



Draft Visual Landscape Existing Conditions Report

Twin Creeks Environmental Centre Landfill
Optimization Project Environmental Assessment

WM Canada

Watford, Ontario

November 2023

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Executive Summary

This report presents a description of the existing conditions for the Visual Landscape for the WM Canada (WM) Twin Creeks Environmental Centre (TCEC) Landfill Optimization Project in support of the environmental assessment (EA). This Visual Landscape Existing Conditions Report is one component of the EA. The EA Study Report will incorporate the information presented herein as appropriate, and this report will be included with the EA Study Report as a supporting document.

There are approximately 8 years of approved landfill airspace capacity remaining at the TCEC (i.e., capacity will be reached in approximately 2031). The proposed optimization would provide additional airspace of approximately 14 million cubic metres (m³), which could extend the site life by approximately 12 years (from 2031 to 2043) may be achieved through alternative landfill configurations or alternative methods within the existing 301 ha TCEC site area. No changes are proposed to the size of the TCEC site area, approved service area, or annual fill rate.

The TCEC is located approximately 1 km north of the Village of Watford in the Township of Warwick. The facility is situated southeast of the intersection of Zion Line and Nauvoo Road and the main entrance to the facility is located approximately 300 m south of Zion Line on the east side of Nauvoo Road.

General On-site and Off-site Study Areas were defined for the EA in the approved Terms of Reference (ToR). The limits of the Off-site Study Area for the visual landscape have been modified from the general Off-site Study Area and confirmed through field reconnaissance and an assessment of the 'future existing condition' which corresponds with the findings of the Visual Assessment for Year 26, Phase 11 that was completed as a component of the approved Warwick Landfill Expansion Environmental Assessment (2005). The adjustments to the general 1 km Off-site Study Area for the visual landscape include extending the limit approximately 2.5 km further westward to encompass the potential receptors that are located west of Underpass Road and in the vicinity of Underpass Road and Confederation Line, and approximately 2.5 km further eastward, to include potential receptors that are located along Arkona Road and approximately 2.5 km further northward, to include potential receptors that are located north of Highway 402. As a component of the visual assessment for the TCEC Landfill Optimization Project, the extent Off-site Study Area will be reviewed and may be modified as required to include areas that will be situated within the viewshed under the proposed future condition.

This Visual Landscape Existing Conditions Report was developed based on the evaluation criteria, indicators, and data sources included in the approved ToR (March 30, 2022).

The methods employed to characterize the existing conditions included data collection and analysis, and field studies. Field studies completed to date included site assessments and the compilation of photographic inventories in February 2021 and

November 2022, as well as in June of 2023 with the trees in a full 'leaf-out' condition. The characterization of the future existing condition was derived from the visual assessment for Year 26, Phase 11 as set out in the Warwick Landfill Expansion Project Visual Assessment (2005).

The field studies have been supplemented by the findings of the annual Site Review Report that was prepared by the Township's Technical Review Team. This report provides a summary of the assessment of the condition of the existing visual screening measures. The Site Review Report for 2022 was reviewed and the report confirms that the trees that were originally planted in 2002 have begun to mature and are now starting to function as intended by the original Landscape Plans as visual screening elements.

The visual landscape that encompasses the TCEC is rural in character with minimal topographic relief. To the south and southwest, the Village of Watford includes residential, commercial, and institutional land uses. Given the density and height of the buildings within the village, the TCEC is only visible from the north area of the village, in the vicinity of Confederation Line. The areas to the north, west and east of the TCEC comprise primarily agricultural and rural residential properties. The Significant Woodlands as designated by the Township of Warwick Official Plan, located east and west of the TCEC obstruct views to the TCEC from Arkona Road and areas east of the TCEC, as well as from Underpass Road, west of the TCEC. Community facilities including the Watford Arena (East Lambton Community Complex), YMCA, and parks are situated south of the TCEC. The TCEC is visible from these community amenities. The berms and plantings that were implemented as a component of the construction of the TCEC provide effective visual mitigation under existing conditions. Views to the TCEC are not expected to be the same in 2031 when the Landfill Optimization Project is undertaken since it is anticipated that the landscape within the study area will evolve and change over time.

Acronyms, Units and Glossary

Acronyms

Acronym	Definition
CEV	Combined Effect Value
EA	Environmental Assessment
MECP	Ministry of Environment, Conservation and Parks
OEAA	<i>Ontario Environmental Assessment Act</i>
VACF	Visual Absorption Capacity Factor
VIA	Visual Impact Assessment
ToR	Terms of Reference
TCEC	Twin Creeks Environmental Centre
WM	WM Canada

Units

Unit	Definition
Km	kilometre
M	metre
m ³	cubic metres
Ha	hectare

Glossary

Term	Definition
Approval	Permission granted by an authorized individual or organization for an undertaking to proceed. This may be in the form of program approval, certificate of approval or provisional certificate of approval.
Capacity (Disposal Volume)	The total volume of air space available for disposal of waste at a landfill site for a particular design (typically in m ³); includes both waste and daily cover materials but excludes the final cover.

Glossary

Term	Definition
Environment	As defined by the Environmental Assessment Act, environment means: <ul style="list-style-type: none"> • air, land or water; • plant and animal life, including human life; • the social, economic, and cultural conditions that influence the life of humans or a community; • any building, structure, machine or other device or thing made by humans; • any solid, liquid, gas, odour, heat, sound, vibration, or radiation resulting directly or indirectly from human activities; or • any part or combination of the foregoing and the interrelationships between any two or more of them (ecosystem approach).
Environmental Assessment (EA)	A systematic planning process that is conducted in accordance with applicable laws or regulations aimed at assessing the effects of a proposed undertaking on the environment.
Evaluation criteria	Evaluation criteria are considerations or factors taken into account in assessing the advantages and disadvantages of various alternatives being considered.
Indicators	Indicators are specific characteristics of the evaluation criteria that can be measured or determined in some way, as opposed to the actual criteria, which are fairly general.
Landfill site	An approved engineered site/facility used for the final disposal of waste. Landfills are waste disposal sites where waste is spread in layers, compacted to the smallest practical volume, and typically covered by soil.
Mitigation	Measures taken to reduce adverse impacts on the environment.
Proponent	A person who: <ul style="list-style-type: none"> • carries out or proposes to carry out an undertaking; or • is the owner or person having charge, management or control of an undertaking.
Receptor	The person, plant or wildlife species that may be affected due to exposure to a contaminant.
Terms of Reference (ToR)	A terms of reference is a document that sets out detailed requirements for the preparation of an Environmental Assessment.
Undertaking	Is defined in the Environmental Assessment Act as follows: <ul style="list-style-type: none"> • An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity by or on behalf of Her Majesty in right of Ontario, by a public body or public bodies or by a municipality or municipalities; • A major commercial or business enterprise or activity or a proposal, plan or program in respect of a major commercial or business enterprise or activity of a person or persons other than a person or persons referred to in clause (1) that is designated by the regulations; or • An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under section 3.0.1 in respect of the enterprise, activity, proposal, plan or program ("enterprise").
Waste	Refuse from places of human or animal habitation; unwanted materials left over from a manufacturing process.

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1 Introduction

This report presents a description of the existing conditions for the Visual Landscape for the WM Canada (WM) Twin Creeks Environmental Centre (TCEC) Landfill Optimization Project in support of the environmental assessment (EA). The EA is being carried out in accordance with the requirements of the *Ontario Environmental Assessment Act (OEAA)* and Terms of Reference (ToR), which was approved by the Ministry of Environment, Conservation and Parks (MECP) on December 13, 2022.

There are approximately 8 years of approved landfill airspace capacity remaining at the TCEC (i.e., capacity will be reached in approximately 2031). The proposed optimization would provide additional airspace of approximately 14 million cubic metres (m³), which could extend the site life by approximately 12 years (from 2031 to 2043) and may be achieved through alternative landfill configurations or alternative methods within the existing 301 ha TCEC site area. No changes are proposed to the size of the TCEC site area, approved service area, or annual fill rate.

The approved ToR included a preliminary description of the existing conditions within the area surrounding the TCEC, with the commitment that a more detailed description of existing environmental conditions would be prepared as part of the EA. In accordance with the approved ToR, additional investigative studies were carried out as necessary to generate a more detailed description of the existing visual landscape to characterize existing conditions for the TCEC Landfill Optimization Project EA. This report also includes a description of the 'future existing condition' which corresponds with the completion of Phase 11, Year 26 of the previously approved Warwick Landfill Expansion Project. The characterization of the future existing condition was derived from the visual assessment for Phase 11, Year 26 as set out in the Warwick Landfill Expansion Project Visual Assessment (2005). Table #7 Visual Assessment Data – Year 26, Phase 11, and the photo realistic images from Viewpoints 1 to 6 from the Visual Assessment (2005) were relied upon to characterize the future existing condition and to define the Study Areas. For the purposes of the visual landscape assessment for the optimization project, the future existing condition will serve as the baseline for the determination of potential visual impacts. This Visual Landscape Existing Conditions Report is one component of the EA. The EA Study Report will incorporate the information presented herein as appropriate, and this report will be included with the EA Study Report as a supporting document.

2 TCEC and Study Areas

The TCEC is located approximately 1 km north of the Village of Watford in the Township of Warwick. The facility is situated southeast of the intersection of Zion Line and Nauvoo Road and the main entrance to the facility is located approximately 300 m south of Zion Line on the east side of Nauvoo Road.

