

7 DESCRIPTION OF THE AREA OF CONTINUED ANALYSIS

As described in more detail in Chapter 6, the assessment and evaluation of the illustrative crossing, plaza and access road alternatives led to the development of an Area of Continued Analysis (ACA), which is illustrated in Exhibit 7.1.

Within the Area of Continued Analysis, the study team generated, assessed and evaluated a number of practical crossing, plaza, and access road alternatives, which are described in Chapter 8. The following sections of this chapter are intended to provide the reader with an overview of the existing conditions within the ACA. For each section, the description of existing conditions corresponds to an Area of Investigation, which is generally consistent with an area encompassing the Practical Alternatives in the ACA. For more detailed information, the reader is referred to the following reports:

- *Draft Practical Alternatives Evaluation Working Paper – Air Quality Impact Assessment (May 2008);*
- *Draft Practical Alternatives Evaluation Working Paper – Noise and Vibration Assessment (May 2008);*
- *Draft Practical Alternatives Evaluation Working Paper – Social Impact Assessment (April 2008);*
- *Draft Practical Alternatives Evaluation Working Paper – Economic Impact (May 2008);*
- *Draft Practical Alternatives Evaluation Assessment Report – Existing and Planned Land Use (May 2008);*
- *Draft Practical Alternatives Evaluation Working Paper – Archaeology (April 2008);*
- *Draft Practical Alternatives Evaluation Working Paper – Cultural Heritage (April 2008);*
- *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage (April 2008);*
- *Draft Practical Alternatives Evaluation Assessment Report – Stormwater Management Plan (March 2008);*
- *Draft Practical Alternatives Evaluation Working Paper – Waste and Waste Management (May 2008);*
- *Draft Practical Alternatives Evaluation – Constructability Report for Plaza & Crossing Alternatives (May 2008);*
- *Draft Level 2 Traffic Operations Analysis of Practical Alternatives (December 2008);*

EXHIBIT 7.1 – AREA OF CONTINUED ANALYSIS



7.1 Air Quality

This section provides an overview of existing air quality conditions within the Area of Continued Analysis. For further details, the reader is referred to *the Draft Practical Alternatives Evaluation Working Paper – Air Quality Impact Assessment*.

AREA OF INVESTIGATION

Since air quality is not limited by local political boundaries, a relatively broad area was included in the Air Quality Assessment. This comprised an approximate 10 km x 10 km area in West Windsor, from just south of the present Highway 401 terminus at Highway 3, 10 km north and 10 km west to the Detroit River.

CLIMATE AND METEOROLOGICAL DATA

Characterization of the existing climate and meteorological conditions in the vicinity of the Highway 3/Huron Church Road corridor is important because these are the main forces driving contaminant transport (dispersion) in the atmosphere. The direction and speed of the wind dictates the location and distance from the source that the pollutants may travel. The factors that influence contaminant mixing in the atmosphere are described below.

The Windsor-Essex area has a middle latitude humid continental climate affected by Lake Erie and Lake St. Clair. The region is characterized by pronounced seasonal differences of weather and by a highly variable day-to-day weather pattern. Some periods in summer are essentially humid tropical (high temperatures, high humidity, afternoon thunderstorms, etc.). Some periods in winter are effectively polar (very cold, clear, dry). Precipitation occurs throughout the year.

The surface meteorological data used in the air dispersion modelling was obtained from the Windsor Airport meteorological station (2000 – 2004), which is approximately 5 to 7 km east of the Huron Church Road / Highway 3 corridor. It is well exposed and represents the general wind flow pattern in the vicinity of the corridor since the area is generally flat. The upper air measurements used were from the closest upper air station which is located in Pontiac, Michigan, approximately 30 km northwest of the ACA. In order to be considered representative, the wind and temperature data should be obtained from within 100 km of the study area, and the upper air data (which is a regional parameter) should be within 300 km. The stations used for this study were well within these parameters.

Near-surface Temperature

Temperature and precipitation normals for the Windsor Airport (1971-2000) are presented in Table 7.1. "Normals" is the term commonly used for values of climatic elements averaged over a fixed standard period of years (usually 30 years).

Temperature near the surface of the earth controls the buoyant component of turbulence (vertical motion). Heat from the earth's surface heats the air near the ground causing it to rise. This mechanism reaches a maximum in early afternoon and is at a minimum near sunrise. This affects the dispersion of air pollutants through the influence of thermal mixing as the air mass rises.

Table 7.1 indicates that the mean (averaged over 30 years) daily minimum temperature is -8.1°C in January and the mean daily maximum temperature is 28°C in July at the Windsor Airport site. The annual mean temperature is 9.4°C.

Precipitation

Precipitation acts as an atmospheric cleansing mechanism, as contaminants in the air are generally washed out by precipitation. More precipitation produces more washout. For this study, the role of precipitation in the removal of pollutants from the air was not considered; generally providing conservatively high ground level concentrations.

As shown in Table 7.1, the Windsor area normally receives a total of 918.3 mm of precipitation per year; 805.2 mm of rainfall and 126.6 cm (49.8 in) of snowfall. The maximum mean monthly rainfall is 96.2 mm, which occurs in September.

TABLE 7.1 - WINDSOR AIRPORT CLIMATE NORMALS (1971-2000)¹

Temperature	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Daily Average (°C)	-4.5	-3.2	2	8.2	14.9	20	23	21.6	17	11	4.6	-1.5	9.4
Standard Deviation	2.9	2.7	2.1	1.6	2.1	1.3	1.1	1.2	1.3	1.7	1.7	2.7	0.8
Daily Maximum (°C)	-0.9	0.6	6.4	13	20.5	25	28	26.6	23	16	8.3	1.9	14
Daily Minimum (°C)	-8.1	-7	-2.4	3	9.3	15	17	16.6	12	6.2	0.9	-4.8	4.9
Precipitation													
Rainfall (mm)	29	33	55.6	81	80.7	90	82	79.7	96	64	67	47	805.2
Snowfall (cm)	35	28	20.6	4.3	0	0	0	0	0	0.7	8.3	30	126.6
Precipitation (mm)	58	57	75	85	80.8	90	82	79.7	96	65	76	75	918.3
Days with Rainfall													
>= 0.2 mm	5.7	5.6	9.4	12	11.8	11	10	10	11	11	11	7.9	115.7
Days With Snowfall													
>= 0.2 cm	13	9.1	6.7	2.3	0.03	0	0	0	0	0.3	3.8	10	45
Days with Precipitation													
>= 0.2 mm	15	12	13.9	13	11.8	11	10	10	11	11	13	15	146.7
Wind													
Days with Winds >= 52 km/hr	1.9	1.4	2.5	1.8	1.1	0.9	0.7	0.3	0.4	0.5	1.2	1.2	14
Days with Winds >= 63 km/hr	0.6	0.4	0.7	0.7	0.5	0.3	0.4	0.2	0.1	0.2	0.3	0.3	4.7

The meteorological file used in the air dispersion modelling for this study utilizes hourly temperatures for each day in the year.

Atmospheric Stability

Normally, temperature decreases with increasing height above sea level. The relationship of the actual vertical temperature to the near-surface temperature determines the atmosphere's ability to resist or enhance vertical motion. The amount of vertical motion is a measure of the stability of the atmosphere.

The atmosphere can have three general stability states - unstable, neutral and stable. The stability scale normally used for air quality simulations varies from very unstable (A) through neutral (D) to very stable (F). The stability class distribution for the Windsor Airport station for the period 2000 - 2004 is presented in Table 7.2. At this station, neutral stability conditions {D (neutral) + C (near neutral)} occur approximately 67 per cent of the time and stable conditions (E, F) about 28 per cent of the time. Stable conditions can produce higher concentrations of contaminants because of reduced turbulent mixing.

TABLE 7.2 - STABILITY CLASS DISTRIBUTION - WINDSOR AIRPORT (2000-2004)

Stability Class	% Frequency						Descriptor
	2000-2004	2000	2001	2002	2003	2004	
A	0.5	0.4	0.8	0.6	0.4	0.4	Unstable
B	4.2	3.6	4.6	4.4	4.4	3.9	
C	10.1	10.6	10.3	9.8	9.9	9.9	
D	57.0	56.0	56.2	57.1	57.0	58.6	Neutral
E	13.3	13.6	14.0	13.2	12.8	13.1	
F	14.9	15.8	14.2	15.0	15.5	14.1	

The meteorological file used in the air dispersion modelling for this study requires hourly stability classes for each day in the year.

¹ Environment Canada website, http://www.climate.weatheroffice.ec.gc.ca/climate_normals/index_e.html

Wind Direction

Wind direction is reported as the direction from which the wind blows and is based on surface (10 m) observations. In general terms, if the wind does not blow toward a receptor, there will be no impact from an upwind emission source. The wind blows in all directions with varying frequencies. Certain directions occur more frequently than others. These are known as the prevailing wind directions.

Exhibit 7.1 presents a wind rose for the Windsor Airport for the years 2000 - 2004. The prevailing wind is from the southwest, primarily during the summer months, with winds blowing from the west through southwest directions (i.e., from Southeast Michigan) approximately 32 per cent of the time.

