed Transmission Line, West Side Bronson Line, View North

Plate 40 Proposed Transmission Line North Side of Rodgerville Rd, View Northwest

Plate 41 Proposed Transmission Line, North Side of Rodgerville Rd, View East

Plate 42 Proposed Transmission Line, South Side of Rodgerville Rd, View East

Plate 43 Proposed Transmission Line South Side of Rodgerville Road, ViewWest

Plate 44 Close-up of Disturbed Soil in Corn Field

Plate 45 Proposed Transmission Line North Side of Road 183, View Southwest

Plate 46 Proposed Transmission Line North Side of Road 183, View Northeast

Plate 47 Surface Survey, North Side of Road 183, View Southwest

Plate 48 Judgmental Test Pit, North Side of Road 183, View Northeast

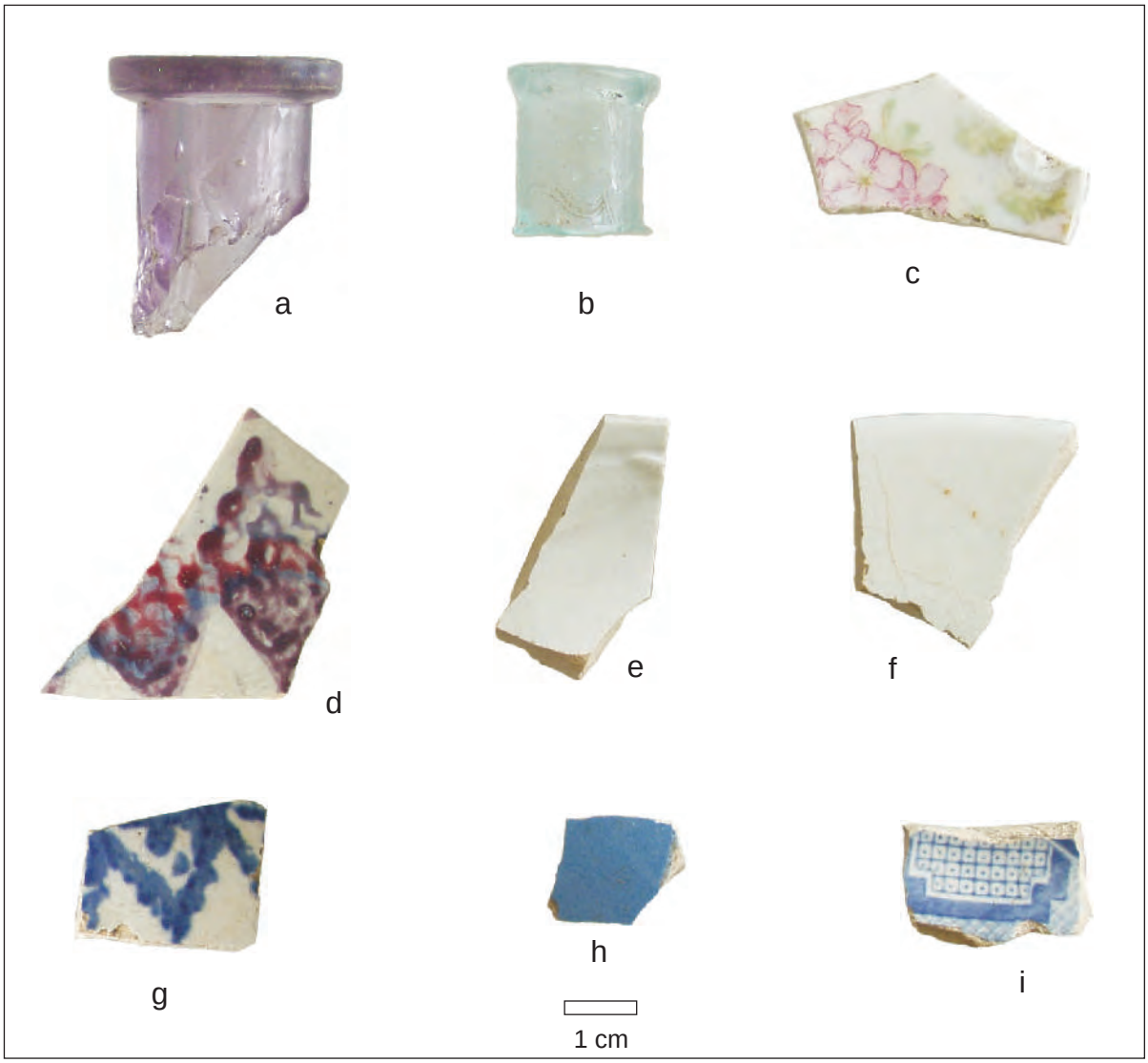


Plate 49 Select Artifacts from the Turbine 1 Site

a Prescription Finish Solarized Bottle Glass
b Patent Finish Bottle Glass
c Under-Glaze Decal Printed Porcelain Sherd
d Stamped Ironstone Sherd
e Wheat Pattern Moulded Ironstone Saucer Rim
f Plain Ironstone Plate Rim
g Stamped Ironstone Sherd
h Dipt Whiteware Sherd
ij Blue Willow Transfer Printed Whiteware Sherd