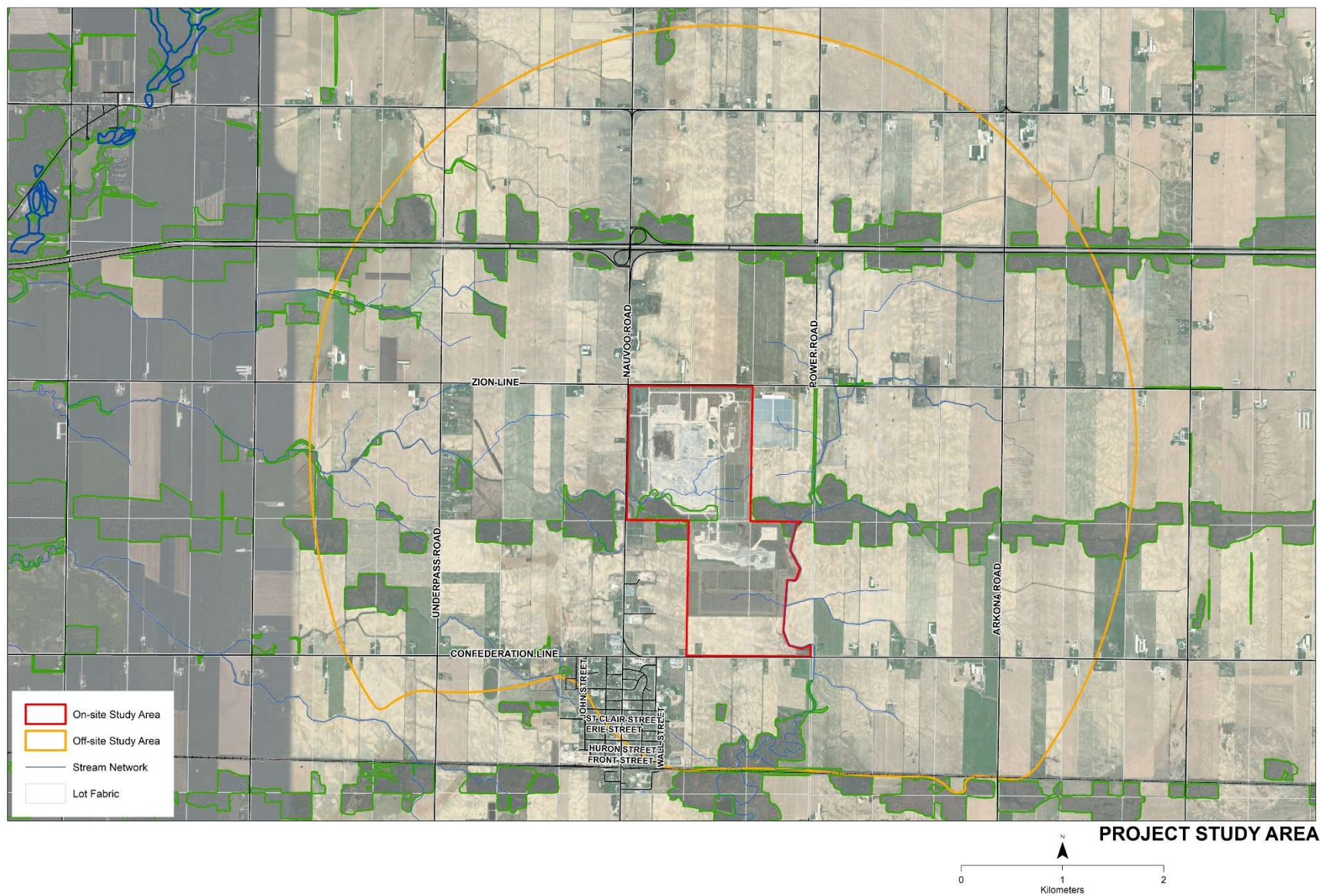
The local landscape in the vicinity of the TCEC comprises primarily agricultural lands to the north, west, east, and southeast. The Village of Watford is located south and southwest of the TCEC and includes residential, institutional, and commercial land uses, as well as public amenities including the East Lambton Community Complex/Watford Arena, YMCA, and parks.

The north and west perimeters of the TCEC site comprise high berms with established coniferous and deciduous trees that perform an effective visual screening function. The recently constructed Twin Creeks Greenhouses complex is effective in screening views from the areas that are located northeast of the TCEC. The portions of the east and west sides of the TCEC are partially screened from view by the existing woodlots that are located east and west of the TCEC. These woodlots are designated as 'Significant Woodlands' in the Township of Warwick Official Plan. To the south of the TCEC, a soil stockpile functions as an effective visual barrier for the receptors that are located along Confederation Line and within the Village of Watford.

General On-site and Off-site Study Areas were defined for the EA in the approved Terms of Reference (ToR). The limits of the Off-site Study Area for the visual landscape have been modified from the general Off-site Study Area and confirmed through field reconnaissance. The adjustments to the general 1 km Off-site Study Area for the visual landscape include extending the limit approximately 2.5 km further westward to encompass the potential receptors that are located west of Underpass Road and in the vicinity of Underpass Road and Confederation Line, and approximately 2.5 km further eastward, to include potential receptors that are located along Arkona Road and approximately 2.5 km further northward, to include potential receptors that are located north of Highway 402. As a component of the visual assessment for the TCEC Landfill Optimization Project, the extent Off-site Study Area will be reviewed and may be modified as required to include areas that will be situated within the viewshed under the proposed future condition.

The On-site and Off-site Study Areas for Visual Landscape based on the existing conditions assessment are shown on Figure 2-1.

Figure 2-1. On-site and Off-site Study Areas for Visual Landscape



3 Methods

This Visual Landscape Existing Conditions Report was developed based on the evaluation criteria, indicators, and data sources included in the approved ToR, which were developed in consultation with government agencies and other stakeholders. The evaluation criteria, rationale, indicators, and data sources used for Visual Landscape as per the approved ToR are provided in **Table 3-1**.

Table 3-1. Evaluation Criteria, Indicators and Data Sources for Visual Landscape

Evaluation Criteria	Rationale	Indicators	Data Sources
<i>Socio-Economic Environment</i>			
Visual Landscape			
Visual Impact of Facility	The contours of the waste disposal facility may affect the visual appeal of a landscape.	<ul style="list-style-type: none"> Predicted changes in perceptions of landscapes and views. 	<ul style="list-style-type: none"> Site grading plans Aerial mapping and field reconnaissance Proposed facility characteristics Existing landfill design and operations data Regional topographic mapping Results of other discipline assessments

3.1 Data Collection and Review

Relevant background information was sourced and compiled including the following:

- topographic base map that illustrates the existing conditions;
- aerial photography of the site and the vicinity;
- natural heritage features inventory data and maps;
- cultural heritage features inventory and maps;
- local and regional Official Plans and land use maps; and
- data and background information from the original EA.

This data was reviewed and summarized. The Cultural Heritage Existing Conditions Report (draft updated November 2023) was reviewed in order to identify cultural heritage resources within the Study Areas. The Ecological Environment Existing Conditions Report (draft November 2023) was reviewed to confirm the current state and status of the woodlands that are located within the Study Areas.

The Visual Assessment that was completed as a component of the EA (2005) was reviewed and the data that was generated for Year 26, Phase 11 was relied upon to define the future existing condition.

In addition to the above, the latest annual Monitoring Report that documents the condition of the existing visual screening measures was reviewed. This report was prepared by the Township's Technical Review Team as a component of the ongoing TCEC monitoring program.

3.2 Field Studies

The field studies comprised three site visits that were conducted during three seasons, winter, late spring, and fall, in order to characterize the visual landscape with trees in-leaf, as well as in leaf-off condition. An initial visit to the site and the vicinity was conducted on February 11, 2021, during a period when the trees were in a defoliated condition. A second site visit was conducted on November 16, 2022. A third site visit was conducted on June 16, 2023, to document the visual landscape with the trees in full leaf-out condition and to assess the condition of the visual mitigation plantings that were installed as a component of the construction of the TCEC. The photographs that were taken during each of these site visits are contained within Appendices A, B and C, respectively. The purpose of the field studies was to identify potential visual receptors and to document the existing visual landscape condition utilizing photographs. The vantage points for photographs correspond with residences, businesses, and community amenities including parks, churches, and the community complex. It is important to note that the vantage points for assessing the visual landscape condition and compiling the photographic inventories were confined to public lands (road rights-of-way, parks, and public open spaces).

This visual inspection was informed by the findings of the Site Review Report that was prepared by the Township's Technical Review Team that confirms that the trees that were originally planted in 2008 are starting to function as intended by the original Landscape Plans in terms of providing visual screening.

Based on the results of the field studies that characterized the existing condition, the Off-site Study Area for Visual Landscape was refined to incorporate potential receptors situated beyond the general Off-site Study Area of 1 km from the TCEC. Candidate receptors include residences, businesses, public amenities (such as parks and recreational facilities), cemeteries, and other land uses that may be sensitive to changes in the visual environment. Based on the findings of the field studies, the specific locations of receptors will be confirmed and views from receptors will be documented as a component of the Visual Assessment.

Characterization of Existing Conditions

The existing conditions for Visual Landscape were characterized as follows:

1. Information collected from the sources identified in **Section 3.1** were reviewed and summarized;

2. Field studies were undertaken to characterize the visual landscape, refine the limits of the Off-site Study Area, and identify potential receptors (**Section 3.2**); and
3. Information from all sources was compiled by environmental criterion.

4 Description of Existing Conditions

The TCEC is located 1.6 km south of Highway 402. The topography throughout the Off-site Study Area is relatively flat and the landscape is predominantly rural, with the exception of the Village of Watford. There are several Significant Woodlands within the Off-site Study Area that obstruct views to the TCEC from the lands further east, west and southeast. The site is visible from just south of the intersection of Hwy 402 and Nauvoo Road (County Road 79). Existing buildings do not afford a direct view of the TCEC from the Watford village centre. Land uses to the north, east and west of the site are primarily agricultural. Several residences and businesses are located along Confederation Line to the south of the TCEC. Rural residential and agricultural properties are located along Arkona Road to the east, Zion Line to the north, and Underpass Road to the south of the TCEC. Since the time that the TCEC was constructed, several new buildings/developments have been erected, including the Twin Creeks Greenhouses complex. These facilities function as visual screening elements.

Significant public amenities in the vicinity of the TCEC include the East Lambton Community Complex (Watford Arena) and YMCA, the Watford cemetery, Centennial Park, Rotary Park, and Confederation Park, which was constructed as a component of the development of the TCEC. Confederation Park includes an off-leash dog park and a trailhead.

Several commercial facilities have been recently constructed along Nauvoo Road, to the southeast of the TCEC. The Settlement Boundary for Watford extends north of Confederation Line on both sides of Nauvoo Road (Schedule “C”, Township of Warwick Official Plan) and therefore it is anticipated that additional commercial enterprises will become established within this portion of the Settlement Area in the future. An industrial park is planned for the agricultural area east of Nauvoo Road to the west /southwest of the TCEC, which will provide further visual screening from Nauvoo Road and adjacent businesses.

The lands that are owned by WM include the TCEC, adjacent agricultural lands, and a significant woodland.

Nauvoo Road accommodates the majority of traffic into the TCEC. Nauvoo Road has a rural cross-section with paved shoulders from Highway 402 to the TCEC site entrance and, south of the entrance, the road has gravel shoulders and ditches on both sides. Approaching the TCEC from the north, the existing vegetated berm is the dominant visual element. The entrance driveway represents an opening in the continuous perimeter berm; however, the view corridor that is afforded by the entrance

driveway does not expose the landfill. The main entrance to the TCEC that was formerly located on the south side of Zion Line has been closed and Zion Line is no longer a landfill haul route.

