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36-68 Union Street
Hawk Ridge Homes Development
Elmira, Ontario

Final Report

Land Use Planning Air Quality Assessment

RWDI # 1502121
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1. INTRODUCTION

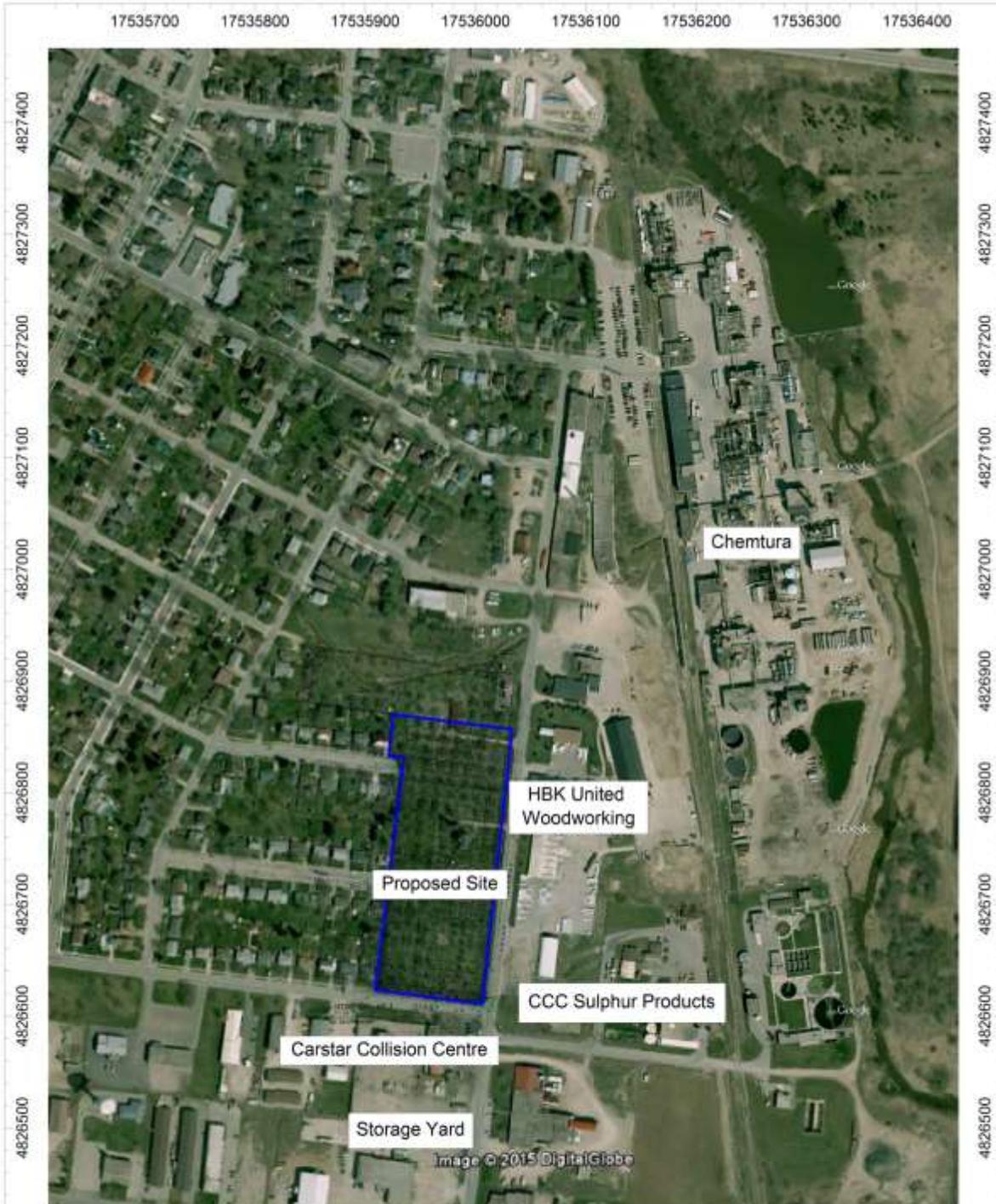
RWDI was retained by Hawk Ridge Homes to conduct an air quality feasibility study as required by the Township of Woolwich and the Regional Municipality of Waterloo (RMOW). This assessment was completed to support the zoning and site plan approval application for the proposed residential development on Union Street in Elmira, Ontario. The lands are currently vacant and are located on the west side of Union Street spanning the area between First St E and Shirt Creek.

