REPORT

Visual Assessment –
Technical Study Report

DURHAM YORK
RESIDUAL WASTE EA STUDY

REPORT NO. 1009497

EXECUTIVE SUMMARY

Durham and York Regions' proposed Project involves the construction of a Facility to thermally process solid waste that remains after Regional diversion efforts. The Proposed Thermal Treatment Facility (the Facility) would be located approximately 2 kilometres (km) south of Highway 401, between Courtice Road and Osborne Road in Clarington, Ontario. The initial design capacity of the Facility is expected to manage approximately 140,000 tonnes per year (tpy) of waste at the beginning of the planning period. A further analysis of a maximum design capacity scenario with an annual tonnage of 400,000 tpy was also undertaken representing potential waste quantities and future expansion towards the end of the planning period.

This *Visual Assessment Technical Study Report* (Report) outlines the scope of Jacques Whitford Stantec Limited's (JWSL) visual assessment that has been completed for use in the Environmental Assessment (EA) for the Project and includes consideration and assessment of the following:

- The sensitivity of the landscape and the identified receptors to the potential change in the visual aesthetics that could result from the development of the Facility;
- The magnitude of the potential effects on the landscape and the identified receptors resulting from the development of the Facility; and,
- The anticipated overall level of effect on each identified receptor.

The initial phase of the visual impact assessment is a baseline study which describes the existing environment potentially affected within approximately 1 km of the Proposed Thermal Treatment Facility Site (the Site), or the Project Site and Vicinity Study Area (PSVSA) and within 5 km of the Site, or the Local Community Study Area (LCSA).

The visual impact assessment focuses on:

- Visibility of the Durham/York Facility structures;
- Effects on receptors; and,
- Local community viewshed analysis.

This Report includes assessments of the three phases of the Project, construction, operation and post-closure/decommissioning. Visual effects associated with construction could include Site clearing, grubbing, and associated ground disturbance, which may be considered unsightly. Large construction equipment could be visible from different vantages around the Site, potentially resulting in visual disturbances.

The duration of the construction period is currently anticipated to be approximately 30 months. However, construction activities would take place in stages. The early stages of construction could have the greatest potential for visual effects during this period; however, this intensive stage of construction would be of short duration.

The visual effects associated with the Project during operation, as discussed herein, considered the Facility, and specific structures associated with the Facility, including the buildings and Facility stack(s). Both the initial design capacity of 140,000 tpy (140,000 tpy scenario) and potential future expansion maximum design capacity 400,000 tpy scenarios (400,000 tpy scenario) were assessed. The 400,000 tpy scenario would result in the addition of several facility buildings and an additional stack. This larger operation would be contained within the same Facility footprint, and the additional structures would remain adjacent to the existing structures. Overall, the visual difference of the 400,000 tpy scenario Facility compared to the 140,000 tpy scenario Facility would not be considerable.

Within the PSVSA, other industrial facility structures are as visible, if not more visible, than the Facility. Currently, two commercial properties, Copart Auto Auctions and Manheim Oshawa Auctions are situated within the Clarington Energy Business Park. Additionally, as the Facility would be situated between these commercial properties, the Courtice Water Pollution Control Plant and the Clarington Energy Business Park, when travelling along the Highway 401 and local thoroughfares, the addition of the Facility would not represent a considerable change to the current landscape. As outlined in this Report, the visual characteristics of the Facility and the adjacent industrial landscape type are considered to exhibit minimal scenic attributes with respect to landscape distinction.

Within 10 to 20 years, the Clarington Energy Business Park is expected to be further built-out to include the proposed Energy Drive, OPG Building and OPG Visitors Centre. Additionally, the Highway 407 expansion would include interchange ramps with Highway 401 to the north of the Site may result in a greater number of receptors within the PSVSA. The development timeframe for the proposed facilities and infrastructure is not currently known, thus the level of potential cumulative effect cannot be readily determined. The construction and operation of these additional facilities may overlap with either the 140,000 or 400,000 tpy capacity Facility.

The visual effects associated with post-closure/decommissioning, are expected to be similar to those experienced during construction and of similar duration. Demolition and removal of structures at the Facility would likely occur first and could be the most visually apparent phase of the decommissioning, despite its expected short-term timeframe. These activities could potentially include the presence of piles of debris, demolition equipment, and land remediation activities on the Site. Decommissioning of the Facility was concluded to result in minimal visual effects.

The Facility would be visible from around the PSVSA, and no mitigation is possible to reduce the visual effects of the Facility due to the minimal viewing distance from the adjacent roadways to the activities. The presence of the Facility cannot be readily shielded from the adjacent roadways, and would result in a change to the existing local landscape for the duration of the operational period for the Facility. As described in the Host Community Agreement, Durham will incorporate a cash allowance of up to nine million dollars in the RFP for the provision of architectural treatments and upgrades to the Facility.

Receptors within the LCSA would remain largely unaffected by activities during the construction and operational periods of the Facility. During the post-closure period, there could be minimal visual effects during the early phase of decommissioning, as tall structures are dismantled. The overall effects of decommissioning could be positive as the activities could result in a less obstructed skyline. However, at the time of decommissioning, the Clarington Energy Business Park would be built-out such that

these additional facilities and structures would act to obstruct the view of the activities on the Site for many nearby receptors within the PSVSA. These activities would be temporary in nature and the overall effect experienced by receptors for the post-closure period is anticipated to be minimal.

To reduce the potential visual impact of the overall Facility, as described in the Host Community Agreement, Durham will incorporate a cash allowance of up to nine million dollars in the RFP for the provision of architectural treatments and upgrades to the Facility to reduce the visual distraction that could result from the presence of the structures. Further, hedgerows and small woodlots occur throughout the LCSA, providing some visual obstruction from various vantages. Additionally, a berm of approximately 350 m by 800 m with an average elevation of 25 to 30 m is situated to the east of the Site, associated with the Ontario Power Generation's Darlington Nuclear Generating Station. This berm could block much of the visual effects to the east. If visual concerns are raised by receptors in the vicinity of the Facility then various strategies towards mitigating these effects could be assessed, such as possibly planting trees or other suitable vegetation at the receptor location to provide a screen against the line of the sight of the Facility.

The potential for visual effects from the development of a Facility is highly subjective and varies across receptors. However, due to the presence of existing industrial structures and commercial buildings a certain level of visual impact is already present. The presence of the OPG buildings and the Highway 407 interchange ramps would act to obstruct the view of the Facility from certain perspectives from the north of the Site. As the Clarington Energy Business Park is built-out, the cumulative effect of the Facility, in addition to disclosed future projects within the PSVSA, would be expected to decrease as the landscape sensitivity and magnitude rankings would decrease.

The Facility is being constructed in an area that is not a pristine landscape but, rather, one that has already been, and is expected to be continue to be, influenced by human activities. As a result, the cumulative effect of the Facility in addition to other planned and disclosed future projects, given the presence of the other existing structures in the landscape, would have a minimal effect on the landscape, while having an overall medium level effect on some receptors within the PSVSA and LCSA.

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GLOSSARY AND ABBREVIATIONS

** An asterisk (*) beside a defined term indicates that the term is defined in the Environmental Assessment Act.*

Alternatives:	Both alternative methods and alternatives to a proposed undertaking.
Alternative Methods:	Alternative methods of carrying out the proposed undertaking are different ways of doing the same activity. Alternative methods could include consideration of one or more of the following: alternative technologies; alternative methods of applying specific technologies; alternative sites for a proposed undertaking; alternative design methods; and, alternative methods of operating any facilities associated with a proposed undertaking.
Alternatives To:	Alternatives to the proposed undertaking are functionally different ways of approaching and dealing with a problem or opportunity.
Buffer Area:	That part of a disposal site or facility that is not a waste fill area (in the case of a landfill) or is not occupied by a building. (i.e., area between actual facility and the property boundary).
Certificate of Approval:	A license or permit issued by the Ministry of the Environment for the operation of a waste management site/facility.
Durham:	The Regional Municipality of Durham or its geographic area, as the context requires.
Durham/York Residual Waste Study:	The Durham/York Residual Waste Study is a joint initiative between the Region of Durham and York Region to work together to find a way to manage solid waste remaining after at-source diversion.
Energy-from-Waste (EFW):	The recovery of energy in the form of heat and/or power from the thermal treatment of waste. Generally applied to incineration, pyrolysis, gasification but can also include the combustion of landfill gas and gas produced from anaerobic digestion of organic materials.

Environment*:	The environment is broadly defined under the Environmental Assessment Act as follows: (a) Air, land or water; (b) Plant and animal life, including human life; (c) The social, economic and cultural conditions that influence the life of humans or a community; (d) Any building, structure, machine or other device or thing made by humans; (e) Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or, (f) Any part or combination of the foregoing and the interrelationships between any two or more of them.
Environmental Assessment:	Environmental assessment is a study, which assesses the potential environmental effects (positive or negative) of a proposal. Key components of an environmental assessment include consultation with government agencies and the public; consideration and evaluation of alternatives; and, the management of potential environmental effects. Conducting an environmental assessment promotes good environmental planning before decisions are made about proceeding with a proposal.
Environmental Assessment Act:	The *Environmental Assessment Act* (and amendments and regulations thereto) is a provincial statute that sets out a planning and decision-making process to evaluate the potential environmental effects of a proposed undertaking. Proponents wishing to proceed with an undertaking must document their planning and decision-making process and submit the results from their environmental assessment to the Minister for approval.
Environmental Effect:	The effect that a proposed undertaking or its alternatives has or could potentially have on the environment, either positive or negative, direct or indirect, short- or long-term.
Government Review Team:	Staff from government ministries and agencies (federal; provincial, including local Conservation Authorities; and, municipal, including local Boards of Health) who contribute to the review of environmental assessment documentation (terms of reference and environmental assessment) by providing comments from their mandated areas of responsibility.

Impact Management Measures:	Measures which can lessen potential negative environmental effects or enhance positive environmental effects. These measures could include mitigation, compensation, or community enhancement.
Impact Studies:	Studies that predict negative consequences (if any) of a proposed undertaking. Air, Visual, Natural Environmental, Traffic, Hydrogeological, Noise, Health Risk, Land Use and Hydrological Impact Studies are required under the *Environmental Protection Act*.
Individual Environmental Assessment:	An Individual Environmental Assessment requires the following steps to fully address the requirements of the EAA: Preparation of the Proposed EA Terms of Reference; Submission of the EA Terms of Reference to the Minister of the Environment for Approval; Completion of the EA Study in accordance with approved EA Terms of Reference, and; Submission of the EA Study to the Minister of the Environment for Approval.
Ministry of the Environment (MOE) Ontario:	The MOE monitors pollution and restoration trends in Ontario and uses that information to develop environmental laws, regulations, standards, policies, programs, and guidelines. The MOE works to provide cleaner air, land, and water for Ontarians.
Mitigation:	Measures taken to reduce adverse impacts on the environment.
Municipal Solid Waste (MSW):	Common garbage or trash generated by industries, businesses, institutions, and homes.
Ontario:	The Province of Ontario, or its geographic area, as the context requires.
Post-Closure:	The time period, following the shutdown of a landfill, waste management or manufacturing facility; established for monitoring purposes.
Project:	Encompasses the design, construction (including construction financing) and operation of the EFW Facility, and includes, the EA Study, the supply of municipal waste, and the sale of energy.

Proponent*:	A person, agency, group or organization that 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.
Regions:	Durham and York collectively.
Relief:	The topographical difference in elevation between the high and low points in a landscape.
Residual:	Amount of a pollutant remaining in the environment after a natural or technological process has taken place; e.g., the sludge remaining after initial wastewater treatment, or particulates remaining in air after it passes through a scrubbing or other process.
Siting:	The process of choosing a location for a facility.
Slope:	An inclined surface, the gradient of which is determined by the amount of inclination from horizontal.
Stack:	A smokestack, or vertical pipe that discharges flue gas or used air.
Stakeholder:	Any organization, governmental entity, or individual that has a stake in or may be impacted by a given approach to environmental regulation, pollution prevention, energy conservation, etc.
Storey:	The space in a building between two adjacent floor levels.
Terrain:	The landscape or lay of the land. The physical features of a tract of land; e.g., landform (or surface expression), active and inactive processes that modify material and form, slope, aspect and drainage conditions. Terrain analysis is the identification of the above land surface features, to a more or less defined depth and determining their areal extent. The identification of special features such as permafrost, erosion, and landforms indicating subsurface structures are included in such analyses.
Topography:	The physical features of a district or region, such as those represented on a map, taken collectively; especially the relief and contours of the land. On most soil maps topography may also mean topography classes that describe slopes according to standard ranges of percent gradient.

Terms of Reference:	A document prepared by the proponent and submitted to the Ministry of the Environment for approval. The terms of reference sets out the framework for the planning and decision-making process to be followed by the proponent during the preparation of an environmental assessment. In other words, it is the proponent's work plan for what is going to be studied. If approved, the environmental assessment must be prepared according to the terms of reference.
Thermal Treatment:	Use of elevated temperatures to treat wastes (e.g., combustion or gasification).
Undertaking*:	An enterprise, activity or a proposal, plan, or program that a proponent initiates or proposes to initiate.
Viewscape:	A visual connection that occurs between a person and the spatial arrangement of urban and landscape features. A viewscape is composed of: ▪ View subject – the view must be of something; ▪ Vantage point – the view must be from some place; and, ▪ Visual corridor – the area extending out from the vantage point.
Viewshed:	The area from which a line of sight on an object is available.
Waste-to-Energy (WTE) Facility/Municipal-Waste Combustor:	Facility where recovered municipal solid waste is converted into a usable form of energy, usually via combustion.
York:	The Regional Municipality of York or its geographic area, as context requires.

List of Abbreviations

2D	2-dimensional
3D	3-dimensional
CN	Canadian National
CP	Canadian Pacific
EA	Environmental assessment

ESRI	Environmental Systems Research Institute, Inc.
GIS	Geographic Information System
ha	Hectares
LCSA	Local Community Study Area
MOE	Ontario Ministry of the Environment
OBM	Ontario Base Mapping
OPG	Ontario Power Generation
PSVSA	Project Site and Vicinity Study Area
RFP	Request for Proposals
RFQ	Request for Quotations
RSA	Regional Study Area
ToR	Terms of Reference
Tpy	Tonnes per year

UNITS OF MEASUREMENT

Area

km	kilometre
m	metre
m^3	cubic metre

Miscellaneous

°C	temperature in degrees Celsius
N/A	not available
%	percent

REPORT

1.0 INTRODUCTION

Durham and York Regions (the Regions) have partnered to undertake a joint Residual Waste Planning Environmental Assessment (EA) Study. Both municipalities are in need of a solution to manage the residual solid waste that remains after diversion. The Regions are working together to address the social, economic, and environmental concerns through an Environmental Assessment (EA) Study process to examine potential long-term residual waste management alternatives.

1.1 The Environmental Assessment Process

The purpose of the undertaking (i.e., what the outcome of this EA Study is intended to do) as described in the Approved EA Terms of Reference is:

> *"To process - physically, biologically and/or thermally - the waste that remains after the application of both Regions' at-source waste diversion programs in order to recover resources - both material and energy - and to minimize the amount of material requiring landfill disposal. In proceeding with this undertaking only those approaches that will meet or exceed all regulatory requirements will be considered."*

The EA Study follows a planning approach where environmental constraints or opportunities are considered in the context of the broadly defined environment under the *Environmental Assessment Act* (EAA) (i.e., the natural environment as well as the social, economic and heritage and other "environments" relevant to the undertaking) and potential effects are understood and addressed before development occurs. In accordance with the Approved EA Terms of Reference and EAA, the EA process evaluates: alternatives considering potential effects on the environment; the availability of mitigation measures that address, in whole or in part, the potential effects; and, the comparison of the advantages and disadvantages of the remaining or "net" effects. The result of this process provides the planning rationale and support for a preferred approach and method to implement the undertaking.

It is understood and contemplated that environmental management measures recommended as part of the EA process and this Technical Study Report will in many cases be refined, updated, modified and/or superceded as a result of subsequent approval processes.

The EA document has been prepared and conducted in accordance with the EAA, and in accordance with the Terms of Reference approved by Ontario's Minister of the Environment on March 31, 2006. There are currently no federal environmental assessment process triggers identified and, therefore, this project does not require approval under the *Canadian Environmental Assessment Act* (CEAA).

This EA process essentially consists of three parts taking place in stages including:

- the Development and Approval of an EA Terms of Reference,

- the evaluation of “Alternatives to” the undertaking; and,
- the evaluation of “Alternative methods” of implementing the undertaking.

The Environmental Assessment Report to which this Technical Study is appended provides a detailed description of the EA process undertaken as part of the Durham/York Residual Waste EA Study.

1.2 Purpose of the Report

This Report entitled the *Visual Assessment - Technical Study Report* has been prepared for the Proposed Thermal Treatment Facility Site (the Site), Clarington 01. This Report reviews potential visual impacts, potential mitigation required, potential net effects and impact management measures. This report will form part of the supporting documentation and materials for the “Description of the Undertaking”, completed as part of the EA Study.

A more detailed assessment of the potential visual effects associated with the preferred architectural design would be completed by the vendor as part of the *Environmental Protection Act* application (as outlined in the Regional Municipalities of Durham and York RFP-604-2008 to Design, Build, Operate and Maintain an Energy from Waste Facility).

1.3 Overview of Report Contents

This Report describes the existing visual conditions related to the preferred “Alternative method”, Clarington Site 01 (the Site), followed by an effects analysis including net effects of the Project on the subject aspect(s) of the environment and summary of the required monitoring. The key components of the Report are as follows:

- An explanation of the study methodology, assumptions and limitations is located in Section 2.0;
- A description of existing visual conditions of the Project Site and Vicinity Study Area (PSVSA) and Local Community Study Area (LCSA) is included in Section 3.0;
- The results of the analyses, including the viewshed effect on the PSVSA and LCSA, and the assessment of visual effects on receptors is located in Section 4.0;
- Impact management is discussed in Section 5.0; and,
- A description of net effects is located in Section 6.0.

The information contained in this Report has been used to complete the EA.

2.0 STUDY METHODOLOGY

The visual analysis conducted for the Project used techniques that illustrate potential visual effects and are generally based on the planning approach and graphic communication techniques, as demonstrated in *Guidelines for Landscape and Visual Impact Assessment* (1st Edition) (The Landscape Institute, 2002).

2.1 Visual Sensitivity

Impacts on a landscape are related to the potential effects of a development on the physical characteristics, quality and unique features of the landscape (i.e., topography, geology, vegetation and cultural features). Visual impacts are related to the effects on the views of the landscape from visual receptors (i.e., residents, workers, tourists) and on the amenities experienced by the visual receptors. The sensitivity of a viewscape depends upon its nature, quality and condition while the sensitivity of viewers depends on their distance from the development and viewing opportunities (i.e., permanent resident, passerby or tourist). Therefore, a permanent resident could have a higher sensitivity than people who may only have a passive interest in the landscape, such as passing motorists. Sensitivity of a viewer also depends on their subjective level of interest or feelings for the subject matter.

Landscape and visual impacts may potentially arise from the following:

- Construction of the Facility, including permanent loss of existing landscape features;
- Operation of the Facility including permanent structures, landscaping and visible lighting; and,
- Decommissioning/Post-Closure of the Facility, including potential activities such as demolition, waste removal and remediation/restoration.

The initial design capacity of the Facility is 140,000 tonnes per year (tpy) of waste. A further analysis of a maximum design capacity of 400,000 tpy was also undertaken representing potential waste quantities and future expansion towards the end of the planning period.

Impacts on a visual landscape are described as having a minimal, medium or high effect. The severity of the effect is dependent upon the magnitude of change and the sensitivity of the landscape or viewer to the change. Table 2-1 below provides a summary of the definitions of magnitude and sensitivity.

Table 2-1 Definitions of Impact Magnitude and Sensitivity

		Magnitude	Sensitivity
Minimal	Landscape	Almost imperceptible change in components or character of the landscape.	A landscape which is not valued for its scenic quality and tolerant of substantial change.
	Visual	Few viewers affected by minor changes in view of landscape.	A viewer with passing interest in their surroundings, e.g., motorists.
Medium	Landscape	Moderate change in landscape components and character.	A moderately valued landscape, perhaps a locally important landscape, tolerant of some change.
	Visual	Many viewers affected by moderate changes in views.	A viewer with moderate interest in their environment, e.g., users of recreational facilities.
High	Landscape	An obvious change in landscape components over an extensive area.	A landscape of particularly distinctive character or nationally valued for its scenic quality.
	Visual	Many viewers affected by obvious changes in view.	A viewer with proprietary interest and prolonged viewing opportunities, e.g., resident.

The level of impact is described as being minimal, medium, or high and impacts can either be positive or negative. The levels of impact may be used to standardize results of the assessment. Table 2-2 below provides the definitions of the levels of anticipated impact.

Table 2-2 Definition of Levels of Impact

	High Magnitude of Landscape Change	Moderate Magnitude of Landscape Change	Low Magnitude of Landscape Change
High Landscape or Viewer Sensitivity	High	Medium/High	Minimal/Medium
Moderate Landscape or Viewer Sensitivity	Medium/High	Medium	Minimal
Low Landscape or Viewer Sensitivity	Minimal/Medium	Minimal	No impact

Effects on landscape characteristics relate to the quality of what people see from places they commonly visit. Levels of effect for viewers should take into consideration the number of viewers affected. If many viewers are affected, the overall level of effect would usually be higher than otherwise expected; if few viewers are affected it would be lower. The level of impact can be affected by the topography of the study area (rolling terrain minimizes views), distance (as distance increases the ability to detect

detail decreases) and position of the viewer (facing towards the east or west), unique landscape characteristics (i.e., waterfall or bedrock outcrop) and conspicuous (natural landforms) or inconspicuous (extensively disturbed) landscape patterns.

2.2 Study Areas

The study areas identified are used for the purposes of this *Visual Assessment Technical Study Report*.

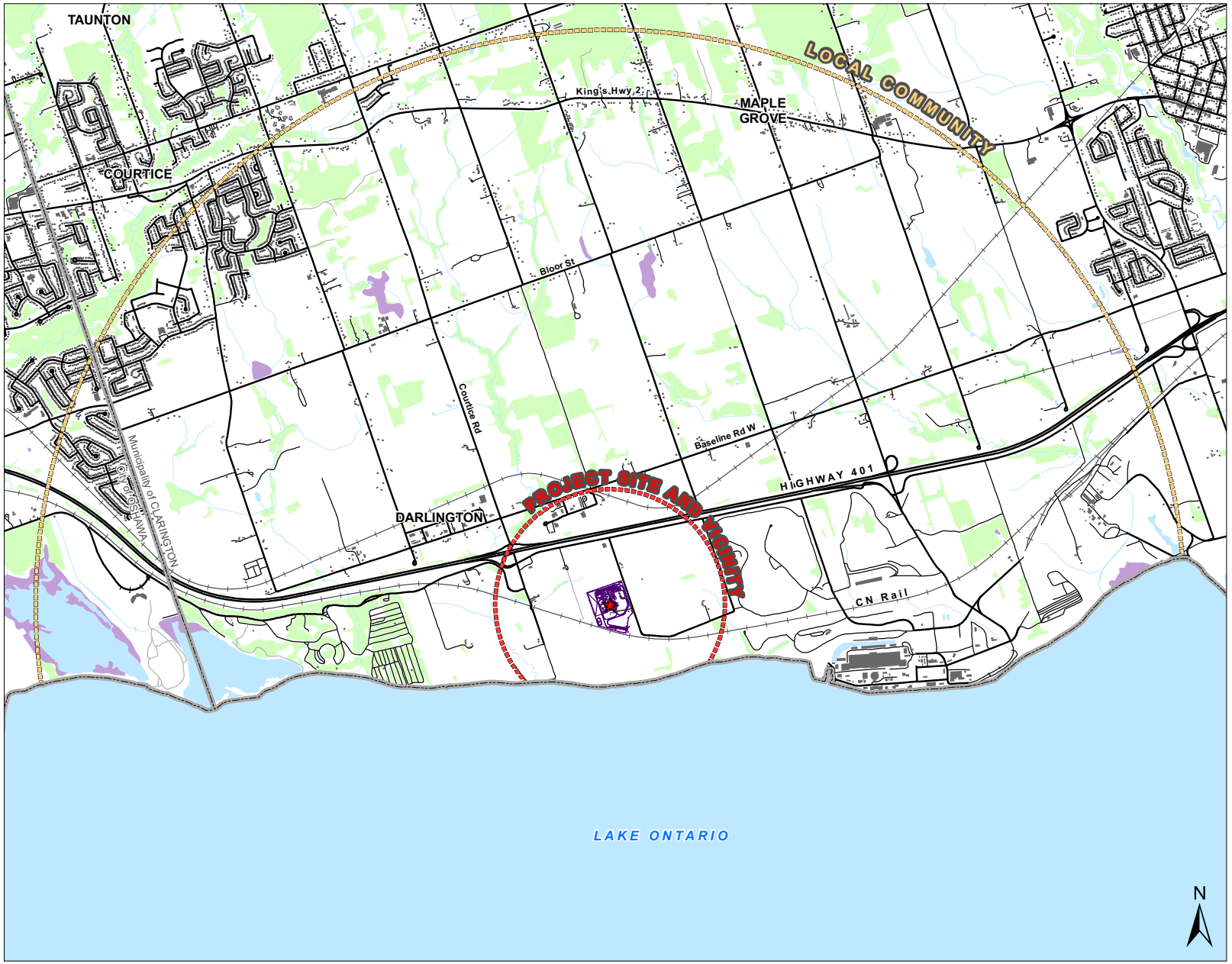
Examination of land use within a one kilometre (km) radius around the Site was determined to be appropriate based on professional judgment and experience in undertaking similar studies for the siting of industrial facilities. Research completed to date on thermal treatment facilities suggests that a 1 km radius from the Site is more than adequate to address potential impacts within the immediate vicinity of the Site or the Project Site and Vicinity Study Area (PSVSA) (Figure 2-1). This research includes the Generic Human Health and Ecological Risk Assessments which were completed by Durham and York Regions in 2007 (Jacques Whitford, 2007).