4.1 Visual Landscape

The design of the existing TCEC incorporated visual impact mitigation measures, including berms and plantings that have matured over time. The north and west perimeters of the TCEC facility comprise high berms with established coniferous and deciduous trees that perform an effective visual screening function. The recently constructed Twin Creeks Greenhouses complex is effective in screening views from the areas that are located northeast of the TCEC. The east and west sides of the TCEC are partially screened from view by the existing Significant Woodlands that are located east and west of the TCEC. To the south of the TCEC, a soil stockpile functions as an effective visual barrier that obstructs views from Confederation Line. The existing visual landscape conditions are described as follows:

- The existing TCEC is framed on its west and north sides by 7 m and 6 m high berms, respectively, that are vegetated with coniferous and deciduous trees, effectively screening the landfill operation from both Zion Line and Nauvoo Road. These vegetated berms are visually dominant within the local landscape but are aesthetically pleasing.
- From the southern view, the soil stockpile and the existing woodland are the dominant landscape features.
- The recently constructed Twin Creeks Greenhouses facility comprises a 16-ha campus of large buildings that dominate the landscape on the northeastern side of the TCEC.
- The existing Significant Woodlands that are located east and west of the TCEC function to screen views from the areas along Arkona Road and Underpass Road that are located east and west of the TCEC, respectively.
- Several commercial buildings that have been recently constructed within the industrial park east of Nauvoo Road, north of Confederation Line obstruct views to the TCEC from the southwest.
- The TCEC is not visible from the central area of the Village of Watford.
- The TCEC is visible from various locations along Underpass Road, although the existing Significant Woodlands east of Underpass Road, in conjunction with the rising topography, limit views at specific locations.
- Since the time that the TCEC was constructed, improvements to the East Lambton Community Complex have been implemented, a new YMCA facility has been constructed, and Rotary Park has been expanded and enhanced. All of these community amenities are located on the south side of Confederation Line, east of Nauvoo Road.

- Figure 4.1 Illustrates the viewshed to the TCEC under the existing condition. Existing Significant Woodlands, the Twin Creeks Greenhouse Complex, buildings within the Industrial Park, and the screening berms and trees that were implemented as a component of the Landfill Expansion obstruct views to the TCEC.
- The future existing condition is described in the Visual Assessment (2005) corresponding with Year 26, Phase 11. The images generated as a component of this assessment from Viewpoints 1 to 6 illustrate that the landfill will be visible from various locations along County Road 29, Zion Line, Arkona Road, and Highway 7. The area described as the High Visual Impact Zone is located within a 1.5 km radius of the Twin Creeks facility. Figure 4.2 Illustrates the viewsheds to the TCEC under the future existing condition.

The visual landscape assessment will assess the potential visual impact of the facility in comparison with the future existing condition. The indicator that will be utilized in the assessment is the 'predicted changes in perceptions of landscapes and views', as described in **Section 4.1.1** below.

Figure 4-1. Existing Viewshed

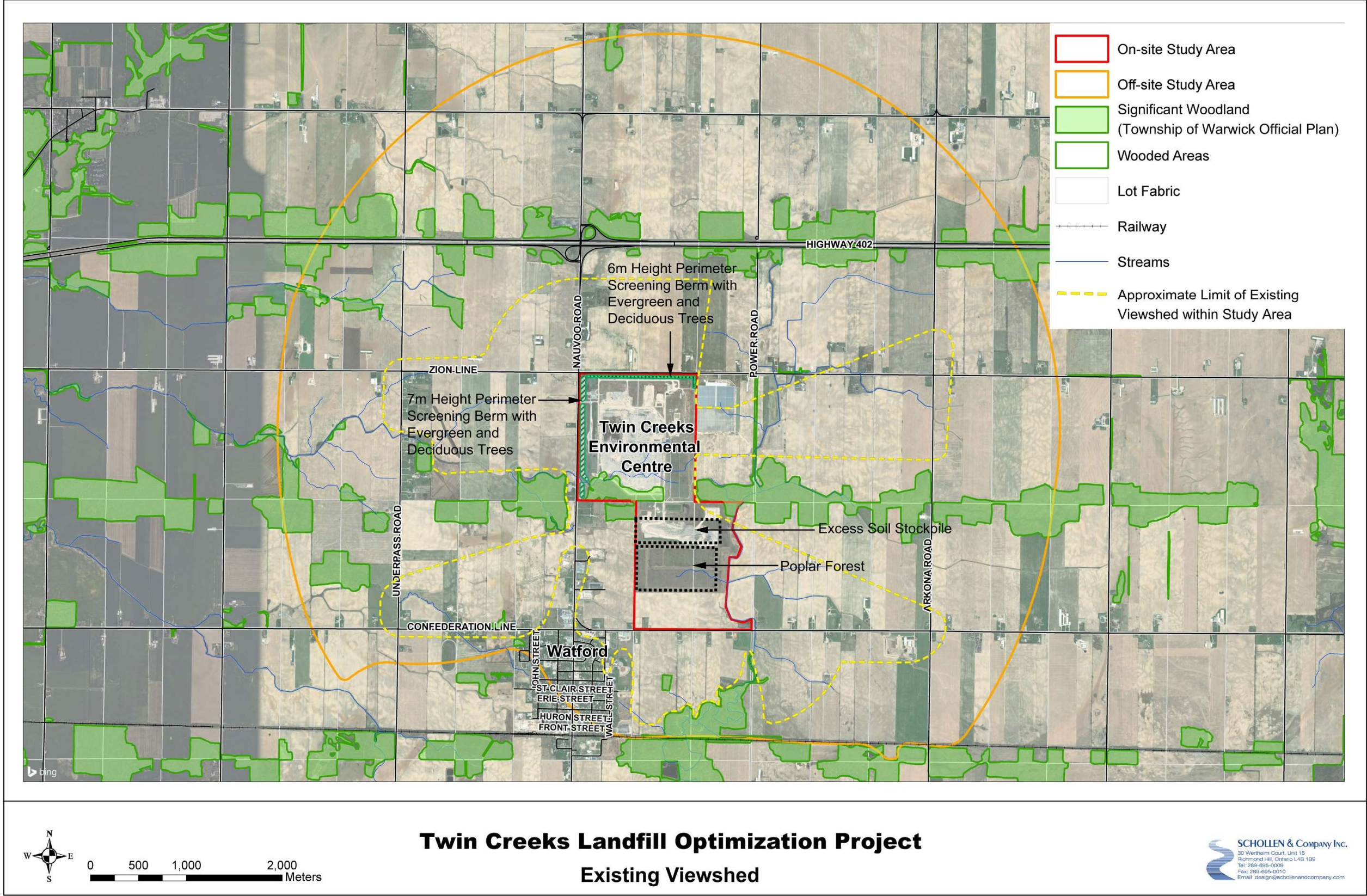
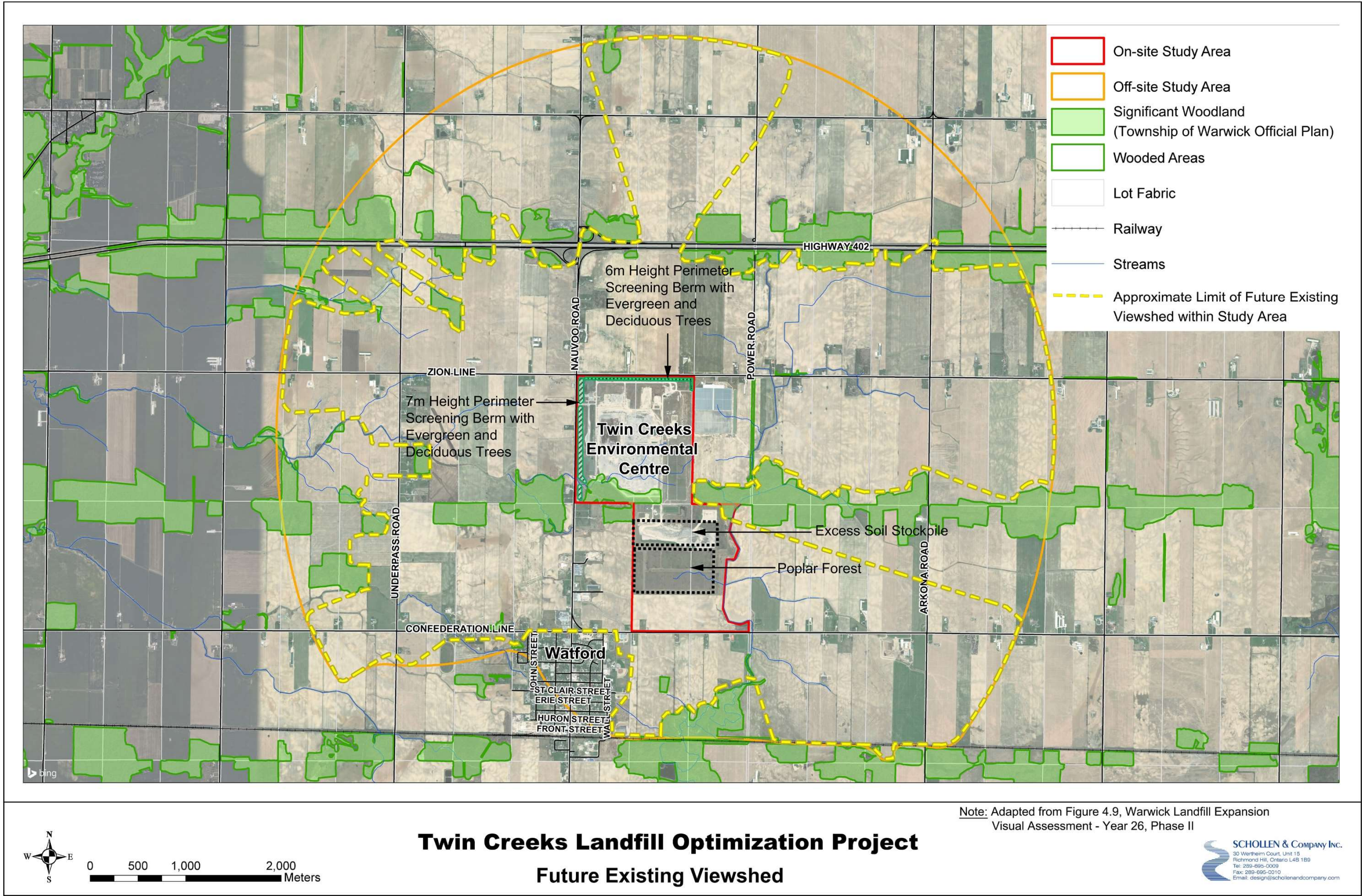


Figure 4-2. Future Existing Viewshed



4.1.1 Predicted Changes in Perceptions of Landscapes and Views

The implementation of the TCEC Optimization project may result in changes in the perception of the visual landscape for certain receptors. The magnitude of change will be determined by the following criteria:

1. Visible landfill area
2. Distance from the landfill optimization site within the TCEC
3. Horizontal angle of view
4. Visual Absorption Capacity Factor (VACF)

The existing conditions assessment was aimed at confirming the appropriate Off-site Study Area for Visual Landscape and identifying the locations of potential receptors based on these criteria under multi-seasonal conditions. Existing woodlands and structures, as well as the berms and plantings that were implemented in conjunction with the original construction of the TCEC effectively mitigate potential changes in the perception of the visual landscape for some receptors. All of the above criteria will be applied to confirm the locations of receptors. These criteria will also be applied in the assessment of potential effects.