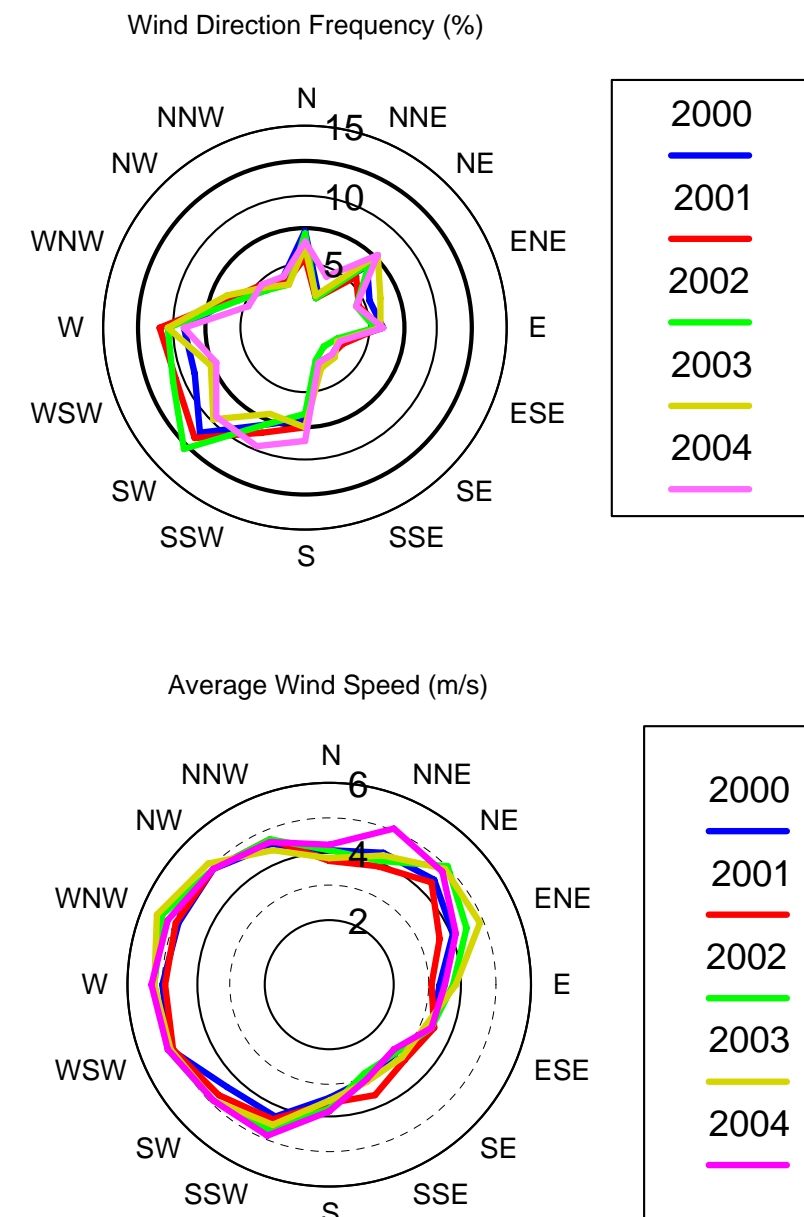
The dispersion modelling for this study uses the hourly wind directions of each day in the year.

Wind Speed

Contaminant concentrations decrease with increasing wind speed as a result of atmospheric mixing. The wind speed used in the air quality modelling was based on surface observations from the Windsor Airport. Wind speed increases with height as surface friction is reduced. The variation of wind speed with height was built into the dispersion model used in this assessment. When wind speeds are high, there is good dispersion of gases and particles, but more potential for re-suspension of surface dust. When wind speeds are near zero, the primary mechanism of pollutant transport away from a source is via diffusion, which can lead to very high pollutant concentrations near the ground. Calms were recorded 4.3 per cent of the time at the Windsor Airport meteorological station (Exhibit 7.2) during 2003 compared with 3.6 per cent for the 2000 – 2004 period.

The meteorological file used in the air dispersion modelling for this study utilized hourly wind speed and directions for each day in the year.

EXHIBIT 7.2 - WIND ROSE - WINDSOR AIRPORT (2000 - 2004)



Mixing Height

Another very important parameter in the dispersion of contaminants from a source is the mixing height. This is the vertical extent through which the plume can be mixed. With a higher mixing height, there is a larger volume of air available within which the pollutants can mix, which results in lower concentrations. With a lower mixing height, the plume may become trapped resulting in higher concentrations.

The concept of mixing height is founded on the principle that heat transferred to the atmosphere at the earth's surface results in convection, vigorous vertical mixing and the establishment of a dry-adiabatic lapse rate². For annual and 24-hour average concentrations, the mixing height does not have much effect on the modelled ground level concentrations³. For one-hour average concentrations, however, mixing height is very important. The use of variable mixing heights, that are as close to the actual conditions as possible, improves the ability of the model to accurately predict downwind concentrations. For the sources that are close to the ground, the mixing heights do not play a major role.

The closest station having the upper air data necessary for this study is in Pontiac, Michigan. The mixing height data for each day in the five-year meteorological period (2000 - 2004) was developed using the Holzworth methodology. The surface values and the mean monthly minimum (morning) and maximum (afternoon) mixing heights were then pre-processed through the US EPA meteorological pre-processor (PCRAMMET)⁴, which combines surface and upper air measurements to create the hourly mixing heights that are required by the dispersion model. Missing data was filled in by interpolation. There were no significant blocks of data missing from this meteorological data set.

ASSESSMENT CRITERIA

Environment Canada and the Ontario Ministry of the Environment (MOE) have set air quality objectives, and air quality standards and criteria, respectively for various air pollutants.

The Ontario MOE as a component of the MOE standard setting process has developed a list of the Ambient Air Quality Criteria (AAQCs). The AAQCs are effect-based levels in air, with variable averaging time (e.g., 24-hour, 1-hour and 10 minutes) appropriate for the effect that it is intended to protect against. The AAQCs, which represent desirable levels in ambient air, are used for assessing general air quality and the potential for causing an adverse effect. The Standards Development Branch of the MOE publishes a set of guideline limits in *Ontario's Ambient Air Quality Criteria* [MOE 2008]. These criteria are not enforceable and with certain contaminants such as acrolein, the AAQCs are set below ambient background concentrations. Federal Air Quality Objectives encompass three levels of air quality objectives: maximum desirable level (MDL), maximum acceptable level (MAL) and maximum tolerable level (MTL). The MAL is intended to provide adequate protection against effects on soil, water, vegetation, materials, visibility, personal comfort and well-being. The MAL is considered to be a realistic objective. When the MAL is exceeded, the need for control action by a regulatory agency is

indicated. Table 7.3 summarizes the applicable available criteria from the MOE and Environment Canada.

TABLE 7.3 - AIR QUALITY CRITERIA FOR PM_{2.5} AND NO_x

Contaminant	Averaging Time	MOE AAQC µg/m ³ (ppb)	Federal AQ Objective or Maximum Acceptable Level (MAL) (µg/m ³)
NO _x (as NO ₂)	1 h	400 (200)	-
	24 h	200 (100)	-
	Annual	-	100 ¹
PM _{2.5}	24 h	-	30 *

Notes
 NO_x – nitrogen oxides – sum of nitrogen dioxide (NO₂) and nitric oxide (NO)
 PM_{2.5} includes all particulate matter with an aerodynamic diameter less than 2.5 µm – considered respirable
¹ MAL is for NO₂
 - Indicates no criterion available
 * comes into force in 2010

Emissions of NO_x and PM_{2.5} from the vehicles traveling on the freeway and the local service roads, other local arterial roadways, local industry and transboundary pollution from the southeastern United States have the greatest potential to impact local air quality. NO_x is the sum of nitrogen dioxide (NO₂) plus nitric oxide (NO). At present, there is no annual provincial AAQC for NO_x, but there is a federal MAL for NO₂. The assessment was conservatively completed assuming that 100 per cent of the NO_x is NO₂. Typically, NO₂ comprises approximately 60 per cent of total NO_x. With respect to PM_{2.5}, the MOE does not currently have an AAQC for PM_{2.5}. Instead, MOE has adopted the Canada Wide Standard (CWS) for PM_{2.5}, which is a federal air quality objective that comes into force in 2010. The CWS objective is not enforceable but non-attainment of the CWS may indicate that regional action is required to reduce emissions.

The MOE measures air contaminants at various locations throughout Ontario, and reports on the state of Ontario's air quality on an annual basis. These reports are known as "Air Quality in Ontario" reports.

The existing air quality is greatly influenced by local and long range (cross-border) contaminants generated in upwind urban and industrial areas. The predominant wind directions in Windsor are from the west to southwest, which brings these contaminants from the heavily industrialized areas of Detroit, nearby communities and beyond. Air quality impacts in the area are dominated by the substances that combine to produce smog or acid rain. This includes both NO_x and PM_{2.5}.

Exhibit 7.3 presents a breakdown of PM_{2.5} emissions in Southwestern Ontario in 2000⁵.