A Local Community Study Area (LCSA) consisting of a 5 km radius was selected, to include any potential visual effects on the surrounding landscape to the general extent that the Facility is visible to the wider community (Figure 2-1). This larger community area addresses viewshed areas that may be able to discern the Facility from a distance. It is believed that areas beyond that distance would not be adversely affected by the presence of the Facility as increasing distance is correlated with a decreasing ability to detect visual details and thus is associated with a higher probability that intervening features such as vegetation, buildings or other features would figure more prominently in the landscape. In addition, as the distance from the Facility increases the level of impact decreases.

2.3 Methods

The approach in conducting the assessment involved the mapping of the landscape of the LCSA, then assessing these specific components of the landscape with respect to the Project, as viewed from selected points of view in and around the Site. This assessment takes into consideration the viewshed of identified receptors within the PSVSA and LCSA of the Project.

The following sections outline the methodology used in the Visual Impact Assessment.



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Project Site and Vicinity and Local Community Study Areas

- Stack Location
- Building
- Site Plan (From Covanta Energy Inc. "Base Case Site Plan", Drawing M-2000)
- Primary Access
- Secondary Access
- Tertiary Access
- Railway
- Watercourse
- Building
- Waterbody
- Wetland Area
- Wooded Area
- Municipality Boundary
- Project Site and Vicinity Study Area (Approximate 1 km Project Buffer)
- Local Community Study Area (Approximate 5 km Project Buffer)

0 500 1,000 1,500

Metres - 1:32,500

JW-1009497-NS2-1

MB QC ON USA Area of Interest

Jacques Whitford

FIGURE NO.

2-1

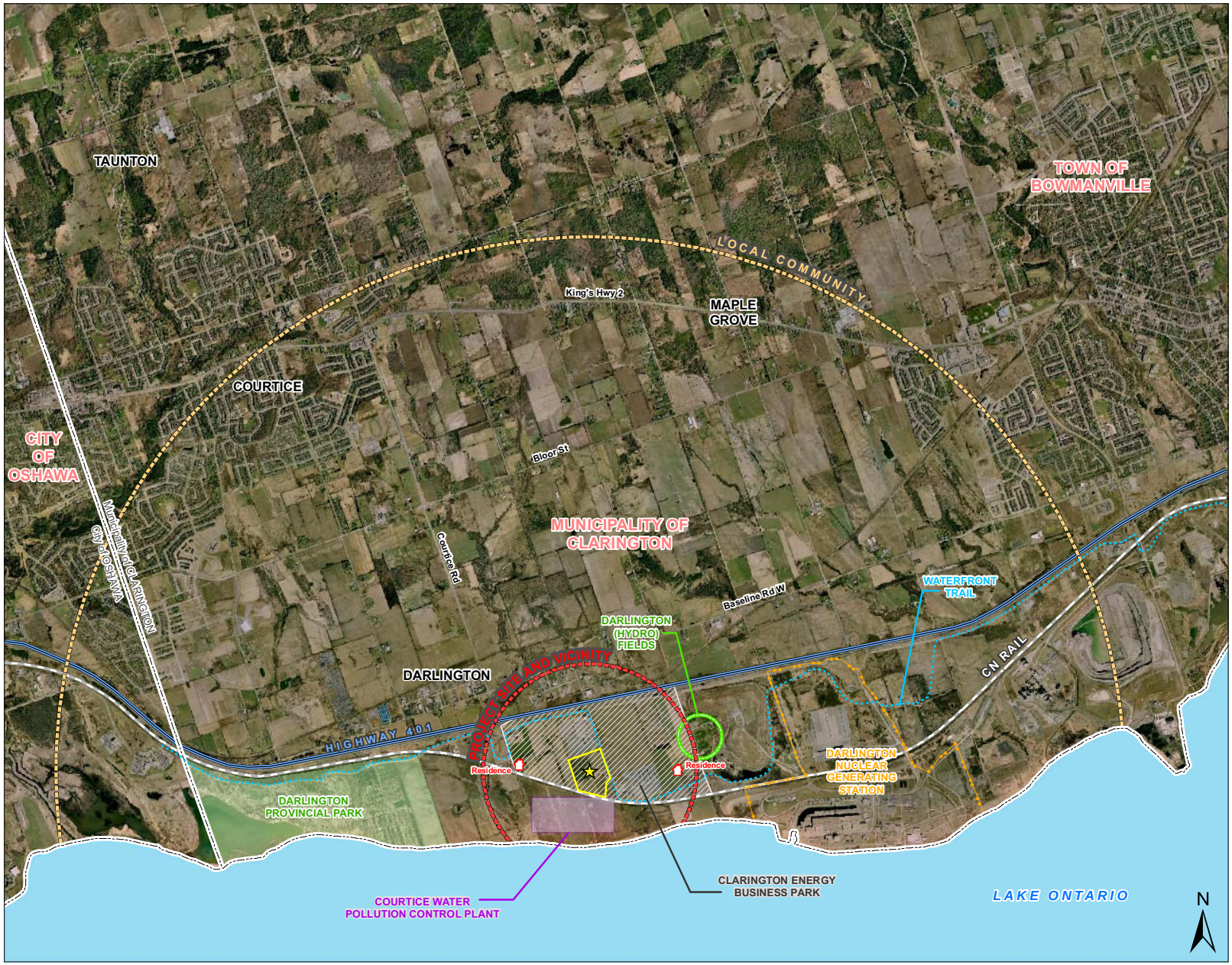
Last Modified: May 5, 2009 By: L. Marshall

2.3.1 Potential Sensitive Receptors

A number of residential as well as recreational features, businesses, and public facilities and institutions located within the vicinity of the PSVSA and LCSA were identified to assist with the consideration of potential visual effects that may result from the Project. These receptors are outlined below:

- *Clarington Energy Business Park* – the Site is located within the Park (currently includes the two existing commercial operations Copart Auto Auctions and Manheim Oshawa Auctions);
- *Courtice Water Pollution Control Plant* – located just south of the Site;
- *CN Rail* – VIA Rail passenger trains and CN cargo trains– located adjacent to the south boundary of the Site;
- *Highway 401 users* - The nearest major intersection is Highway 401 and Courtice Road, which is approximately 2 km to the north of the Site;
- *Waterfront Trail users* – the Waterfront Trail runs west to east along the shore of Lake Ontario, and loops around the Site to the north;
- *Residences* - The nearest residential area designated as future urban residential is 3 km northwest of the Site in the vicinity of Bloor Street and Townline Road, in the community of Courtice. Two existing residences are located northwest of property (one of which is abandoned) and one is located to the east;
- *Darlington (Hydro) Sport Fields* (*Ontario Power Generation*) – recreational users of the sport fields (upper and lower), located 1 km to the east (Note: for the purposes of this assessment, impacts were modelled for the lower sports fields due to proximity to the Site);
- *Darlington Nuclear Generating Station* (*Ontario Power Generation*) - located approximately 2 km to the east;
- *Darlington Provincial Park* – potential receptors include day users and campers, located approximately 2 km to the west;
- *Municipality of Clarington* – the municipality that the Project is located within;
- *Town of Bowmanville* – the outskirts of which are located approximately 5 km to the northeast; and,
- *City of Oshawa* – the outskirts of which are located approximately 5 km to the west (for the purposes of this assessment, the community of Courtice [approximately 4 km northwest of the Site] is included with Oshawa as one receptor).
- *Proposed 407 Expansion* – The Highway 407 extension interchange ramps are proposed to connect with Highway 401 north of the site.
- *Proposed OPG Administrative Building* – OPG purchased a 61 acre property within the Clarington Energy Business Park for potential future office space and a visitors' centre. The site is currently vacant.

Refer to Figure 2-2 for a map of these receptors, in relation to the PSVSA, the LCSA and the proposed footprint of the Facility.



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Potentially Affected Receptors within the Region

- Stack Location
- Project Area
- Municipality Boundary
- Project Site and Vicinity Study Area (Approximate 1 km Project Buffer)
- Local Community Study Area (Approximate 5 km Project Buffer)

0 500 1,000 1,500

Metres - 1:35,000

JW-1009497-NS2-2

MB QC ON USA Area of Interest

Jacques Whitford

FIGURE NO.

2-2

Last Modified May 05, 2009 By L. Kimball

2.3.2 Viewshed Analysis

JWSL used Environmental Systems Research Institute, Inc. (ESRI) Geographic Information Systems (GIS) software to compute a "Viewshed Analysis" for the Visual Impact Assessment. This analysis uses the topographic surface model as the base, along with additional available 3-dimensional (3D) spatial features, to model all areas that are visible from a "source". In this case, the source is the stack of the Facility (one stack in the initial design capacity of 140,000 tpy [140,000 tpy] scenario and two stacks in the maximum design capacity of 400,000 tpy [400,000 tpy scenario]).

Software:

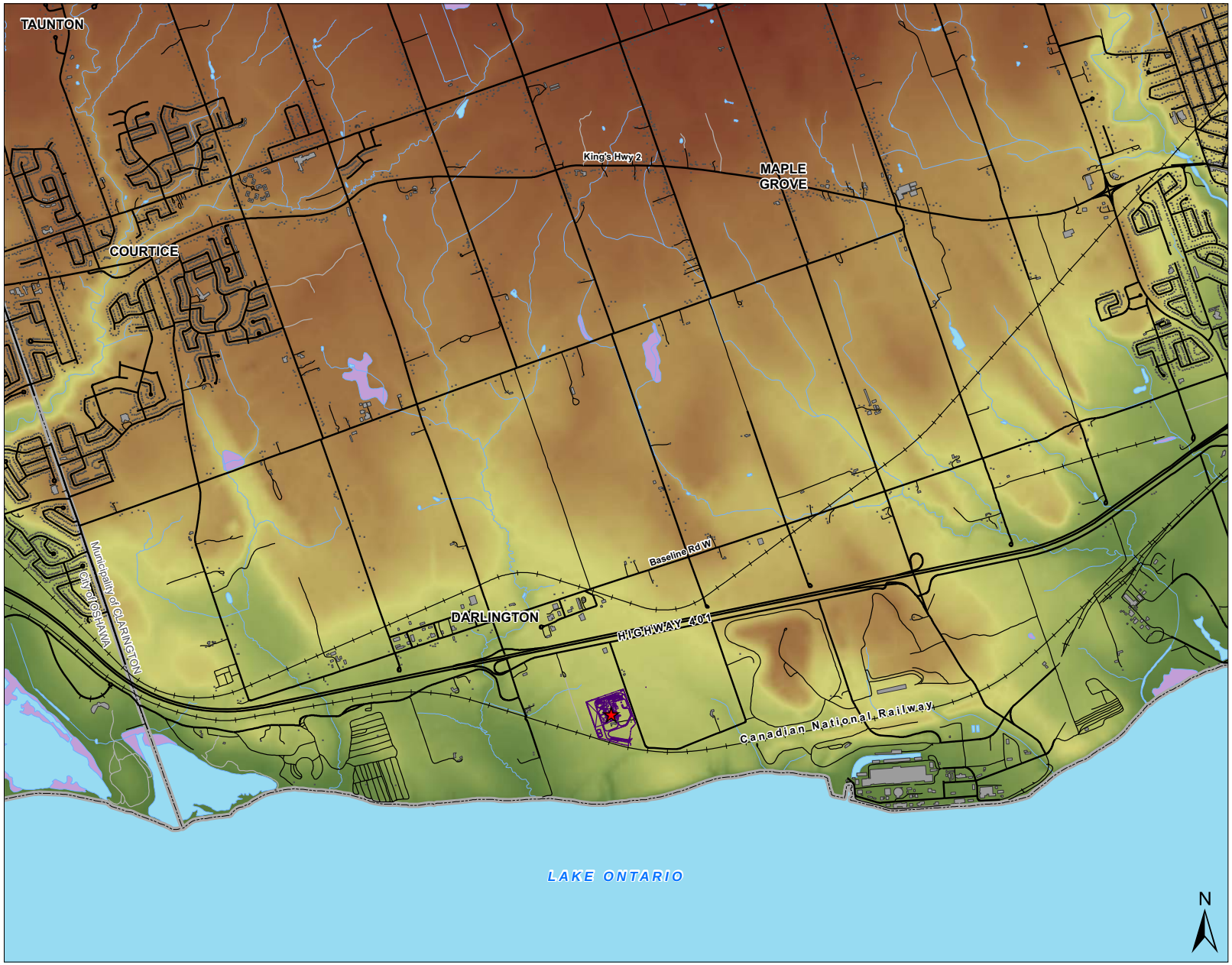
The viewshed analysis was done using ESRI ArcINFO 9.2 with ESRI 3D Analyst Extension. All mapping has been prepared in ESRI ArcMap 9.2. The Photo Montages were rendered using ESRI ArcScene 9.2 and graphically prepared in CorelDRAW 10.

2.3.2.1 Local Community Detailed Model (Worst-Case)

The viewshed was performed using a 10 metre (m) resolution surface model platform (Figure 2-3). The surface model was enhanced by the addition of 3D woodlot coverage provided by the Ministry of Natural Resources (2008) and building polygons available from 1:10,000 planimetric mapping. All woodlot polygons were assigned a global 10 m height value. All building polygons were assigned a global 5 m height value.

An observer point for the viewshed model was established as being the top of the stack that is part of the proposed infrastructure as this is the highest structure on the Site and is anticipated to be the primary feature of the Facility that would be visible at a distance. The stack location was taken from a preliminary Site plan prepared by Covanta Energy Corporation (Covanta) of the Facility (Figure 2-4), which illustrates the proposed layout for the 140,000 tpy scenario (April 2009). Figure 2-5 illustrates the layout of the 400,000 tpy scenario, which includes two stacks. The observer point (each stack) was then assigned the height value of 87.6 m (to the top of the flue). Facility components for both the 140,000 and 400,000 tpy scenarios are identified on Figures 2-4 and 2-5. For a more detailed description of the Facility components and its operations, please refer to Section 10 of the EA Study document.

While other Facility components, such as the transmission yard, storage and handling areas and buildings would add to the visual landscape, the stack would remain the most highly visible component across the PSVSA and LCSA. Additionally, the elevated receiving area above Energy Drive would likely contribute to the visual effects of the facility considering it is located at the north end of the facility and likely visible from within the CEBP. However, no internal road networks were modelled as part of this study. Table 2-3 identifies the estimated heights of the modelled Facility components (see Figures 2-4 and 2-5).



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Digital Terrain Model (10 metre)

- Stack Location
- Building
- Site Plan (From Covanta Energy Inc. "Base Case Site Plan", Drawing M-2000)
- Primary Access
- Secondary Access
- Tertiary Access
- Railway
- Watercourse
- Building
- Waterbody
- Wetland Area
- Municipality Boundary

Terrain Model (10m Grid)

Elevation (m)

High : 161.231

Low : 58.0241

0 400 800 1,200

Metres - 1:30,000

JW-1009497-NS2-3

MB QC ON USA Area of Interest

Jacques Whitford

FIGURE NO.

2-3

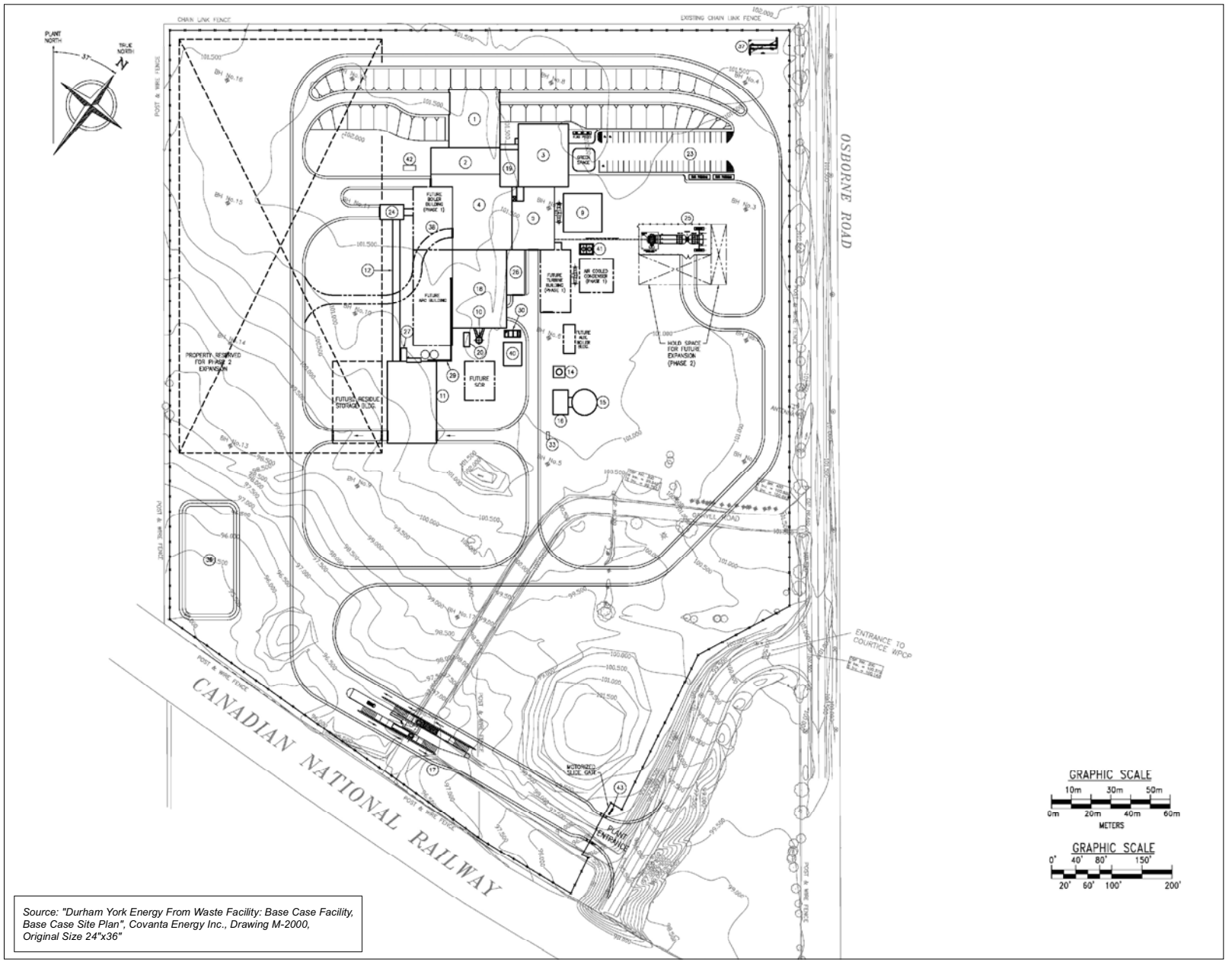
Last Modified: April 28, 2009 By: L. Kendall

Table 2-3 Facility Component Estimated Height Values

Site Feature	Height (m)
Stack(s)	87.6
Tipping Floor	13.9
Refuse Building	34.9
Control/Electrical Rooms	12.1
Air Cooled Condenser	5
Administration Building	6.7
Boiler Building	34.9
Turbine Building	12.1
FDG/APC Building/Baghouse Building	31
APC Building	31
Residue Storage Building	10.1
Maintenance and Storage Building	12.1
ID Fan VFD Building	10
Fire Water Pump House	10
Fire Water Storage Tank	8

*NOTE: Estimated heights are for both 140,000 and 400,000 tpy scenario components, based on conceptual drawings of the Facility created by Covanta.

Artistic renderings of the Site, prepared by Covanta for the 140,000 tpy scenario, are included as Figure 2-6. Figures 2-7 and 2-8 are illustrations of the conceptual Site layout, based on the layouts presented in Figures 2-4 and 2-5.



Source: "Durham York Energy From Waste Facility: Base Case Facility, Base Case Site Plan", Covanta Energy Inc., Drawing M-2000, Original Size 24"x36"

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Durham/York Thermal Treatment Facility Site Layout (140,000 tpy Scenario)

LEGEND

1. TIPPING FLOOR
2. REFUSE BUILDING
3. ADMINISTRATION BUILDING
4. BOILER BUILDING
5. TURBINE BLDG.
6. NOT USED
7. NOT USED
8. NOT USED
9. AIR COOLED CONDENSER
10. STACK
11. RESIDUE STORAGE BUILDING
12. INCLINED BELT CONVEYOR GALLERY ENCLOSURE
13. NOT USED
14. AMMONIA STORAGE TANK & CONTAINMENT
15. FIRE WATER STORAGE TANK
16. FIRE WATER PUMP HOUSE
17. TRUCK SCALE AREA
18. FDG/APC BUILDING/BAGHOUSE BLDG.
19. CONTROL/ELECTRICAL ROOMS
20. CEMS BUILDING
21. NOT USED
22. NOT USED
23. PARKING LOT
24. GRIZZLY BUILDING
25. SWITCHYARD
26. MAINTENANCE AND STORAGE BUILDING
27. RESIDUE PROCESSING ELECTRICAL BUILDING
28. NOT USED
29. FLY ASH TRANSPORT CONVEYORS
30. SETTLING BASIN
31. NOT USED
32. NOT USED
33. MAINT. TRUCK DIESEL OIL STORAGE TANK
34. NOT USED
35. NOT USED
36. RETENTION POND
37. GAS METERING STATION
38. GRAVEL ACCESS ROAD
39. NOT USED
40. ID FAN MTD BUILDING
41. CLOSED COOLING WATER HEAT EXCHANGER
42. EMERGENCY DIESEL GENERATOR ENCLOSURE
43. PLANT ENTRANCE SIGN

JW-1009497-NS2-4

Jacques Whitford

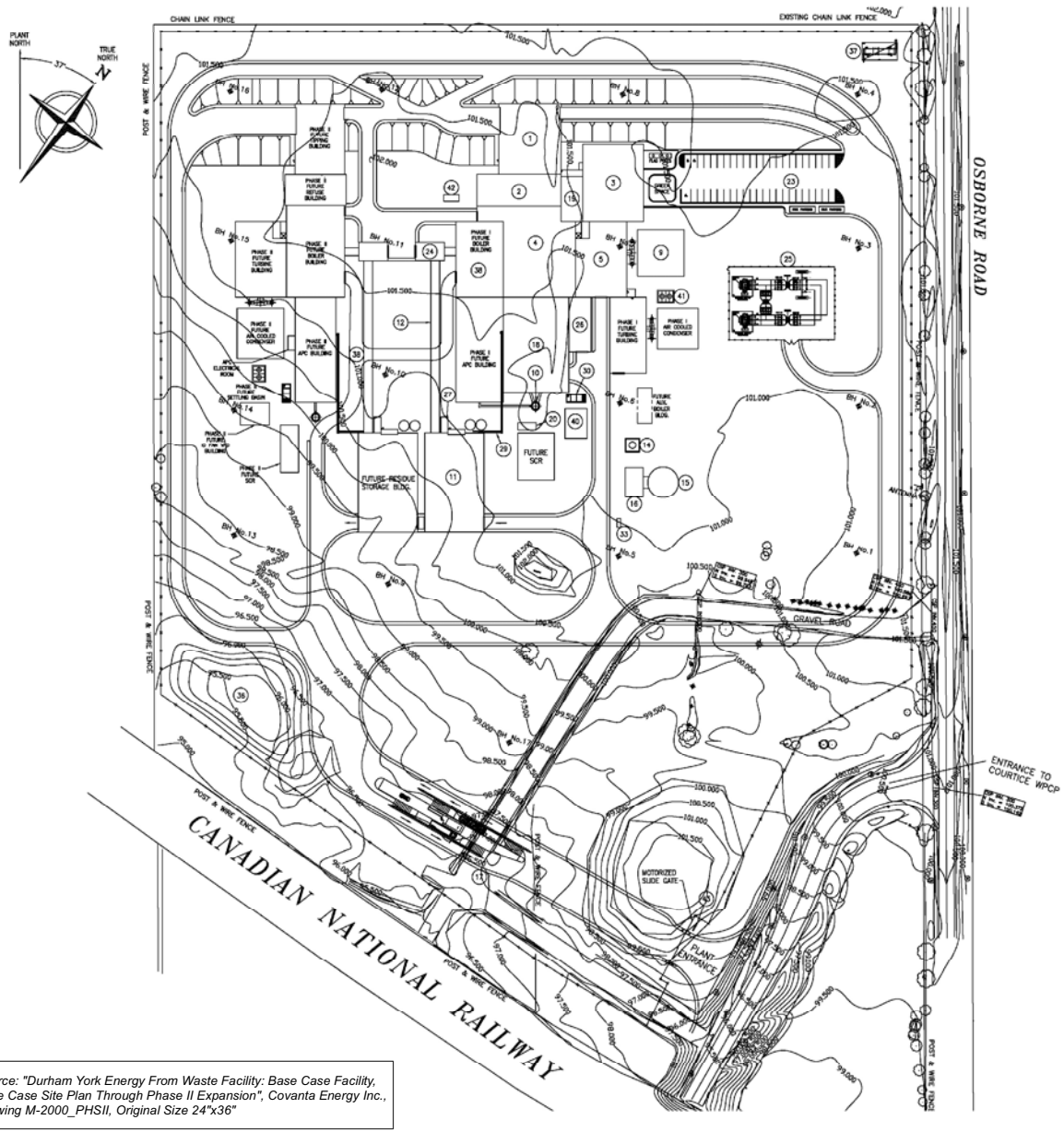
FIGURE NO.