It is anticipated that the conditions within the viewshed will change between the present day and the time that the Landfill Optimization project is undertaken in 2031. Buildings constructed within the Industrial Park in the future will obstruct views to the TCEC from the southeast, the tree plantings on the screening berms will have increased in height and density and other changes may occur that will affect views to the TCEC.

4.2 Summary of Existing Conditions

The visual landscape that encompasses the TCEC is rural in character with minimal topographic relief. To the south and southwest, the Village of Watford includes residential, commercial, and institutional land uses. Given the density and height of the buildings within the village, the TCEC is only visible from the north area of the village, in the vicinity of Confederation Line. The areas to the north, west and east of the TCEC comprise primarily agricultural and rural residential properties, the Significant Woodlands that are located east and west of the TCEC limit views to the TCEC from Arkona Road and areas east of the TCEC, as well as from Underpass Road, west of the TCEC. Community facilities including the East Lambton Community Complex (Watford Arena), YMCA, and parks are situated south of the TCEC. The TCEC is visible from areas around these community amenities. The berms and plantings that were implemented as a component of the construction of the TCEC provide effective visual mitigation under the existing condition. Under the future existing condition, the TCEC will be visible from various locations as documented in

the findings of the Visual Assessment (2005). The visual landscape assessment will assess the potential visual impact of the facility in comparison with future existing conditions. Changes in the viewshed to the TCEC are anticipated to occur between the condition that exists today and the time that the Landfill Optimization project is undertaken in 2031.

5 References

Archaeological Services Inc. November 2023, Draft Cultural Heritage Resources Existing Conditions Report - Twin Creeks Environmental Centre Landfill Optimization Project Environmental Assessment – WM Canada

Baker Turner Inc. September 2005, Warwick Landfill Expansion Project Visual Impact Assessment Report

Lambton County Planning & Development Services Department 2021, Township of Warwick Official Plan Office Consolidation, 5 Year Update

Natural Resource Solutions Inc. November 2023, Draft Ecological Environment Existing Conditions Report – Twin Creeks Environmental Centre Landfill Optimization Project Environmental Assessment – WM Canada

Township of Warwick Technical Review Team August 25, 2022, Technical Review Team 2022 Annual Review (Draft), WM Twin Creeks Landfill – 2021 Reporting Year

Vafiades Landscape Architect Inc. May 30, 2022, Township of Warwick Twin Creeks Landfill Annual Review, Landscape Elements 2021, Site Review Report

A

Existing Conditions
Photographic Inventory
February 11, 2021

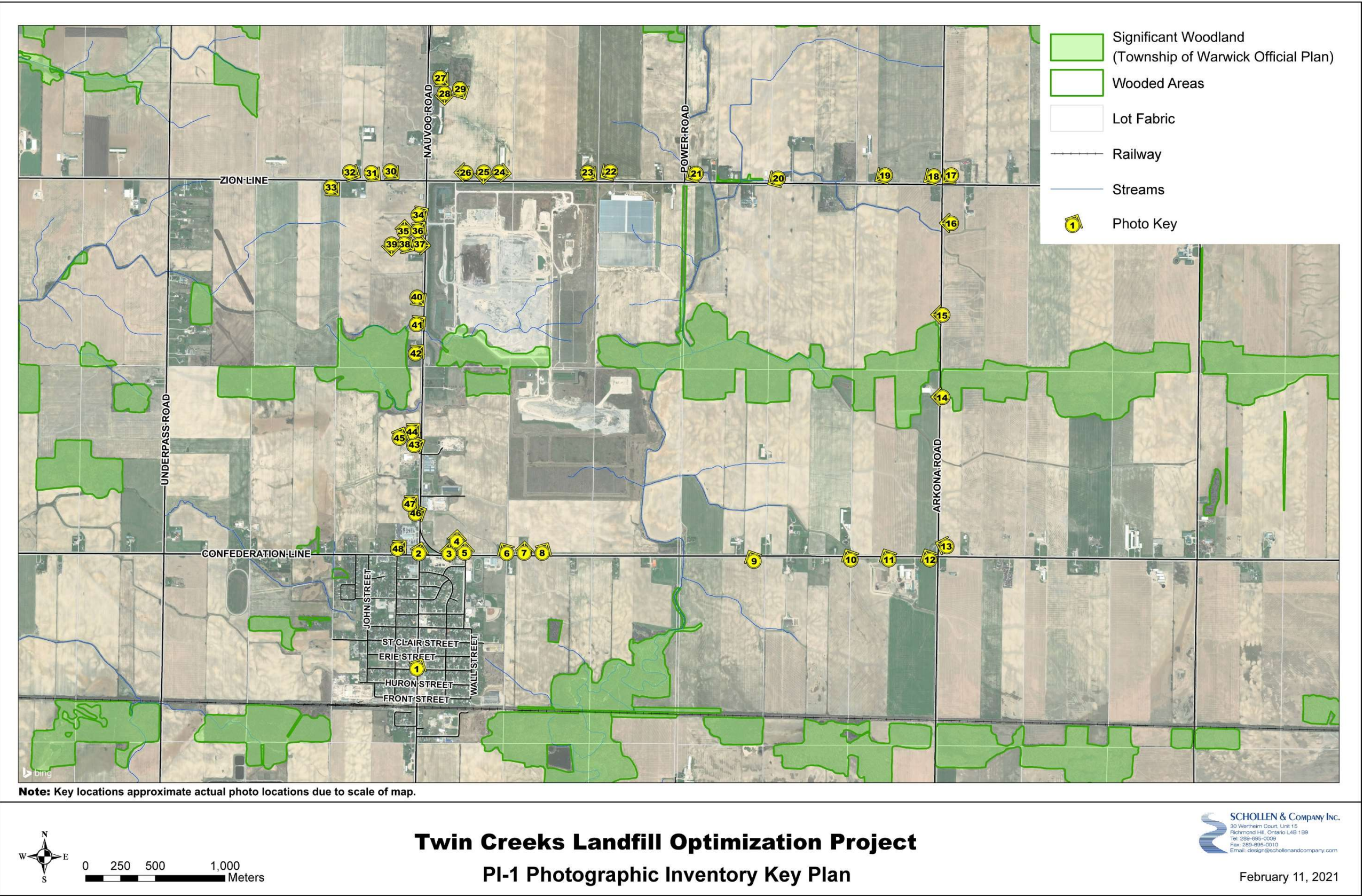




Photo 1 - Intersection of Nauvoo Road and Erie Street viewing N/E



Photo 2 - East of intersection of Nauvoo Road and Confederation Line viewing N/E



Photo 3 - View northward from Confederation Park (north side of Confederation Line)



Photo 4 - View northward from Confederation Park (north side of Confederation Line)



Photo 5 - Intersection of Centennial Avenue and Confederation Line viewing north



Photo 6 - Views N / NE / NW from Confederation Line travelling eastward to Arkona Road



Photo 7 - Views N / NE / NW from Confederation Line travelling eastward to Arkona Road



Photo 8 - Views N / NE / NW from Confederation Line travelling eastward to Arkona Road



Photo 9 - Views NW from Confederation Line travelling eastward to Arkona Road



Photo 10 - Views NW from Confederation Line travelling eastward to Arkona Road



Photo 11 - Views NW from Confederation Line travelling eastward to Arkona Road



Photo 12 - Views NW from Confederation Line travelling eastward to Arkona Road



Photo 13 - Intersection of Confederation Line and Arkona Road viewing N/E



Photo 14 - Views westward from Arkona Road between Confederation Line and Zion Line



Photo 15 - Views westward from Arkona Road between Confederation Line and Zion Line



Photo 16 - Views westward from Arkona Road between Confederation Line and Zion Line



Photo 17 - North of intersection of Zion Line and Arkona Road viewing S/W



Photo 18 - West of intersection of Zion Line and Arkona Road viewing S/W



Photo 19 - Zion Line travelling westward from Arkona Road viewing S/W



Photo 20 - Zion Line travelling westward from Arkona Road viewing S/W



Photo 21 - Zion Line view S/W - Twin Creeks Greenhouses Complex in middle ground of view



Photo 22 - Zion Line view S/W to N/E corner of Twin Creeks Environmental Centre



Photo 23 - Zion Line viewing S/W to Twin Creeks Greenhouse Complex at N/E corner of Twin Creeks Environmental Centre



Photo 24 - Zion Line west of Nauvoo Road viewing east



Photo 25 - Zion Line west of Nauvoo Road viewing south



Photo 26 - Zion Line west of Nauvoo Road viewing east



Photo 27 - Nauvoo Road north of Zion Line viewing S/E



Photo 28 - Nauvoo Road north of Zion Line viewing S/SE and south



Photo 29 - Nauvoo Road north of Zion Line viewing S/SE and south



Photo 30 - Zion Line west of Nauvoo Road viewing east and ESE



Photo 31 - Zion Line west of Nauvoo Road viewing east and ESE



Photo 32 - Zion Line 1.15 west of Nauvoo Road viewing east and ESE



Photo 33 - Zion Line 1.15 west of Nauvoo Road viewing east and ESE



Photo 34 - Entrance to Environmental Centre off of Nauvoo Road



Photo 35 - Progressive panorama west side of Environmental Centre along Nauvoo Road - N



Photo 36 - Progressive panorama west side of Environmental Centre along Nauvoo Road - N/NE



Photo 37 - Progressive panorama west side of Environmental Centre along Nauvoo Road - E



Photo 38 - Progressive panorama west side of Environmental Centre along Nauvoo Road - SE



Photo 39 - Progressive panorama west side of Environmental Centre along Nauvoo Road - S/SE



Photo 40 - Progressive panorama from west side of Nauvoo Road, north of cemetery S/SE



Photo 41 - Progressive panorama from west side of Nauvoo Road, north of cemetery N



Photo 42 - Progressive panorama from west side of Nauvoo Road, north of cemetery NE



Photo 43 - West side of Nauvoo Road 0.7km north of Confederation Line viewing N/E



Photo 44 - West side of Nauvoo Road 0.7km north of Confederation Line viewing N/E



Photo 45 - West side of Nauvoo Road 0.7km north of Confederation Line viewing N/E