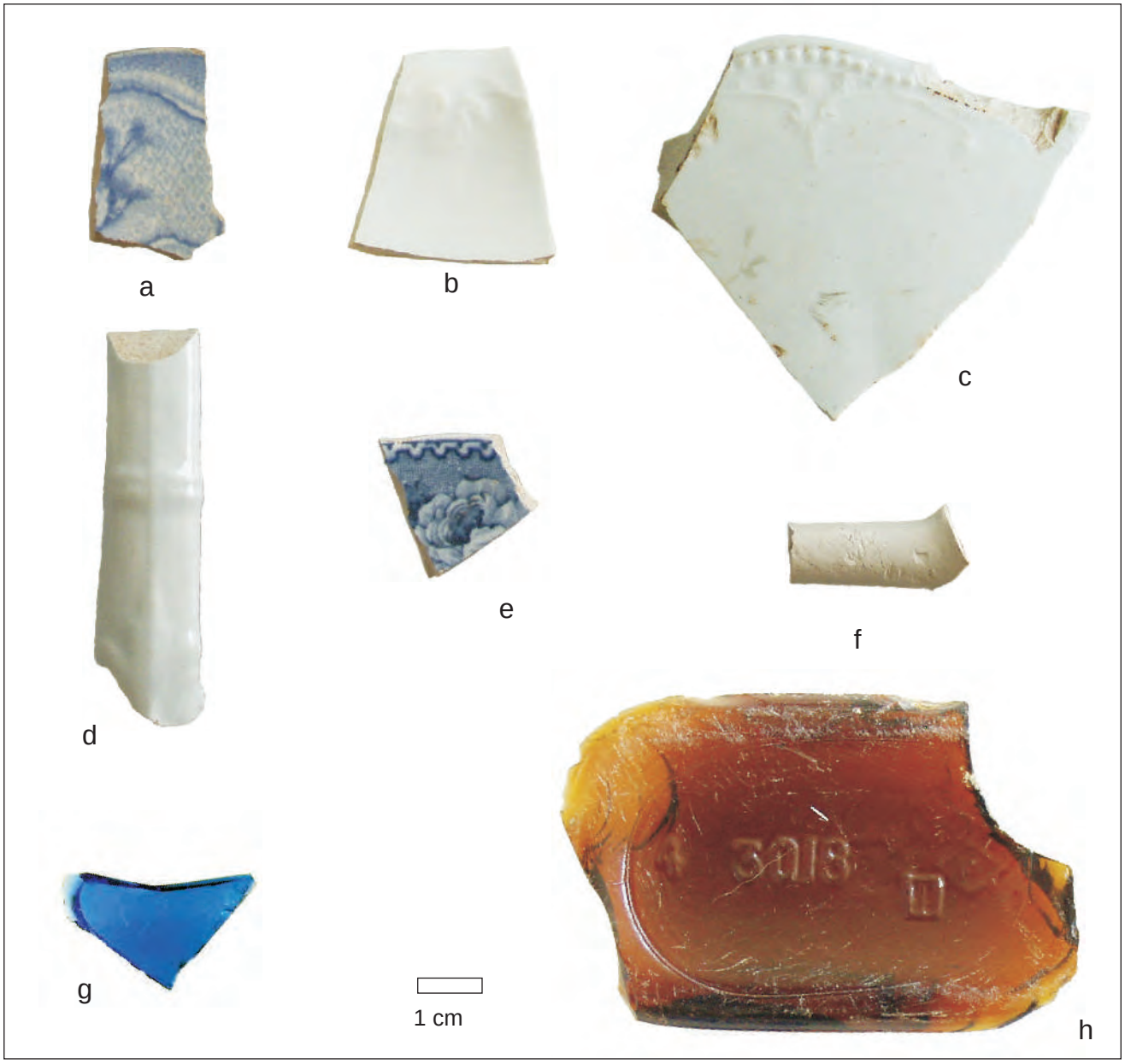


Plate 50 Select Artifacts from the Turbine 3 Site

a Transfer Printed Ironstone Plate Rim
b Moulded Semi-Porcelain Saucer Rim
c Gilt, Moulded and Decal Printed Lid
d Moulded Ironstone Handle Fragment
e Transfer Printed Ironstone Plate Rim
f Plain White Ball Clay Pipe Stem Fragment
g Cobalt Blue Bottle Glass Sherd
h Dominion Glass Bottle Base