Industries are located to the northeast through the south. A site visit was completed in July of 2015 to review surrounding area and to identify sources of air emissions relevant to this study. This study is limited to an assessment of the potential for dust and odour impacts on the proposed development.

The proposed development will consist of 15 two-storey single detached homes, 24 two-storey semi-detached homes, and open space and parkland. Figure 1 shows the proposed subdivision and surrounding land uses.

The objective of this study is to:

- assess the potential for dust and odour emissions from nearby industries; and
- determine feasibility of the project with respect to odour and dust emissions



Aerial Photography from: Google Earth Professional. Image© 2014 Digital Globe ©2010 Google.

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True North ↑	
Site Layout 36-38 Union St - Elmira, Ontario	Drawn by: KAMH Figure: 1 Scale: 1:1500 Date: Jan. 15, 2016
	
	Project #1502121

2. APPLICABLE ACTS AND REGULATIONS

2.1 Environmental Protection Act

Section 9 of Ontario's Environmental Protection Act (EPA) requires industrial facilities to obtain an Environmental Compliance Approval (ECA) before constructing, altering or operating a piece of equipment that discharges a contaminant to the atmosphere. An ECA addresses both air quality and noise emissions. In order to obtain an ECA, a facility must demonstrate compliance with applicable regulations and standards. Another section of the EPA that applies to industrial facilities is Section 14, which generally prohibits anyone from causing an adverse effect on people and the environment.

2.2 Ontario Air Quality Regulations

The regulation framework for industrial air quality emissions in Ontario is outlined in Ontario Regulation 419/05 (O.Reg. 419/05): Local Air Quality. O. Reg. 419/05 applies to all industries in the province and is the regulation against which contaminant concentrations from air emissions are assessed under Section 9 of the EPA. Demonstration of compliance with this regulation is a requirement as part of the ECA process. The air quality standards are evaluated at a Points of Impingement (POI). "POI" is defined in the regulation as any point off-property from the source. The type of land use being impacted is not distinguished in the regulation.

Fugitive dust from industrial operations does not need to be assessed quantitatively under O. Reg. 419/05 (except in specific circumstances), but industries with extensive outdoor handling of bulk materials and/or operations of mobile equipment on unpaved areas are typically required to have a dust management plan in place, consistent with industry best practices.

In March 2005, the MOECC published a position paper in which it proposed to develop an odour policy framework. As part of this position paper, the MOECC recognized the need to review odour-based limits. The MOECC now recognizes that the potential for an objectionable effect depends on several other factors besides the intensity of the odour. These other factors are the frequency, duration, offensiveness and location of the odour. In developing an approach for dealing with odours in Ontario, it is likely that appropriate limits will eventually be established for all of the relevant factors. At the present time, however, the MOECC has not finalized its framework for dealing with odours and the objective limits that will apply to the various factors in the future are unknown.

2.3 D-Series Land Use Planning Guidelines

The MOECC D-series guidelines provide direction for land use planning to maximize compatibility of industrial uses with adjacent land uses. The goal of Guideline D-6 is to minimize encroachment of sensitive land uses on industrial facilities and vice versa, in order to address potential incompatibility due to adverse effects such as noise, odour and dust. Recommended minimum separation distances are provided based on the industry size and operation type.

Guideline D-6 separates industry into three broad categories, depending on the nature of their operations and the types of potential impacts:

- Class I facilities are small scale, self-contained plants or buildings, which produce and store products internally, and have low probability of fugitive emissions. They have daytime operations only, with infrequent movements of products and/or heavy trucks.
- Class II facilities perform medium scale processing, with some outdoor storage of wastes and materials, frequent movement of products and/or heavy trucks, and shift work.
- Class III facilities conduct large scale manufacturing, and are characterized by their large size, continuous operations and movements of products, outdoor storage of materials, and a high probability of fugitive emissions.

The recommended minimum setback distances and areas of potential influence (i.e., distance within which adverse effects could potentially occur) are summarized below.