Photo 46 - West side of Nauvoo Road north of Confederation Line viewing N/E



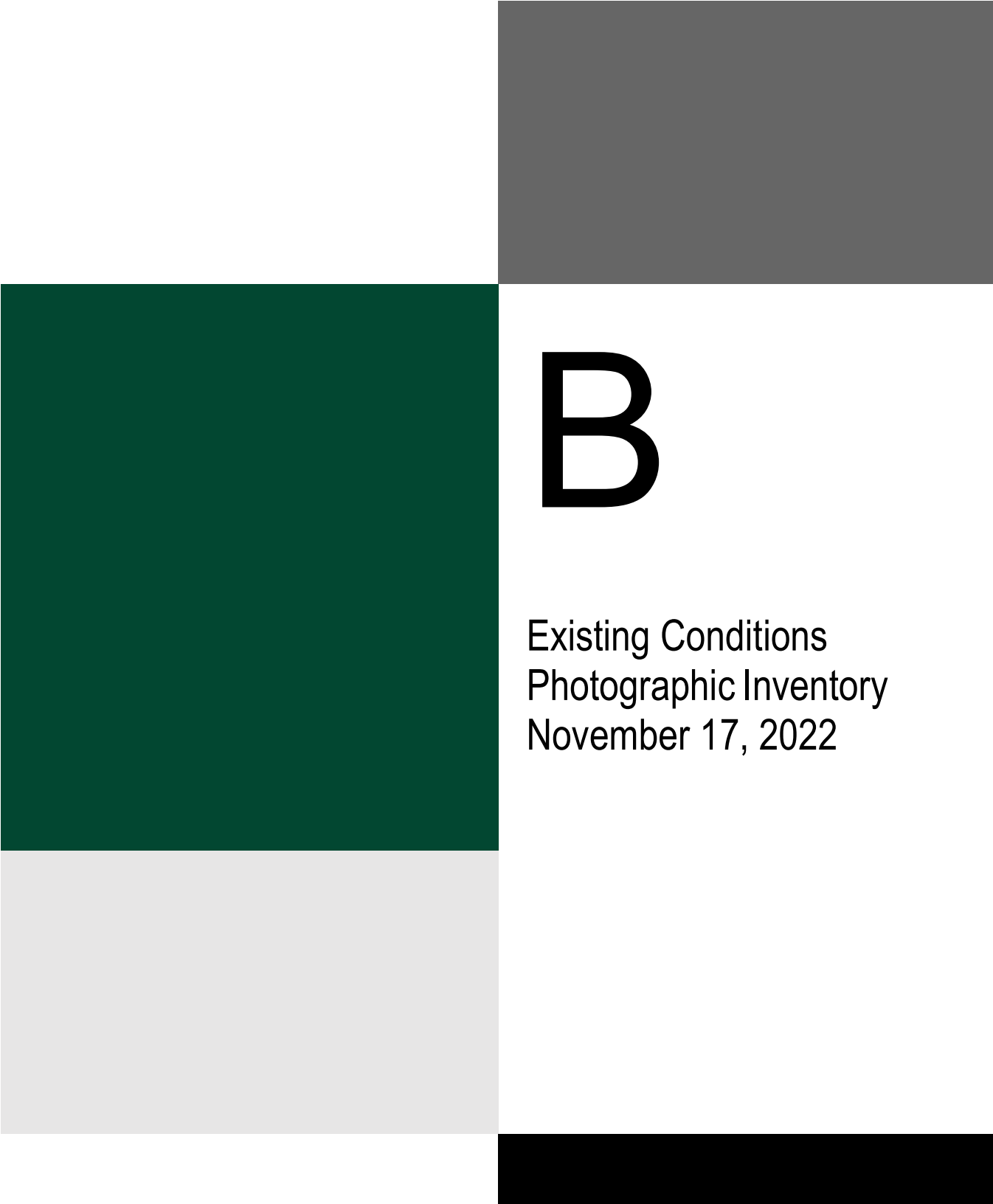
Photo 47 - West side of Nauvoo Road north of Confederation Line viewing N/E



Photo 48 - Confederation Line west of Nauvoo Road viewing N/E



Photo 49 - Aerial oblique viewing south to village of Watford

The page features a large, abstract background design. It includes a dark green square on the left side, a grey square at the top right, a light grey square at the bottom left, and a black square at the bottom right. The letter 'B' is positioned to the right of the dark green square.

B

Existing Conditions
Photographic Inventory
November 17, 2022

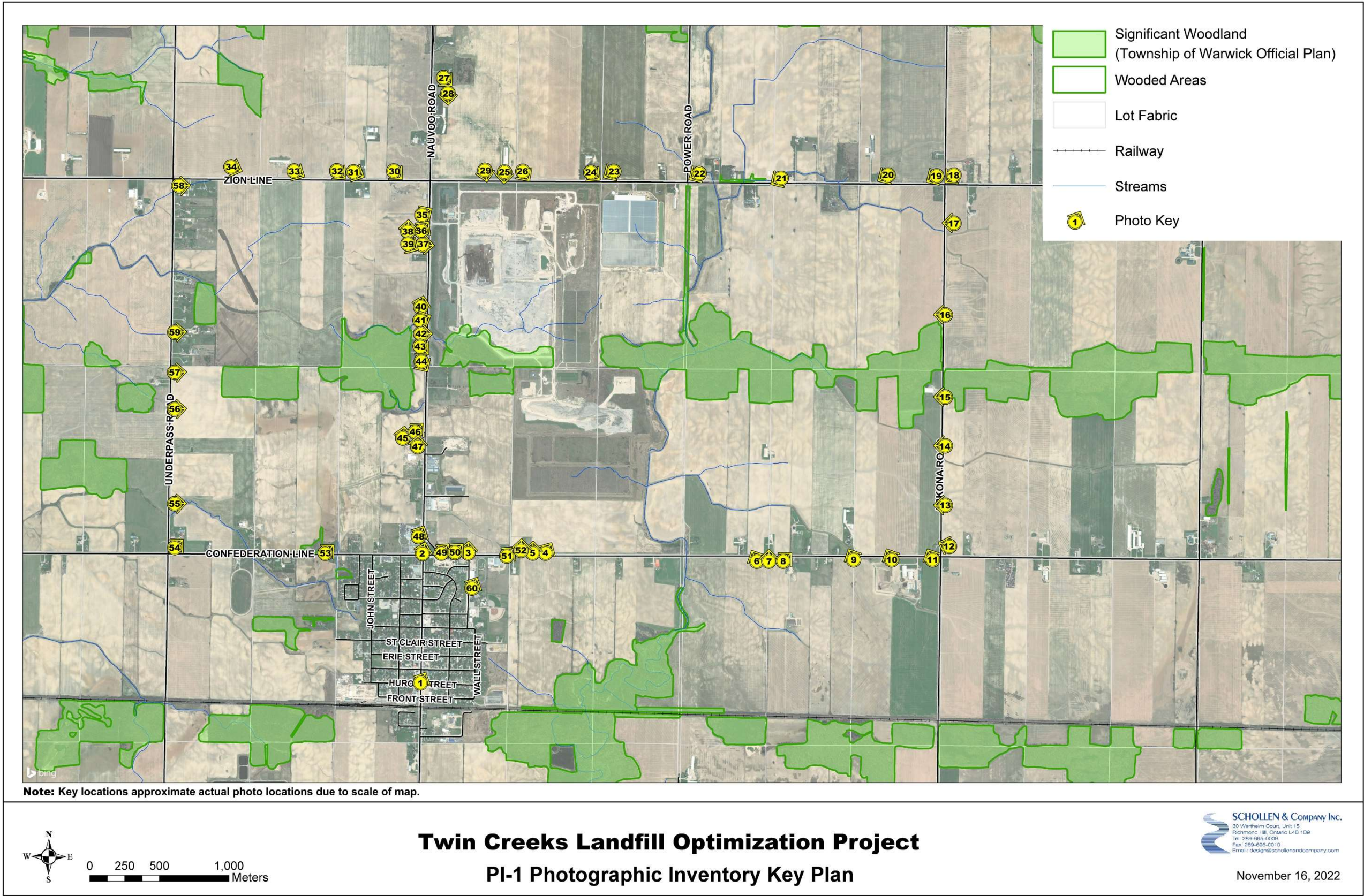




Photo 1 - Intersection of Nauvoo Road and Huron Street viewing north



Photo 2 - Southwest corner of Nauvoo Road and Confederation Line viewing northeast



Photo 3 - Intersection of Centennial Avenue and Confederation Line viewing north



Photo 4 - View northward from Confederation Park



Photo 5 - View N / NE from Confederation Park



Photo 6 - View NW from Confederation Line travelling eastward to Arkona Road



Photo 7 - View N from Confederation Line travelling eastward to Arkona Road



Photo 8 - View NE from Confederation Line travelling eastward to Arkona Road

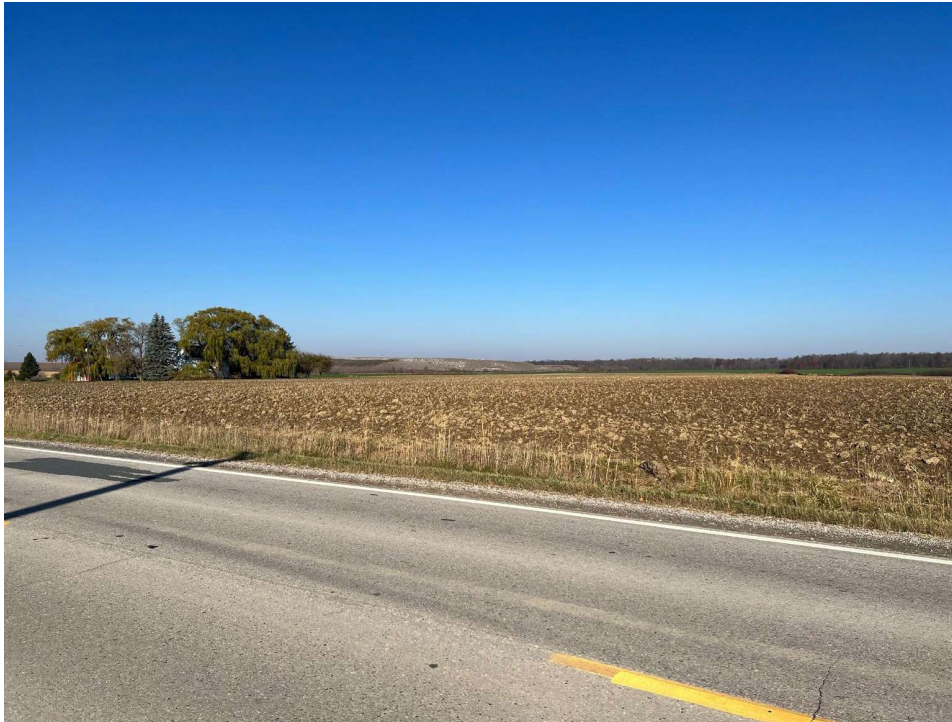


Photo 9 - View NW from Confederation Line travelling eastward to Arkona Road



Photo 10 - View N/W from Confederation Line travelling eastward to Arkona Road



Photo 11 - View NW from just west of Arkona Road / Confederation Line intersection