Plate 51 Select Artifacts from the Turbine 41 Site

a Transfer Printed and Moulded Ironstone Chamber Pot Rim
b Wheat Pattern Ironstone Saucer Rim
c Over-glaze Painted Porcelain Saucer Rim
d Gilt, Moulded and Flow Printed Semi-Porcelain Plate Rim
e Transfer Printed Semi-Porcelain Saucer Rim
f Decal Printed Semi-Porcelain Plate Rim
g Canadian Schenley Valleyfield Quebec Bottle Base
h Anchor Hocking Corporation Opaque White Glass Base
i Solarized Glass Sherd

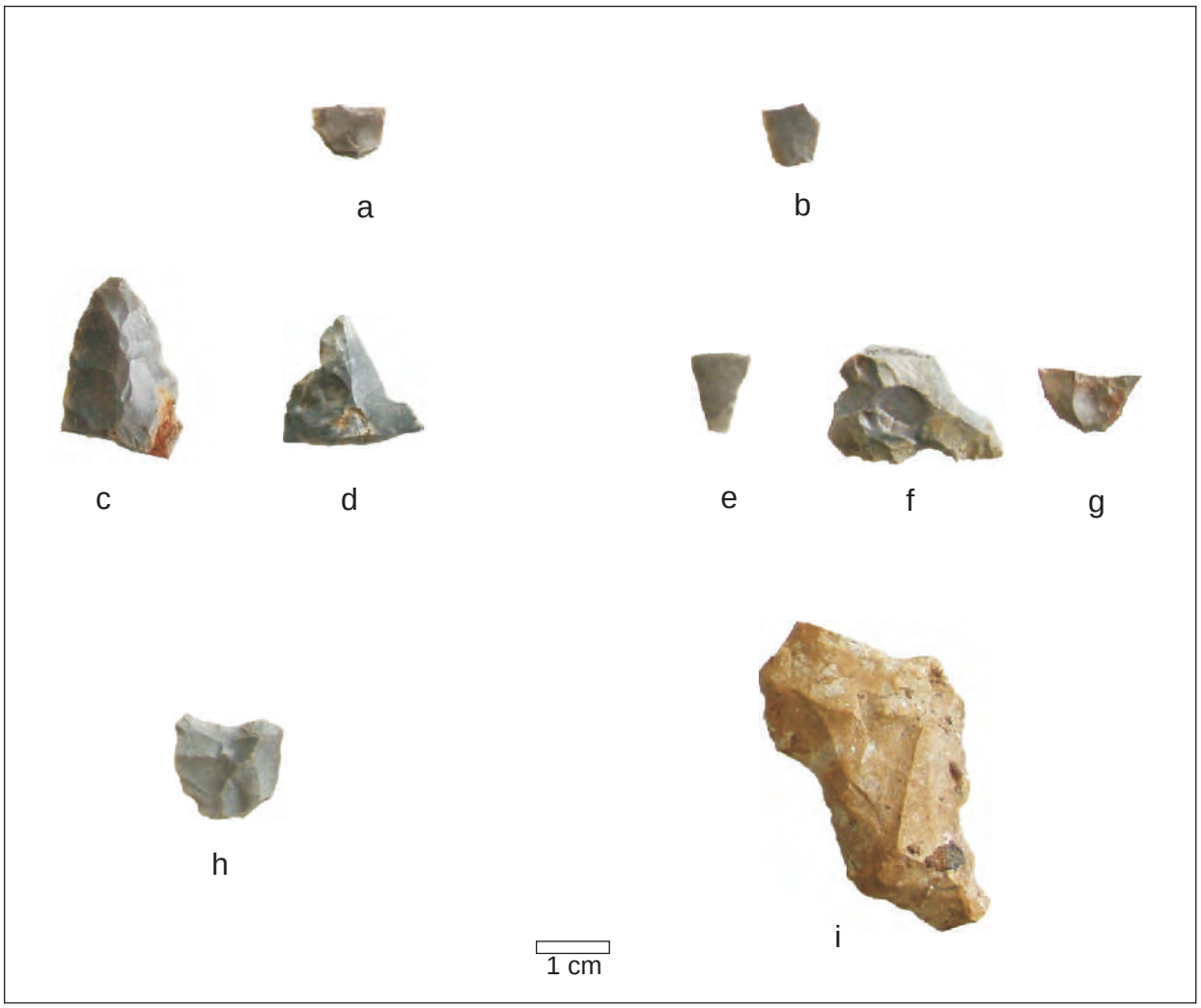


Plate 52 Artifacts from the Pre-Contact First Nations Sites

Turbine 18	a	Isolated Find #1 Onondaga Biface Thinning Flake
	b	Isolated Find #2 Ondonaga Flake Fragment
Turbine 30	c	Isolated Find #1 Kettle Point Drill Tip
	d	Isolated Find #1 Onondaga Biface Fragment
	e	Isolated Find #2 Onondaga Biface Thinning Flake
	f	Isolated Find #2 Kettle Point Biface Fragment
	g	Isolated Find #2 Kettle Point Flake Fragment
Turbine 32	h	Isolated Find #1 Colborne Chert Biface Thinning Flake
	i	Isolated Find #2 Unidentified Chert Side Scraper

APPENDIX A

TURBINE 41 SITE CATALOGUE (April 12, 2012)

CSC #	Cat #	Category	Class	Type	Description	Colour	Freq	Burnt	Portion	Form
CSC #1	1	Tableware	ceramic	porcelain	painted	blue	1		rim	saucer
CSC #2	2	Tableware	ceramic	porcelain	plain	white	1		sherd	
CSC #2	3	Tableware	ceramic	semi-porcelain	flow	blue	1		rim	plate
CSC #2	4	Tableware	glass		moulded	colourless	1		handle	
CSC #4	5	Tableware	ceramic	semi-porcelain	transfer print / moulded	green	1		sherd	
CSC #7	6	Personal Item	hygiene	ironstone	transfer print / moulded	blue	1		rim	chamber pot
CSC #8	7	Tableware	ceramic	ironstone	plain	white	2		sherd	
CSC #8	8	Tableware	ceramic	porcelain	plain	white	1		sherd	
CSC #9	9	Tableware	ceramic	semi-porcelain	decal print	green	1		rim	plate