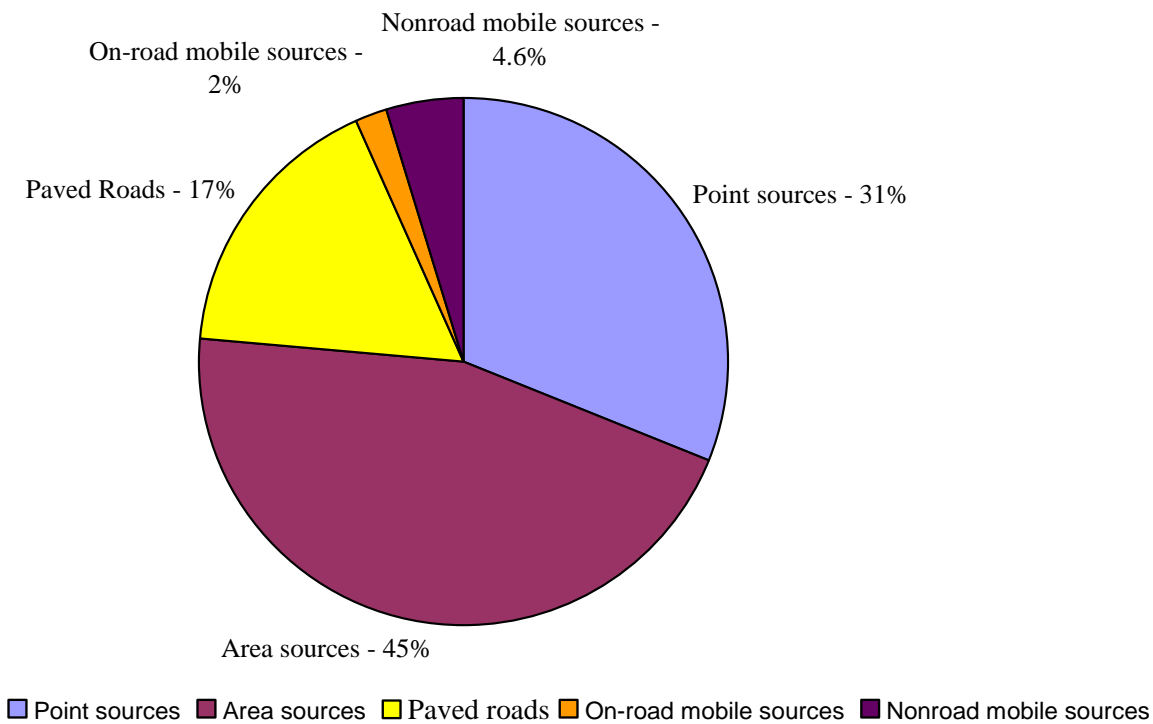
² Holzworth, G.C., 1967. Mixing Depths, Wind Speeds and Air Pollution Potential for Selected Locations in the United States. Journal of Applied Meteorology.

³ Young, J.W.S. and Z. Radonjic 1993. Air Quality Simulations – How Much Bias and Error Can Climate Introduce? Paper presented at the 27th CMOS Congress, Fredericton N.B., June.

⁴ United States Environmental Protection Agency 1995 (U.S.EPA). *User's Guide to CAL3QHC Version 2.0: A Modelling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*. September.

⁵ Environment Canada Great Lakes Basin Airshed Management Framework Pilot Project

EXHIBIT 7.3 - PM_{2.5} EMISSIONS IN SOUTHWESTERN ONTARIO (2000)



Ambient Monitoring Data

The MOE has historically operated a number of ambient air monitoring stations in Windsor. Information is routinely published for two stations at:

- MOE Windsor Downtown – 467 University Ave. (Station #060204 C); and
- MOE Windsor West – College / South St. (Station #060211R).

As part of this EA study, the study team established two ambient air monitoring stations in the Area of Continued Analysis, along the existing Huron Church/Talbot Rd. corridor. The stations were located approximately 45 m from the road at:

- DRIC OPHL Station – The Ontario Public Health Laboratory; and
- DRIC SCC Station – South of St. Clair College.

The locations of the ambient air monitoring stations are presented in Exhibit 7.4.

Detailed results from the DRIC monitoring program are provided in the *Draft Practical Alternatives Evaluation Working Paper – Air Quality Impact Assessment (May2008)*.

The main purpose of the monitoring program was to collect data on the total pollutant concentrations of various pollutants that are routinely observed in the corridor. The monitoring program commenced in September 2006 and continued to October 2007.

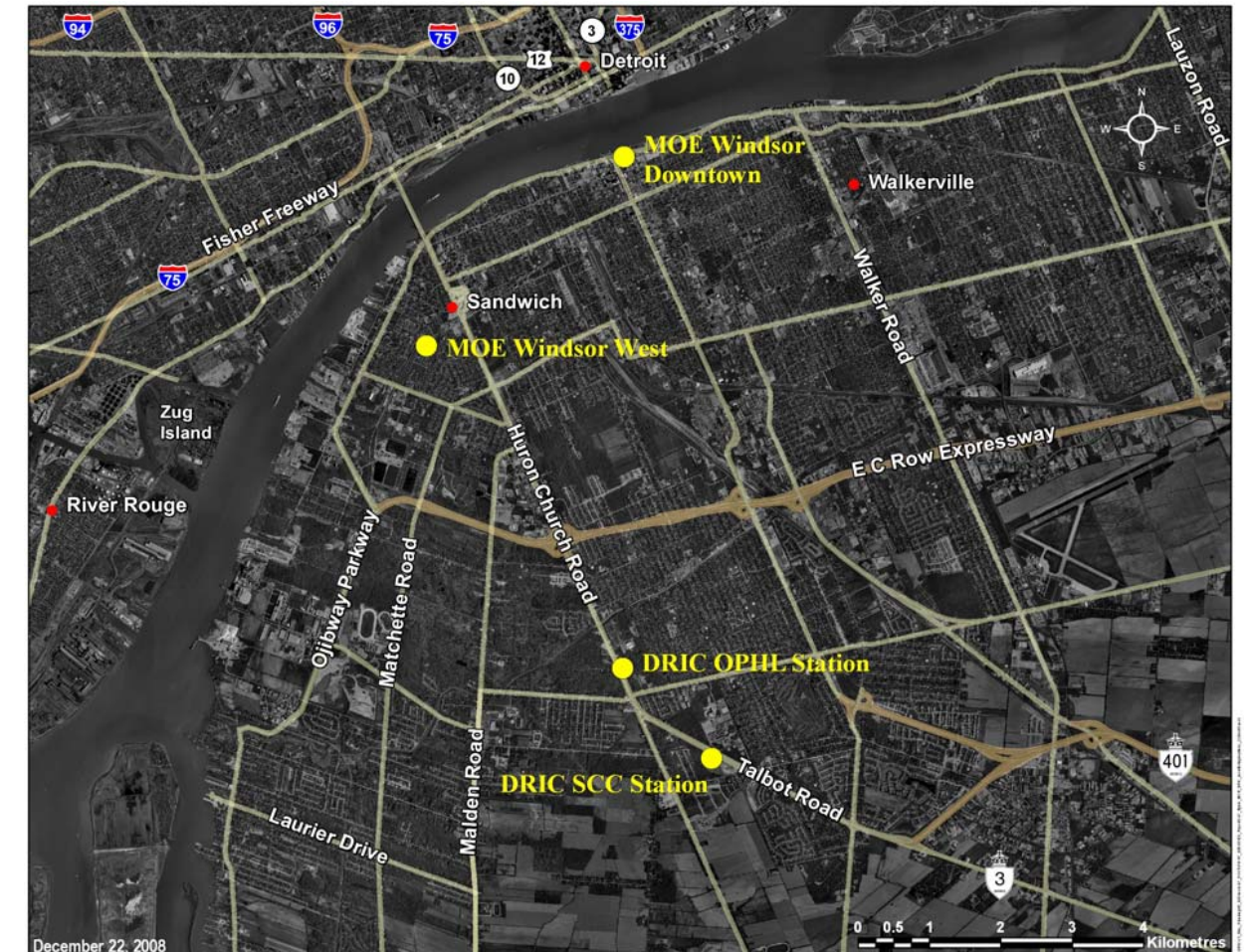
The data was used to:

- Establish current conditions within the corridor;

- Assist in determining background air concentrations of the pollutants being measured; and,
- Benchmark the air dispersion modelling.

In addition to PM_{2.5} and NO₂ which are discussed in this assessment, additional contaminants were included in the monitoring program and considered in the analysis of the Recommended Plan (the reader is referred to Chapter 10 for further detail on the assessment of the Recommended Plan).

EXHIBIT 7.4 - MOE MONITORING STATION LOCATIONS AND DRIC MONITORING STATION LOCATIONS



To assess the existing air pollutant concentrations in the area, monitoring data from these two stations were obtained from the MOE⁶. The MOE AAQCs are based on Nitrogen Dioxide (NO₂) measurements rather than total NO_x, thus the NO₂ data has been presented. Tables 7.4 and 7.5 present a summary of the measurements for NO₂ and PM_{2.5} respectively.

Table 7.6 presents a summary of the PM_{2.5} and NO₂ measurements collected from the two DRIC stations from October 2006 to December 2006. These first quarter results were used to assist in establishing background concentrations for the modelling of the alternatives. While data is currently available for additional periods, the initial model runs were performed when only limited data was

⁶ Ontario Ministry of the Environment (MOE). *Air Quality in Ontario, 2000–2005* (Reports & Appendices), Queen's Printer for Ontario

available. To keep the comparisons consistent between alternatives, the first quarter results were used for all alternatives. The reader is referred to Chapter 8 for more details on evaluation of alternatives.

Table 7.7 presents a summary of the PM_{2.5} and NO₂ measurements collected from the two DRIC stations from November 2006 through October 2007. After being fully evaluated, these data were used as part of the final analysis of the Recommended Plan. The reader is referred to Chapter 10 for more details on the assessment of the Recommended Plan.