Photo 12 - Intersection of Confederation Line and Arkona Road viewing N/E



Photo 13 - View W / NW from Arkona Road north of Confederation Line



Photo 14 - View west from Arkona Road north of Confederation Line



Photo 15 - View westward from Arkona Road between Confederation Line and Zion Line



Photo 16 - View westward from Arkona Road between Confederation Line and Zion Line



Photo 17 - View westward from Arkona Road between Confederation Line and Zion Line



Photo 18 - North of intersection of Zion Line and Arkona Road viewing S/W



Photo 19 - View westward along Zion Line



Photo 20 - Zion Line travelling westward from Arkona Road



Photo 21 - Zion Line viewing southwestward



Photo 22 - Zion Line viewing S/W - Twin Creeks Greenhouses Complex in middle ground of view



Photo 23 - Zion Line viewing S/W to Twin Creeks Greenhouse Complex at N/E corner of Twin Creeks Environmental Centre



Photo 24 - Viewing SW along Zion Line



Photo 25 - Viewing SW along Zion Line



Photo 26 - Viewing SE along Zion Line



Photo 27 - Nauvoo Road north of Zion Line viewing S/E



Photo 28 - Nauvoo Road north of Zion Line viewing S/SE and south



Photo 29 - North entry gate



Photo 30 - Zion Line west of Nauvoo Road viewing east



Photo 31 - Zion Line west of Nauvoo Road viewing E / SE



Photo 32 - Zion Line west of Nauvoo Road viewing E / SE



Photo 33 - Zion Line west of Nauvoo Road viewing E / SE



Photo 34 - Zion Line east of Underpass Road viewing E / SE



Photo 35 - West side of Nauvoo Road, south of Zion Line viewing north



Photo 36 - West side of Nauvoo Road viewing towards Twin Creeks Environmental Centre entrance



Photo 37 - West side of Nauvoo Road viewing towards Twin Creeks Environmental Centre entrance



Photo 38 - West side of Nauvoo Road viewing towards Twin Creeks Environmental Centre entrance



Photo 39 - West side of Nauvoo Road viewing towards Twin Creeks Environmental Centre entrance



Photo 40 - West side of Nauvoo Road viewing north from north of cemetery



Photo 41 - West side of Nauvoo Road viewing N/E from north of cemetery



Photo 42 - West side of Nauvoo Road viewing east



Photo 43 - West side of Nauvoo Road viewing SE



Photo 44 - West side of Nauvoo Road viewing S / SE



Photo 45 - West side of Nauvoo Road, north of Confederation Line viewing N / NE



Photo 46 - West side of Nauvoo Road, north of Confederation Line viewing NE



Photo 47 - West side of Nauvoo Road, north of Confederation Line viewing north



Photo 48 - Northwest corner of Nauvoo Road at Confederation Line viewing northeast



Photo 49 - South side of Confederation Line, east of Nauvoo Road viewing N / NE



Photo 50 - South side of Confederation Line, east of Nauvoo Road viewing NE



Photo 51 - South side of Confederation Line viewing NE



Photo 52 - South side of Confederation Line viewing north



Photo 53 - Confederation Line, west of Nauvoo Road viewing NE



Photo 54 - Confederation Line, west of Nauvoo Road viewing NE



Photo 55 - Underpass Road / Confederation Line intersection viewing NW



Photo 56 - Underpass Road north of Confederation Line viewing west



Photo 57 - Underpass Road north of Confederation Line viewing west



Photo 58 - Underpass Road / Zion Line intersection viewing west



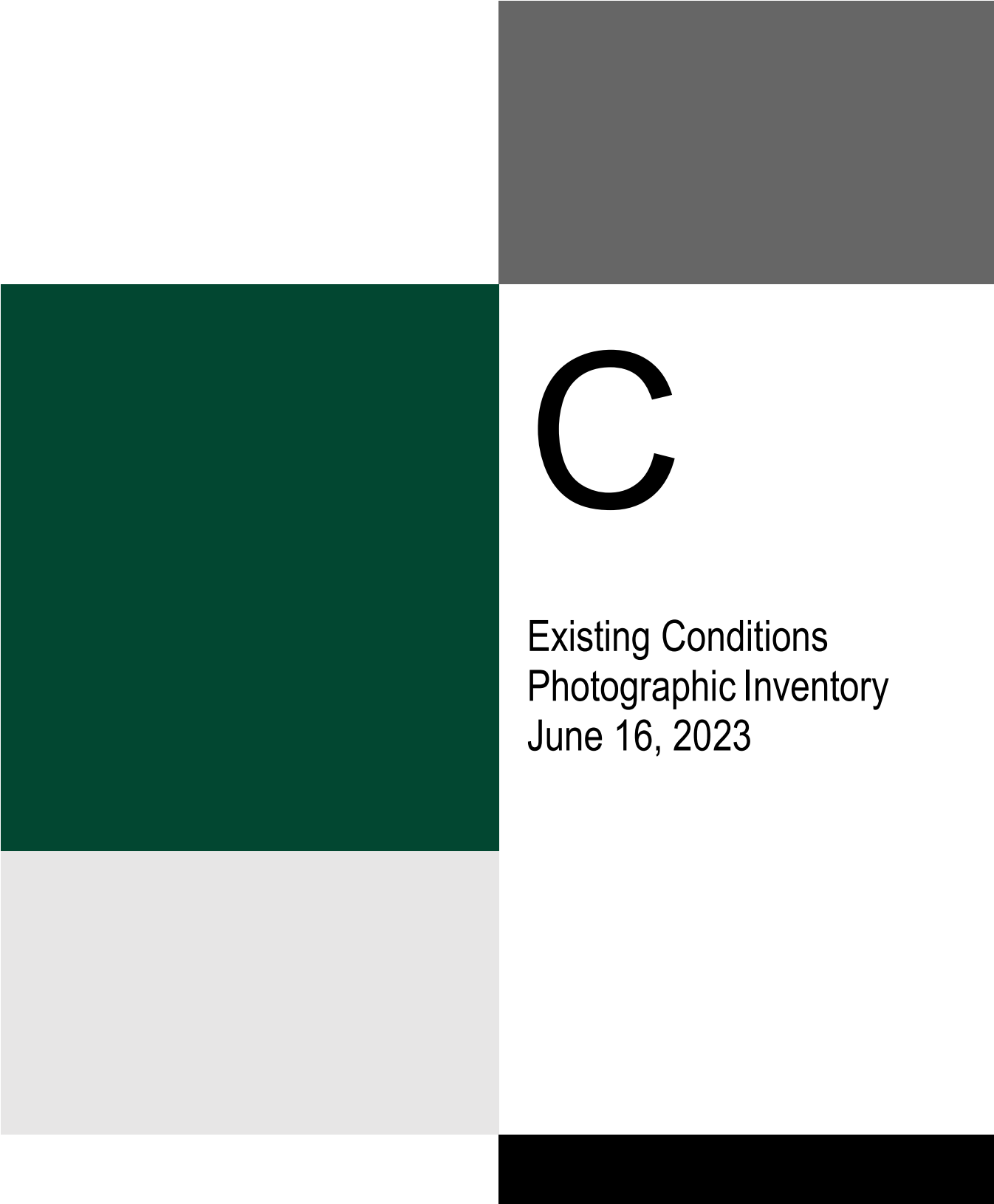
Photo 59 - Underpass Road south of Zion Line viewing west



Photo 60 - East side of Memorial Park, viewing N / NE

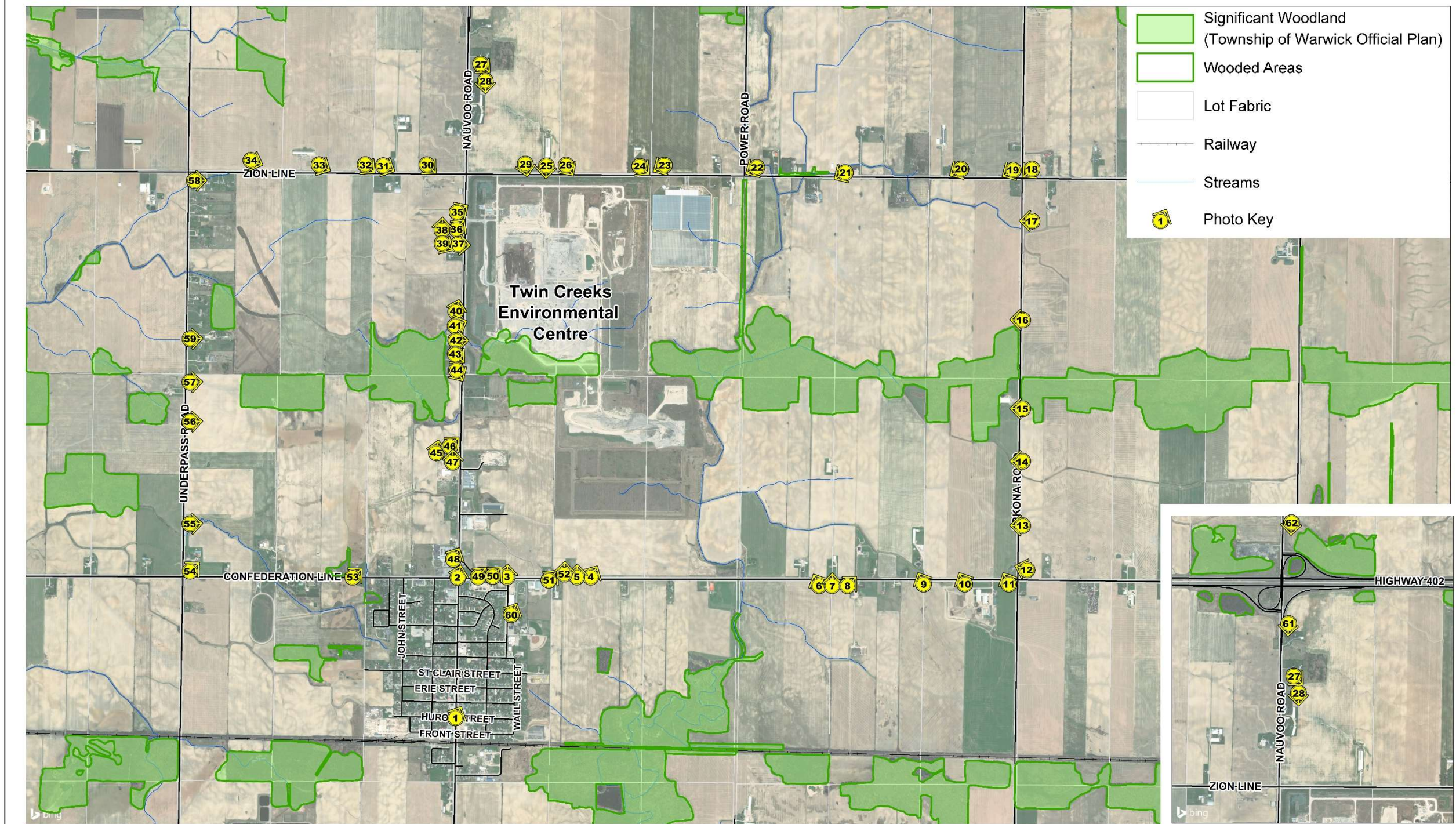


Photo 61 - Aerial oblique viewing south to village of Watford

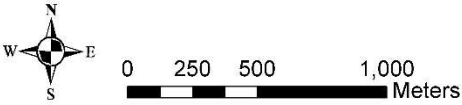
The background features a large, dark green square on the left side, a grey square at the top right, a light grey square at the bottom left, and a black square at the bottom right. A large, bold, black letter 'C' is positioned to the right of the green square.