CSC #10	10	Tableware	ceramic	semi-porcelain	decal print	green	1		rim	plate
CSC #10	11	Tableware	ceramic	ironstone	plain	white	1		sherd	
CSC #10	12	Utilitarian ware	glass	bottle		colourless	1		sherd	
CSC #10	13	Utilitarian ware	glass	bottle		solarized	1		sherd	
CSC #10	14	Utilitarian ware	glass	bottle	liquour	brown	1		base	
CSC #11	15	Tableware	ceramic	semi-porcelain	decal print / marked	green	1		sherd	base - plate?
CSC #11	16	Tableware	ceramic	ironstone	plain	white	1		rim	
CSC #11	17	Tableware	ceramic	semi-porcelain	transfer print / moulded	green	1		rim	saucer
CSC #12	18	Utilitarian ware	glass	bottle		aqua	1		sherd	
CSC #12	19	Tableware	ceramic	ironstone	moulded	white	1		sherd	
CSC #12	20	Tableware	ceramic	ironstone	unidentified / marked	black	1		sherd	
CSC #13	21	Utilitarian ware	glass	vessel	moulded / marked	milk glass	1		sherd	base
CSC #13	22	Tableware	ceramic	semi-porcelain	transfer print	green	1		sherd	
CSC #14	23	Tableware	ceramic	ironstone	moulded	white	1		rim	saucer

THE TURBINE 3 SITE CATALOGUE (April 5, 2012)

Cat #	Category	Class	Type	Description	Colour	Freq	Burnt	Portion	Form
1	Utilitarian ware	glass	bottle		brown	1		sherd	base
2	Personal item	smoking	pipe	plain	white	1		stem	
3	Apparel	fastener	button	2-hole	shell	1			
4	Utilitarian ware	glass	bottle		cobalt	1		sherd	
5	Tableware	ceramic	semi-porcelain	moulded/decal print	gilt	1		lid	
6	Tableware	ceramic	ironstone	moulded	white	1		sherd	hollow ware
7	Tableware	ceramic	ironstone	moulded	white	1		handle	
8	Tableware	ceramic	ironstone	moulded	white	1		rim	saucer
9	Tableware	ceramic	ironstone	transfer print	blue	1		rim	plate
10	Tableware	ceramic	ironstone	transfer print	blue	1		rim	plate
11	Tableware	ceramic	ironstone	transfer print	blue	1		rim	plate