TABLE 7.4 - FIVE YEAR SUMMARY OF MOE MONITORING RESULTS – NO₂

Station ID	Station Location	Averaging Period	Nitrogen Dioxide (µg/m ³)						Ave
			Canada Wide Standard	Year					
				2001	2002	2003	2004	2005	
#060211-R	College / South St.	Annual Average	-	39	37	INS*	33	32	35
		1-hr 90 th Percentile	-	66	62	69	62	62	64
		1-Hour Maximum	400	130	175	182	176	133	159
		24-Hour Maximum	200	83	116	92	79	109	96
#060204-C	467 University Ave.	Annual Average	-	36	36	INS	34	32	35
		1-hr 90 th Percentile	-	62	60	73	68	62	65
		1-Hour Maximum	400	163	130	150	182	124	150
		24-Hour Maximum	200	77	86	94	90	100	89

* INS = Insufficient data available to compute a representative average

TABLE 7.5 - FIVE YEAR SUMMARY OF MOE MONITORING RESULTS – PM_{2.5}

Station ID	Station Location	Averaging Period	PM _{2.5} (µg/m ³)						Ave
			Canada Wide Standard	Year					
				2001	2002	2003	2004	2005	
#060211-R	College / South St.	Annual Average	-	-	11.8	9.6	9.5	10.5	10
		24-hr 90 th Percentile	-	-	26	20	21	24	23
		1-Hour Maximum	-	-	74	64	56	74	67
		24-Hour Maximum	30**	-	56	41	38	52	47
		No. of Times above Benchmark	-	-	18	7	9	9	11
#060204-C	467 University Ave.	Annual Average	-	9.4	9.8	8.5	8.6	10.4	9
		24-hr 90 th Percentile	-	20	21	19	19	24	21
		1-Hour Maximum	-	72	75	64	54	72	67
		24-Hour Maximum	30**	40	56	43	39	48	45
		No. of Times above Benchmark (30 µg/m ³)	-	7	10	5	8	12	8

TABLE 7.6 - SUMMARY OF DRIC 1ST QUARTER MONITORING RESULTS (OCT 06 – DEC 06)

Pollutant	Averaging Time	OPHL	SCC	Average of 2 Stations
NO ₂ (1-hr), µg/m ³	Max	85	85	85
	Min	0	0	0
	Average	27	21	24
	90 th Percentile	47	39	43
NO ₂ (24-hr), µg/m ³	Max	52	50	51
	Min	2	2	2
	Average	26	21	24
	90 th Percentile	43	32	38
PM _{2.5} (24-hr), µg/m ³	Max	48	46	47
	Min	8	8	8
	Average	21	20	21
	90 th Percentile	32	29	31

TABLE 7.7 - SUMMARY OF DRIC MONITORING RESULTS (NOVEMBER 2006 – OCTOBER 2007)

Pollutant	Averaging Time	OPHL	SCC	Average of 2 Stations
NO ₂ (1-hr), µg/m ³	Max	104	110	107
	Min	0	0	0
	Average	27	23	25
	90 th Percentile	50	44	47
NO ₂ (24-hr), µg/m ³	Max	68	52	60
	Min	3	3	3
	Average	27	23	25
	90 th Percentile	43	36	40
PM _{2.5} (24-hr), µg/m ³	Max	48	46	47
	Min	8	7	8
	Average	20	21	21
	90 th Percentile	32	33	33

It should be noted that the results collected at the DRIC monitoring stations are somewhat higher than those collected at the MOE monitoring stations. This was expected since the DRIC monitoring stations are located closer to a high traffic corridor (Huron Church/Highway 3), whereas the MOE stations are not subject to the same traffic influences. Thus, the MOE stations are not influenced by the same volumes of traffic.

Contribution from Upwind / Background Sources

Air dispersion models provide an estimate of the air pollutant concentrations resulting from emission sources that are specifically included in the model set-up and inputs. However, concentrations resulting from other, upwind (areas to the south and west of Windsor) sources are not included, but must be considered when assessing total expected air pollutant concentrations against relevant standards and guidelines. This is typically done by adding a background component to all model-predicted results. MOE generally advocates the use of 90th percentile air pollutant concentrations

obtained from ambient air monitoring stations for this purpose (i.e., background concentrations are lower 90 per cent of the time). This approach is considered to provide a conservative estimate of background concentrations.

Data on the existing air pollutant concentrations in the Windsor area were obtained from the two MOE air monitoring stations. Given their locations in an urban setting, data from the MOE stations reflect local traffic. The MOE data therefore provided somewhat higher background concentrations of pollutants such as PM_{2.5} and NO₂ than might otherwise be observed at stations further from traffic but upwind (i.e. south and west) of the study area. However, the two MOE stations were considered to be far enough away from the Highway 3/Huron Church Road corridor as not to be impacted by existing traffic conditions from this corridor would not be impacting the MOE monitors to any notable degree.

Tables 7.4 and 7.5 indicate that the average 90th percentile measured concentrations at each of the MOE stations are 23 and 21 ug/m³ for 1-hour PM_{2.5} and 64 and 65 ug/m³ for 1- hour NO₂. The first quarter data from the two DRIC air monitoring stations were used in conjunction with the MOE monitoring data in determining the appropriate background concentrations.

As shown in Table 7.6, the average measured concentration at the DRIC stations for the first quarter of monitoring data (Oct 1 – Dec 31st, 2006) was 21 µg/m³ for PM_{2.5}. This corresponds to the 22 ug/m³ of the 90th percentile for the MOE monitoring stations. Therefore, for the purposes of background, a rounded value of 20 µg/m³ was chosen. This value allows for a conservative approach to determining the possible combined effects of the roadway and other contributions to PM_{2.5}.

For NO₂, the average value from the DRIC monitoring stations is 24 µg/m³. The 90th percentile value for the MOE monitoring stations is 65 µg/m³. Because of the large discrepancy between the MOE and DRIC monitoring stations and the general acceptance by the MOE of 90th percentile values, a conservative rounded value of 70 µg/m³ was chosen for background for NO_x.

Established background levels were re-evaluated in greater detail to reflect the full year of monitoring in the Highway 3/Huron Church Road corridor.

Table 7.8 presents the selected background concentrations used in the DRIC AQ assessment.

TABLE 7.8 - SUMMARY OF BACKGROUND CONCENTRATIONS USED IN DRIC AIR QUALITY ASSESSMENT

Pollutant	Averaging Time		
	1-hour	24-hour	Annual
NO _x	70 µg/m ³	70 µg/m ³	-
PM _{2.5}	-	20 µg/m ³	9 µg/m ³

The receptors selected for noise impact assessment were those determined to be potentially most likely to be impacted (i.e., subject to frontline exposure) by the various alternatives, but not anticipated to be displaced. Multiple receptors were selected to capture the anticipated variations in exposure to noise from traffic based on the alignment of existing roads, the alignment of the proposed alternatives, and variations in traffic volumes.

Within the ACA, the results of the study team’s noise modeling indicate that existing sound levels are generally high (> 55 dBA) during both daytime and nighttime hours. Daytime sound levels of 55 dBA, or higher, were identified at most of the 33 receptors modeled. The daytime sound levels are predicted to range from a low of approximately 56 dBA to a high of approximately 79 dBA. The nighttime sound levels are predicted to range from a low of approximately 52 dBA to a high of approximately 72 dBA. These sound levels reflect the predicted high traffic volume on the major roads within the study area and the relatively high percentage of truck traffic on a number of these roads.

The vibration assessment includes both field measurements to establish baseline vibration levels and an assessment of vibration impacts associated with the proposed practical routes.

The methodology for estimating vibration impacts consisted of the following key steps:

- Through consultations with other disciplines, locations potentially vulnerable to ground borne vibration were identified.
- Receptors within the potentially vulnerable areas were identified for vibration monitoring.
- Ground vibration levels were measured at two locations (side by side) at each of eight representative receptors. The traffic at each location was monitored over a period of 30 minutes. About 15 minutes were recorded by the chart recorder. Two twelve minute periods were measured by the analyzer to produce two spectrum plots. The monitoring was conducted over two different days to identify any differences in the vibration patterns. (Note: Under busy traffic conditions, truck speeds are reduced considerably, thereby reducing vibration levels).

Receptor Locations

Eight receptor locations were chosen to measure pre-modification vibration levels. The eight locations are:

1. The grassy area adjacent to the roadway at the house, between 1140 and 1202 Talbot Street.
2. Adjacent to the West sidewalk opposite to the church (at the foundation block of the Ambassador Bridge – the 5th Block south of Riverside Avenue).
3. Adjacent to the sidewalk of the cul-de-sac at the end of Mill Street.
4. The grassy area adjacent to the roadway (east side of Huron Church Road) outside the Heritage Park Alliance Church.
5. In the park near the cul-de-sac at the end of Northway Avenue.
6. Just south of the Railway tracks at the intersection of Ojibway Parkway and Broadway).
7. Just north of the EC Row Expressway (west side) at 4340 Malden Road.
8. Near the sidewalk of the turn-around-loop on Huron Church Road – opposite to 3495 Huron Church Road.

7.2 Socio-Economic Environment

7.2.1 Noise and Vibration

This section provides an overview of noise and vibration conditions within the Area of Continued Analysis. For further details, the reader is referred to the *Draft Practical Alternatives Evaluation Working Paper – Noise and Vibration Assessment*.

7.2.2 Neighbourhood and Community Characteristics

This section provides an overview of neighbourhood and community characteristics within the Area of Continued Analysis. For further details, the reader is referred to *the Draft Practical Alternatives Evaluation Working Paper – Social Impact Assessment*.

It is important to understand the demographics of the study area in order to understand the degree of impact from project activities that may be experienced by residents. As part of the consultation carried out for this study, data collection as part of the Social Impact Assessment involved household questionnaires, social feature questionnaires, focus group sessions, input received as part of the public consultation efforts, stakeholder interviews, site visits, and review of various published secondary sources (e.g. Census Canada, City of Windsor). The demographic baseline for the ACA is presented in Table 7.9. For comparison purposes, this table provides data for the City of Windsor, Essex County, and the Province of Ontario. A higher percentage of residents within the ACA own their homes compared to the City of Windsor as a whole. The percentage of the population who are immigrants or visible minorities is lower in the ACA comparatively to the City of Windsor; however, it is similar to that of the Province. The largest percentage of residents within the ACA identified English as their first language.