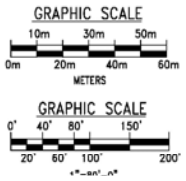
2-4

Last Modified: June 3, 2009 By: L. Kendall

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Durham/York Thermal Treatment Facility Site Layout (400,000 tpy Scenario)





Source: "Durham York Energy From Waste Facility: Base Case Facility, Base Case Site Plan Through Phase II Expansion", Covanta Energy Inc., Drawing M-2000_PHSII, Original Size 24"x36"

LEGEND

1. TIPPING FLOOR
2. REFUSE BUILDING
3. ADMINISTRATION BUILDING
4. BOILER BUILDING
5. TURBINE BLDG.
6. NOT USED
7. NOT USED
8. NOT USED
9. AIR COOLED CONDENSER
10. STACK
11. RESIDUE STORAGE BUILDING
12. INCLINED BELT CONVEYOR GALLERY ENCLOSURE
13. NOT USED
14. AMMONIA STORAGE TANK & CONTAINMENT
15. FIRE WATER STORAGE TANK
16. FIRE WATER PUMP HOUSE
17. TRUCK SCALE AREA
18. FGD/APC BUILDING/BAGHOUSE BLDG.
19. CONTROL/ELECTRICAL ROOMS
20. CEMS BUILDING
21. NOT USED
22. NOT USED
23. PARKING LOT
24. GRIZZLY BUILDING
25. SWITCHYARD
26. MAINTENANCE AND STORAGE BUILDING
27. RESIDUE PROCESSING ELECTRICAL BUILDING
28. NOT USED
29. FLY ASH TRANSPORT CONVEYORS
30. SETTLING BASIN
31. NOT USED
32. NOT USED
33. MAINT. TRUCK DIESEL OIL STORAGE TANK
34. NOT USED
35. NOT USED
36. RETENTION POND
37. GAS METERING STATION
38. GRAVEL ACCESS ROAD
39. NOT USED
40. ID FAN VFD BUILDING
41. CLOSED COOLING WATER HEAT EXCHANGER
42. EMERGENCY DIESEL GENERATOR ENCLOSURE
43. PLANT ENTRANCE SIGN

JW-1009497-NS2-5

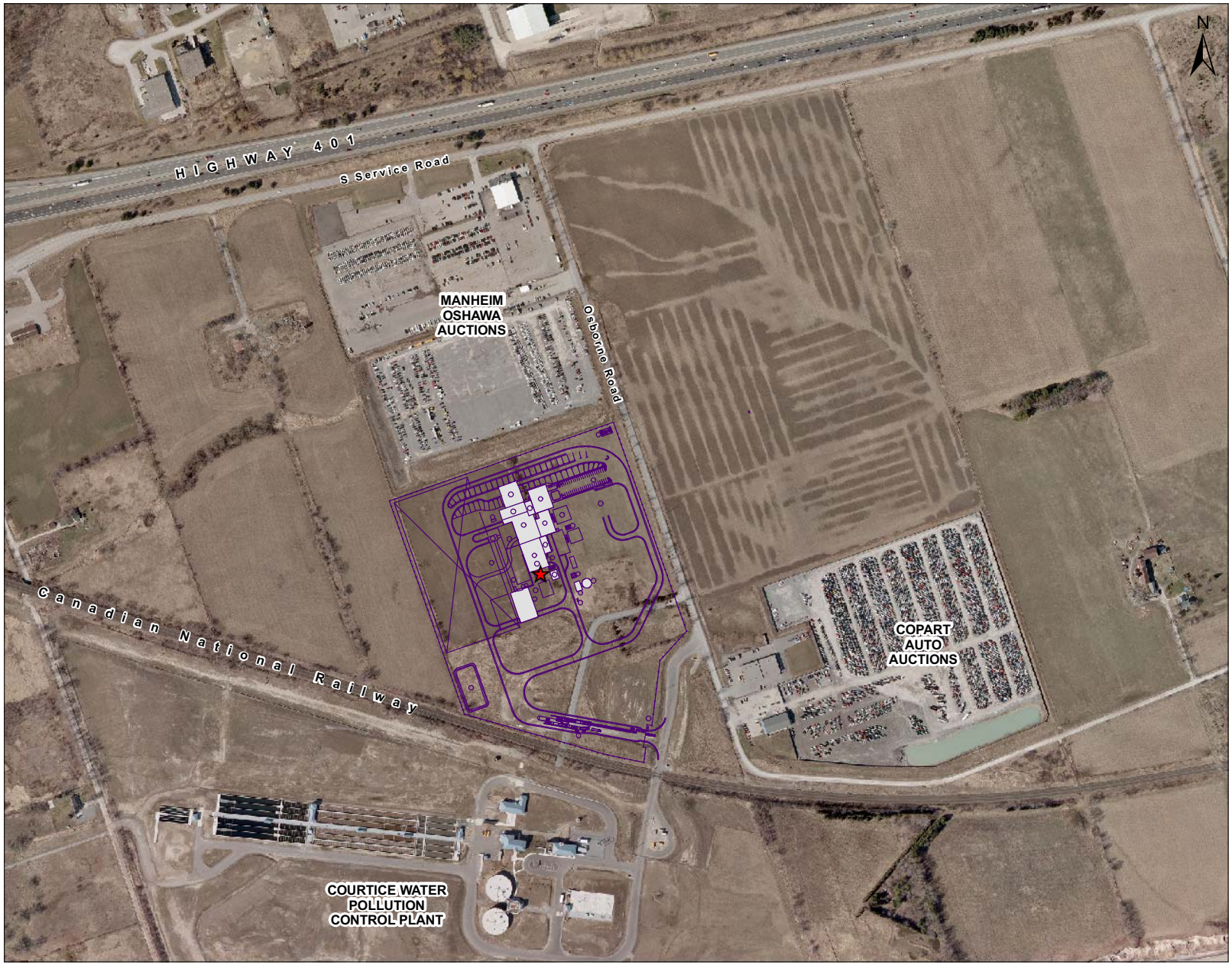
Jacques Whitford

FIGURE NO.

2-5

Last Modified: June 3, 2009 By: L. Kendall

DATE: 03/06/2009	YORK REGION AND DURHAM REGION RESIDUAL WASTE STUDY	FIGURE NO: 2-6
PREPARED BY: L. Kendell	**Conceptual Artistic Rendering of the Durham/York Thermal Treatment Facility (140,000 tpy Scenario)**	Jacques Whitford
PROJECT NO.: 1009497.04		
SOURCE: *Covanta Energy: "Rendering of Durham/York Energy-From-Waste Facility" by McMillan Associates Architects*		



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Preliminary Site Layout (140,000 tpy Scenario)

Stack Location

Site Plan (From Covanta Energy Inc. "Base Case Site Plan", Drawing M-2000)

Proposed Building Layout

0 75 150 225

Metres - 1:5,000

JW-1009497-NS2-7

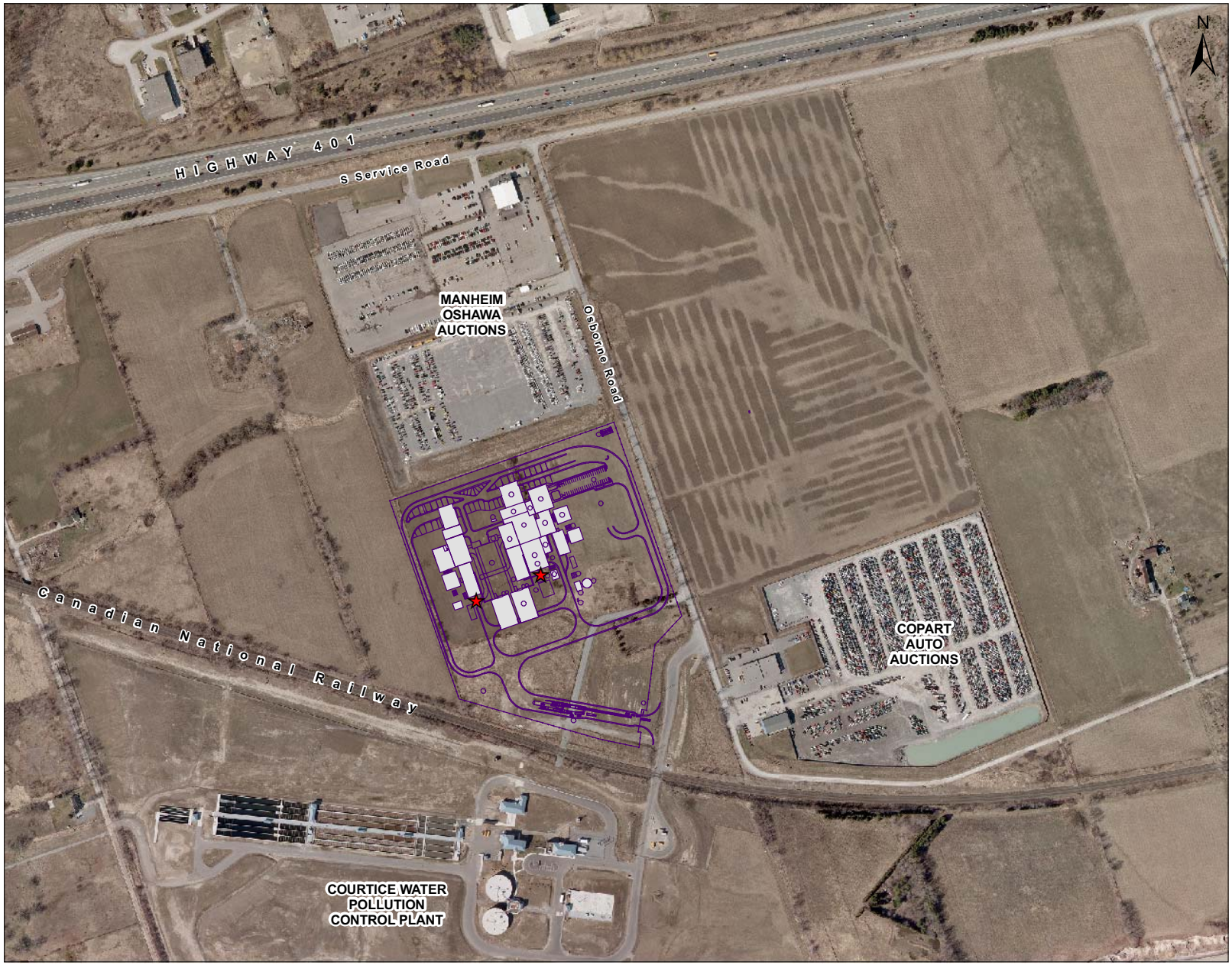
MB QC ON USA Area of Interest

Jacques Whitford

FIGURE NO.

2-7

Last Modified: June 17, 2009 By: L. Kendall



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Preliminary Site Layout (400,000 tpy Scenario)

- Stack Locations
- Site Plan (From Covanta Energy Inc. "Base Case Site Plan Through Phase II Expansion", Drawing M-2000_PHSII)
- Proposed Building Layout

0 75 150 225

Metres - 1:5,000

JW-1009497-NS2-8

Jacques Whitford

FIGURE NO.

2-8

Last Modified: June 17, 2009 By: L. Kendall

Using the assigned observer point, a viewshed analysis was then performed on the enhanced surface model, using the option to account for earth curvature. The result was a grid of the regional extents which was comprised of two values. The analysis assigned all cells a value of 0 or 1; 0 being not visible from the stack, and 1 being visible from the stack. The grid was then added to the base mapping and classified appropriately; value cells were removed, and cells with a value of 1 were coloured in orange and labelled as being "Visible from Stack". Mapping was produced at an approximate 5 km project radius scale to address both the PSVSA and LCSA.

This viewshed type is referred to as "worst-case" because it is an extremely conservative method that does not account for any view obstructions other than topographic barriers, existing woodlots, and available building polygons.

The model has assigned a "visible" rank to any 10 m cell of the surface model within a direct line of sight of the stack unless inhibited by one of these three spatial barriers. The model has not taken into account, for example, the potential clearing of wooded areas as part of the development of the Facility, nor does the model account for other spatial barriers such as buildings (additional to those in the planimetric dataset), roads, and other unmapped infrastructure. While some of these layers may exist digitally, it is not always possible to assume an appropriate height for inclusion. The viewshed analysis does also not account for atmospheric conditions (i.e., smog) that may inhibit human visibility. The absence of these additional obstructions that may exist within the PSVSA or LCSA during the viewshed analysis suggests that the model results are recognized as being conservative, or an over-estimation.

An additional viewshed analysis was then performed to identify how much of the stack (presented as a percentage) was visible from various locations for both the 140,000 and 400,000 tpy scenarios. For the purpose of this assessment, multiple viewsheds were calculated based on 20% increments of the stack height. The following incremental stack heights (Table 2-4) were used to calculate four additional viewsheds (the 100% stack height viewshed was already calculated).

Table 2-4 Incremental Viewshed Analysis Based on Stack Height

Stack Height for Analysis (metres)	Percentage of Total Stack Height (%)
87.6	100
70.08	80
52.56	60
35.04	40
17.52	20

The five viewshed grids were overlaid on the Local Community scale map. Areas that could see the bottom 20% of the stack height (<= 17.52 m) could theoretically see >80% of entire stack and are depicted in orange. Areas that could only see the top 20% of the stack height (>= 87.6 m) could theoretically only see <20% of entire stack and are depicted in magenta.

2.3.2.2 Photo Montage & 3D Renderings

JWSL also prepared a series of photo montages taken from various vantage points of the Facility. A series of photos were taken in December 2008 and April 2009 by JWSL field staff, in the general

direction of the proposed infrastructure. An additional set of field photos were taken in June 2009 to incorporate into the build-out analysis portion of the project.

ESRI ArcScene software was used to create a 3D representation of the proposed infrastructure. Figure 2-9 displays the 3D model of the Facility over draped aerial imagery. ArcScene has extensive lighting and detailed 3D feature capabilities to enhance the building layout and make it look more realistic in a 3D setting.

Also indicated in Figure 2-9 as insets are a 3D representation of the Site in its current condition and an artistic rendering of the Facility as conceived by McMillan Associates Architects. While the 3D representation of the proposed infrastructure takes into account the general dimensions, shapes and location of the conceptual design of the Facility, it does not account for the overall architectural design, landscaping, material and colour choices and other elements that have been considered in the preliminary design. Therefore, this represents a “worst-case” concept of the Facility for the purposes of the modelling and visual assessment.

The Facility depicted will initially process about 140,000 tonnes of municipal solid waste annually and may be expanded to process up to 400,000 tonnes of waste per year. For the initial 140,000 tpy Facility, there will be two completely independent waste processing trains at the Facility. Each train will consist of a feed chute, stoker, integrated furnace/boiler, acid gas scrubber, a fabric filter baghouse and associated ash and residue collection systems. Steam produced in the boilers will drive a turbine-generator to produce electricity for delivery to the grid, for in-plant use and potentially to provide district heating to the neighbouring Courtice Water Pollution Control Plant and Clarington Energy Business Park.

A Facility waste processing capacity of 400,000 tpy was also assessed. This capacity would be achieved by expanding the baseline 140,000 tpy Facility in two phases. The Phase I expansion would increase the total Facility waste processing capacity to 250,000 tpy, while the Phase II expansion would increase the Facility capacity to 400,000 tpy. The 400,000 tpy Facility would include the two completely independent waste processing trains installed for the 140,000 tpy Facility (each 70,000 tpy), a single independent 110,000 tpy train (installed in the Phase I expansion) and a single independent 160,000 tpy train (installed in the Phase II expansion). The emissions from the Phase I expansion would exhaust from a second flue installed in the stack built for the 140,000 tpy Facility, while the emissions from the Phase II expansion would be exhausted from a new independent stack, identical in height to that of the 140,000 tpy facility stack. The Phase II expansion would be enclosed in new buildings onsite and include a second tipping building, refuse building, process building. Each train in the expanded Facility would utilize identical processing technologies and APC equipment, appropriately sized to the process train throughput.

For the build-out analysis, additional 3D renderings were prepared from various vantage points of the Facility and of the proposed OPG Building and Visitors Centre. Vantage points were determined in accordance with the visual study conducted by the Municipality. Two vantage points were selected along proposed highway interchanges to the north of the Facility. The proposed highway interchange vantage points were prepared from post-construction assumed elevations. Two additional vantages of

the Facility were prepared from the assumed heights of the third and fifth floors of the proposed OPG Building.

The photo locations were then used to set a vantage point of the Site and export the infrastructure for creation of photo montages. Infrastructure exported for the build-out analysis also incorporated the proposed OPG Building and its Visitors Centre. Prior to export, at least two control points had to be marked within the 3D environment that could be exported and identified on the 2D photograph. Using the control points, the 3D infrastructure was imported and embedded into the photographs using Corel Photo-Paint software. Additional graphical editing was then required to enhance the realistic nature of the figures.

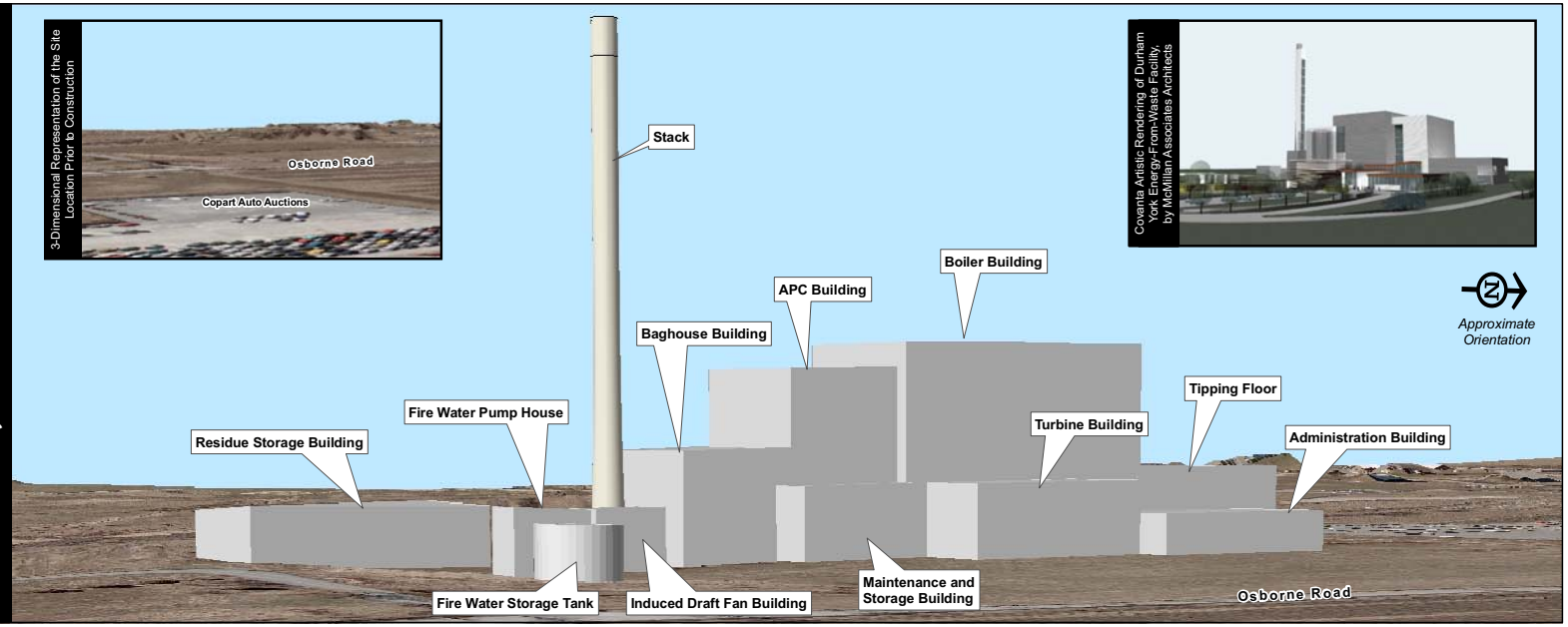
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

3-Dimensional Representation of the Site Layout (140,000 tpy and 400,000 tpy Scenarios)

140,000 TPY SCENARIO

3-Dimensional Representation of the Site Location Prior to Construction

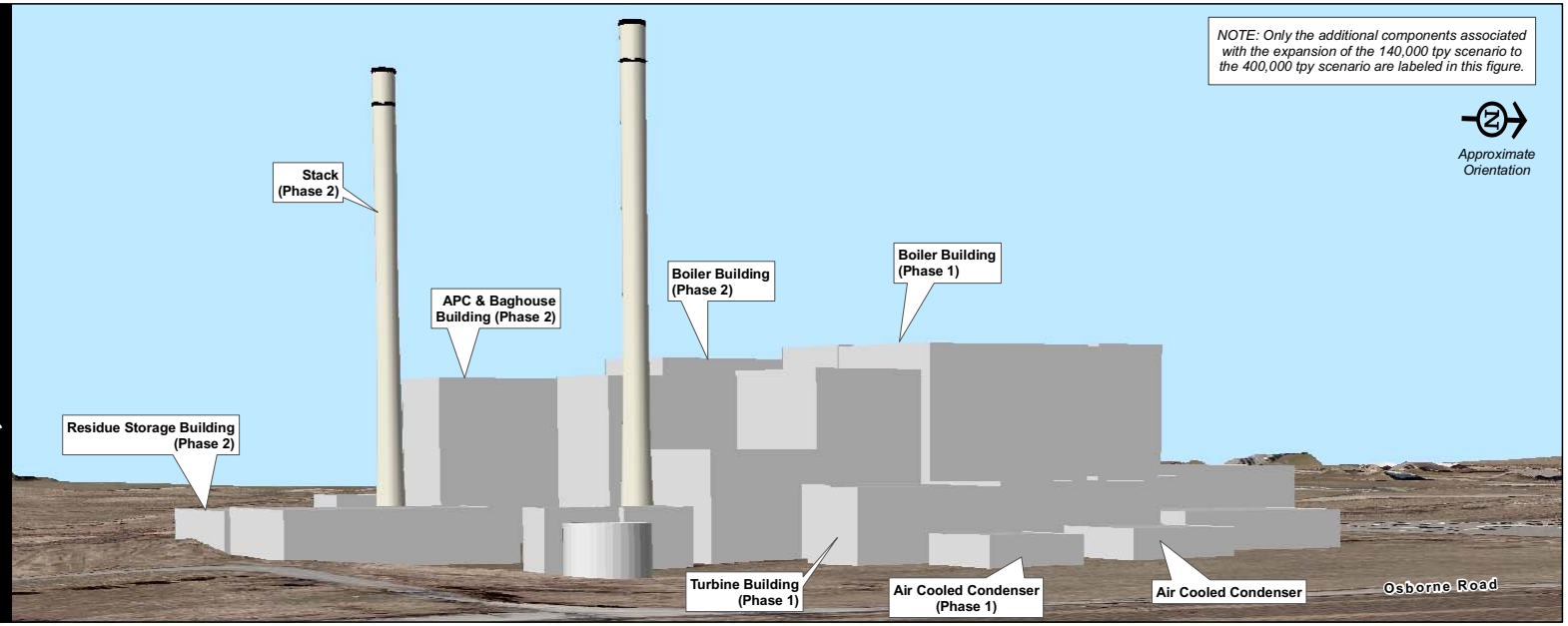
Covanta Artistic Rendering of Durham York Energy-From-Waste Facility by McMillan Associates Architects



Approximate Orientation

400,000 TPY SCENARIO

NOTE: Only the additional components associated with the expansion of the 140,000 tpy scenario to the 400,000 tpy scenario are labeled in this figure.



Approximate Orientation

JW-1009497-NS2-9

Jacques Whitford

FIGURE NO.
2-9

Last Modified: July 15, 2009 By: L. Kendall

An analysis of the potential visual effect of the Facility, as viewed from several vantages in relation to receptors within both the PSVSA and the LCSA was undertaken and is documented in Section 4.2.1.

2.3.2.3 Assumptions and Limitations

The following assumptions were applied during the viewshed analysis:

- A 10 m resolution digital elevation model was used as the base for the viewshed analysis;
- The woodlots spatial layer was provided by the Ministry of Natural Resources, 2008;
- All woodlot polygons within the model were assigned a 10 m height;
- The buildings polygon spatial layer is from base 1:10,000 planimetric mapping for the province of Ontario;
- All available polygon buildings within the model were assigned a 5 m height;
- Facility component height values were estimated, based on the conceptual drawings by Covanta (see Table 2-3);
- Conceptual drawings of the Facility (both 140,000 and 400,000 tpy scenarios) were used to identify an observer point for the viewshed model. The tallest feature, the top of the stack (both stacks in the 400,000 tpy scenario), was selected (87.6 m);
- The Site plan drawings of the 140,000 and 400,000 tpy scenario Facilities were used; it should be noted that the locations for Facility structures and components, as represented in this analysis (Figures 2-4 and 2-5) and their indicated heights, may still be adjusted for the final Facility layout; and,
- The heights and locations used to model the proposed OPG buildings and Highway 407 interchange ramps for the future build-out scenario were estimated based on currently available information from the Municipality of Clarington, and are subject to change (see Section 4.1.3).

3.0 DESCRIPTION OF EXISTING CONDITIONS

The Site is undeveloped land owned by the Region of Durham, south of Highway 401 in the Municipality of Clarington. Situated within the Clarington Energy Business Park, the Site is on the west side of Osborne Road, near the intersection of Highway 401 and Courtice Road. This parcel of land is 12.1 hectares (ha) in size. The Site is located on the west side of Osborne Road north of a CN Rail corridor. There are commercial properties north of the Site. The lands east and west of the Site are undeveloped and are currently used for agricultural purposes. The Courtice Water Pollution Control Plant is located just southwest of the Site. The Site is composed of four fields with a periphery of hedgerows. An active meteorological tower is currently in the centre of the Site and some hedgerows occur, the most significant of which bisects the upper half of the Site. The Site is partially used as agricultural land while the remainder of the Site is undeveloped and is not being used.

3.1 Landscape Characterization

In this section the visual characteristics of the various existing landscapes found within the PSVSA are summarized.

3.1.1 The Municipality of Clarington and the Project Site and Vicinity Study Area

Land use in the PSVSA is a mixture of rural, industrial, residential, natural and agricultural uses. Land use designations within 1 km of the Site, according to the Regional Official Plan land use designations consist of Employment Areas, Waterfront Areas and Major Open Space Areas. The 1 km eastern boundary touches the Darlington Nuclear Generating Station. The Area Municipal Official Plan land use designations within the 1 km radius of the Site consist of Business Park, Light Industrial, Prestige Industrial, Waterfront Greenway and Environment Protection Area and Utility. Field observation of the area determined that the 1 km radius includes commercial properties, agricultural land and several residential properties. There are park and recreation lands (i.e., the Darlington [Hydro] Sports Fields) approximately 1 km east of the Site.

3.1.1.1 Landscape Categories of the PSVSA

The PSVSA can be divided into four main landscape categories, which are described below.

Agricultural – This category is comprised of an agricultural landscape that is characteristic of the Site. The landscape is typically flat and exhibits few topographic changes. This category is comprised of agricultural fields used mainly for growing field crops (i.e., corn). The agricultural fields are separated by the presence of some hedgerows.

Woodlot – Hedgerows are pervasive throughout the PSVSA, with the presence of small woodlots. A portion of the riparian area along Tooley Creek, to the west of the Site, is also treed. These forested areas comprise the only natural features in the PSVSA.

Commercial/Industrial – This category includes existing facilities in the PSVSA, particularly the Clarington Energy Business Park. Several large operations are present and include the Courtice Water Pollution Control Plant, and two commercial properties, Copart Auto Auctions and Manheim Oshawa Auctions, near the Site. These facilities add to the commercial and industrial visual character of the PSVSA, and have minimal associated scenic attributes.