Table 1: MOECC Guideline D-6 Recommended Setback Distances and Areas of Influence

Industry Classification	Recommended Minimum Setback Distance (m)	Potential Area of Influence (m)
Class I: Light Industry	20	70
Class II: Medium Industry	70	300
Class III: Heavy Industry	300	1000

Guideline D-6 states that the proponent of a development should provide studies for noise, dust and odour, but in the absence of such studies, the influence areas shown in Table 1 shall be used.

Appendix A of Guideline D-6 provides criteria for classifying industrial land uses, based on their outputs, scale of operations, processes, schedule and intensity of operations. Often an industry will fall between two Classes. Guideline D-6 states that no incompatible development should occur within the recommended minimum separation distance as noted in Table 1. Section 4.10 of the Guideline, however, identifies exceptional circumstances with respect to redevelopment, infill and mixed use areas. In these cases, it suggests that separation distances less than the recommended minimum values may be acceptable if a justifying impact assessment is provided.

3. INDUSTRIAL EMISSIONS

Industrial facilities that have the potential for causing air quality issues within 1,000 metres of the new development were identified based on information provided by the National Pollutant Release Inventory (NPRI) database, the MOECC Access Environment website (ECA database), and information collected by RWDI during a site visit in July 2015. The intent of the site visit was to identify surrounding land uses and to identify industries that may have an impact on the proposed development.

Table 2 includes industries of interest for this study, their facility class from an air quality perspective, and distance between the proposed development and the facility. The industry class for each facility is based on the Guideline D-6 definitions.

Table 2: Guideline D-6 Recommended Setback Distances and Areas of Influence

Facility Name	Estimated D-6 Class	Separation Distance (m)	Meets Minimum Setback Distance	Outside Area of Influence
Chemtura	III	170	N	N
HBK United Woodworking	I	20	Y	N
CCC Sulphur Products	II	100	Y	N
Elmira Pet Products	II	950	Y	Y
Precision Metal Castings	II	300	Y	Y
Toyota Boshoku	II	900	Y	Y
Carstar Collision Centre	I	25	Y	N
Storage Yard	II	25	N	N

Two facilities fall within the suggested minimum setback distance and five facilities are within the area of influence as defined by Guideline D-6. Only Chemtura, HBK, CCC, Carstar and Storage Yard will be evaluated further. All other industries listed in Table 2 are not expected to have a compatibility issue with the proposed development.

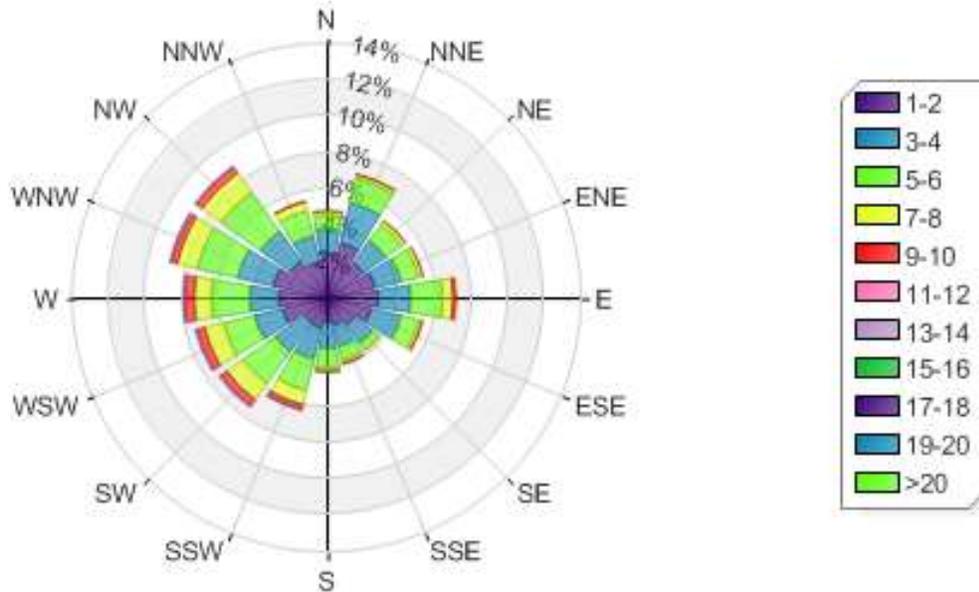
3.1 Local Meteorological Conditions

Long term meteorological data from 2003 to 2013 for the Elora Climate Station was used in assessing adverse impacts of air quality, odour and dust on the proposed development. Data was obtained from RWDI's in-house library and is considered representative for Elmira.