TABLE 7.9 – DEMOGRAPHIC BASELINE⁷

GEOGRAPHIC BOUNDARIES	TOTAL DWELLINGS	TOTAL POPULATION	HOME OWNERSHIP		IMMIGRANT POPULATION 1996-2001 (%)	VISIBLE MINORITIES (%)	LANGUAGES		
			Own (%)	Rent (%)			English (%)	French (%)	Non-official languages (%)
Ontario*	4,219,41	11,410,046	68	32	18	19	71	4	24
Essex County*	141,300	374,975	73	27	20	11	73	4	22
City of Windsor*	88,533	208,402	65	35	27	17	68	4	28
Area of Continued Analysis	479	1,327	91	10	18	13	71	2	26

Project effects will impact people differently depending on their characteristics. Those members of society whose quality of life is vulnerable to changes within their community are referred to in Social Impact Assessments (SIA) as special populations. For this study, such populations include children, the disabled, ethnic minorities and adults over the age of 65. Estimates on the number of affected residents belonging to special populations were collected from the questionnaire data. Of those that completed the questionnaire, 21 per cent are under the age of 18 years, 13 per cent are over the age of 65 years, and 9 per cent were identified as having special needs. Comparatively, based on Statistics Canada data, the City of Windsor is similar with 25 per cent of the population under the age of 18 years, and 14

⁷ Statistics Canada. 2002. 2001 Community Profiles.

per cent over the age of 65 years. There is no data that specifically identifies the percentage of the population with special needs.

In order to predict and evaluate the effects of the project on the community, an understanding of the characteristics of the community is required. The term “community” can mean different things to different people; however, it generally refers to the qualitative attributes relating to how people feel or identify with their surrounding environment. This project will impact the broader communities of South Windsor and LaSalle; however, within these broader communities are unique neighbourhood communities that will experience more specific impacts. It is for this reason that greater emphasis is placed on identifying the characteristics of these unique neighbourhood communities in this section.

The “community characteristics” described include community character, the level of satisfaction residents feel toward living in their community, changes that have been observed in the last five to ten years, and the level of cohesion within the community. The business community within the ACA that provides services to the neighbourhood communities is also briefly described. Sources of information include questionnaires, focus group discussions, public information open houses, and stakeholder meetings and input from the Economic Impact Assessment (Hemson 2008).

“Community character” is defined by the physical attributes and features of the neighbourhood such as the age of the development, the surrounding environment (e.g. natural, urban), or demographics (e.g., family, seniors). This data was collected through site visits, questionnaires, and focus group workbooks and discussion.

Community cohesion is generally described as a measure of how tied together the community is. It can be a very difficult concept to get an understanding of and data to support; however, it is essential in understanding the community and the residents within it. Some of the information collected through various consultations gives an understanding of the cohesiveness of the community. Other sources of data include questionnaires, and focus group workbooks and discussion.

The use and enjoyment of property contributes to residents’ feelings of satisfaction with the community. The presence of nuisance impacts, or physical disturbances such as excessive noise, dust, traffic and aesthetics, is also related to how residents use and enjoy their property. The presence of such nuisance features often defines the attributes residents dislike about their community.

SOUTH WINDSOR, LASALLE AND TECUMSEH COMMUNITY CHARACTERISTICS

The ACA crosses through the communities of South Windsor, LaSalle, and Tecumseh. Within these broader communities are unique neighbourhood communities that share common characteristics.

The character of the broader community is a mixture of established and new residential development. The Highway 3/Huron Church Road transportation corridor defines the political boundary of Windsor and LaSalle between Howard Avenue and Todd Lane. The corridor is a mixture of urban land uses including pockets of residential development, highway commercial development and natural areas. The Highway 3/Huron Church Road transportation corridor experiences high volumes of traffic from both local and international traffic. The corridor serves as the main access to the Ambassador Bridge and is subject to traffic congestion during delays and peak volumes at the border crossing. The width of the right-of-way and volume of traffic presents a barrier to the movement of pedestrians across the corridor. The underpass at the Grand Marais Drain is the only location that offers safe off-road passage for pedestrians and cyclists across the corridor. Common property uses in the residential neighbourhoods within the broader communities include gardening, relaxing, barbecuing, entertaining,

children's activities, swimming (for those households with a pool), an appreciation for nature and bird watching, and yard work, done on a daily and/or weekly basis. The frequency of these activities increases with favourable weather in the non-winter months.

NEIGHBOURHOOD COMMUNITY CHARACTERISTICS

Within the ACA, 17 unique neighbourhood communities were identified based on input from the focus group meetings. Focus group participants discussed what the terms “community” and “neighbourhood” meant to them and concluded by drawing the boundary of their community on a map. The delineation of community boundaries varied; for some the boundary was their immediate street, and for others the boundary included a large part of South Windsor and LaSalle. Although focus group residents identified with being part of a broader community such as South Windsor or LaSalle, they, generally, identified more closely with their local neighbourhood community (e.g., Sandwich Towne, Huron Estates or Southwood Lakes).

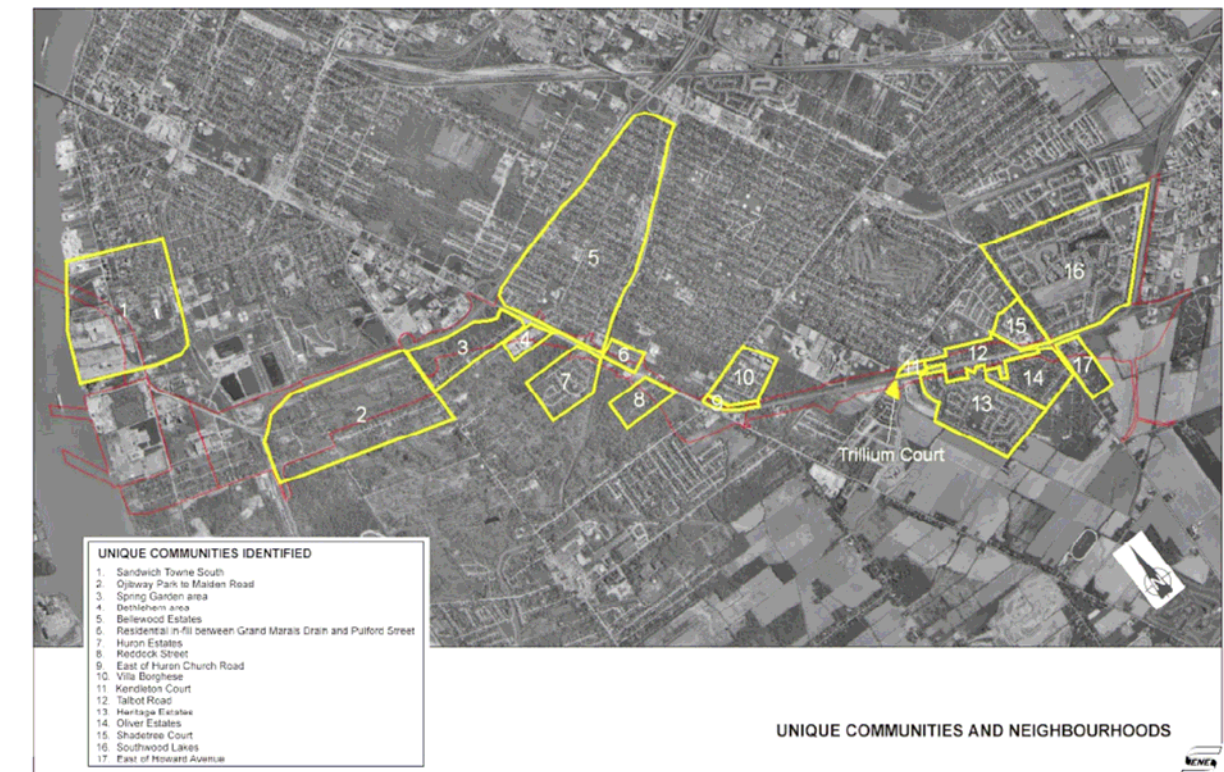
Other sources of information used to help define the community boundaries included geographic features, municipal planning documents, and input received from PIOHs and stakeholder meetings. There are some areas within the ACA that are not obviously part of a distinct neighbourhood or community. These areas consist of residential in-fill and strip development adjacent to the existing transportation corridors.

Unique neighbourhood communities identified within the ACA are listed below and illustrated in Exhibit 7.5. The neighbourhood communities are discussed west to east starting from the Detroit River and ending at Highway 401.

1. Sandwich Towne South;
2. Ojibway Park to Malden Road;
3. Spring Garden Area;
4. Bethlehem Area;
5. Bellewood Estates;
6. Residential in-fill between Grand Marais Drain and Pulford Street;
7. Huron Estates;
8. Reddock Street;
9. East of Huron Church Road;
10. Villa Borghese;
11. Kendleton Court;
12. Talbot Road;
13. Heritage Estates;
14. Oliver Estates;
15. Shadetree Court;
16. Southwood Lakes; and
17. East of Howard Avenue.

Although similar due to their proximity to each other in South Windsor, LaSalle and Tecumseh, characteristics of each one are identified and discussed in the sections below.