Shoreline Area – This category is situated along the Lake Ontario shoreline and is comprised of some beach areas and recreational areas, including the Waterfront Trail.

3.1.1.2 Landscape Categories of the LCSA

The LCSA contains the landscape categories Agricultural and Shoreline Area, as described above. Slight variations in the Commercial/Industrial and Woodlot landscape categories are identified below. Additionally Residential Communities are a landscape category specific to the LCSA, and are described below.

Commercial/Industrial – This category includes existing facilities in the LCSA. In particular, this refers to the Darlington Nuclear Generating Station, situated to the east of the Site.

Woodlot – Hedgerows are pervasive throughout the LSCA, but the largest wooded area is located to the west of the Site, as part of the Darlington Provincial Park. The riparian area along Tooley Creek, to the west of the Site, is also treed. These forested areas are the most dominant natural features in the LCSA.

Residential Communities – This category considers the population centers of Oshawa, Courtice, Bowmanville and Clarington, as well as smaller communities in the vicinity of the Site. The two communities in the Municipality of Clarington partially captured within the LCSA are Courtice and Bowmanville. The southeast outskirts of Oshawa are also represented within the LCSA. Due to their proximity, for the purposes of this assessment, Courtice is grouped with Oshawa as one receptor. Primarily, the outskirts of the communities of Oshawa and Bowmanville nearest to the Facility may be affected, with the remainder of the LCSA being characterized by a more diffuse, rural habitation pattern.

4.0 RESULTS OF ANALYSIS

The overall potential visual effects resulting from the development of the Facility are outlined in the following sections.

4.1 Visual Characteristics of the Facility

The Facility would consist of several buildings and a stack as well as ancillary structures including parking lots, storage and tanks. The design (dimensions) and layout of the Facility, as portrayed in the Site plan layout drawings for the 140,000 and 400,000 tpy scenarios prepared by Covanta, has been used for the purposes of this assessment for the location and size of the structures on the Site.

4.1.1 Construction Period - Potential Visual Effects

Visual effects associated with construction could include Site clearing, grubbing, and associated ground disturbance, which may be considered unsightly. Large construction equipment would be visible from different vantages around the Site, potentially resulting in visual disturbances.

It is assumed that all equipment and materials for the construction of the Facility would be transported to the Site via the same haul route that would be used for regular Site access during operations. Materials would be delivered to the Site via Highway 401, Courtice Road, then along South Service Road to Osborne Road. Access to the Site would be from Osborne Road.

The duration of the construction period is currently anticipated to be approximately 30 months. However, construction activities would take place in stages. Clearing of existing vegetation would occur first as the land area is prepared. Site grading would require heavy equipment and machinery that would be stored onsite. This Site preparation activity would result in debris piles and may cause

dust. Material delivery and storage in laydown areas would also be required. Additional heavy equipment, such as cranes, would be required to construct some of the structures at the Site. The early stages of construction could have the greatest potential for visual effects, however, this intensive stage of construction is not expected to have a long duration.

If the potential expansion of the Facility capacity to the 400,000 tpy scenario is required, much of the initial ground preparation will already have taken place during the construction of the 140,000 tpy scenario Facility. While there would be a requirement for additional construction materials, machinery and construction personnel, the duration of the construction for the expansion should be of a similar or lesser extent. Potential visual effects would be similar to those experienced during the construction of the 140,000 tpy scenario Facility. However, as the 140,000 tpy scenario Facility would already be present and operational, the existing structures would act to obstruct much of the visual effects associated with the expansion from certain vantages (i.e., the majority of the new features would be constructed to the west of the existing structures, so the views would be obstructed primarily from the east of the Site).

4.1.2 Operational Period - Potential Visual Effects – Current Visual Conditions

Potential visual effects associated with the operational Facility were assessed by creating visual simulations of the fully constructed Facility. These simulations are artistic renderings based on the current project data and regional 3D modelling, and the final Facility may appear differently than as portrayed by these simulations. While these simulations take into account the conceptual design details, such as the proposed size, shape and locations of Facility structures, they do not account for the overall architectural design, landscaping, material and colour choices and other elements that have been considered in the preliminary design and therefore represent a “worst-case” concept of the Facility.

The initial design capacity of the Facility is 140,000 tpy with the potential to expand to a maximum design capacity of 400,000 tpy. Both operating scenarios were assessed. This 400,000 tpy scenario would result in the addition of several Facility structures and buildings and an additional stack. This larger operation would be contained within the same Facility footprint, and the additional structures would remain adjacent to the existing structures. Approximately 14 new structures (i.e., tanks, buildings and enclosures) are associated with the 400,000 tpy scenario. Overall, the visual difference of the 400,000 tpy scenario Facility compared to the 140,000 tpy scenario Facility would not be considerable.

On December 12, 2008, JWSL staff took 15 photos from different vantage points around the PSVSA. By taking the photos for the visual modelling during the winter months, there is less vegetation present to obscure the potential visual effects of the Facility, allowing for the presentation of a worst-case analysis. The visual conditions that day were generally overcast with sunny periods with good visibility. In response to a request from the Municipality of Clarington, an additional photo was taken from the top of the OPG berm adjacent to the Darlington Nuclear Generating Station on April 16, 2009. The photo taken from Site 5 was updated on June 16, 2009. Visual conditions associated with these two dates

consisted of sunny, clear conditions with good visibility. Figure 4-1 illustrates the locations from which the photos were taken.

4.1.2.1 Visibility of the Facility Structures

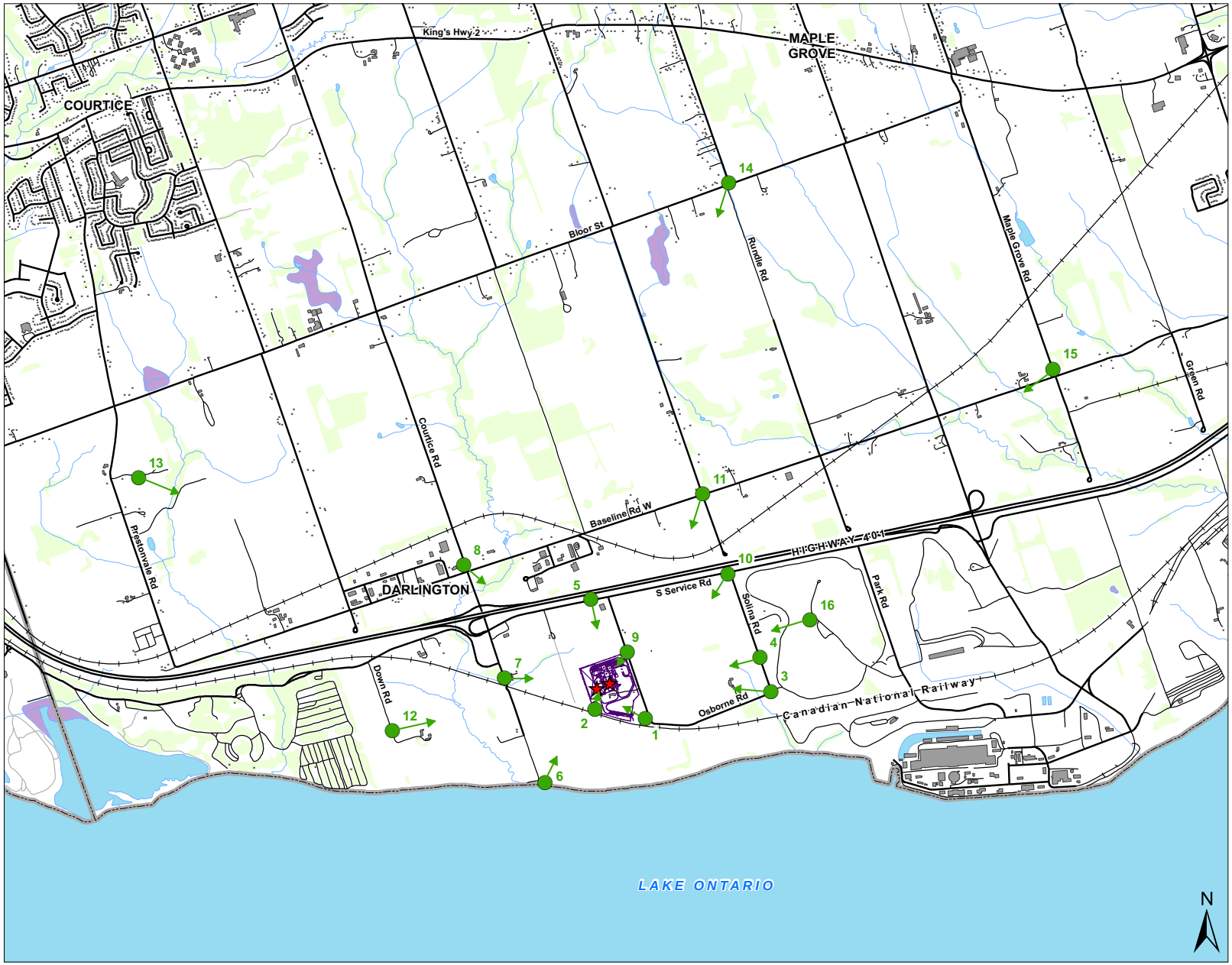
The following summarizes the visual assessment of the Facility with respect to the photographic locations (i.e., Sites 1 to 16) as identified on Figure 4-1. The photographic locations were selected to reflect views from community areas, shoreline areas, from Highway 401, from within the PSVSA (i.e., agricultural and commercial land) and from within the Local Community Study Area (LCSA) in the vicinity of the communities of Oshawa and Bowmanville. All photographs were taken from public road allowances or areas of public walking access.

The viewshed for each landscape category was photographed in the field and assessed to determine which Facility structures would potentially be seen from specific locations and which receptors (as identified in Figure 2-2) would be most affected by these views. The view of the structures varies according to factors relating to distance, topography, other man-made structures and existing vegetation cover. The tree blockage areas and man-made structures, such as houses and other buildings, transmission lines and communication towers, largely determine the visibility of the Facility as viewed from each location.

The impact magnitude and sensitivity in relation to effects on the existing landscape relating to the 140,000 tpy scenario are discussed as per the definitions listed in Table 2-1. With respect to the 400,000 tpy scenario, only the differences in the visual characteristics from the initial 140,000 tpy scenario are discussed. By the time the potential future case expansion is required, the baseline visual characteristics of the area would be much altered from those currently described, resulting in differing impact magnitude and sensitivity ratings. As such, an updated Visual Impact Assessment may be undertaken at that time and as required.

Site 1 – Southeast corner of the Site (just north of CN Rail), looking northwest. This location is approximately 414 m to the Facility. In both the 140,000 tpy and 400,000 tpy scenarios, the visible structures from this vantage include the stack and the process buildings (Figure 4-2).

The current landscape is a mix of both rural and agricultural characteristics with commercial and industrial features. The existing presence of the commercial properties, the Courtice Water Pollution Control Plant and the rail lines to the south categorizes the landscape sensitivity as medium, while a high magnitude landscape impact would be anticipated.



YORK REGION AND DURHAM REGION RESIDUAL WASTE STUDY

Current Visual Conditions - Photo Locations (140,000 tpy and 400,000 tpy Scenarios)

- Photo Location and Direction
- Stack Locations
- Building
- Site Plan (From Covanta Energy Inc. "Base Case Site Plan", Drawing M-2000)
- Primary Access
- Secondary Access
- Tertiary Access
- Watercourse
- Building
- Waterbody
- Wetland Area
- Wooded Area

0 400 800 1,200

Metres - 1:25,000

JW-1009497-NS4-1

Jacques Whitford

FIGURE NO.

4-1

Last Modified: June 25, 2009 By: L. Kindell

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 1

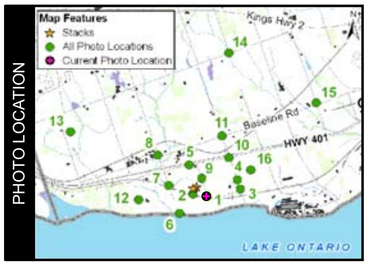
View looking Northwest from the Southwestern corner of Osborne Road, North of the CN Railway.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-2

Last Modified: June 17, 2009 By: L. Kendell JW-1009497-NS4-2

Site 2 – Southwest corner of the Site (just north of CN Rail), looking northeast. This photo location is approximately 147 m from the Facility. The visible structures from this vantage of the 140,000 tpy scenario include the stack and the process buildings (Figure 4-3). In the 400,000 tpy scenario, additional structures and the second stack are also highly visible from this vantage.

The current landscape is a mix of both rural and agricultural characteristics with industrial features. The existing presence of the commercial properties, the Courtice Water Pollution Control Plant and the rail lines to the south categorizes the landscape sensitivity as medium, while a high magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 2

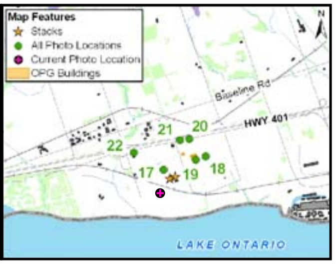
View looking Northeast from Field, North of the CN Railway and West of Osborne Road.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-3

JW-1009497-NS4-3

Last Modified: July 7, 2009 By: L. Kendell

Site 3 – Intersection of Osborne Road and Solina Road, at the trailhead to the waterfront trail as it enters Darlington property, looking northwest. This photo location is approximately 1,197 m from the Facility. The stack can be seen from this vantage, however the majority of the process buildings are obscured by the existing vegetation and the residential buildings (Figure 4-4). There are minimal differences in the level of visibility between the 140,000 and 400,000 tpy scenarios.

The current landscape is a mix of both rural and agricultural characteristics with commercial features. The line of sight in this photo goes through a residential property. The existing presence of these features as well as the Darlington (Hydro) Sports Fields to the north and the rail lines to the south categorizes the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

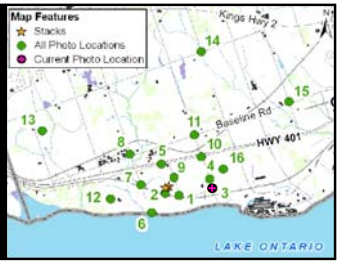
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 3

View looking Northwest from the Intersection of Solina Road and Osborne Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-4

Last Modified: June 17, 2009 By: L. Kendall
JW-100487-N3I-4

Site 4 – Solina Road at the Darlington (Hydro) Sports Fields, looking west. This photo location is approximately 1,142 m from the Facility. The visible structures from this vantage include the stack and the process buildings (Figure 4-5). The main visual difference in visual characteristics of the 400,000 tpy scenario from the 140,000 tpy scenario is the addition of the second stack. The additional structural features associated with the maximum design capacity of 400,000 tpy are not readily visible from this vantage.

The current landscape is a mix of both rural and agricultural characteristics with commercial features. The vantage in this photo includes nearby residential property (located on the left of the photo). The existing presence of these properties as well as the adjacent Darlington (Hydro) Sports Fields and the rail lines to the south categorizes the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

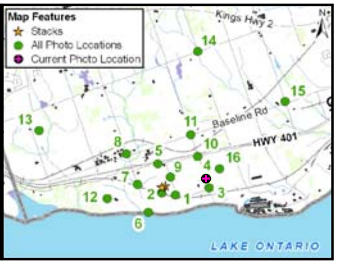
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 4

View looking West from the Parking Area of the Lower Darlington (Hydro) Fields, on Solina Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-5

JW-1009497-NS4-5

Last Modified: June 3, 2009 By: L. Kendell

Site 5 – South Service Road, west of Osborne Road, looking south, looking through Manheim Oshawa Auctions. This location is approximately 575 m to the Facility. The visible structures from this vantage include the stack and the process buildings (Figure 4-6). The 400,000 tpy scenario includes the additional stack and Facility process buildings to the right (in the photo) of the initial structures.

The current landscape is a mix of both rural and agricultural characteristics with industrial features. The existing presence of Manheim Oshawa Auctions to the south of this location and the presence of Highway 401 immediately to the north categorizes the landscape sensitivity as minimal, while a medium magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

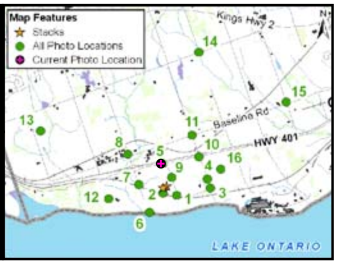
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 5

View looking South, South of Highway 401, North of South Service Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-6

Last Modified: June 25, 2009 By: L. Kendell JW-1009497-NS4-6

Site 6 – Shore of Lake Ontario, near the southern end of Courtice Road, looking northeast through the Courtice Water Pollution Control Plant property (visible in this photo is the security fencing). This photo location is approximately 707 m from the Facility. The only visible structure from this vantage is the stack for the 140,000 tpy scenario (Figure 4-7). In the 400,000 tpy scenario, the additional stack can be seen, as can the top of some of the additional process buildings.

The current landscape is a mix of both shoreline characteristics and industrial features. The proximity of this location to the shoreline of Lake Ontario would increase the sensitivity of the landscape to the addition of the Facility, however, due to the presence of the large Courtice Water Pollution Control Plant which is industrial in nature, the overall landscape sensitivity would be classified as minimal, while a medium magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

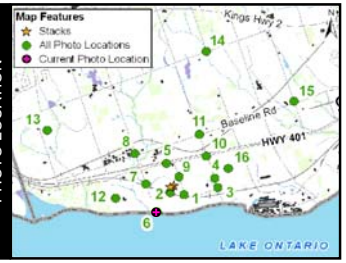
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 6

View looking Northeast from the bluff on the north shore above Lake Ontario, approximately 20 metres East of Courtice Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-7

Last Modified: June 17, 2009 By: L. Kendall JW-100487-NSA-7

Site 7 – Courtice Road, south of Darlington Park Road, looking southeast. This photo location is approximately 587 m from the Facility. The visible structures from this vantage include the stack and the top portion of the process buildings for the 140,000 tpy scenario (Figure 4-8). The 400,000 tpy scenario includes the additional stack as well as a partially obstructed view of additional process buildings. The foundation of an old residential structure is visible in the foreground.

The current landscape is a mix of both rural and agricultural characteristics with commercial features. The existing presence of the residence in this location, the commercial property to the east, the rail lines to the south and Highway 401 to the north categorizes the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

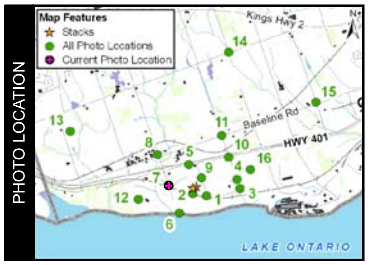
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 7

View looking East from Courtice Road, North of CN Railway.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-8

JW-1009497-NS4-8

Last Modified: June 3, 2009 By: L. Kendell

Site 8 – Intersection of Courtice Road and Baseline Road, looking southeast. This photo location is approximately 1,187 m from the Facility. In both the 140,000 and 400,000 tpy scenarios, only the upper portion of the stacks can be seen from this location. The majority of the Facility infrastructure is obscured by the existing vegetation and container storage yard. The transmission lines and traffic lights also add to the existing vertical relief (Figure 4-9).

The current landscape is a mix of both residential and commercial characteristics. The existing presence of the commercial properties and distance from the Site categorizes the landscape sensitivity as minimal, while a minimal magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

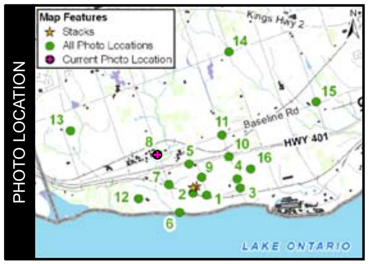
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 8

View looking Southeast from the Intersection of Baseline Road and Courtice Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-9

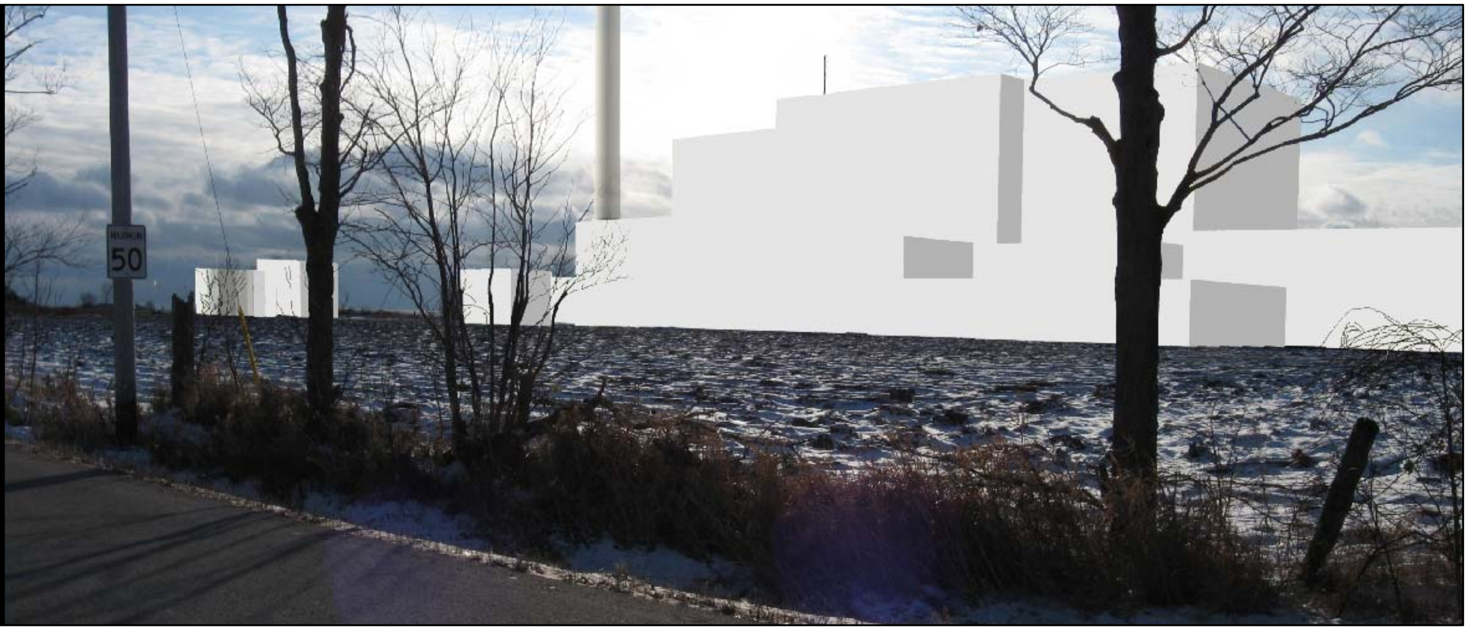
JW-1009497-NS4-9

Last Modified: June 3, 2009 By: L. Kendell

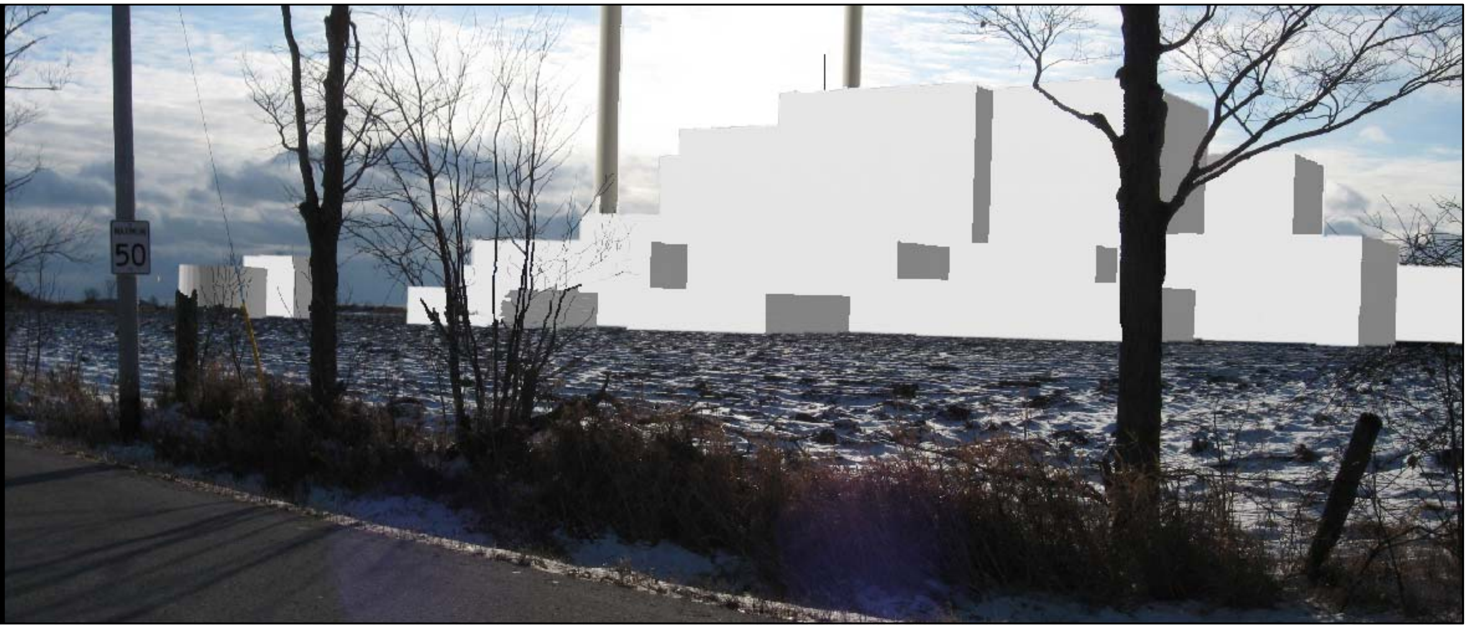
Site 9 – Osborne Road, south of Service Road, looking southwest. This photo location is approximately 336 m from the Facility. The stack and the process building are very prominently visible from this location at the north east corner of the Site in the 140,000 tpy scenario (Figure 4-10). The additional features for the 400,000 tpy scenario Facility are located to the other side of the 140,000 tpy scenario structures, and are primarily obstructed from this vantage. Only the additional stack can be seen.