The distribution of winds for summer and winter months are provided in Figure 2 below.

Prevailing wind directions (blowing from) for the proposed development would be southwest through to northwest for the entire year. Summer months also see frequent winds from the north-northeast through to east-southeast and the winter months also see frequent winds from the east and east-southeast.

**Directional Distribution (%) of Winds in m/s (Blowing From)
Summer Winds (Months 5-10), Elora Reference Climate Station, (2003-2013)**



**Directional Distribution (%) of Winds in m/s (Blowing From)
Winter Winds (Months 11-4), Elora Reference Climate Station, (2003-2013)**

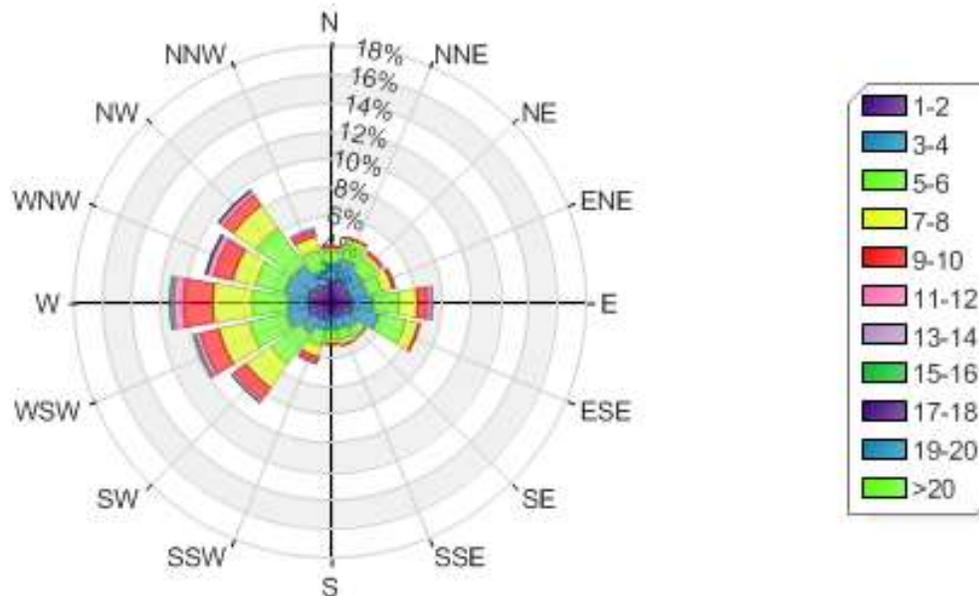


Figure 2: Directional Distribution of Winds for Elora Climate Station (2003 – 2013)

3.2 Air Quality

An industrial facility has to meet air quality standards at their property line and at all POIs off-property whether the POI is at ground level or elevated (e.g., top floor balcony of a residential apartment building). All industries listed in Table 2, with the possible exception of the Storage Yard property, are required to hold a valid ECA for their operations. It is known that Chemtura and CCC have recently received updated ECAs for their facilities within the last two years. HBK United Woodworking submitted an ECA application in 2014. At the time of this report, HBK have not received an ECA for their facility. Carstar would only have to register their operations with the MOECC's Environmental Activity and Sector Registry as an automotive refinishing facility.

Those industrial facilities that have obtained an ECA had to demonstrate compliance with the air quality standards in O. Reg. 419/05 at the site of the proposed development, as well as at all other POIs. If the proposed development were to include multi-storey buildings (greater than 2-storey), then it would introduce new, elevated POIs that were not previously considered in the ECA's of the nearby industries. Fortunately, the proposed development includes only two-storey dwellings and, therefore, does not create any new POIs that might result in an unforeseen compliance issue for a nearby industry.

3.3 Odour

For industrial sites, certain types of processes can emit odours through exhaust stacks or odour emissions can occur from leaks within piping, building envelopes, or from open areas such as sewage treatment facilities.