EXHIBIT 7.5 – UNIQUE COMMUNITIES AND NEIGHBOURHOODS WITHIN THE ACA



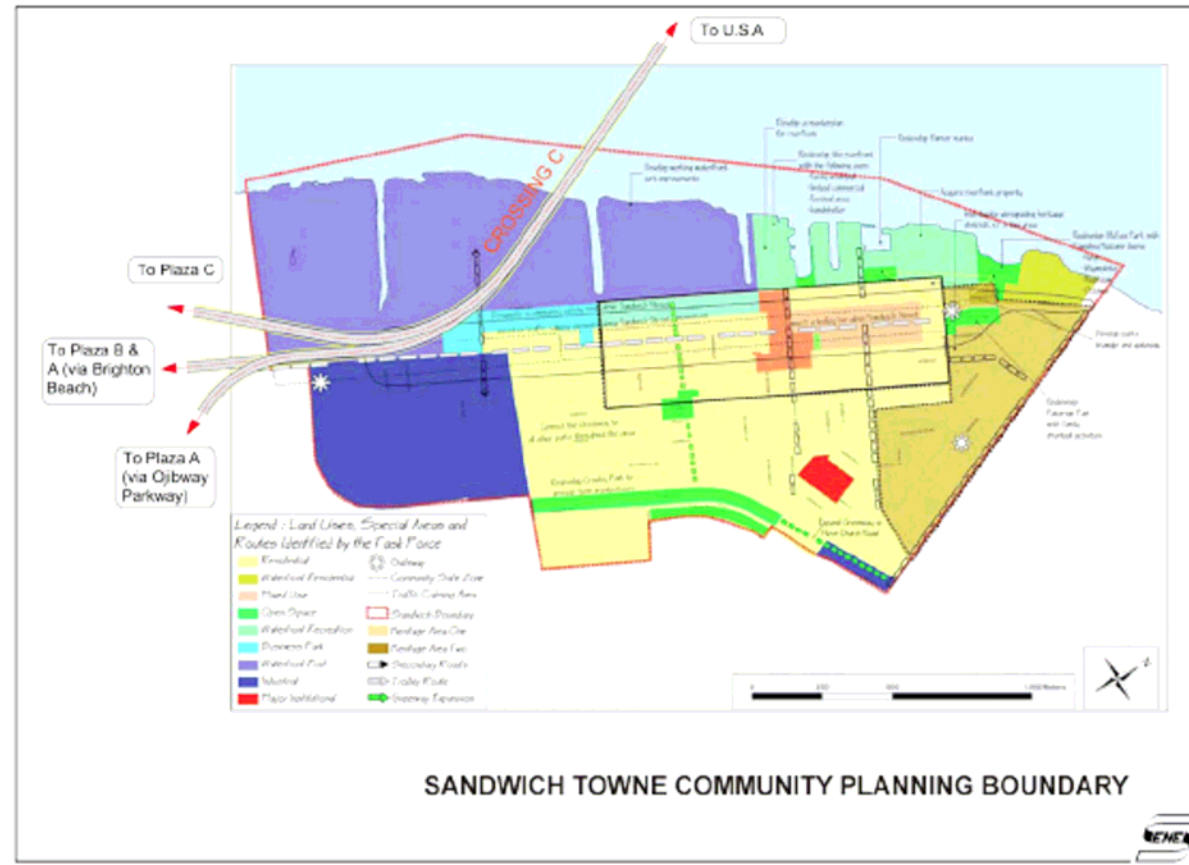
Sandwich Towne South

A portion of the ACA is within the southern portion of Sandwich Towne. The Sandwich Towne South neighbourhood is characterized by a mix of residential and industrial development, as illustrated in Exhibit 7.6.

Community Character

Sandwich Towne is located west of the Ambassador Bridge adjacent to the Detroit River. *The Olde Sandwich Towne Community Planning Study (October 2006)* defines the boundaries of Sandwich Towne as Huron Church Road, College Avenue on the east, Prospect Avenue on the south, and the Detroit River. The community has a rich history with Aboriginal settlement dating back several hundred years prior to European settlement in the 1700's. Exhibit 7.6 illustrates the boundary of the Community Planning Study boundary.

EXHIBIT 7.6 – SANDWICH TOWNE COMMUNITY PLANNING BOUNDARY



Over the course of this study, residents and other participants from Sandwich Towne made it known that the south boundary of the community of Sandwich was Prospect Avenue. In January 2007, during the DRIC study focus group mental mapping exercise, residents were asked to identify how they would physically define their community. The focus group mental mapping exercise yielded a community map with boundaries which were very similar to the study area identified within the *Old Sandwich Towne Community Planning Study*.

Sandwich Towne is characterized as a community with a rich heritage evidenced by many significant historical buildings and landmarks. The picture of the community that emerged through PIOHs and focus groups was a community that still offers a friendly small-town feeling. Despite its multicultural and socially and economically diverse population, anecdotal evidence provided from focus group participants suggested that residents are caring, respectful of one another, and close-knit.

Sandwich Towne struggles with the high proportion of properties owned by absentee landowners and left either vacant or rented.

In Sandwich Towne, there are a number of family-owned and run businesses which focus group participants indicated as part of the unique character of the community. The community's rich history is reflected in many unique features including the eclectic mix of architecture, the wall murals depicting historic events, ornamental lighting and streetscape, and the presence of the river. Many focus group participants also mentioned the parkettes and parks within Sandwich Towne as a unique feature contributing to the quality of life. Sandwich Towne was founded around the four pillars of society: the

freedom to worship, to assembly, to justice and to education. The intersection at Sandwich Street and Brock Street continues to emanate these founding values with a historic church, apartment building, historic MacKenzie Hall and jail, neighbourhood police station, and school. As one participant stated, and echoed by many others, "Sandwich Towne is the oldest European settlement in Ontario and holds historical significance that needs to be preserved." Others stated, "It [Sandwich Towne] is the very beginning of Windsor."

Community Satisfaction

Focus group results showed that most people in general are very satisfied with Sandwich Towne as a place to live. When asked to comment on what they liked best about the community, the residents listed the best things about their community as being:

- People (friendly, proud of their heritage and community, respectful, caring);
- Heritage of community;
- Ethnic diversity;
- Small town feel;
- Convenience of having a business hub that provides essential services;
- Parks;
- Ability to walk to most destinations due to proximity, and
- Access to children's programming and activities.

The presence of nuisance impacts, or physical disturbances such as excessive noise, dust, traffic and aesthetics, is also related to how residents use and enjoy their property. The presence of such nuisance elements often defines the attributes residents dislike about their community. Focus group participants were also asked to identify what they liked the least about the community. Respondents indicated the following:

- Noise and vibration from trucks on the Ambassador Bridge;
- Large corporations buying up multiple homes without communicating what the future use of the property may be;
- Students at the University and other neighbours not cleaning up their yards;
- Businesses closing, houses for sale and/or demolished;
- Air and noise pollution;
- Perception that the west end of Windsor (Sandwich Towne) is a "dumping" ground for undesirable services, facilities or businesses;
- Resistance to invest in Sandwich Towne;
- Possibility of two international bridges;
- Disruption to the historical area of Sandwich Towne; and
- Lack of services and business.

Community Change

Both positive and negative changes were identified in the community within the last five to ten years. Positive changes include:

- Growing awareness of historical aspects and their significance to Sandwich Towne;
- Improved attitude from City of Windsor administration, e.g., new or enhanced park development in Sandwich, new sidewalks, decorative street lights, plantings;
- Revitalization of Sandwich Street;
- Implementation of Sandwich Towne Festival;
- Improved attitude and self-respect of residents, e.g., increased community involvement, increased caring and pride in community;
- Residents choosing to stay and additional people moving in to the community; and
- Safer community.

Negative changes seen by residents in the last five to ten years include:

- Increase of absentee landlords and rental properties, often used for student housing or left abandoned;
- Selling of residential and business properties to big corporations;
- Decreased enrolment at Forster High School;
- Development of pockets of illegal rooming houses;
- Increased volume of trucks;
- Significant and mature tree species being cut down;
- Changes in the built form e.g., fires destroying buildings, and new development;
- Increased industry in the community; and
- New and younger families moving to Sandwich Towne that don't appear to take pride in the neighbourhood.

Some of these changes are the result of community based action or initiatives to improve the community, while other changes infringe on future development goals. Change will continue in the future as the community strives to implement the recommendations of *The Olde Sandwich Towne Community Planning Study (October 2006)*, and in so doing create a vibrant community where residents are proud to live, work and play.

Community Cohesion

Some of the information collected through various consultations gives an understanding of the cohesiveness of the community. Other sources of data include questionnaires delivered to potentially displaced residents and focus group workbooks and discussion.

Through public consultation and the focus groups, Sandwich Towne was portrayed by many as a close-knit community measured by close relations with neighbours.

Ojibway Park to Malden Road

This area is located between Ojibway Parkway and Malden Road south of the E.C. Row Expressway (as illustrated in Exhibit 7.5).

Community Character

The area is primarily a natural environment with trails and mature trees. Residential development, some of which dates back to the 1930s, occurs in a strip format along the road network, that is, Matchette, Beech, Chappus and Armanda Streets. Participants in the focus groups were asked to describe the current character of the community. Residents listed the natural environment and the feeling of living "in the country" with the amenities of the city.

Community Satisfaction

When asked to comment on what they liked best and least about the community, residents listed the best things about their community as being:

- Friendly neighbours in a well established community;
- Nature and wildlife;
- Easy access to E.C. Row, the City (downtown), and the University of Windsor;
- A country-in-the-city atmosphere;
- Close to work, family, schools; and
- Enjoyment of home and property with family and friends.

Some residents indicated that they did not have any dislikes concerning their community. However, those residents that did list the things they like the least, listed:

- Air quality;
- Noise;
- Truck traffic;
- Pollution;
- Volume of traffic on Armanda and Matchette; and
- No sidewalks and open ditches.

Community Change

When asked what changes they have seen in their community in the last five to ten years, focus group participants identified:

- Increased noise levels;
- Increased volume of truck traffic;
- Decrease air quality;
- Increased awareness and concern with health issues related to changes in the environment;
- Increased development (i.e. housing development) and growth in neighbourhood.

Community Cohesion

Focus group results indicated that people feel very close-knit, getting together with neighbours several times a week.

Spring Garden Area

The Spring Garden area is bounded by Malden Road, E.C. Row and the Huron Church interchange, and Spring Garden Road. This community is delineated in Exhibit 7.5. Residential development occurs in a strip along the road network, that is, Spring Garden and Malden. Future residential land use development is planned for the area between E.C. Row Expressway and Spring Garden Road.

Community Character

Spring Garden Road is a mix of older and newly built homes. When asked to describe the current character of the community, residents identified it as a private and older established area in a park-like setting, with easy access to all transportation arteries and areas of the city.