The current landscape is a mix of both rural and agricultural characteristics with commercial features. The proximity of this Facility to the existing commercial properties categorizes the landscape sensitivity as medium, while a high magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO



400,000 TPY SCENARIO



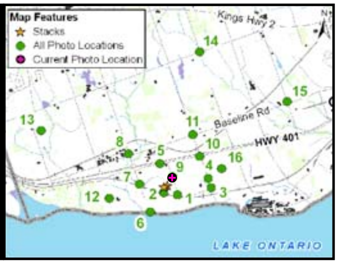
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 9

View looking Southwest from Northeast Project Property Corner on Osborne Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-10

JW-1009497-NS4-10

Last Modified: June 17, 2009 By: L. Kendell

Site 10 – South Service Road, west of Solina Road, looking southwest. This photo location is approximately 1,185 m from the Facility. The visible structures from this vantage include the stack and the process buildings (Figure 4-11). The views from this vantage of the 140,000 and 400, 000 tpy scenarios are generally similar, with the addition of a few new structures and the additional stack.

The current landscape is a mix of both rural and agricultural characteristics with commercial features. The vantage in this photo includes Copart Auto Auctions to the east of the Site. The existing presence of these properties as well as the proximity to Highway 401 which is adjacent to the north categorizes the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

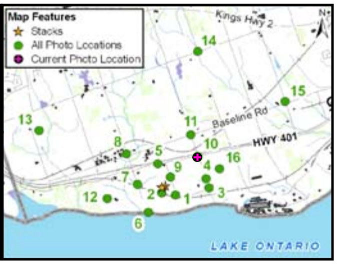
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 10

View looking Southwest from the Intersection of South Service Road and Solina Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-11

JW-1009497-NS4-11

Last Modified: June 3, 2009 By: L. Kendell

Site 11 – Baseline Road, at the intersection of Hancock Road and Baseline Road, looking southwest. This photo location is approximately 1,493 m from the Facility. The stack can be seen from this vantage, however a large portion of the process buildings are obscured by existing vegetation (Figure 4-12). In the 400,000 tpy scenario, both stacks are visible, while the process buildings continue to be partially obscured by the existing vegetation.

The current landscape at this location is primarily rural in character. The viewscape in this photo includes Baseline Road and an agricultural field in the foreground. The existing presence of these features categorizes the landscape sensitivity as minimal, while a minimal magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 11

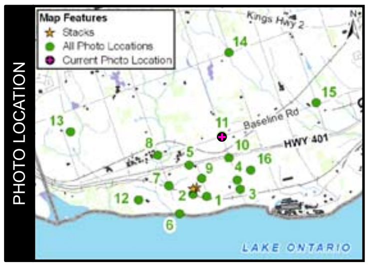
View looking Southwest from the Intersection of Baseline Road and Solina Road.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-12

JW-1009497-NS4-12

Last Modified: June 3, 2009 By: L. Kendell

Site 12 – Down Road, adjacent to eastern edge of Darlington Provincial Park, looking east. This photo location is approximately 1,365 m from the Facility. The stack in the 140,000 tpy scenario can be seen from this vantage, however the majority of the process buildings are obscured by existing vegetation (Figure 4-13). In the 400,000 tpy scenario, both stacks are visible, while the majority of the process buildings remain partially obscured by the existing vegetation. A residential property can be seen in the foreground on the right of the photo.

The current landscape is a mix of both rural and natural characteristics with some agricultural features. The proximity to Darlington Provincial Park and the Lake Ontario shoreline would categorize the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 12

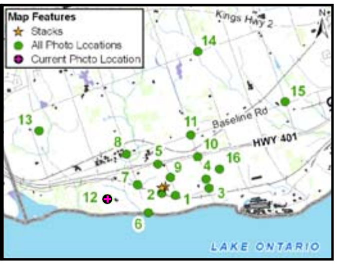
View looking East from Down Road.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-13

JW-1009497-NS4-13

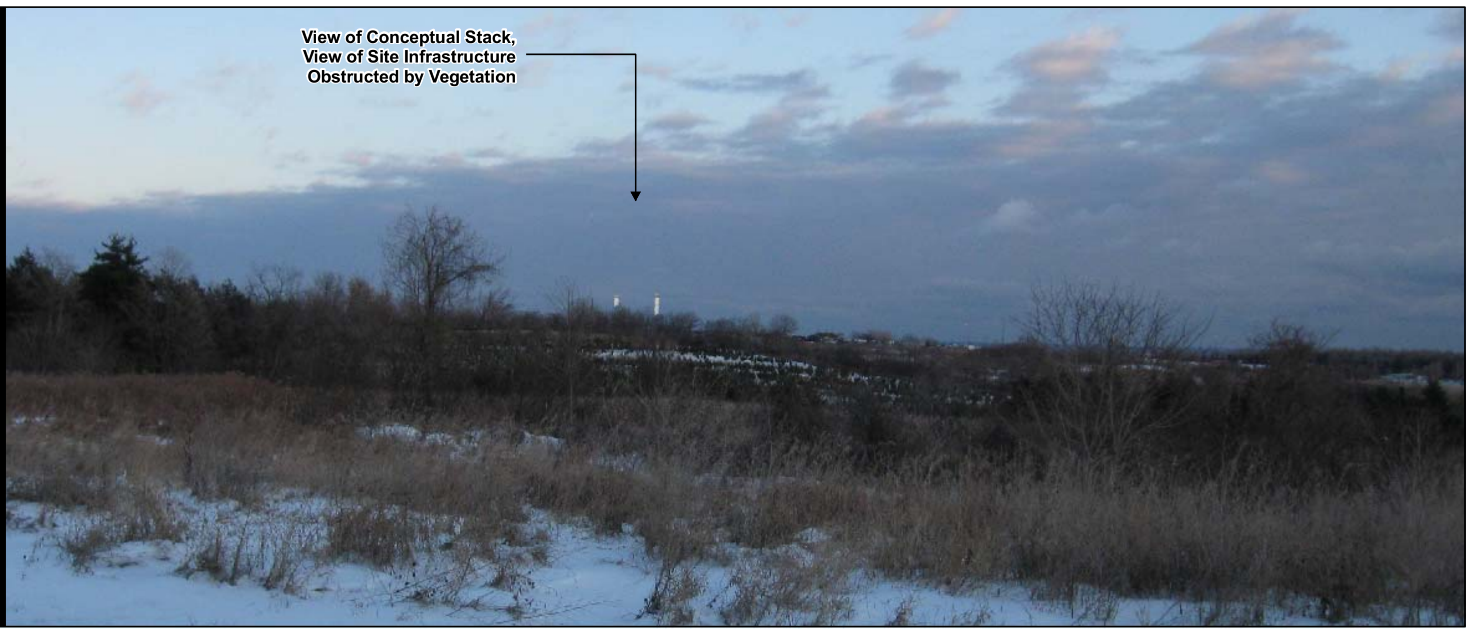
Last Modified: June 3, 2009 By: L. Kendell

Site 13 – South of the intersection of Prestonvale Road and Bloor Street, from the South Courtice Arena, looking southeast. This photo location is approximately 3,340 m from the Facility. Only the top portions of the stacks in both the 140,000 and 400,000 tpy scenarios can be seen from this vantage, and the remainder of the Facility is obscured by distance and existing vegetation (Figure 4-14).

The current landscape is a mix of both rural and residential characteristics. The viewscape in this photo represents the view from the southeast outskirts of Oshawa. The landscape sensitivity would be classified as minimal, while a minimal magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO



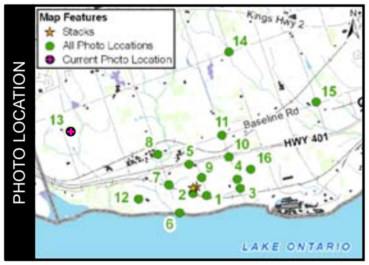
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 13

View looking Southeast from behind the Courtice Arena, off Prestonvale Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-14

JW-1009497-NS4-14

Last Modified: June 4, 2009 By: L. Kendell

Site 14 – Intersection of Bloor and Rundle Road, looking southwest. This photo location is approximately 3,498 m from the Facility. The view of the Facility infrastructure for both the 140,000 and 400,000 tpy scenarios is obstructed by existing vegetation and is further impaired due to the distance to the Facility (Figure 4-15).

The current landscape is a mix of both rural and residential characteristics. The viewscape in this photo includes Highway 401 and the OPG berm, associated with the Darlington Nuclear Generating Station. This vantage is located between the population centres of Oshawa and Bowmanville. The existing presence of these features categorizes the landscape sensitivity as minimal, while a minimal magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

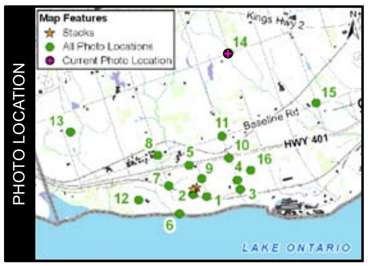
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 14

View looking Southwest from the Intersection of Bloor Road and Rundle Road.

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-15

JW-1009497-NS4-15

Last Modified: June 3, 2009 By: L. Kendell

Site 15 – Intersection of Baseline Road and Maple Grove Road, looking southwest. This photo location is approximately 3,749 m from the Facility. The view of the Facility infrastructure is obstructed by existing vegetation and other vertical structures (i.e., hydro poles and transmission lines) (Figure 4-16). Only the upper portions of the stacks can be seen from this distance in either operating scenario.

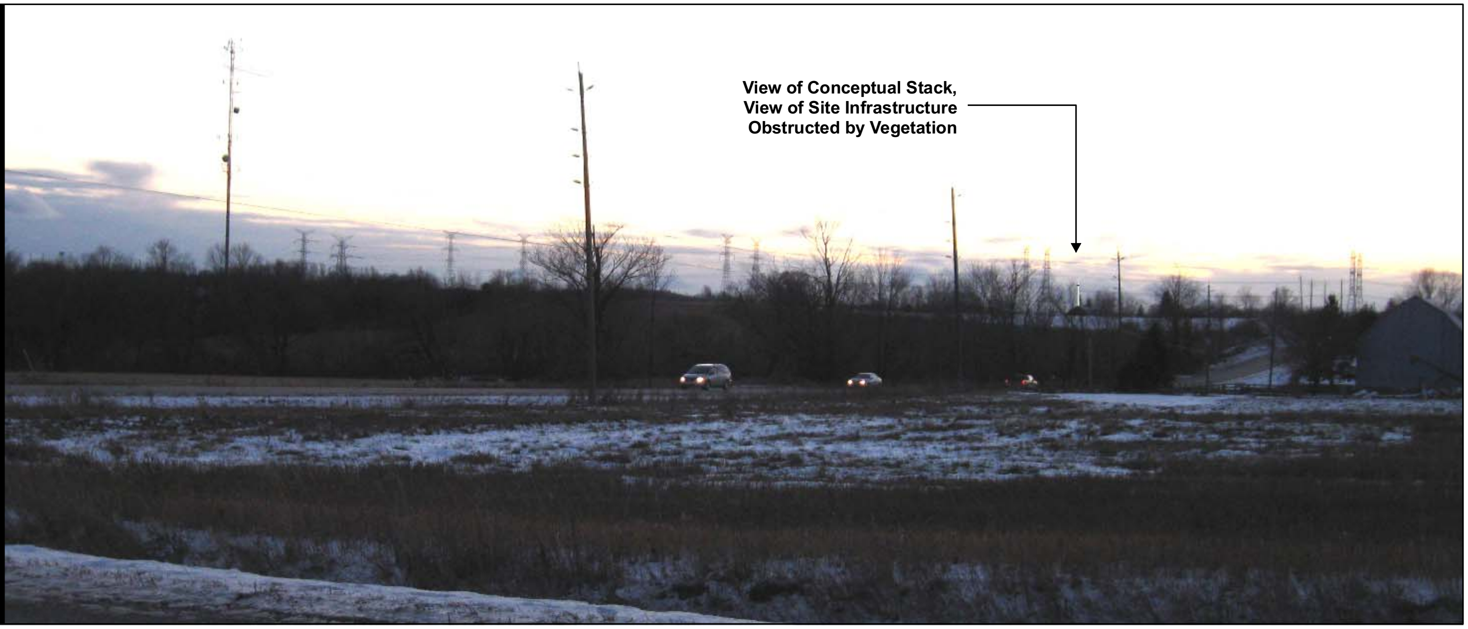
The current landscape is a mix of both rural and residential characteristics. The viewscape in this photo includes Highway 401 and the OPG berm. Residences within the Town of Bowmanville are situated approximately 1 km to the north and east of this location, and this viewscape provides an indication of the visibility of the Facility to the closest residential areas. The viewscape in this photo represents the view from the southwest portion of the residential areas of Bowmanville. The existing presence of these features categorizes the landscape sensitivity as minimal, while a minimal magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

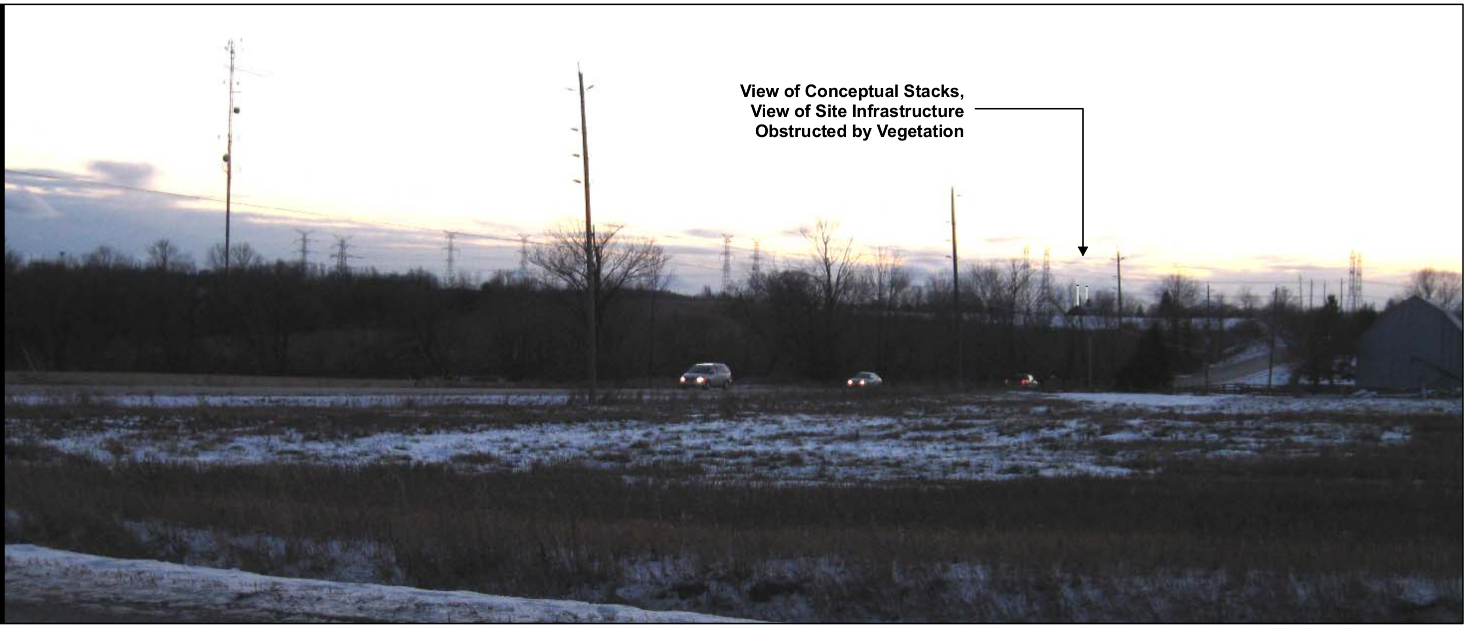
Visual Simulation from Site 15

View looking Southwest from the Intersection of Baseline Road and Maple Grove Road.

140,000 TPY SCENARIO

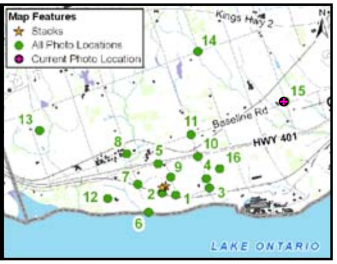


400,000 TPY SCENARIO



ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-16

JW-1009497-NS4-16

Last Modified: June 3, 2009 By L. Kendell

Site 16 – Top of the berm associated with the Darlington Nuclear Generating Station, to the east of the Site. This photo location is approximately 1,527 m from the Facility. The visible structures from this vantage include the stack and the process buildings in the 140,000 tpy scenario (Figure 4-17). Visual differences between the 140,000 tpy and 400,000 tpy scenarios are minimal from this vantage.

The current landscape is a mix of both rural and agricultural characteristics with commercial features. This photo was taken to the west of the lookout on the top of the berm, and the viewscape from this location includes Copart Auto Auctions and Manheim Oshawa Auctions, as well as the adjacent Darlington (Hydro) Sports Fields. The added presence of the rail lines to the south categorizes the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 16

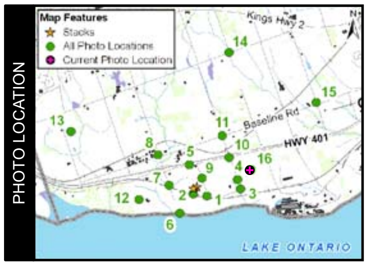
View looking West from the Walking Trail at the top of the OPG Berm.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-17

JW-1009497-NS4-17

Last Modified: June 4, 2009 By: L. Kendell

4.1.2.2 Potential Effects on Receptors

The magnitude and sensitivity of the potential visual effect on receptors have been assessed for the 140,000 tpy scenario and are discussed below in relation to definitions presented in Table 2-1.

- *Clarington Energy Business Park* – The view for this receptor is represented by Sites 1, 2, 3, 4, 5, 7, 9, and 10 (Figures 4-2, 4-3, 4-4, 4-5, 4-6, 4-8, 4-10 and 4-11, respectively). Employees and visitors to the Business Park could experience a medium level of visual magnitude and sensitivity.
- *Courtice Water Pollution Control Plant* – The view for this receptor is represented by Sites 2 and 6 (Figures 4-3 and 4-7, respectively). Employees and visitors to the plant would experience a medium level of visual magnitude and sensitivity.
- *CN Rail* – The view for this receptor is represented by Sites 1 and 2 (Figures 4-2 and 4-3, respectively). Due to the temporary nature of the exposure to this view, there could be a medium visual magnitude and a minimal sensitivity rating for this receptor.
- *Highway 401 users* – The view for this receptor is represented by Sites 5 and 10 (Figures 4-6 and 4-11, respectively). Due to the temporary nature of the exposure to this view, there could be a medium visual magnitude and a minimal sensitivity rating for this receptor.
- *Waterfront Trail users* – The view for this receptor is represented by Sites 1, 3, 5, 7 and 16 (Figures 4-2, 4-4, 4-6, 4-8 and 4-17, respectively). Due the potential number of seasonal users, this could result in a medium visual magnitude and sensitivity.
- *Residences* – Two existing residences are located northwest of property (one of which is abandoned) and one is located to the east. The views for these receptors are represented by Sites 4 and 7 (Figures 4-5 and 4-8, respectively). As these residences represent a permanent receptor with proprietary interest and prolonged viewing opportunities, this could result in a minimal visual magnitude and a high visual sensitivity.
- *Darlington (Hydro) Sports Fields* – The view for this receptor is represented by Site 4 (Figure 4-5). Due to the potential number of seasonal users, this could result in a medium visual magnitude and minimal visual sensitivity.
- *Darlington Nuclear Generating Station* – The view for this receptor is represented by Sites 3 and 16 (Figures 4-4 and 4-17, respectively), and could potentially experience a medium level of magnitude and sensitivity.
- *Darlington Provincial Park* – The view for this receptor is represented by Site 12 (Figure 4-13). Due the potential number of seasonal users, this could result in a medium visual magnitude and medium visual sensitivity.
- *Municipality of Clarington* – The Municipality is fairly widespread, but the views for this receptor would be best represented by Sites 8, 11 and 14 (Figures 4-9, 4-12 and 4-15, respectively). Due to the dispersed population, this could result in a medium visual magnitude and high visual sensitivity rating.
- *City of Oshawa* – The view for this receptor is represented by Site 13 (Figure 4-14). Due to the permanent population in Oshawa, this would result in a medium visual magnitude impact and high sensitivity rating.

- *Town of Bowmanville* – The view for this receptor is represented by Site 15 (Figure 4-16). Due to the permanent population in Bowmanville, this could result in a medium magnitude impact and high sensitivity rating.

It should be noted that the sensitivity of these receptors to the potential future case expansion of the Facility to the maximum design capacity of 400,000 tpy would likely be much reduced from those values identified for the 140,000 tpy scenario. The expansion would not take place until after the initial Facility is operational, and this base case would become part of the new level of existing visual characteristics for the area. If required, an updated Visual Impact Assessment for the expansion may be undertaken.

The Facility would be a component of Durham Region's Public Infrastructure and as such, its development is not required to conform with existing area municipal planning policies and zoning provisions. As a result, the Site is considered compatible with current land use designations and zoning. Clarington 01 also has the greatest distance to designated residential areas and the fewest residences within a 1 km radius.

It is possible that on days with very low temperatures that the water vapour emissions from the stack could be visible. However, this is dependent on local climate conditions.

Lighting from the Facility is not expected to create a nuisance at nearby receptors as the exterior lighting system has been designed to minimize nuisance lighting on neighboring receptors. For an elevated light source, such as the stack and other process units, as required by the Canadian Aviation Regulations, use of low intensity, or slow flashing white lights is recommended to decrease potential nuisance effects on nearby receptors, and to reduce potential effects on wildlife (i.e., bird collisions).

Development of the Facility would be compatible with the landscape character and local and regional distinctiveness, in keeping with the current land use designations and zoning of the Clarington Energy Business Park. There are no seasonal residents (i.e., cottagers), and very few permanent residents in this area. While there is some recreational use within the LCSA, the main source of potential direct effects would be to the Waterfront Trail users. These recreationists already make use of the trail system, which traverses other highly industrial areas in the Oshawa area and through Darlington Nuclear Generating Station property. Overall, the addition of the Facility would be a source of visual intrusion, and to a lesser extent, as a visual obstruction of Lake Ontario.

4.1.3 Operational Period - Potential Visual Effects – Future Build-Out Visual Conditions

In response to a request from the Municipality of Clarington, potential visual effects associated with the operational Facility were also assessed for what is currently known to be part of the planned future build-out of the Clarington Energy Business Park and the PSVSA. These future build-out facilities and infrastructure include the proposed OPG Building and Visitors Centre (identified to be situated on 61 acres of currently vacant land, northeast of the Facility), Energy Drive (an east-west thoroughfare traversing the Clarington Energy Business Park), as well as the proposed Highway 407 extension interchange ramps to connect with Highway 401. As in Section 4.1.2, these simulations are artistic renderings based on the currently available project data and regional 3D modelling, and the final

Facility, OPG facilities and infrastructure may appear differently than as portrayed by these simulations. While these simulations take into account the current conceptual design details, including the proposed size, shape and locations of the Facility and these other proposed structures, they do not account for the overall architectural design, landscaping, material and colour choices and other elements that may represent the final design/appearance of these various structures. By minimizing the presence of potential mitigating factors in the modelling, a "worst-case" visual representation of the visual effects associated with the Facility is the conceptualized result.

As in Section 4.1.2, both the 140,000 and 400,000 tpy operating scenarios for the Facility were assessed.

On June 16, 2008, JWSL staff took six photos from different vantage points around the PSVSA and also to represent the viewscape from specific vantages associated with the OPG Building, Energy Drive and the east and westbound Highway 407 interchanges. The visual conditions that day were sunny with good visibility. Figure 4-18 illustrates the locations from which these additional photos were taken.

4.1.3.1 Visibility of the Facility Structures

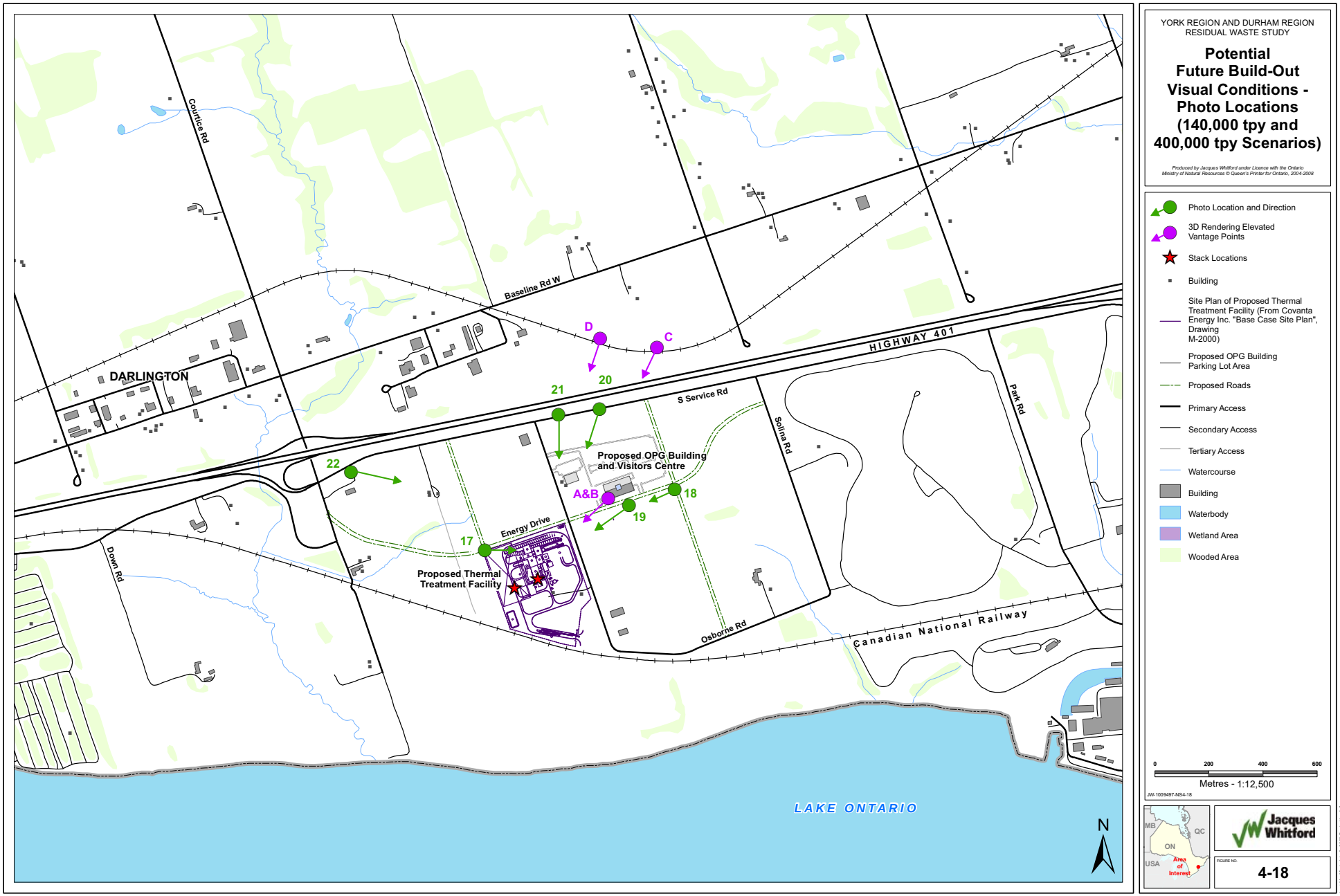
The following summarizes the visual assessment of the Facility with respect to the photographic locations (i.e., Sites 17 to 22) as identified on Figure 4-18. The photographic locations were selected to reflect views from the future build-out case of the Clarington Energy Business Park, the PSVSA, and Highway 407 interchanges, all of which is currently planned to be constructed gradually over the next 10 to 20 years. Photos were taken, wherever possible, from public road allowances or areas with public walking access. OPG granted permission to access the agricultural fields representing the future locations of Energy Drive, and the OPG Building.