THE TURBINE 1 SITE CATALOGUE (MAY 4 2012)

CSC	Cat #	Category	Class	Type	Description	Colour/Mat.	n	b	Portion	Form
212	212a	Tableware	ceramic	ironstone	plain	white	3		sherd	
212	212b	Tableware	ceramic	ironstone	plain	white	1		rim	plate
213	213a	Utilitarian ware	glass	bottle		aqua	1		sherd	
213	213b	Utilitarian ware	glass	bottle	finish - prescription	solarized	1		lip/neck	lip/neck
214	214a	Tableware	ceramic	ironstone	makers mark	black	1		sherd	
214	214b	Tableware	ceramic	ironstone	plain	white	1		rim	cup
214	214c	Tableware	ceramic	porcelain	decal print	polychrome	1		sherd	
214	214d	Utilitarian ware	glass	bottle	plain	colourless	1		sherd	
215	215a	Utilitarian ware	glass	bottle	embossed lettering	aqua	1		sherd	
215	215b	Utilitarian ware	glass	bottle	embossed	colourless	1		sherd	
216	216a	Utilitarian ware	glass	bottle	finish - patent	aqua	1		lip/neck	
216	216b	Tableware	ceramic	porcelain	moulded	white	1		sherd	base with foot
216	216c	Tableware	ceramic	ironstone	moulded	white	1		rim	cup
216	216d	Tableware	ceramic	ironstone	stamped	blue	1		sherd	
217	217a	Utilitarian ware	glass	bottle	plain	solarized	1		sherd	
217	217b	Tableware	ceramic	semi-porcelain	decal print	poly	1		rim	saucer
217	217c	Tableware	ceramic	ironstone	plain	white	1	1	rim	cup
218	218a	Tableware	ceramic	whiteware	transfer print	blue	2		sherd	
218	218b	Tableware	ceramic	ironstone	plain	white	1		rim	plate
218	218c	Tableware	ceramic	ironstone	moulded	white	1		rim	saucer
219	219a	Tableware	ceramic	whiteware	banded	blue	1		sherd	
219	219b	Tableware	ceramic	ironstone	plain	white	1		sherd	
220	220a	Tableware	ceramic	ironstone	plain	white	1		rim	plate
220	220b	Tableware	ceramic	whiteware	transfer print	blue	1		sherd	
220	220c	Tableware	ceramic	ironstone	stamped	polychrome	1		sherd	
220	220d	Tableware	ceramic	ironstone	plain	white	2		sherd	
220	220e	Tableware	ceramic	ironstone	moulded	white	1		rim	cup
220	220f	Tableware	glass	tumbler	pannelled	colourless	1		sherd	
221	221	Tableware	ceramic	whiteware	transfer print	blue	1		sherd	
222	222	Tableware	ceramic	ironstone	stamped	blue	1		rim	bowl
223	223	Tableware	ceramic	porcelain	moulded	white	1		sherd	handle
224	224a	Tableware	ceramic	whiteware	plain	white	1		sherd	
224	224b	Apparel	fastenter	button	two hole	shell	1		complete	
225	225	Tableware	ceramic	whiteware	transfer print	blue	1		rim	plate

TURBINE 18 ISOLATED FINDS (April 24, 2012)

Location	Cat. #	Category	Class	Type	Description	n	b	Material	Comments
IF 1	1	Lithic	Chipped Lithic	Chipping Detritus	Biface thinning	1		Onondaga	
IF 2	2	Lithic	Chipped Lithic	Chipping Detritus	Fragment	1		Onondaga	

TURBINE 30 ISOLATED FINDS (May 4, 2012)

Location	Cat. #	Category	Class	Type	Description	n	b	Material	Comments
IF 1	1	Lithic	Chipped Lithic	Drill	fragment	1		Kettle Point	tip
IF 1	2	Lithic	Chipped Lithic	Biface	fragment	1	1	Onondaga	
IF 2	3	Lithic	Chipped Lithic	Chipping Debitage	biface thinning fl	1		Onondaga	
IF 2	4	Lithic	Chipped Lithic	Biface	fragment	1		Kettle Point	tip
IF 2	5	Lithic	Chipped Lithic	Chipping Debitage	fragment	1	1	Kettle Point	

TURBINE 32 ISOLATED FINDS (April 25, 2012)

IF 1	1	Lithic	Chipped Lithic	Scraper	Side scraper	1		Unidentified	
IF 2	2	Lithic	Chipped Lithic	Chipping Detritus	Biface Thinning f	1		Colborne	possible utilized