The natural setting in which Spring Garden is situated, and its related offerings (e.g. wildlife, trails, mature trees) is valued by residents as a unique feature that defines the character of their community. Being close to all conveniences yet still able to watch wildlife in the yard is a unique characteristic of the community. Residents are able to enjoy the conveniences of an urban lifestyle without living on a main transportation artery.

Community Satisfaction

Focus group results showed that people are very satisfied with their community. When asked to comment on what they liked best about the community, the residents listed the best things about their community as being:

- Hiking trails;
- Watching the wildlife in their habitat; and
- The open green space, and private lots.

Focus group results showed that the use of residential property for a variety of purposes such as social and recreational was important. Outdoor activities include children's activities, entertaining friends and relatives, gardening, nature appreciation, birdwatching, and relaxing. These outdoor activities were enjoyed during all seasons of the year, due in part to large property size and rural/natural character of the properties. When asked what they disliked about the community, none of the focus group participants indicated anything they disliked.

Community Change

Changes in the community in the last five to ten years included the addition of new houses, heavier truck traffic and expanded shopping malls in the broader community.

Community Cohesion

Residents that participated in the focus groups were asked to identify how close-knit they felt towards their community. The results showed most people felt close knit and that they had developed close relations with their neighbours.

Bethlehem Area

Adjacent to Spring Garden Road and located on the edge of the Spring Garden Road Prairie is an in-fill residential settlement that is characterized by new homes surrounded by a forested area. The north end of Bethlehem connects to Huron Church Road and Spring Garden Road. As seen in Exhibit 7.5, the ACA encroaches into this community. The alignment for the access road passes through this area.

Community Character

The homes along Bethlehem, 6th Street and Lamont Avenue were built within the last 10 years. Residents enjoy a quiet setting, as both Bethlehem and Lamont dead-end at the forested area. The forested area offers wildlife viewing and recreation trails. Residents value the natural setting and low traffic volumes due to the dead-end streets. The character of the community is new, friendly and quiet, and consists predominantly of retirees. The neighbourhood is central to shopping and medical services.

Residents that participated in the focus groups were asked to identify features that they felt were unique to their community. Many of the same features, that is the tranquility of living adjacent to a natural area and the low traffic volume as a result of living on a dead end street, were identified that also define the character of the community. Residents also value the convenient access to the major transportation arteries, such as E.C. Row for cross town travel and Huron Line to Highway 3.

Community Satisfaction

Residents experience a range of satisfaction with their community from very satisfied to somewhat satisfied. Generally, however, residents are satisfied with their community. When asked to comment on what they liked best about the community, residents listed the:

- Friendly, tolerant of people (all ethnic peoples);
- Proximity of nature and wildlife;
- Quiet and tranquil neighbourhood; and
- Easy access to services.

The use and enjoyment of their property also contributes to their feelings of satisfaction. Residents use their property for a variety of purposes including social and recreational. Outdoor activities include children's activities, entertaining friends and relatives, gardening, nature appreciation, birdwatching, relaxing, yard work, and casual maintenance. Participants indicated they enjoy outdoor activities during all seasons of the year and do so due to the location of their property adjacent to a natural area, and for personal enjoyment and satisfaction.

The presence of nuisance impacts, or physical disturbances such as excessive noise, dust, traffic and aesthetics, is also related to how residents use and enjoy their property. The presence of such nuisance elements often defines what attributes residents dislike about their community. Those residents that listed the things they like the least, listed:

- Increase in traffic, especially truck traffic, on Huron Church Road;
- Noise; and
- Pollution.

Community Change

Community change was not as relevant to focus group participants, as this is a new area; however, residents did identify the efforts of the Ministry of Transportation in purchasing properties from developers in order to protect the natural lands in the vicinity.

Community Cohesion

Residents that participated in the focus groups were asked to identify how close-knit they felt towards their community. Responses varied from not very close knit to very close knit. Some of the participants have close relations with a few neighbours and visit almost daily with neighbours, while others enjoy their privacy and rarely socialize with neighbours other than in casual greetings and conversations. The range in cohesion can be attributed, in part, to the length of time residents have lived in this relatively new development.

Anecdotal evidence from public meetings suggested that several residents relocated to Bethlehem Street for their retirement due to its proximity to the natural area.

Bellewood Estates

Bellewood Estates is an established subdivision development located north of Huron Church Road, between E.C. Row and Pulford Street (see Exhibit 7.5). Bellewood Estates extends from E.C. Row to Grand Marais Road, and from Huron Church Road to the Randolph Avenue area. Well over 1,000 homes, several schools and parks are located within Bellewood Estates.

Community Character

Much of Bellewood Estates is an established residential community. When asked to describe the character of their community, residents that participated in the focus groups identified individual homes and well maintained properties. Residents felt that home improvements evident within their community reflect pride in ownership and the expectation that property values will increase.

Other unique features identified in Bellewood Estates include the variety of elementary and secondary schools (Catholic, French, public) available in the area, the variety of churches, recreation areas (park, ice rink, gyms), and the availability of medical service. The location of Bellewood Estates provides convenient and easy access to Highway 401, the U.S. border crossing, and downtown Windsor for work.

Community Satisfaction

Generally, residents are satisfied with their community. When asked to comment on what they liked best about their community, residents listed:

- Unique architecture of homes in Bellewood Estates, i.e., individual structures/appearance. There is not a uniform look to the homes as is common with builder projects or more recently built subdivisions;
- Pride in ownership is evident on each property through landscaping and the upkeep of homes; and
- Mature trees.

The focus group results showed people use their property for a variety of purposes including social and recreational. Outdoor activities include children's activities, entertaining friends and relatives, swimming, gardening, nature appreciation, birdwatching, relaxing, etc. These outdoor activities are

enjoyed during all seasons of the year due in part to the property location or characteristics. On responding to what people liked least about their community, many indicated the increasing traffic on Huron Church Road and decreasing property values in their neighbourhood.

Community Change

When asked what changes they have seen in their community in the last five to ten years, the residents identified an increase in larger, more expensive housing. Residents also felt that the public parks and green spaces adjacent to Huron Church Road have been well maintained. A more recent change residents identified is that they feel their property values are threatened and that homeowners morale has decreased.

Community Cohesion

Focus group showed that many people felt their community was somewhat close-knit or very close-knit. Some residents indicated that they enjoy their privacy, and rarely socialize with neighbours, while others indicated that they have close relations with a few neighbours.

Residential In-fill Between Grand Marais Drain and Pulford Street

The residential in-fill between Pulford Street Grand Marais Drain is shown on Exhibit 7.5 and is within the ACA. The access road alignments may potentially affect this residential area.

Community Character

The area east of Bellewood Estates and the Grand Marais Drain is characterized as a relatively new in-fill residential development with the oldest home dating back to 1997. The area is quiet, and residents display their pride in home ownership through well maintained and well landscaped properties.

The well kept houses were identified as a unique feature by focus group participants. The home owners association was also identified as a unique feature. Due to the home owner association, residents have been able to meet and socialize with their neighbours. Other unique features include the proximity of the neighbourhood to the South Windsor recreation complex, walking paths in a naturalized area, and the proximity of local business within walking distance.

Community Satisfaction

Generally, residents are very satisfied with their community. When asked to comment on what they liked best about their community, residents listed:

- Nice area, close to everything;
- Easy accessibility to the surrounding environs, e.g., walking trails along Grand Marais drain and Oakwood area.

Property uses include a variety of purposes involving social and recreational uses. Outdoor activities include entertaining friends and relatives, gardening, nature appreciation, birdwatching, and relaxing. Residents engage in outdoor activities during all seasons for the pure enjoyment of it and the resulting beautifying effects. When asked to comment on what they like least about their community, those that responded identified their close proximity to Huron Church Road and the resulting truck traffic noise and pollution.

Community Change

When asked what changes they have seen in their community in the last five to ten years, the focus group results identified growth in terms of new subdivisions and businesses, and an increase in truck traffic on Huron Church.

Community Cohesion

Residents that participated in the focus groups felt that the community ranged from being somewhat close knit to very close-knit. Several participants identified that relatives live in the community that they visit often or almost daily. When asked how frequently they socialize with their neighbours, most people provided a variety of responses from rarely, as they enjoy their privacy, to occasionally, as they enjoy close relations with a few neighbours.

Huron Estates

The community of Huron Estates is located south of Huron Church Road between Lambton Road and the Grand Marais Drain/Turkey Creek. As depicted on Exhibit 7.5, Huron Estates is located on the periphery of the ACA. Huron Estates backs onto the parkland adjacent to the drain and Spring Garden Road.

Community Character

Huron Estates is characterized as a friendly community, convenient to shopping and all major amenities with lots of mature trees and opportunities for wildlife viewing. Due to the limited access into Huron Estates, traffic is localized, thus creating a low volume of traffic, semi-quiet, peaceful and safe environment for raising families.

When asked to identify unique features of their community, the focus group identified the mature trees, wildlife, and proximity to Turkey Creek and the Grand Marais ditch. Some participants also identified very light local traffic within Huron Estates and the privacy of not having neighbours in their backyards.

Community Satisfaction

Generally, residents of Huron Estates are satisfied with their community. When asked to comment on what they liked best about their community, residents listed:

- Convenient to shopping and work;
- Low volume of traffic;
- Safe neighbourhood to raise children;
- Beautiful and quiet; and
- Great neighbours.

Residents use their property for a variety of purposes including social and recreational. Outdoor activities include children's activities, entertaining friends and relatives, gardening, nature appreciation, birdwatching, and relaxing. Residents indicated they enjoyed outdoor activities during all seasons of the year. This sense of enjoyment was reportedly due to convenience, and the importance families placed on outdoor and family activities.

Residents were also asked to comment on what they liked the least about the community. Those residents that listed the things they like the least, listed:

- Huron Estates adjacent to heavy traffic on Huron Church Road;
- Property taxes increasing every year; and
- Pollution coming from Huron Church.