These visual simulations are meant to reflect a more advanced build-out scenario, as currently disclosed, and do not take into account the gradual nature of the construction timeline for these various facilities and structures. These photos were taken from within a close proximity to the Facility, reducing the effect of potential mitigating factors, such as distance and topography. The addition of the OPG buildings and other potential man-made structures within the Clarington Energy Business Park, would largely determine the eventual level of visibility of the Facility across the PSVSA.

As some of these vantages are from locations with an elevated perspective (i.e., the Highway 407 west and eastbound interchanges are elevated 17 and 27 m, respectively), 3D simulations were created for these "at-height" viewscapes through the use of ESRI ArcScene, as discussed in Section 2.3.2.2 (see Figure 4-18). For each elevated location, a photo was taken at ground level, along the line of sight from the selected vantage point. These photo simulations illustrate current visual characteristics (i.e., obstruction by existing vegetation), and provide a general demonstration of how the Facility might appear in relation to the other planned projects for the area.

As either operating capacity scenario may be affected by the future build-out case in the PSVSA, the impact magnitude and sensitivity in relation to effects on the future build-out landscape for both the 140,000 and 400,000 tpy scenarios are discussed, as per the definitions listed in Table 2-1. By the time the potential future capacity expansion is required, the baseline visual characteristics of the area would likely include some or all of the described developments, resulting in differing impact magnitude

and sensitivity ratings than those described herein. As such, an updated Visual Impact Assessment may be undertaken at that time and as required.



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Potential Future Build-Out Visual Conditions - Photo Locations (140,000 tpy and 400,000 tpy Scenarios)

- Photo Location and Direction
- 3D Rendering Elevated Vantage Points
- Stack Locations
- Building
- Site Plan of Proposed Thermal Treatment Facility (From Covanta Energy Inc. "Base Case Site Plan", Drawing M-2000)
- Proposed OPG Building Parking Lot Area
- Proposed Roads
- Primary Access
- Secondary Access
- Tertiary Access
- Watercourse
- Building
- Waterbody
- Wetland Area
- Wooded Area

0 200 400 600

Metres - 1:12,500

JW-1009497-NS4-18

Jacques Whitford

FIGURE NO.

4-18

Last Modified: July 8, 2009 By: L. Randall

Site 17 – Northwest corner of the Site, looking east along the right of way for the proposed thoroughfare, Energy Drive. This location is approximately 221 m to the Facility. In both the 140,000 tpy and 400,000 tpy scenarios, the visible structures from this vantage include the Facility process buildings (Figure 4-19).

The current landscape is a mix of both commercial (i.e., Manheim Oshawa Auctions) and agricultural characteristics. The berm on the north side of the chain link fence visible in this photo, associated with Manheim Oshawa Auctions, would obstruct the view of that commercial facility, as well as the proposed OPG Visitors Centre, from this vantage. The future build-out case will include the OPG Building, on the east side of Osborne Road, which would be visible from this vantage, and Energy Drive (not depicted in this simulation). The presence of these commercial and business properties would categorize the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 17

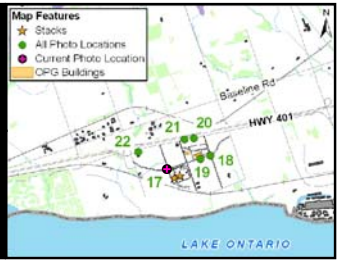
View looking East along Future Energy Drive from the Northwest Corner of the Project Site

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-19

Last Modified: July 7, 2008 By: L. Kendall - JW-100347-1434-19

Site 18 – Southeast corner of the proposed OPG building, looking west along the right of way for the proposed thoroughfare, Energy Drive. This location is approximately 602 m to the Facility. In both the 140,000 tpy and 400,000 tpy scenarios, the visible structures from this vantage include the stack(s) and the process buildings (Figure 4-20).

The current landscape is a mix of both commercial (i.e., Manheim Oshawa Auctions) and agricultural characteristics. The future build-out case will include the OPG Building and Energy Drive (not depicted in this simulation). From this vantage, both Manheim Oshawa Auctions and the OPG Visitors Centre are not visible as the line of sight to these buildings is obstructed by the OPG Building. The presence of these commercial and business properties would categorize the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

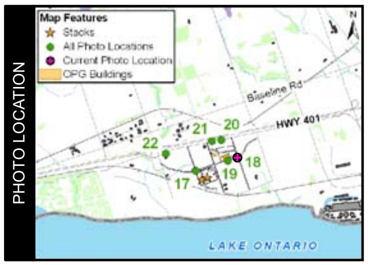
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 18

View looking Southwest from the Southeast Corner of the OPG Property along Proposed Energy Drive

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-20

Last Modified: June 26, 2009 By: L. Kendell JW-1009497-NS4-20

Site 19 – The future site of the OPG Building, looking southwest towards the site. This ground-level photo location is approximately 431 m to the Facility. In both the 140,000 tpy and 400,000 tpy scenarios, the visible structures from this vantage include the stack(s) and the process buildings (Figure 4-21).

Elevated views simulating the vantage from within the proposed OPG Building were also created from 3D rendering locations A and B (see Figure 4-18). These elevated views illustrate the potential view from the third floor (14 m above ground level) and the fifth floor (20 m above ground level), looking southwest at the Facility (Figures 4-22 and 4-23). For the purposes of this modelling, an average height of 1.65 m was added to each estimated storey height to account for a receptor standing on each floor, resulting in visual simulations for the third and fifth floor at 15.65 m and 21.65 m, respectively. These elevated views were created to represent the view from the southwest corner of the OPG Building, approximately 392 m to the Facility. The heights used to model these elevated perspectives are only estimations, and the actual view from the OPG Building may differ from those presented in these simulations. These viewscapes include the Facility, Energy Drive, Osborne Road and Manheim Oshawa Auctions.

The current landscape is a mix of both commercial (i.e., Manheim Oshawa Auctions) and agricultural characteristics. The future build-out case will include Energy Drive. The OPG buildings cannot be seen from this perspective. The presence of these commercial and business properties would categorize the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

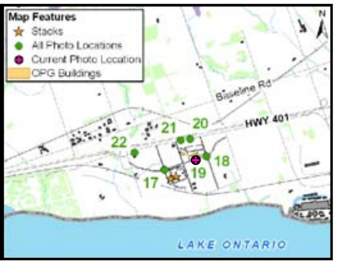
YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 19

View looking Southwest from the OPG Building along Proposed Energy Drive

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.

4-21

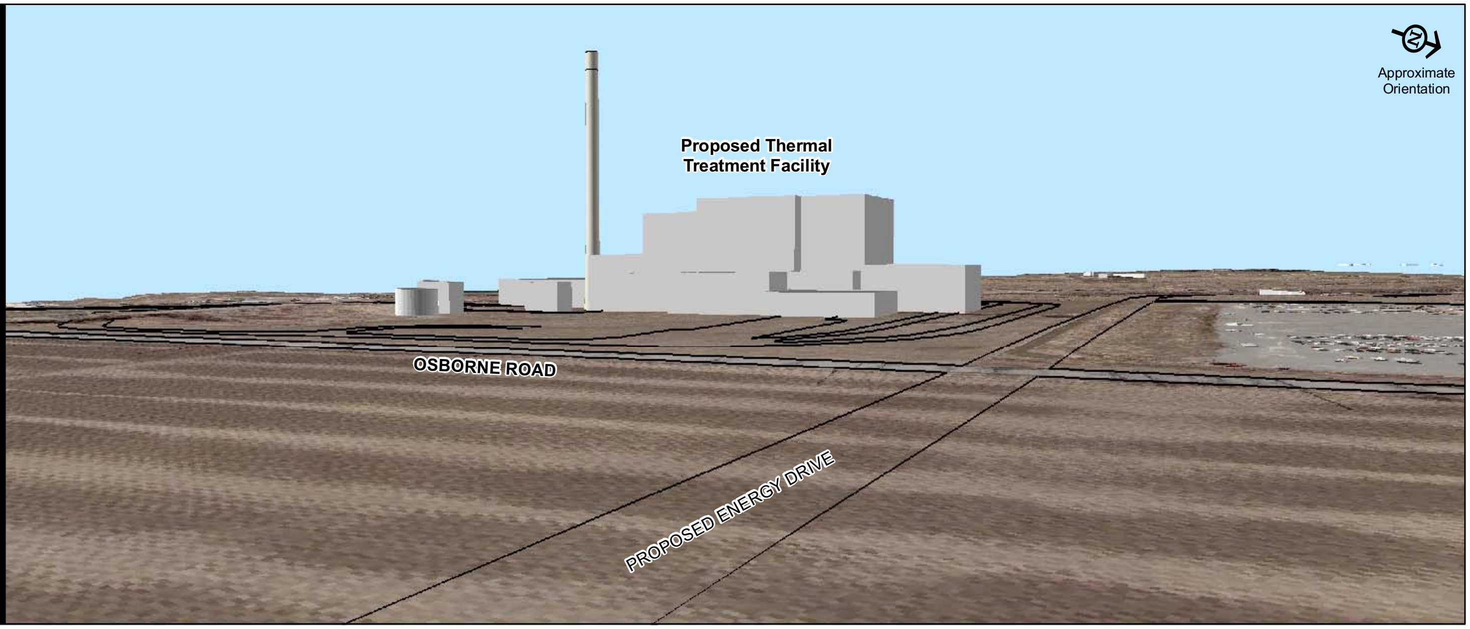
Last Modified: June 26, 2009 By: L. Kendell JW-1009497-NS4-21

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

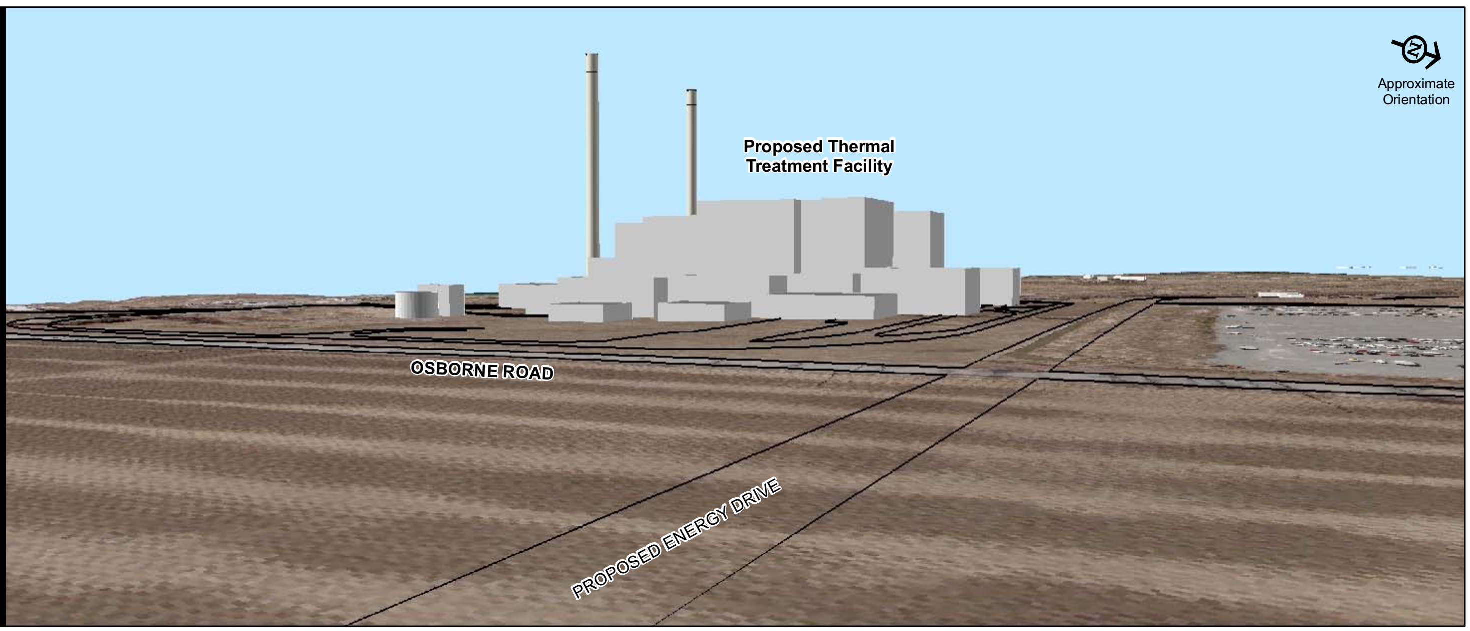
Elevated Visual Simulation from the Third Floor of the Proposed OPG Building (Site A)

3-Dimensional Representation of the Site Layout (140,000tpy and 400,000 tpy Scenarios)

140,000 TPY SCENARIO

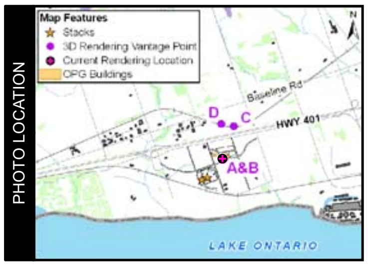


400,000 TPY SCENARIO

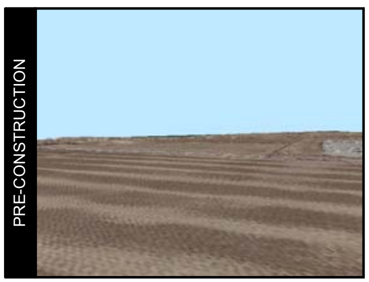


ARTISTIC RENDERING 140,000 TPY SCENARIO (McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION



Jacques Whitford

FIGURE NO.

4-22

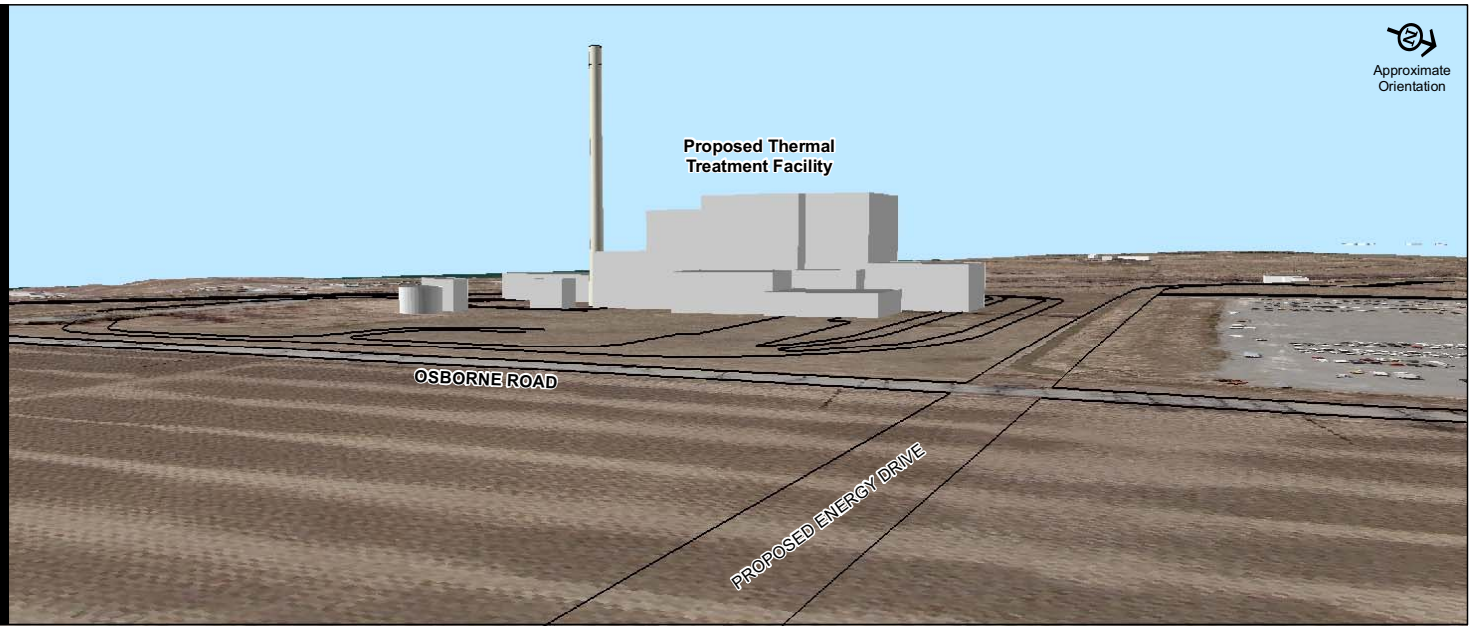
Last Modified: July 6, 2009 By: L. Kendell JW-1009497-NS4-22

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

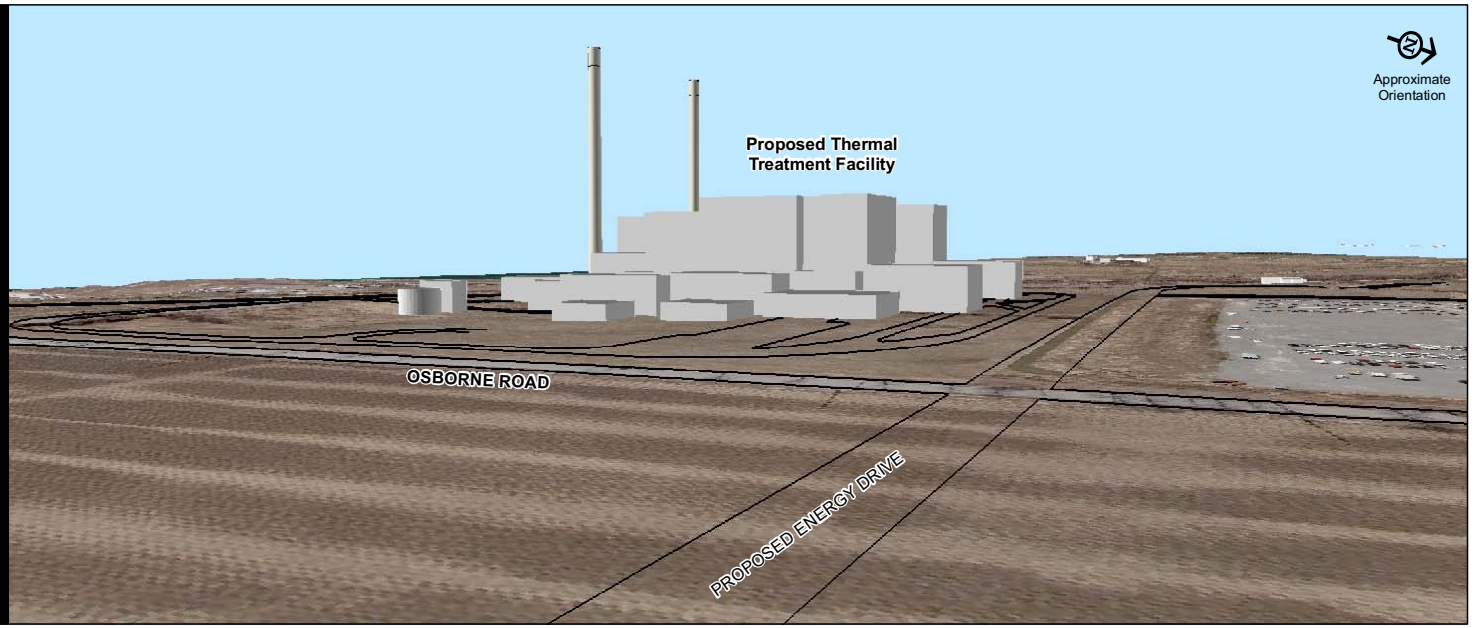
Elevated Visual Simulation from the Fifth Floor of the Proposed OPG Building (Site B)

3-Dimensional Representation of the Site Layout (140,000tpy and 400,000 tpy Scenarios)

140,000 TPY SCENARIO

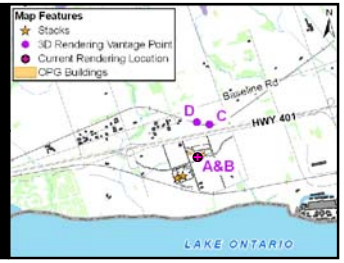


400,000 TPY SCENARIO

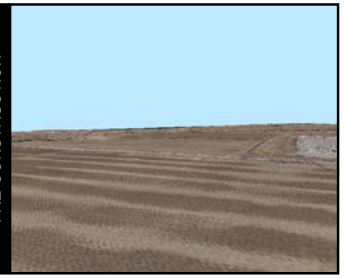


ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION



Jacques Whitford

FIGURE NO.
4-23

Last Modified: July 8, 2008 By: L. Kendall JW-1003497-1434-23

Site 20 – The view from the eastbound Highway 407 interchange ramp, looking southwest. This ground-level photo location is approximately 608 m to the Facility. In both the 140,000 tpy and 400,000 tpy scenarios, the visible structures from this vantage include the stack(s) and the process buildings (Figure 4-24).

The actual view from the eastbound Highway 407 interchange ramp would be elevated into the air over the Canadian Pacific (CP) railway by approximately 27 m (Figure 4-25). This vantage is located approximately 958 m northeast of the Facility (see figure 4-18 for 3D rendering location C). The height used to model this elevated perspective is based on current design specifications, and the actual view from the eastbound interchange ramp may differ from that presented in this simulation. From this elevation, all of the structures associated with the proposed OPG Building, proposed OPG Visitors Centre, the Facility and Highway 401 can all be seen. Manheim Oshawa Auctions is also visibly apparent from this perspective.