C

Existing Conditions
Photographic Inventory
June 16, 2023



Note: Key locations approximate actual photo locations due to scale of map.



Twin Creeks Landfill Optimization Project

PI-1 Photographic Inventory Key Plan

SCHOLLEN & COMPANY INC.
20 Wertheim Court, Unit 10
Highwood Hills, Ontario L4B 1B9
Tel: 289-896-0009
Fax: 289-896-4010
Email: design@schollenandcompany.com

June 16, 2023



Photo 1 - Intersection of Nauvoo Road and Huron Street viewing north



Photo 2 - Southwest corner of Nauvoo Road and Confederation Line viewing northeast



Photo 3 - Intersection of Centennial Avenue and Confederation Line viewing north



Photo 4 - View northward from Confederation Park



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Photo 7 & 8 - View N / NE from Confederation Line travelling eastward to Arkona Road



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Photo 11 - View NW from just west of Arkona Road / Confederation Line intersection



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Photo 33 - Zion Line west of Nauvoo Road viewing E / SE



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Photo 43 - West side of Nauvoo Road viewing SE



Photo 44 - West side of Nauvoo Road viewing S / SE



Photo 45 - West side of Nauvoo Road, north of Confederation Line viewing N / NE



Photo 46 - West side of Nauvoo Road, north of Confederation Line viewing NE



Photo 47 - West side of Nauvoo Road, north of Confederation Line viewing north



Photo 48 - Northwest corner of Nauvoo Road at Confederation Line viewing northeast



Photo 49 - South side of Confederation Line, east of Nauvoo Road viewing N / NE



Photo 50 - South side of Confederation Line, west of Nauvoo Road viewing NE



Photo 51 - South side of Confederation Line viewing NE



Photo 52 - South side of Confederation Line viewing north



Photo 53 - Confederation Line, west of Nauvoo Road viewing NE



Photo 54 - Confederation Line, west of Nauvoo Road viewing NE



Photo 55 - Road / Confederation Line intersection viewing NE



Photo 56 - Underpass Road north of Confederation Line viewing east



Photo 57 - Underpass Road north of Confederation Line viewing east



Photo 58 - Underpass Road / Zion Line intersection viewing east



Photo 59 - Underpass Road south of Zion Line viewing east



Photo 60 - East side of Memorial Park, viewing N / NE



Photo 61 - Viewing south from east side of Nauvoo Rod, south of Highway 402



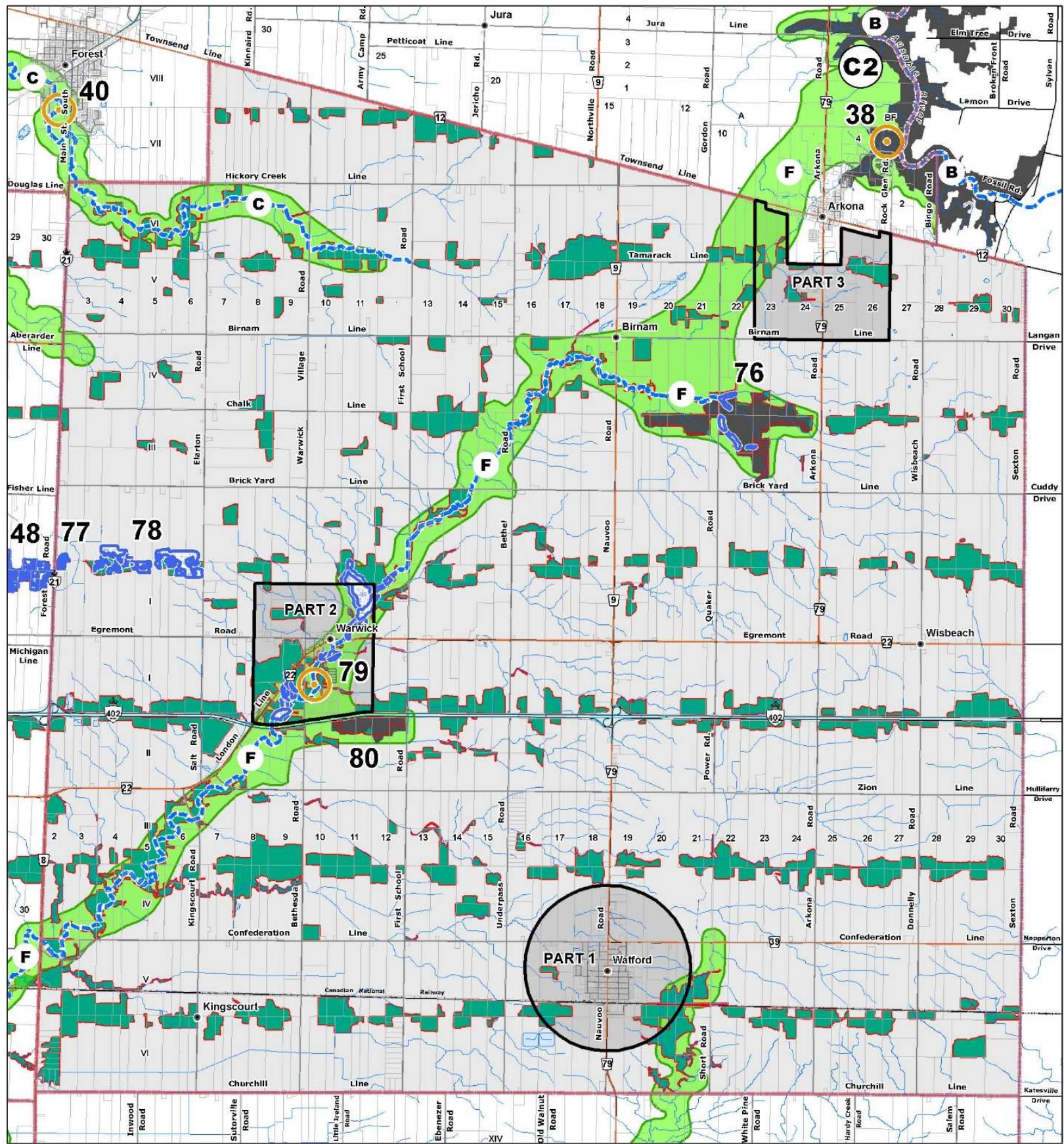
Photo 62 - Viewing south from east side of Nauvoo Rod, north of Highway 402



Photo 63 - Aerial oblique viewing south to village of Watford

D

Township of Warwick Official
Plan 2021
Schedule “C” Natural
Heritage



Township of Warwick OFFICIAL PLAN SCHEDULE "C" Natural Heritage

LEGEND

- Assessment Parcels
- Rivers - Streams - Drainage
- Roads
- Provincial Highway
- Railroad
- Waterbodies
- Township Boundary
- Schedule Inset Boundaries (Parts 1 to 3)

Lambton County Official Plan - Designations

Refer to "Chapter 8" and
Map 2 - Natural Heritage System
from the Lambton County Official Plan.

- C2 Core Area - Feature Inventory Identifier
- 45 Feature Inventory Identifier (Identified)
- A Cross Municipal - Feature Inventory Identifier
- Conservation Area / Habitat Management Area (HMA) Identifier
- Group "A" Features (Provincially, Locally Significant Wetlands (PSW, LSW))
- Group "B" Features (ANSI, LS, ESA, SAA, CGR, CC, VA, PC)
- Primary Corridor (Group "C" Feature)
- Cross Municipal Corridor Feature

Reference

Disclaimer: These digital mapping products have been produced on the County of Lambton's Geographic Information System. Data provided herein is derived from sources with varying levels of accuracy and currency. This is not a survey product. The County of Lambton disclaims all responsibility for the accuracy or completeness of information contained herein. The County of Lambton assumes no responsibility for errors arising from use of these digital mapping products.

The Official Plan information contained herein is current as of the last recorded amendment noted under "Official Plan Amendments".

Cadastral database is current to December 2020.

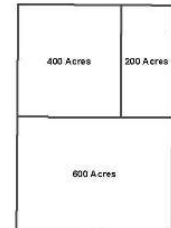
Projection: UTM NAD 83 Zone 17

Consultant: NPG Planning Solutions, July 2021

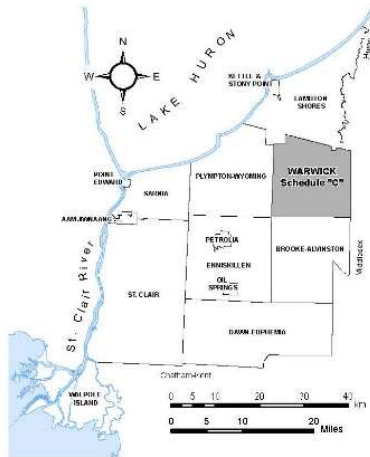
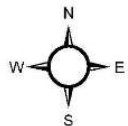
COUNTY OF LAMBTON
Planning and Development Services, July 2021

www.lambtononline.ca

Area Estimator



Notes: Area Estimator generalized blocks (shown at left) are scaled to represent typical area measures.
Acre area measures can be converted to hectares (ha) by dividing by (2.471).