Odours from Chemtura have historically been an issue however they have implemented a number of odour control technologies over the years to reduce off site odour levels. The relevant wind directions that could cause odours to occur at the site of the proposed development are from north-northeast through to the southeast. These winds occur approximately 30% of the time. Chemtura has been reporting the occurrences of odour and other environmental complaints to the Chemtura Public Advisory Committee (CPAC). The CPAC meeting minutes were reviewed for information related to odour from 2012 to 2015. Generally there has been only one to two odour complaints received by Chemtura every year however the complaint was not always linked to Chemtura operations. A discussion with personnel at the MOECC's District Office confirmed that there have been very few complaints about odours from that neighbourhood in recent years.

The Environmental Registry notice for the ECA application made by HBK United Woodworking did not include any sources that would emit VOCs typically found in painting or varnishing operations. VOC contaminants from this type of operation would likely be detectable as odour. Based on the Environmental Registry posting, it does not appear this facility would emit odour. Furthermore, based on the meteorological data from Elora, the proposed development is upwind of the industrial site approximately 18% of time and the potential for odour impacts would be minimal. Therefore, adverse impacts due to odour from HBK United Woodworking are not expected at the proposed development.

The CCC Sulphur Products facility emits contaminants that have detectable odours including hydrogen fluoride and sulphur dioxide. According to the facility's ECA, a number of packed tower gas scrubbers are used at the facility. These scrubbers are used for gas absorption, cooling and recovery and some will be used to control odour emissions. As already mentioned, the MOECC indicated that there have been very few complaints about any odours at the existing residences in the area, in recent years. Thus, the potential for odours from CCC Sulphur Products appears to be low.

Carstar Collision Centre includes automobile body repairs and painting operations at the site. Odours would be expected from their painting operation. These types of facilities generally do not require an ECA and any odours from their operations would be infrequent due to the size of their operations. The proposed development is not in the direction of prevailing winds and any potential for odour impacts would be minimal. Therefore, adverse impacts due to odour from Carstar Collision Centre are not expected at the proposed development.

The Storage Yard to the south is unlikely to have any sources of odour. The proposed development is not in the direction of prevailing winds and any potential for odour impacts would be unlikely anyway. Therefore, adverse impacts due to odour from the Storage Yard are not expected at the proposed development.

3.4 Dust

Dust, or particulate matter can occur within industrial processes, when vehicles travel over unpaved areas or when wind blows over a storage pile dust-laden material. Dust from vehicles and storage piles is often referred to as fugitive dust.

Chemtura reported particulate matter emissions to NPRI from point sources (e.g., stacks) and other non-point releases. According to their ECA a number of particulate matter control technologies are in operation at the site and any air emissions associated with this equipment or other parts of their processes have to meet the O.Reg. 419/05 standards for particulate at all POIs. There is an unpaved area just south of the main plant that could be a source of fugitive dust emissions. However, it is downwind of the proposed development site for the majority of time. Therefore, the potential for dust impacts is considered to be low.

HBK United Woodworking included particulate matter emissions in their ECA application as noted in the posting of the ECA application on the Environmental Registry. The facility has two baghouses serving woodworking operations at the site and any air emissions associated with this equipment have to meet the O.Reg. 419/05 standards for particulate matter at all POIs. The active storage yard for the site is paved. Furthermore, based on the meteorological data from Elora, the HBK site is downwind of the proposed development site for the majority of time. Therefore, like Chemtura, the potential for dust impacts from HBK is considered to be low.

CCC Sulphur Products did not report any particulate matter emissions to NPRI. Based on the operations of the site, it is unlikely the process includes air emissions related to particulate matter. The onsite road is paved and no storage piles exist therefore the potential for fugitive dust emissions is unlikely.

Carstar Collision Centre includes automobile body repairs and painting operations at the site. There is no storage yard at the site. The proposed development is not in the direction of prevailing winds and any potential for dust impacts would be unlikely.

The Storage Yard to the south is unpaved and fugitive dust emissions would occur during vehicle movement on the property. However, the proposed development is not in the direction of prevailing winds. Therefore, the potential for dust impacts is considered to be low.

4. CONCLUSIONS

The indications are that, while odours and possibly dust may occur at the site of the proposed development due to nearby industrial operations, the potential frequency of occurrence is low. We conclude that the site of the proposed development is not needed as a buffer zone with respect to the nearby industries and can be developed for residential use. However, the following are recommended:

- Air conditioning should be included in the residential units; and
- A warning clause regarding odour and dust emissions from nearby industry should be placed on the title of the properties.