The current landscape is a mix of both commercial (i.e., Manheim Oshawa Auctions) and agricultural characteristics. The future build-out case will include the OPG buildings and Energy Drive. This view would also be somewhat obstructed by presence of the Highway 407 off-ramp connections to Highway 401, which are not visually depicted in this rendering. The presence of this additional infrastructure, in addition to the depicted commercial and business properties, would categorize the landscape sensitivity as low, while a medium magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 20

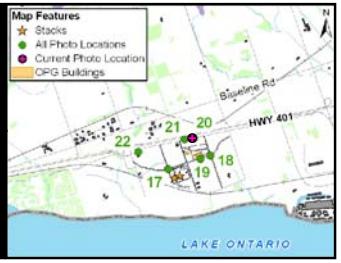
View looking Southwest from along South Service Road at the Highway 407 Off Ramp, Interlink with Highway 401

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-24

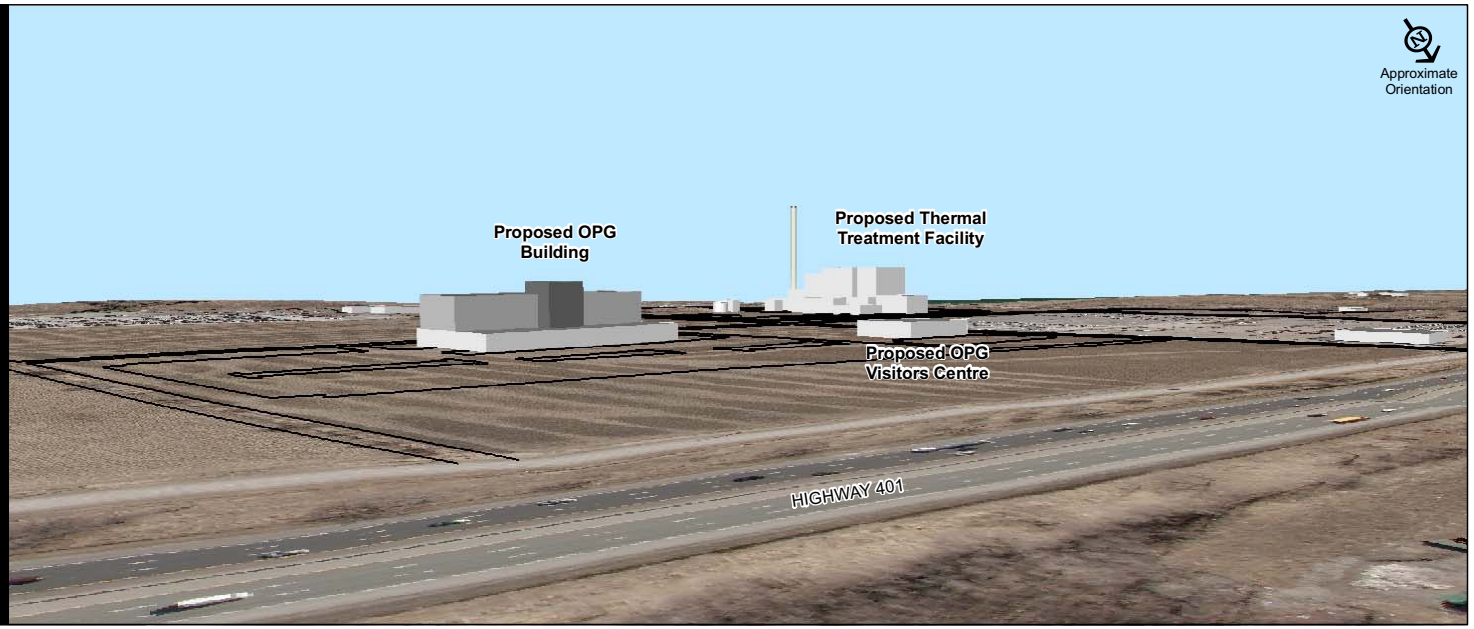
Last Modified: July 8, 2008 By: L. Kendall - JW-1003497-1434-24

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

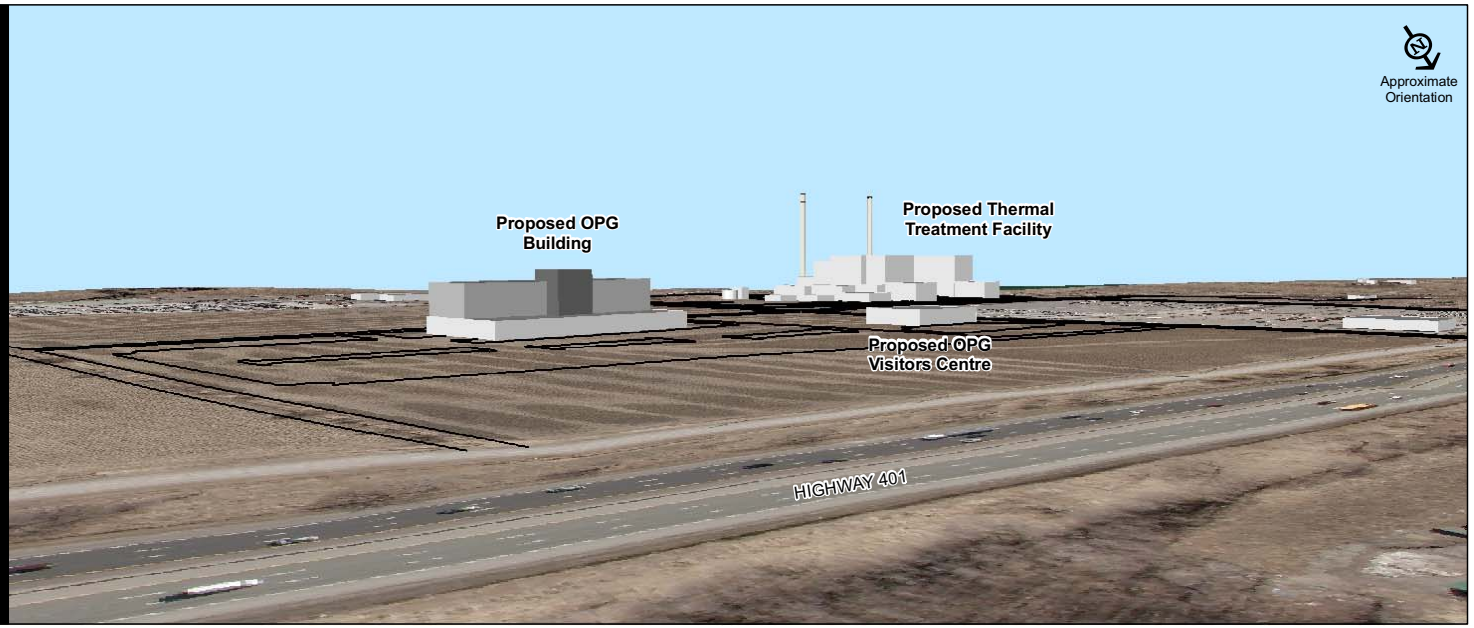
Elevated Visual Simulation from the Proposed Eastbound Highway 407 Interchange Ramp (Site C - Elevated 27 Metres)

3-Dimensional Representation of the Site Layout (140,000tpy and 400,000 tpy Scenarios)

140,000 TPY SCENARIO

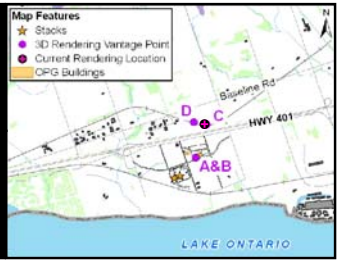


400,000 TPY SCENARIO

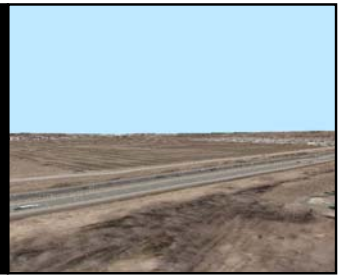


ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION



Jacques Whitford

FIGURE NO.
4-25

Last Modified: July 7, 2008 By: L. Kendall - JW-1003497-1434-25

Site 21 – The view from the westbound Highway 407 interchange ramp, looking southwest. This ground-level photo location is approximately 663 m to the Facility. In both the 140,000 tpy and 400,000 tpy scenarios, the visible structures from this vantage include the stack(s) and the process buildings (Figure 4-26). The view of the Facility would be partially obstructed by the presence of the proposed OPG Visitors Centre.

The actual view from the westbound Highway 407 interchange ramp would be elevated into the air over the CP railway by approximately 17 m (Figure 4-27). This vantage is situated approximately 915 m to the northeast of the Facility (see Figure 4-18 for 3D rendering location D). The height used to model this elevated perspective is based on current design specifications, and the actual view from the westbound interchange ramp may differ from that presented in this simulation. From this elevation, the proposed OPG Building, proposed OPG Visitors Centre, the Facility, Highway 401 and Manheim Oshawa Auctions are all visibly apparent.

The current landscape is a mix of both commercial (i.e., Manheim Oshawa Auctions) and agricultural characteristics. The future build-out case will include the OPG buildings and Energy Drive. This view would also be somewhat obstructed by the presence of the Highway 407 off-ramp connections to Highway 401, which are not visually depicted in this rendering. The presence of these properties and supporting infrastructure would categorize the landscape sensitivity as low, while a medium magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 21

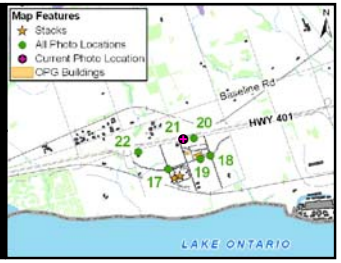
View looking Southwest from along South Service Road at the Highway 407 Interlink with Highway 401

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

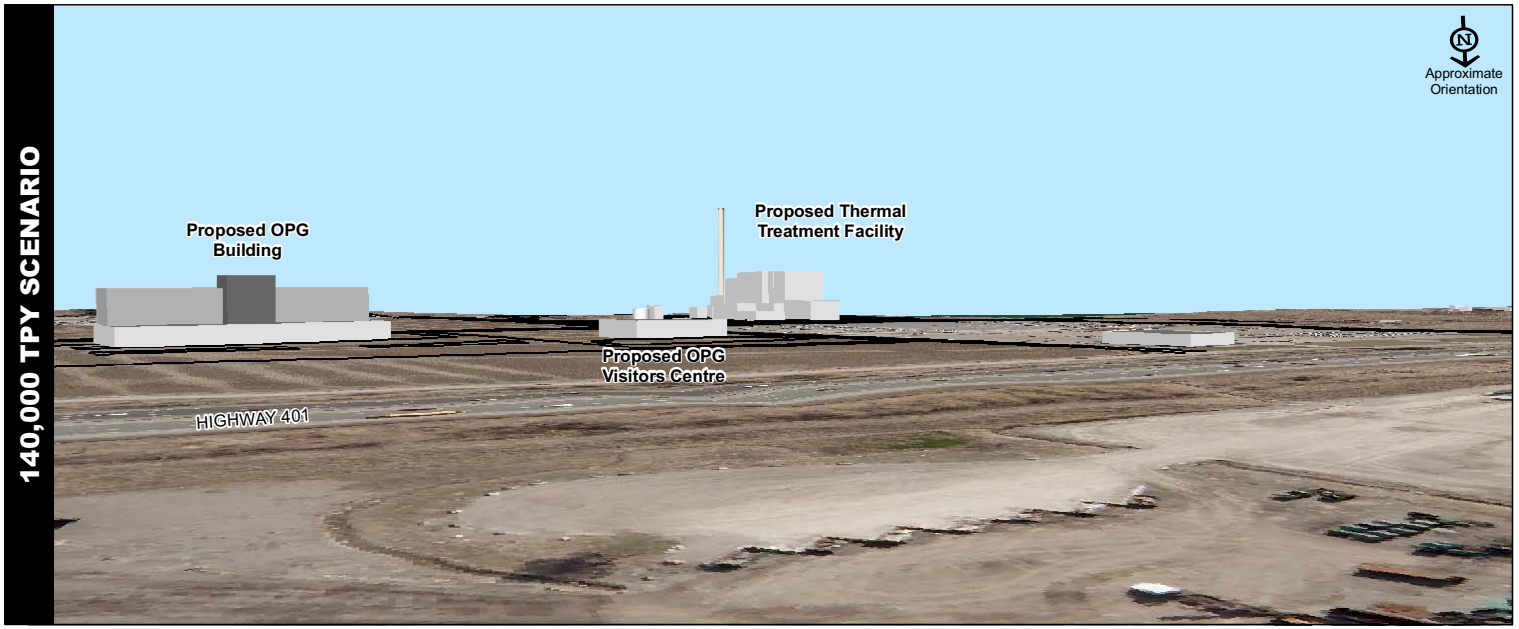
FIGURE NO.
4-26

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

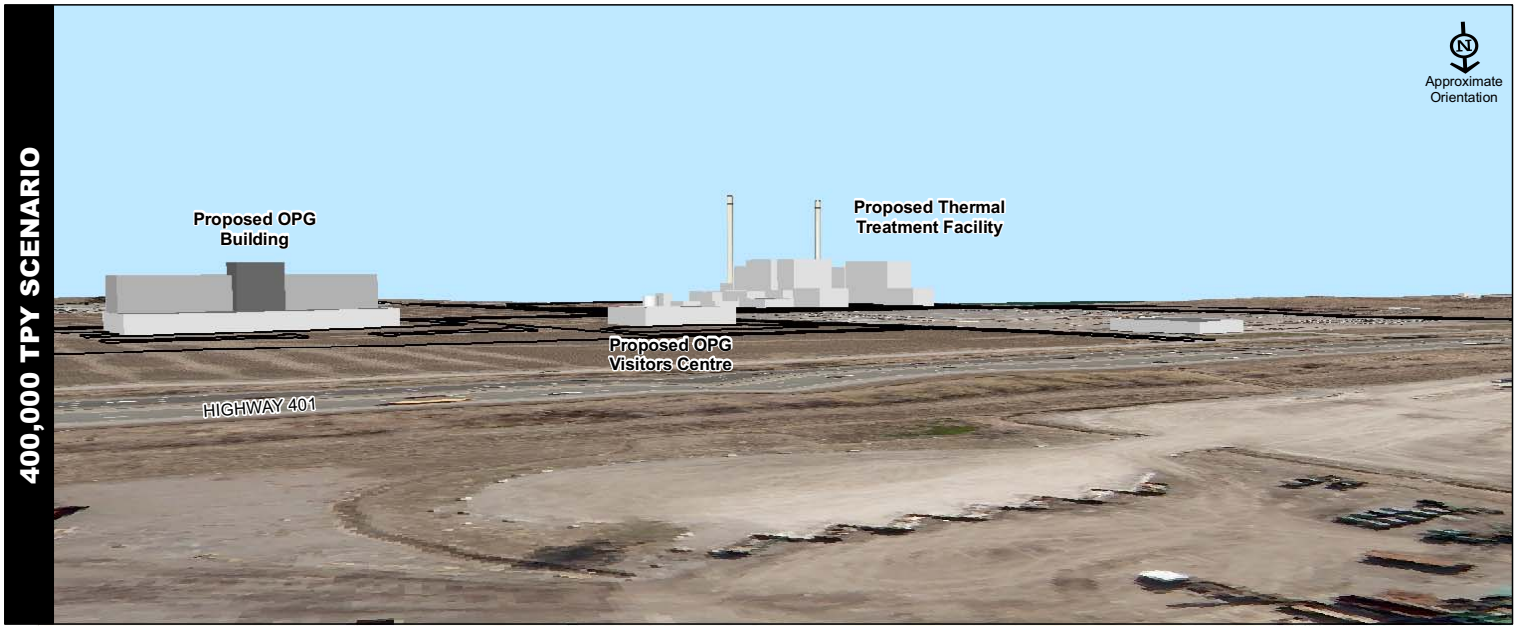
Elevated Visual Simulation from the Proposed Westbound Highway 407 Interchange Ramp (Site D - Elevated 17 Metres)

3-Dimensional Representation of the Site Layout (140,000tpy and 400,000 tpy Scenarios)

140,000 TPY SCENARIO

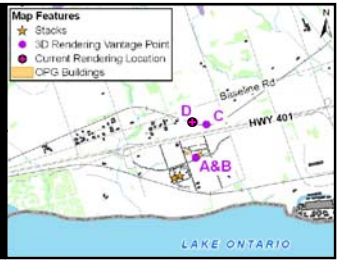


400,000 TPY SCENARIO

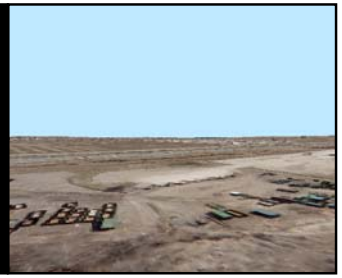


ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION



Jacques Whitford

FIGURE NO.
4-27

Last Modified: July 7, 2008 By: L. Kendall - JW-1003497-1434-27

Site 22 – The view from the Highway 401 and Courtice Road interchange, looking southeast. This location is approximately 794 m to the Facility. In both the 140,000 tpy and 400,000 tpy scenarios, the visible structures from this vantage include the Facility process buildings (Figure 4-28).

The current landscape from this vantage is primarily undeveloped and includes some agriculture and the presence of hedgerows. The future build-out case will include the proposed OPG Building. The presence of these commercial and business properties would categorize the landscape sensitivity as medium, while a medium magnitude landscape impact would be anticipated.

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Visual Simulation from Site 22

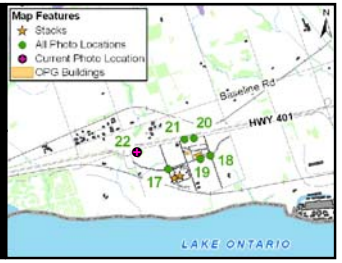
View looking Southeast, East of Courtice Road and South Service Road Intersection, from the Driveway of an Abandoned Building.

140,000 TPY SCENARIO

400,000 TPY SCENARIO

ARTISTIC RENDERING
140,000 TPY SCENARIO
(McMillan Associates Architects)

PHOTO LOCATION



PRE-CONSTRUCTION

Jacques Whitford

FIGURE NO.
4-28

Last Modified: July 7, 2008 By: L. Kendall - JW-1003497-1434-28

4.1.3.2 Potential Effects on Receptors

The magnitude and sensitivity of the potential visual effect on future receptors associated with the build-out conditions have been assessed for the 140,000 tpy scenario are discussed below in relation to definitions presented in Table 2-1.

- *Energy Drive users* – The view for this receptor is represented by Sites 17 and 18 (Figures 4-19 and 4-20). Due the potential number of part-time and full-time employees and visitors using this thoroughfare, this could result in a medium visual magnitude and sensitivity.
- *OPG Building and Visitors Centre (Clarington Energy Business Park)* – The view for this receptor is represented by Site 19, and 3D rendering locations A and B (Figure 4-21, Figure 4-22 and 4-23, respectively). Employees and visitors to the OPG buildings could experience a medium level of visual magnitude and sensitivity.
- *Highway 407 users* – The view for this receptor is represented by Sites 20 and 21, and 3D rendering locations C and D (Figures 4-24 and 4-26, and 4-25 and 4-27, respectively). Due to the temporary nature of the exposure to this view, there could be a medium visual magnitude and a minimal sensitivity rating for this receptor.
- *Highway 401 users* – The view for this receptor is represented by Site 22 (Figures 4-28). There may be an increased volume of traffic along this portion of Highway 401 based on the new Highway 407 interchange. Due to the temporary nature of the exposure to this view, there could be a medium visual magnitude and a minimal sensitivity rating for this receptor.

Again, it should be noted that the sensitivity of these receptors to the potential future case expansion of the Facility to the maximum design capacity of 400,000 tpy would likely be much reduced from those values identified for the 140,000 tpy scenario. Additionally, the future build-out of the Clarington Energy Business Park and the PSVSA (i.e., the Highway 407 interchanges) would add to the human-modified nature of the area and further reduce the sensitivity of the landscape to the changes. Depending on the order and timing of the construction of these facilities, the nature of the existing visual character for the area would vary.

The main source of potential direct effects would be to the Clarington Energy Business Park users. These users would include part and full-time employees, as well as customers and visitors. The number of permanent and casual employees within the eventual full build-out of the Clarington Energy Business Park is estimated to be between 3,000 and 5,000, which would be the main source of receptors with the potential for prolonged viewing opportunities of the Facilities. This employment projection was calculated by URS Canada Inc. for future traffic conditions through the use of back-calculating the number of employees based on the number of trips estimated during the traffic assessment, and from the number of employees per net hectare used in Durham Region employment corridors. Due to the nature of the Clarington Energy Business Park, and the generally temporary duration of the use and visitation, these users would be expected to have a passive to moderate interest in their visual surroundings.

4.1.4 Post-Closure Period

Visual effects associated with post-closure/decommissioning are anticipated to be minimal. Demolition and removal of structures at the Facility would likely occur first and could be the most probable phase for potential visual effects during decommissioning. These activities could potentially include large-scale construction equipment on the Site, and result in the temporary presence of piles of debris. Timely removal of the debris could lessen the effect associated with these activities, and shorten the timeframe in which the use of heavy equipment to remove the resulting rubble and waste material would be required. The movement of the equipment and machinery around the Site would likely be visible from different vantages as they enter and exit the work areas, resulting in a visual effect. Removal of materials would likely be along the same haul route, as identified in Section 4.1.1. However, due to the commercial and industrial nature of the area adjacent to the Site, the effect on the visual landscape would generally be considered to be minimal. Furthermore, the presence of additional buildings and structures within the built-out Clarington Energy Business Park would provide shielding for many receptors against some of the visual effects associated with decommissioning activities from certain vantages within the PSVSA.

While receptors located closer to the Site (i.e., along adjacent roadways or neighbouring properties) may experience a higher level of visual intrusion, the large viewing distance for the majority of the receptors within the LCSA to the decommissioning activities is consistent with the anticipated minimal visual effect.

During the post-closure period, there could be minimal visual effects during the early phase of decommissioning, as tall structures are dismantled. The effects could be positive from the perspective of a less obstructed skyline. These activities would be temporary in nature and the overall effect experienced by neighbours for the post-closure period is anticipated to be minimal.

4.2 Viewshed Analysis

This section will outline the worst-case scenarios of the effect on the local community viewshed. Certain conditions (i.e., clear weather conditions offering high visibility) could affect the overall visibility of the Facility from vantages within the LCSA. The following analysis demonstrates the anticipated greatest level of effect on the visual landscape from the development of the 140,000 tpy scenario Facility and is based upon Figures 4-29 to 4-30. Figure 4-29 and 4-30 demonstrate the anticipated greatest level of effect associated with the 400,000 tpy scenario. These figures illustrate the areas of visibility within the LCSA for the stack(s). The potential visibility of the Facility would vary across the LCSA based on the distance, topography, man-made structures and existing vegetation cover. Tree blockage areas and man-made structures, such as houses and other buildings, transmission lines and communication towers largely determine the visibility of facility structures as viewed from each location.

With respect to the future build-out case for the Clarington Energy Business Park and the PSVSA, as the dimensions and locations of these future structures and buildings cannot be confirmed, these facilities were not included in this aspect of the visual impact assessment modelling. As such, the viewshed analysis reflects the current visual character of the PSVSA and LCSA, without taking into

account potential visual obstruction offered by the proposed OPG buildings and Highway 407 interchange ramps.

These figures visually represent the areas on the landscape where the Facility (particularly the stack[s]) could be visible, taking into consideration the topography of the region and obstructive features such as woodlots or buildings. However, the specifications of the nearby commercial properties were not available and thus were not considered for the level of visual obstruction these properties could potentially provide. As such, receptors situated to the south, north and southeast of the adjacent water pollution control plant and commercial properties, respectively, are anticipated to experience a lower level of effect than that indicated on Figures 4-29 to 4-32 for both scenarios.

The viewshed analysis was based on modelling the worst-case visibility of the tallest and most visible, Facility structure, the stack (87.6 m). In the 140,000 tpy scenario, one stack was modelled and in the 400,000 tpy scenario, two stacks were modelled. The two stacks are approximately 93 m apart, oriented in an east-west direction from each other. As the majority of the Facility would be of a lesser height than these specific features, the buildings associated with the Facility were not modelled.

4.2.1 Local Community Study Area Viewshed Analysis

Within a 1 km radius of the Site, the stack is highly visible. The highest area of visibility is from within the Clarington Energy Business Park. The main area that would be visible from the stack is within an area bounded by Bloor Street, however, a line of sight to the stack is potentially available for the area bounded by King Street (King's Highway #2) (Figure 4-30). The addition of another stack does not alter the local visibility of the Facility in an appreciable manner (Figure 4-32). The differences between the two viewshed models for the 140,000 and 400,000 tpy scenarios are minimal. Differences in visibility within the LCSA between the two capacity scenarios were negligible.

Recreational users of Darlington Provincial Park to the west could be shielded primarily by the vegetation present within the Park. The berm to the east of the Site, associated with the Darlington Nuclear Generating Station could also act as a visual barrier to receptors situated to the east of the berm. Additionally, the topography could prevent the majority of Bowmanville from having a line of sight to the Facility (Figures 4-30 and 4-32). Recreational users of the Darlington (Hydro) Fields and the Waterfront Trail could have an uninterrupted view of the Facility, however, due to their limited exposure to these views and their moderate level of interest they would have in the viewscape, these receptors are not expected to require mitigation.

To further clarify the level of visual intrusion on receptors within the LCSA, the incremental viewshed analysis was conducted (Figures 4-30 and 4-32). Figures 4-30 and 4-32 categorize the potential level of visual intrusion by delineating the areas where a large proportion of the stack could be visible, versus areas where only a line of sight to the top or top portion of the stack is available (increments illustrated by colour where magenta indicates low visibility areas and orange indicates highly visible areas).

The highest visibility for both operating scenarios is contained within an area of approximately 2 km radius around the Site (Figures 4-30 and 4-32). While a line of sight to the stack is potentially available for the area bounded by King Street (King's Highway #2), the intervening vegetation, buildings and

other structures could reduce the actual visibility of the Facility from these distances (Figures 4-30 and 4-32). Areas of lower visibility occur throughout the LCSA, primarily in sparsely populated locales, outside of the main population centers, thus the overall visual sensitivity in the broader LCSA would be low. The distance to the Facility and the minimal changes to the landscape, as visible from this distance, could result in a minimal magnitude effect.

Regionally, a line of sight could be available to the top of the stack as far away as 30 km. This visibility would depend upon the clarity of the viewing conditions on each given day. Haze, fog or precipitation could reduce the visibility of the Facility. Additionally, while the line of sight is available, this structure could be less likely to be visible with the naked eye from such a distance. In order to view the stack, a visual aid, such as the use of binoculars, would be required.

YORK REGION AND DURHAM REGION RESIDUAL WASTE STUDY

Worst-Case Viewshed Results from the Project Stack for the Local Community Study Area (5 km) – 140,000 tpy Scenario

- Facility Location
- Stack Location
- Photo Location and Direction (Sample Montages Provided from Outlying Photo Locations)
- Building
- Site Plan (From Covanta Energy Inc. "Base Case Site Plan", Drawing M-2000)
- Primary Access
- Secondary Access
- Tertiary Access
- Railway
- Watercourse
- Building
- Waterbody
- Wetland Area
- Wooded Area
- Municipality Boundary
- Project Site and Vicinity Study Area (Approximate 1 km Project Buffer)
- Local Community Study Area (Approximate 5 km Project Buffer)

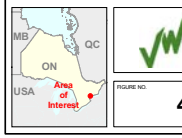
Viewshed

- Visible From Stack

0 400 800 1,200

Metres - 1:30,000

JW-1009497-NS4-29

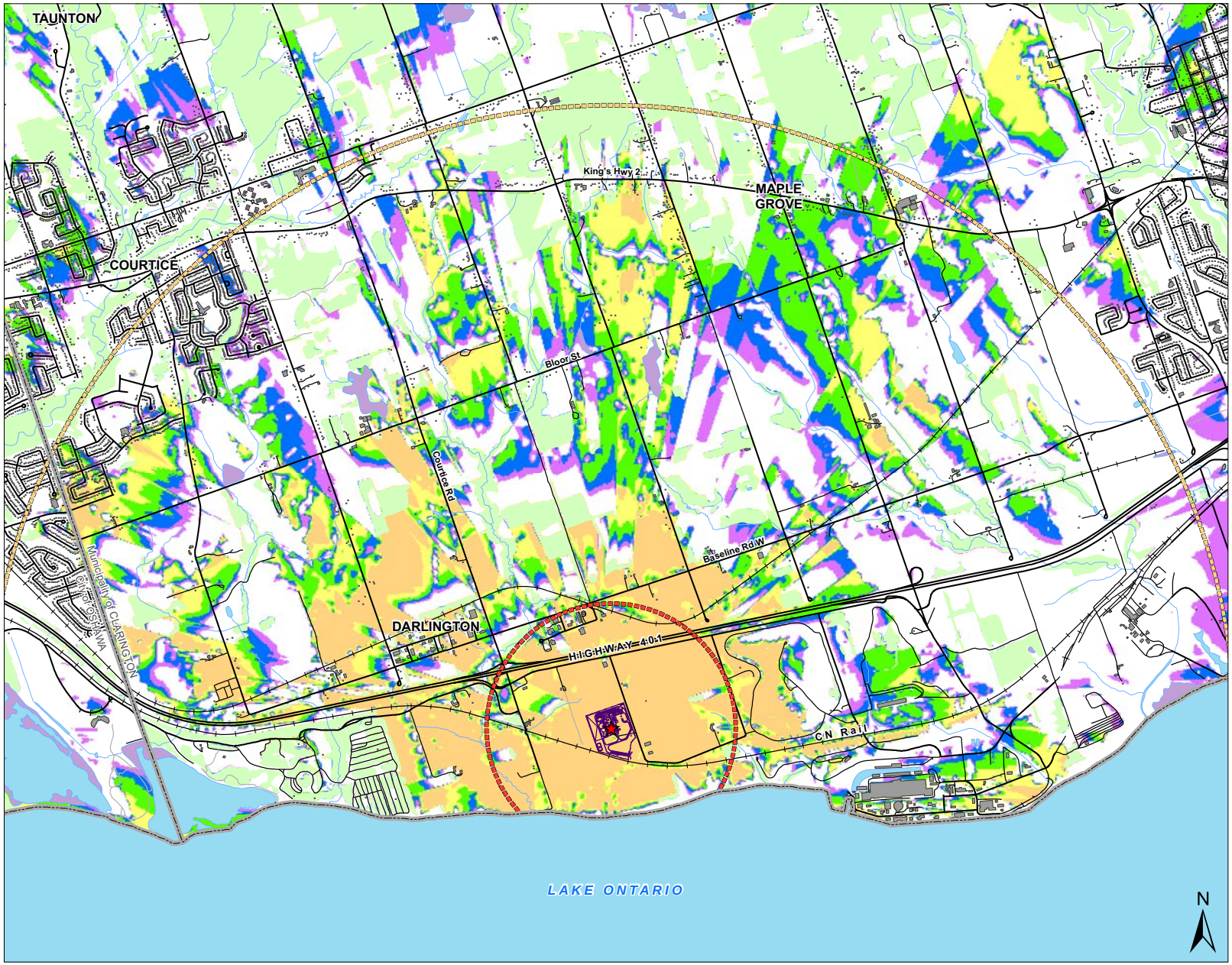


Jacques Whitford

FIGURE NO.