Township of Warwick OFFICIAL PLAN SCHEDULE "C" Natural Heritage

to By-law No. 86 of 2021

Passed this 26 day of July, 2021

Jackie Rombouts, Mayor

Amanda Gubbels, CAO/Clerk

Official Plan Amendments



E

Future Existing conditions Warwick
Landfill Expansion Project
Environmental Assessment Visual
Assessment, Bakeer Turner Inc.,
September 2005

- Table #7 – visual Assessment
Data – Year 26, Phase II
- Photographic Simulations

TABLE #7
VISUAL ASSESSMENT DATA - YEAR 26, PHASE 11 (REFER TO FIGURE 4-9)
(BASED ON FINAL D.P. #8 SEPTEMBER 2005)

Receptor No.	Area			Angle		Distance		Visual Absorption Capability Factor		Total Visual Effect Value 13-20 High 9-12 Moderate ≤8 Low
	Landfill Area Visible (m2)	Perceived Area Index - Area/Distance	Value	Angle of Exposed Views (degrees)	Value	Distance to Visible Landfill (m) Incl. Stockpile	Value	VACF	Value	
000	5702	33	5	83	4	174	5	1	5	19
001	15045	47	5	70	4	323	5	1	5	19
002	18016	40	5	61	4	455	5	1	5	19
003	21436	40	5	56	4	535	5	1	5	19
004	21392	36	5	55	4	587	5	1	5	19
005	21002	33	5	53	4	638	4	1	5	18
006	21203	32	5	52	4	662	4	1	5	18
007	21357	30	5	50	3	718	4	1	5	17
008	22349	26	5	44	3	864	3	1	5	16
009	23095	24	5	42	3	950	3	1	5	16
010	22440	21	4	38	3	1091	3	1	5	15
011	25333	33	5	52	4	767	4	1	5	18
012	23994	30	5	55	4	797	4	1	5	18
013	27030	58	5	100	5	469	5	1	5	20
014	11770	14	3	72.6	4	862	3	1	5	15
015	12144	11	2	59.5	4	1061	3	1	5	14
016	11880	9	2	48.0	3	1351	3	1	5	13
017	11800	9	2	46.9	3	1359	3	1	5	13
018	11180	11	2	59.1	4	1021	3	1	5	14
019	10788	10	2	56.9	4	1084	3	1	5	14
020	11754	10	2	53.8	4	1191	3	1	5	14
021*	13869	15	3	73.5	4	956	3	1	5	15
022	14122	12	2	64.7	4	1199	3	1	5	14

* Represents receptors along north east fringe of the Village of Watford

September, 2005

*Warwick Landfill Expansion Project
Visual Assessment*

47

Receptor No.	Area			Angle		Distance		Visual Absorption Capability Factor		Total Visual Effect Value 13-20 High 9-12 Moderate ≤8 Low
	Landfill Area Visible (m2)	Perceived Area Index - Area/Distance	Value	Angle of Exposed Views (degrees)	Value	Distance to Visible Landfill (m) Incl. Stockpile	Value	VACF	Value	
023	15445	13	3	69.0	4	1184	3	1	5	15
024	18710	15	3	72.3	4	1265	3	1	5	15
025	20610	13	3	65.4	4	1574	2	1	5	14
026	12974	35	5	63	4	372	5	1	5	19
027	18120	29	5	51	4	624	4	1	5	18
028	22285	23	4	41	3	976	3	1	5	15
029	22560	21	4	39	3	1082	3	1	5	15
030	17346	27	5	51	4	654	4	1	5	18
031	24961	18	3	34	3	1423	3	1	5	14
032	22871	19	4	38	3	1179	3	1	5	15
033	25211	16	3	31	3	1570	2	1	5	13
034	9898	38	5	70	4	259	5	1	5	19
035	25518	15	3	31	3	1726	2	1	5	13
041	29822	18	3	32	3	1701	2	1	5	13
042	30245	17	3	31	3	1799	2	1	5	13
043	30318	16	3	29	2	1911	2	1	5	12
044	29837	15	3	27	2	2029	2	1	5	12
045	29812	14	3	27	2	2144	2	1	5	12
046	30653	14	3	27	2	2135	2	1	5	12
047	30568	13	2	24	2	2361	1	1	5	10
048	31294	12	2	22	2	2622	1	1	5	10
049	30024	14	3	27	2	2137	2	1	5	12
050	28838	14	3	28	2	2082	2	1	5	12
051	28192	14	3	28	2	2084	2	1	5	12
052	26100	12	2	27	2	2135	2	1	5	11
053						no view				
054						no view				
055						no view				

September, 2005

*Warwick Landfill Expansion Project
Visual Assessment*

48

Receptor No.	Area			Angle		Distance		Visual Absorption Capability Factor		Total Visual Effect Value 13-20 High 9-12 Moderate ≤8 Low
	Landfill Area Visible (m2)	Perceived Area Index - Area/Distance	Value	Angle of Exposed Views (degrees)	Value	Distance to Visible Landfill (m) Incl. Stockpile	Value	VACF	Value	
056	23730	12	2	4	1	1996	2	1	5	10
057	23103	11	2	20	2	2099	2	1	5	11
058	22936	11	2	18	2	2105	2	1	5	11
059	24011	11	2	14	1	2252	1	1	5	9
060	6600	3	1	15.0	1	2457	1	1	5	8
061	4700	2	1	18.3	2	2076	2	1	5	10
062	7220	3	1	15.0	1	2480	1	1	5	8
063	7027	3	1	15.0	1	2396	1	1	5	8
064	5900	3	1	18.5	2	2061	2	1	5	10
065	5500	3	1	18.4	2	1700	2	1	5	10
066	6700	3	1	18.1	2	2106	2	1	5	10
067	6200	3	1	15.0	1	2331	1	1	5	8
068	12642	6	1	29.3	2	1972	2	1	5	10
069	12239	5	1	33.5	3	2243	1	1	5	10
070	11869	5	1	41.4	3	2217	1	1	5	10
071	8443	4	1	19.7	2	1931	2	1	4	9
072	9320	5	1	20.1	2	2037	2	1	5	10
073	9470	5	1	23.2	2	1832	2	1	5	10
074	10697	5	1	21.2	2	2118	2	1	5	10
075	10792	5	1	22.0	2	2124	2	1	5	10
076	12293	5	1	15.0	1	2719	1	1	5	8
077	12123	4	1	15.0	1	2970	1	1	5	8
078	10318	3	1	15.0	1	3271	1	1	5	8
079	9606	3	1	15.0	1	2746	1	1	5	8
080	10882	3	1	15.0	1	3312	1	1	5	8
081	11397	3	1	16.1	2	3535	0	1	5	8
082	10138	3	1	15.0	1	3490	1	1	5	8

September, 2005

*Warwick Landfill Expansion Project
Visual Assessment*

49

Receptor No.	Area			Angle		Distance		Visual Absorption Capability Factor		Total Visual Effect Value 13-20 High 9-12 Moderate ≤8 Low
	Landfill Area Visible (m2)	Perceived Area Index - Area/Distance	Value	Angle of Exposed Views (degrees)	Value	Distance to Visible Landfill (m) Incl. Stockpile	Value	VACF	Value	
083	9826	3	1	15	1	3263	1	1	5	8
084	26370	8	2	19	2	3143	1	1	5	10
085	26241	10	2	21	2	2720	1	1	5	10
086	26943	10	2	21	2	2771	1	1	5	10
087	26899	9	2	15	1	3070	1	1	5	9
088	26863	8	2	15	1	3259	1	1	5	9
089	26453	10	2	22	2	2552	1	1	5	10
090	27536	11	2	22	2	2562	1	1	5	10
091	25895	12	2	26	2	2093	2	1	5	11
092	26083	14	3	31	3	1845	2	1	5	13
093	15200	6	1	0	1	2734	1	1	5	8
094	15294	5	1	1	1	2997	1	1	5	8
095	17108	6	1	10	1	2746	1	1	5	8
096	17012	6	1	9	1	2930	1	1	5	8
097	17272	6	1	16	2	2784	1	1	5	9
098	17327	6	1	15	1	2944	1	1	5	8
099	17179	6	1	13	1	2861	1	1	5	8
100	16923	6	1	6	1	2720	1	1	5	8
101	16983	6	1	3	1	2897	1	1	5	8
102	23448	8	2	21	2	2836	1	1	5	10
103	31461	11	2	15	1	2981	1	1	5	9
104	30574	7	1	15	1	3301	1	1	5	8
105						no view				
106	7200	3	1	14.3	1	2775	1	1	5	8
107	7400	2	1	14.0	1	3137	1	1	5	8
108	8100	3	1	15.0	1	2724	1	1	5	8
109	7650	3	1	15.0	1	2657	1	1	5	8

September, 2005



FROM ZION LINE VIEWING SOUTH WEST

FIG.
4-40

DRN BY SH	DATE	ES/IS/RE
CHK BY	SCALE	
VIEWPOINT 1		

Year 26 - Phase 11 Simulation
WARWICK LANDFILL



BAKER Turner Inc.
Landscape Architecture
June 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FROM ARKONA ROAD AT COUNTY RD 39 VIEWING NORTH WEST

FIG.
4-41

DWN BY: SH
CHK BY: SH
DATE:
SCALE: 23/18/02
VIEWPOINT 2

**Year 26 - Phase 11
Simulation**
WARWICK LANDFILL



BAKER Turner Inc.
Landscape Architecture Site Design
Suite 300(810) Midland Ave. East
Brampton, Ontario L6Y 5G8
Tel: (905) 453-9788 / Fax: (905) 453-9275



FROM COUNTY RD. 39 @ BROWN CREEK VIEWING NORTHWEST

FIG.
4-42

DWN BY: SH
CHK BY:
DATE: 03/18/02
SCALE:
VIEWPOINT 3

Year 26 - Phase 11
Simulation
WARWICK LANDFILL

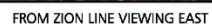


BAKER Turner Inc.
Landscape Architecture
Date: 2008/01/15
Project: Ontario Landfill
1st: 0002 403-9396 / Fax: 0002 403-9375



FROM COUNTY RD. 39 @ ARENA VIEWING NORTH

	<table><tr><td>DWN BY</td><td>SH</td><td>DATE</td></tr><tr><td>CHK BY</td><td>TT</td><td>23/12/22</td></tr><tr><td colspan="3">CANADIAN WASTE SERVICES, INC.</td></tr><tr><td colspan="3">DRAWING NO.</td></tr><tr><td colspan="3">4 - 43</td></tr></table>	DWN BY	SH	DATE	CHK BY	TT	23/12/22	CANADIAN WASTE SERVICES, INC.			DRAWING NO.			4 - 43			<table><tr><td>Year 26 - Phase 11 Simulation</td></tr><tr><td>WARWICK LANDFILL</td></tr></table>	Year 26 - Phase 11 Simulation	WARWICK LANDFILL	VIEWPOINT 4		<table><tr><td></td><td></td></tr><tr><td>Landmark Architecture Site Design</td><td></td></tr><tr><td>Suite 300 6000 Sheppard Avenue East Scarborough, Ontario M1S 1S8</td><td>Tel: (416) 432-2228 Fax: (416) 432-2229 email: info@bticonsulting.com</td></tr></table>			Landmark Architecture Site Design		Suite 300 6000 Sheppard Avenue East Scarborough, Ontario M1S 1S8	Tel: (416) 432-2228 Fax: (416) 432-2229 email: info@bticonsulting.com
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