4-29

Last Modified: July 8, 2008 By: L. Randall



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Worst-Case Viewshed from the Project Stack for the Local Community Study Area (5 km) Illustrating Visual Increments – 140,000 tpy Scenario

- Stack Location
- Building
- Site Plan (From Covanta Energy Inc. "Base Case Site Plan", Drawing M-2000)
- Primary Access
- Secondary Access
- Tertiary Access
- Railway
- Watercourse
- Building
- Waterbody
- Wetland Area
- Wooded Area
- Municipality Boundary
- Project Site and Vicinity Study Area (Approximate 1 km Project Buffer)
- Local Community Study Area (Approximate 5 km Project Buffer)

Viewshed: Visual Increments

- 0-20% of Project Stack is Visible
- 20-40% of Project Stack is Visible
- 40-60% of Project Stack is Visible
- 60-80% of Project Stack is Visible
- > 80% of Project Stack is Visible

0 400 800 1,200
Metres - 1:30,000

JW-1009497-NS4-30

Jacques Whitford

FIGURE NO.
4-30

Last Modified: June 26, 2009 By: L. Kindell

YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Worst-Case Viewshed Results from the Project Stack for the Local Community Study Area (5 km) - 400,000 tpy Scenario

- Facility Location
- Stack Locations
- Photo Location and Direction (Sample Montages Provided from Outlying Photo Locations)
- Building
- Site Plan (From Covanta Energy Inc. "Base Case Site Plan Through Phase II Expansion", Drawing M-2000_PHSII)
- Primary Access
- Secondary Access
- Tertiary Access
- Railway
- Watercourse
- Building
- Waterbody
- Wetland Area
- Wooded Area
- Municipality Boundary
- Project Site and Vicinity Study Area (Approximate 1 km Project Buffer)
- Local Community Study Area (Approximate 5 km Project Buffer)

Viewshed

- Visible From Stack

0 400 800 1,200

Metres - 1:30,000

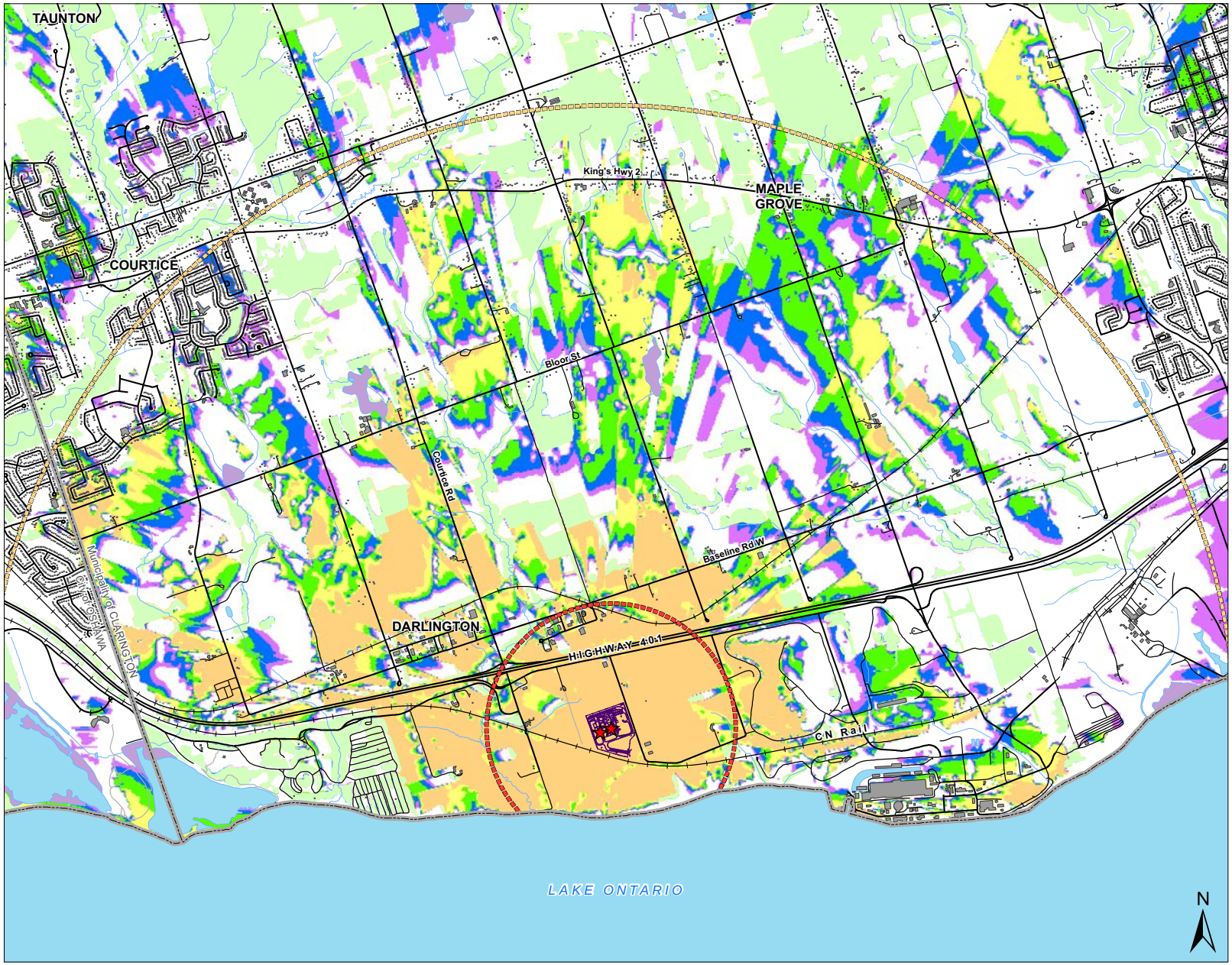
JW-1009497-NS4-31

Jacques Whitford

FIGURE NO.

4-31

Last Modified: July 8, 2008 By: L. Randall



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Worst-Case Viewshed from the Project Stack for the Local Community Study Area (5 km) Illustrating Visual Increments -400,000 tpy Scenario

- Stack Locations
- Building
- Site Plan (From Covanta Energy Inc. "Base Case Site Plan Through Phase II Expansion", Drawing M-2000_PHSII)
- Primary Access
- Secondary Access
- Tertiary Access
- Railway
- Watercourse
- Building
- Waterbody
- Wetland Area
- Wooded Area
- Municipality Boundary
- Project Site and Vicinity Study Area (Approximate 1 km Project Buffer)
- Local Community Study Area (Approximate 5 km Project Buffer)

Viewshed: Visual Increments

- 0-20% of Project Stack is Visible
- 20-40% of Project Stack is Visible
- 40-60% of Project Stack is Visible
- 60-80% of Project Stack is Visible
- > 80% of Project Stack is Visible

0 400 800 1,200
Metres - 1:30,000

JW-1009497-NS4-32

Jacques Whitford

FIGURE NO.
4-32

Last Modified: June 26, 2009 By: L. Kindell

4.3 Identification and Analysis of Potential Effects – Current Visual Conditions

The surrounding topography within several kilometres of the Facility is essentially flat with generally decreasing elevation towards Lake Ontario. There are no major land formations in the area that would dramatically affect the range of visibility, other than the man-made OPG berm situated to the east of the site. The berm, associated with the Darlington Nuclear Generating Station, is approximately 350 m by 800 m with an average elevation of 25 to 30 m. The presence of trees and hedgerows located within the PSVSA and LCSA would shield many receptors from the view of the structures.

140,000 tpy Scenario

Generally, as the Facility would be situated between commercial properties and the Courtice Water Pollution Control Plant, the presence of these operations, along with other structures, such as transmission lines and existing communication towers, provide existing vertical relief in an already industrialized landscape such that the overall visual sensitivity of the countryside would be minimal.

The overall impact on the 12 receptor groups based on the sensitivity and magnitude of the expected effect on the landscape and the viewer is compiled and assessed in Table 4-1, in relation to definitions presented in Table 2-1.

Employees and visitors to the Clarington Energy Business Park, Darlington Nuclear Generating Station and the Courtice Water Pollution Control Plant are anticipated to experience the greatest visual effect from the development of the Facility, due to the proximity of their location of employment in relation to the Facility. However, due to the moderate level of interest in their environment and the duration of exposure to these views throughout the day, this would result in a "**medium**" level of visual impact, even with the obvious changes to the landscape from the development of the Facility.

Darlington Provincial Park, the Waterfront Trail, the Darlington (Hydro) Fields, CN Rail and Highway 401 could experience a "**medium**" visual effect. The relative proximity of these receptors to the Facility could cause the changes to the landscape to be more apparent. The effect on the landscape would be a medium level change in the landscape, though the number of viewers with prolonged viewing opportunities (e.g., permanent residents) would be few.

The communities of Oshawa and Bowmanville could experience "**medium**" visual effects, primarily due to the permanent nature of the change to the viewscape and the high number of viewers with a proprietary interest. However, due to the built-up nature of these population centres, the change to the landscape would only be a moderate alteration to the landscape. Additionally, the greater distance of these communities and the intervening visual obstructions could interfere with the line of sight to the Facility. These factors would result in unremarkable changes in the components or character of the landscape.

The Municipality of Clarington could also experience a "**medium**" level of visual effect due to the diffuse nature of the settlement pattern of permanent residents across the landscape. However, due to distance from the Facility and the low level of visibility of the changes to the current landscape the visual impact of the Facility would be relatively minimal.

Table 4-1 Level of Impact Expected at Each Receptor Associated with the Current Visual Conditions

Receptor		Magnitude	Sensitivity	Overall Level of Impact
Clarington Energy Business Park	Landscape	Medium	Medium	Medium
	Visual	Medium	Medium	
Courtice Water Pollution Control Plant	Landscape	High	Medium	Medium
	Visual	Medium	Medium	
CN Rail	Landscape	High	Medium	Medium
	Visual	Medium	Minimal	
Highway 401	Landscape	Medium	Medium	Medium
	Visual	Medium	Minimal	
Waterfront Trail	Landscape	Medium	Medium	Medium
	Visual	Medium	Minimal	
Residences	Landscape	Medium	Medium	Medium
	Visual	Minimal	High	
Darlington (Hydro) Sports Fields	Landscape	Medium	Medium	Medium
	Visual	Medium	Minimal	
Darlington Nuclear Generating Station	Landscape	Medium	Medium	Medium
	Visual	Medium	Medium	
Darlington Provincial Park	Landscape	Medium	Medium	Medium
	Visual	Medium	Medium	
Municipality of Clarington	Landscape	Minimal	Minimal	Medium
	Visual	Medium	High	
City of Oshawa	Landscape	Minimal	Minimal	Medium
	Visual	Medium	High	
Town of Bowmanville	Landscape	Minimal	Minimal	Medium
	Visual	Medium	High	

400,000 tpy Scenario

The baseline visual characteristics of the area would include the initial 140,000 tpy scenario Facility. Additionally, future projects in the Clarington Energy Business Park would also act to reduce the landscape magnitude and sensitivity to the expansion scenario.

It should also be noted that the sensitivity of the receptors to the potential future case expansion of the Facility to 400,000 tpy scenario would likely be much reduced from those values identified for the

140,000 tpy scenario. As the built character of the Clarington Energy Business Park would be greater than what is currently present, the expansion would not add considerably to the visual characteristics of the PSVSA. An updated Visual Impact Assessment for the expansion would be recommended at that time to assess potential effects, based on the future case of the existing visual nature of the area.

4.4 Identification and Analysis of Potential Effects – Future Build-Out Visual Conditions

The presence of additional facilities and infrastructure (i.e., the proposed OPG buildings, Energy Drive and Highway 407 expansion interchange ramps) are situated in relatively close proximity to the Facility, thus minimal topographical changes and intervening structures would obstruct views of the Facility from within the Clarington Energy Business Park or the PSVSA. There are no major land formations in the area that would dramatically affect the range of visibility, other than the berm situated to the north of the Site, associated with Manheim Oshawa Auctions. The presence of trees and hedgerows located within the PSVSA and LCSA would shield many receptors from the view of the structures.

Generally, as the Facility would be situated between commercial properties (i.e., Manheim Oshawa Auctions) and the OPG Buildings, the presence of these operations, would act to shield the view of the Facility from certain vantages (i.e., specific areas along Highways 401 and 407). The presence of the Highway 407 interchanges ramps would also act to obstruct the view of the Facility while users traverse from Highway 407 to either east or westbound Highway 401. This increased industrialized landscape would result in a minimal overall visual sensitivity and reduced landscape sensitivity for the PSVSA.

The overall impact on the four receptor groups based on the sensitivity and magnitude of the expected effect on the landscape and the viewer is compiled and assessed in Table 4-2, in relation to definitions presented in Table 2-1.

Table 4-2 Level of Impact Expected at Each Receptor Associated with the Future Build-Out Case

Receptor		Magnitude	Sensitivity	Overall Level of Impact
Energy Drive	Landscape	Medium	Medium	Medium
	Visual	Medium	Medium	
OPG Building and Visitors Centre	Landscape	Medium	Medium	Medium
	Visual	Medium	Medium	
Highway 407	Landscape	Medium	Minimum	Medium
	Visual	Medium	Minimum	
Highway 401	Landscape	Medium	Medium	Medium
	Visual	Medium	Minimum	

Employees and visitors to the Clarington Energy Business Park (i.e., the OPG Building and Visitors Centre and Energy Drive), are anticipated to experience the greatest visual effect from the development

of the Facility, due to the proximity of their location of employment in relation to the Facility. However, due to the moderate level of interest in their environment and the duration of exposure to these views throughout the day, this would result in a "**medium**" level of visual impact, even with the obvious changes to the landscape from the development of the Facility.

Due to the casual nature of the viewing opportunities available to Highway 407 and 401 users, the visual intrusion of these additional facilities is expected to have a negligible effect. However, as the number of users along these major thoroughfares is expected to be high, this would result in an overall "**medium**" level effect.

5.0 IMPACT MANAGEMENT

The following sections outline potential impact management measures that could eliminate or reduce the potential visual effects associated with the Facility, as well as any other necessary measures to manage any resultant net effects.

5.1 Identification and Analysis of Mitigation Measures

During the construction and decommissioning periods, the highest potential for visual effects would result during the initial construction and demolition phases within the PSVSA. As the Site is prepared, the presence of debris, and resultant movement of machinery at the site during these phases could create a visual effect. Timely removal of the debris could lessen the effect associated with these phases. Visual effects associated with the construction and decommissioning periods are thus anticipated to be minimal and temporary in nature.

A second construction period may result if the capacity of the Facility is expanded to 400,000 tpy scenario. If this expansion is triggered, approximately 14 additional structures would be constructed around the existing 140,000 tpy capacity Facility. The majority of these new structures would be constructed on the western portion of the Site, so much of the visual disturbance associated with this expansion would be obstructed for receptors situated to the east of the Site.

No mitigation is possible to reduce the visual effects of the Facility due to the minimal viewing distance from the adjacent roadways to the activities. The presence of the Facility could not be readily shielded from the adjacent roadways, and could result in a change to the existing local landscape for the duration of the operational period for the Facility.

Some vertical relief is present in the LCSA, including the OPG berm to the east of the Site, associated with the Darlington Nuclear Generation Station. This topographic feature could act as a visual obstruction to receptors located immediately east of the berm. Wooded areas and hedgerows could also act to obstruct views of the Facility from various vantages across the LCSA. Views of the Facility are expected to be fairly minimal from across the LCSA and over the broader region. However, to reduce the impact of the overall Facility, the use of neutral external colours could also reduce the visual distraction that could result from the presence of the structures. In addition, as described in the Host

Community Agreement, Durham will incorporate a cash allowance of up to nine million dollars in the RFP for the provision of architectural treatments and upgrades to the Facility. Given that the Facility is proposed to be developed within the Clarington Energy Business Park, the Principles established for Design Excellence will be considered in the design of the Facility. The Principles are:

- The physical and business environment of the Clarington Energy Business Park should make it a showcase for Clarington, Durham Region, and Ontario;
- Celebrate the presence of the Clarington Energy Business Park with an innovative design representing modern day technology; and,
- The design should reflect the community's vision for the future of the area.

In the event of a concern, the visual effect could be assessed from that receptor (i.e., using photographs). Open dialogue between the receptors and Durham and York Regions could allow for the development of a mutually acceptable mitigation procedure(s). For example, one potential consideration could be the use of plantings at the location of the receptor to act as a visual screen.

6.0 DESCRIPTION OF NET EFFECTS

The following sections identify the net effects associated with the 140,000 and 400,000 tpy scenarios and the future build-out scenario for the PSVSA.

140,000 tpy Scenario

The stack and the upper portion of the process unit of the Facility would be prominent features that would be visible from within the PSVSA. Only the tallest structures, specifically the stack, could be visible within the broader LCSA and on a regional basis however, the visibility of the stack is affected by distance and the presence of vertical obstructions.

Other industrial facility structures are as visible, if not more visible, than the Facility. Visually, the Darlington Nuclear Generating Station is a very prominent and relatively widespread industrial feature that has a high level of impact on the landscape. The existing commercial and industrial nature of this region does not impede current recreational or tourism activities from occurring.

As the Facility would be situated between the commercial properties and the Courtice Water Treatment Control Plant, which can also be seen from within the PSVSA and the Clarington Energy Business Park, this could lessen the degree to which the new Facility would stand out for some receptors.

The development of the Facility would be considered an additional visual component when existing and planned future developments are taken into account. Disclosed projects for the area include the expansion of express toll route Highway 407 to connect to Highway 401 in the vicinity of the Facility. An environmental assessment is currently underway for that connection. Additionally, OPG is also undertaking an environmental assessment for an expansion of the existing Darlington Nuclear Generating Station. The Secondary Plan and zoning for the Municipality of Clarington's Energy

Business Park was completed in 2006, and is in the process of being implemented The OPG draft plan of subdivision was approved in early 2009, and capital works are being designed..

Due to the already commercial and industrial nature of the PSVSA, this landscape is not valued for its scenic quality and is tolerant of change. The PSVSA is not considered a pristine environment and has been substantially modified by human activity. The development of the Facility and other planned and disclosed projects in the PSVSA would be compatible with the existing land uses in the PSVSA and are not expected to create a cumulative adverse effect on the visual landscape.

Visual effects associated with the Facility from within the PSVSA relate to the tallest structure, specifically the stack, as well as the upper portions of the process units. While the visual effects associated with the Facility would be greater in close proximity to the Site, it is anticipated that only the stack could affect potential receptors in the LCSA.

400,000 tpy Scenario

The future case potential expansion of the Facility to the 400,000 tpy scenario would include the addition of approximately 14 structures, including an additional stack. The two stacks and the upper portions of the process units of the 400,000 tpy scenario Facility would continue to be the most prominent features that would be visible from within the PSVSA. Only the tallest structures, specifically the stacks, could be visible within the broader LCSA and on a regional basis, however, the visibility of the stacks is affected by distance and the presence of vertical obstructions. Additionally, the visual characteristics of the LCSA may also change to offer more or less intervening visual obstructions for certain vantages as the region continues to develop and expand.

It is also expected that the future case of the Facility would take place within a much more developed PSVSA. Development of the 400,000 tpy scenario would be considered to be a relatively minor additional visual component when existing and planned future developments are taken into account. In the future case, other existing projects in the PSVSA and LCSA that may be present at such time the capacity of the Facility may be expanded would include the extension of express toll route Highway 407 to connect to Highway 401 in the vicinity of the Facility, the expansion of the existing Darlington Nuclear Generating Station, and Clarington Energy Business Park would contain more business and industry than currently present.

Future Build-Out Scenario

Within 10 to 20 years, the Clarington Energy Business Park is expected to be further built-out to include the proposed Energy Drive, OPG Building and OPG Visitors Centre. Additionally, more receptors and visitors may result as the Highway 407 expansion would include interchange ramps with Highway 401 to the north of the Site. The development timeframe for the proposed facilities and infrastructure is not currently known, thus the level of potential cumulative effect cannot be readily determined. The construction and operation of these additional facilities may overlap with either the 140,000 or 400,000 tpy capacity Facility.

The presence of the OPG buildings and the Highway 407 interchange ramps would act to obstruct the view of the Facility from certain perspectives from the north of the Site. As a result, the cumulative

effect of the Facility, in addition to these disclosed future projects within the PSVSA, would be expected to decrease as the landscape sensitivity and magnitude rankings would decrease.

7.0 SUMMARY AND CONCLUSION

The potential for visual effects from the development of the Facility is highly subjective and varies across receptors. The Facility would be visible from around the PSVSA, and no mitigation is possible to reduce the visual effects of the Facility due to the minimal viewing distance from the adjacent roadways to the activities. The presence of the Facility could not be readily shielded from the adjacent roadways, and could result in a change to the existing local landscape for the duration of the operational period for the Facility.

The initial design capacity of the Facility is 140,000 tpy of waste, with the potential to expand to a maximum design capacity of 400,000 tpy. Both operating scenarios were assessed. The 400,000 tpy scenario Facility would result in the addition of several Facility structures and buildings and an additional stack. This larger operation would be contained within the same Facility footprint, and the additional structures would remain adjacent to the existing structures. Approximately 14 additional structures are associated with the 400,000 tpy scenario. Overall, the visual difference of the 400,000 tpy scenario Facility compared to the 140,000 tpy scenario Facility would not be considerable.

Some vertical relief is present in the LCSA, including the OPG berm to the east of the Site, associated with the Darlington Nuclear Generation Station. This berm and the presence of vegetation, buildings and other structures could also act to obstruct views of the Facility from various vantages across the LCSA. The greater viewing distance from vantages in the LCSA could also act to reduce visibility of Facility details to any potential receptors.

To reduce the potential visual impact of the overall Facility, the use of neutral external colours could reduce the visual distraction that could result from the presence of the structures. If visual concerns are raised by receptors in the vicinity of the Facility then various strategies towards mitigating these effects could be assessed, such as possibly planting trees or other suitable vegetation at the receptor location to provide a screen against the line of the sight of the Facility.

Regionally, no adverse visual effects are anticipated to result from the Facility. While a line of sight to the tallest structures, the stacks, could be available from various vantages in the LCSA for both the 140,000 and 400,000 tpy scenarios, the dimensions of the stack and the surrounding topography make it unlikely that the stack(s) would be visible in areas of higher population densities. The visual properties of the Facility are expected to be relatively minimal as the stack is slender in design and would appear insubstantial as viewed on the horizon from across the LCSA and the broader region. Across the broader region, the Facility structures would be difficult to view unaided.

Due to the presence of existing industrial structures and commercial buildings a certain level of visual impact is already present. The Facility is being constructed in an area that is not a pristine landscape but, rather, one that has already been influenced by human activities. As a result, the overall long-term effect of the Facility in addition to other planned and disclosed future projects, given the presence of the

other existing structures in the landscape, could have a minimal effect on the landscape, while having an overall medium level effect on some receptors within the PSVSA and LCSA.

With respect to the 400,000 tpy scenario, an even greater amount of built-up industrial structures and commercial buildings would create a higher level of existing visual impact. As a result, the cumulative effect of the expanded Facility, in addition to other planned and disclosed future projects, including the initial 140,000 tpy scenario, would be expected to decrease as the landscape sensitivity and magnitude rankings would decrease. However, if required, this could be confirmed through an updated visual assessment.

Within 10 to 20 years, the Clarington Energy Business Park is expected to be further built-out to include the proposed Energy Drive, OPG Building and OPG Visitors Centre. Additionally, the Highway 407 expansion would include interchange ramps with Highway 401 in an area to the north of the Site, and may result in a greater number of receptors within the PSVSA. The development timeframe for the proposed facilities and infrastructure is not currently known, thus the level of potential cumulative effect cannot be readily determined. The construction and operation of these additional facilities may overlap with either the 140,000 or 400,000 tpy capacity Facility.

The presence of the OPG buildings and the Highway 407 interchange ramps would act to obstruct the view of the Facility from certain perspectives from the north of the Site. As a result, the cumulative effect of the Facility, in addition to these disclosed future projects within the PSVSA, would be expected to decrease as the landscape sensitivity and magnitude rankings would decrease.

8.0 CLOSURE

This Report has been prepared by Jacques Whitford Stantec Limited. The assessment represents the conditions at the subject property only at the time of the assessment, and is based on the information referenced and contained in the Report. The conclusions presented herein respecting current conditions, and potential future conditions at the subject property resulting from the Project, represent the best judgment of the assessor based on current environmental standards. Jacques Whitford Stantec Limited attests that to the best of our knowledge, the information presented in this Report is accurate. The use of this Report for other projects without written permission of Durham Region, York Region and Jacques Whitford Stantec Limited is solely at the user's own risk.

9.0 REFERENCES

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