Community Change

When asked what changes they have seen in their community in the last five to ten years, residents identified the addition of the Windsor Crossing Outlet shopping mall; generally, increasing traffic volumes on Huron Church and, specifically, an increasing number of trucks.

Community Cohesion

Although Huron Estates is an established neighbourhood, the focus group responses varied in terms of how close knit they were and how involved with their neighbours they are. Some residents felt the community was very close knit, they know most of their neighbours and have close relations with many of their neighbours, while other felt the community was only somewhat close knit and enjoy their privacy, thus rarely socializing with their neighbours.

Reddock Street

Reddock Street is located on the periphery of Spring Garden Road between the Grand Marais Drain and Todd Lane. Reddock Street was part of a larger planned development at one time; however, due to the natural significance of the Spring Garden Prairie, additional residential development was stopped. Reddock Street consists of a cluster of 16 households and approximately 44 residents; it is located partly within the ACA as shown in Exhibit 7.5.

All residents on Reddock Street are long term residents and have been enjoying this parklike setting for many years. Trails are integrated into the neighbourhood from the Spring Garden Prairie.

Community Character

Reddock Street is characterized as an isolated and tranquil neighbourhood in a forested area. Unique features of their community include the natural features and the limited number of homes on the street.

Community Satisfaction

Residents are generally satisfied with their community. When asked to comment on what they liked best about their community, residents listed the peaceful surroundings and its natural attributes.

Residents use their property for a variety of purposes including social and recreational. Outdoor activities include children's activities, entertaining friends and relatives, gardening, nature appreciation, birdwatching, and relaxing. Residents indicated they enjoyed outdoor activities during all seasons of the year.

Residents were also asked to comment on what they liked the least about the community. Residents identified that noise from Huron Church Road is what they like the least.

Community Change

Little has changed on Reddock Street in the last five to ten years. The same families have lived on the street for more than 16 years. The exception is the construction of one new home in the mid 1990s.

Community Cohesion

Due to the length of tenure of the residents and the isolation of the community, residents feel close knit.

East of Huron Church Road

Between Pulford Street and Lennon Drain is a mixture of land uses within the ACA, including open green space and highway commercial. From Lennon Drain to Cabana Road West is a strip of residential properties between the Villa Borghese neighbourhood and Huron Church Road. These residential properties adjacent to Huron Church Road are located within the ACA as shown in Exhibit 7.5.

Community Character

Residents living along Huron Church Road characterized their community as being severely impacted by the volume of truck traffic. Due to the close proximity of the heavily traveled road way to their property, residents feel increased levels of stress and extremely unsafe in accessing their property, due to the volume of trucks traffic.

Community Satisfaction

Focus group results indicated residents were very dissatisfied with their community as a place to live. When asked to comment on what they liked best about their community, residents were not able to identify one attribute; rather, they offered that it is unsafe for children or pets to be outside. Residents that participated in the focus groups identified truck traffic as the thing they like the least about their community.

Community Change

Participating residents had not lived in the neighbourhood long enough to comment on changes in the community over the past five to ten years.

Community Cohesion

Residents that participated in the focus groups were asked to identify how close-knit they felt towards their community. The results showed they were not very close knit, as they enjoy their privacy and do not get together with neighbours.

Villa Borghese

The Villa Borghese neighbourhood is located between Cabana Road West and the Lennon Drain on the east side of Huron Church Road. Exhibit 7.5 illustrates its location in relation to the ACA.

Community Character

Villa Borghese is characterized as a well established quiet and family oriented community. Neighbours are close and enjoy the convenience of easy access to services. A unique feature to Villa Borghese is that although the volume of traffic along Huron Church is high and unsafe, the volume of traffic within Villa Borghese is low.

Community Satisfaction

Generally, residents in Villa Borghese are either somewhat or very satisfied with their community. When asked to comment on what they liked best about their community, residents listed:

- The people;
- Multiple opportunities for outdoor activities (e.g. walking, bike riding); and
- Strong sense of community.

One focus group participant felt their strong sense of community was being destroyed by the proposed project (DRIC).

The use and enjoyment of their property also contributes to their feelings of satisfaction. Residents use their property for a variety of purposes, including social and recreational. Outdoor activities include children's activities, entertaining friends and relatives, gardening, nature appreciation, bird watching, and relaxing. Residents indicated they enjoy outdoor activities during all seasons of the year and do so due to the convenience, and their property characteristics.

Residents listed things they least liked in their community:

- Excessive traffic on Huron Church Road;
- Noise from truck traffic on Huron Church Road; and
- Pollution from truck traffic on Huron Church Road.

Community Change

When asked what changes they have seen in their community in the last five to ten years, residents identified increased noise and pollution from truck traffic on Huron Church, and Residents also expressed concern with regard to the DRIC planning process.

Community Cohesion

Residents that participated in the focus groups were asked to identify how close knit they felt towards their community. Most people identified that they felt close knit and that they had developed close relations with a few of their neighbours.

Kendleton Court

Kendleton Court is a new residential pocket north of Talbot Road, east of Cousineau Road. The development is shown on Exhibit 7.5 and is located within the ACA.

Community Character

The Kendleton Court development was built within the last five years. The area is very convenient to access services in the area.

Community Satisfaction

Generally, residents are satisfied with their new neighbourhood. When asked to comment on what they liked best about their community, residents listed the convenience to airports, sports venues, and the milder climate in Windsor.

Residents were also asked to comment on what they liked the least about the community. Those residents that listed the things they like the least, listed:

- Air pollution, and
- Smog and noise from trucks.

Community Change

Residents have not lived on Kendleton Court long enough to comment on changes other than the obvious in-filling of development.

Community Cohesion

Residents felt that their community is not very close knit. They were divided in terms of the relationship they experience with neighbours, some rarely visit with neighbours, however, others have close relations with a few neighbours and visit one or two times a week.

Talbot Road

The Talbot Road community is split by both political boundaries and the physical barrier presented by the existing transportation corridor. Talbot Road serves as the municipal boundary between the City of Windsor, located north of the transportation corridor, and the City of LaSalle, located to the south. Exhibit 7.5 illustrates the location of the Talbot Road community within the ACA.

Anecdotal evidence provided at the focus groups indicated that although residents would like to be able to cross the road and visit with neighbours, they don't due to the barrier imposed by the traffic along Talbot Road.

Talbot Road residents live on unique properties that were originally built in a ribbon strip along the Talbot Road transportation corridor. Many of the homes are set back from the road on large wooded and very deep lots 30.5 x 122 m (100 x 400ft +) thus creating an almost rural or pastoral atmosphere despite the fact that they are adjacent to a busy transportation corridor.

Community Character

Focus group participants described their community as caring and friendly, where neighbours help each other out. Concerns were expressed about declining property values, the inconvenience and "trauma" of road work, and the loss of character and beauty of the Talbot Road properties due to road developments.

When asked what they thought was unique about their community, in addition to the large deep lots, residents identified a number of natural features such as mature trees, and the presence of wildlife such as deer, fox, ducks and geese. Residents also felt that the relationship with their neighbours was unique in that they interact on a daily basis, enjoy neighbourhood BBQs and picnics in summer, and celebrate family life events (e.g. weddings) and other special or annual holiday events together. Residents also listed the proximity to shopping (Windsor Crossing Outlet Mall), church, parks, schools, and the international crossing as a unique feature of their community.

Community Satisfaction

Generally, residents are very satisfied with their community; however, some residents indicated that they are not satisfied due to the volume of traffic on Talbot Road/Highway 3, and specifically the volume of truck traffic and associated noise. The level of satisfaction did not seem to differ from the north (Windsor) side of Talbot Road to the south (LaSalle) side. When asked to comment on what they liked best about their community, residents listed:

- Neighbours/friends,
- Individual property – large lots, privacy, forest/trees, well maintained house and yard,
- Attractiveness of neighbourhood with large lots, many trees and walking areas,
- Similarity of education and background of neighbours; and
- Feeling like living in the country, in a forest glade, while living in the city.

One focus group participant offered, "Not one thing but the sum of the total makes it all work - accessibility to the Windsor Crossing Outlet mall and church across the street, access to the border and St. Clair College and access to the forest behind our house".

Property use varies and includes social and recreational uses. Outdoor activities include children's activities, entertaining friends and relatives, gardening, nature appreciation, bird watching, and relaxing. Residents indicated they enjoy outdoor activities in their backyards during all seasons of the year and do so due to their unique property characteristics. When discussing how residents use and enjoy their property, one resident offered, "...we have a huge yard which we have (over the last 20 years) transformed into a hub of activity for ourselves, our kids and our grandkids – including gardens, pond, potting shed/green house, pool and games area."

Residents were also asked to comment on what they liked the least about the community. Those residents that listed the things they like the least, listed:

- Heavy truck traffic making it difficult to get out of the driveway;
- Perception that personal safety is compromised by heavy traffic;
- Noise, pollution and delays caused by trucks;
- Lack of city services; and
- Increasing volume of traffic on Talbot/Highway 3.

Community Change

When asked what changes they have seen in their community in the last five to ten years, the following were identified:

- Increased volume of traffic on Talbot Road/Highway 3;
- Increased difficulty (i.e. longer wait times) and danger in getting in/out of the driveway;
- A new shopping mall, and new school;
- A busier seniors living complex;
- Traffic noise all day every day, with a noticeable increase since the stoplights installed at St. Clair College; and
- Growing anxiety due to Talbot Road/Highway 3 proposals (including DRIC) and the consequential impact on property values.

Community Cohesion

Talbot Road/Highway 3 residents believe that they are a somewhat close-knit group measured by their close relations with neighbours. Generally, the ties seem to be restricted to one side of the highway. The neighbours that socialize together live adjacent to each other on either the north or south side of Talbot Road/Highway 3.

For those that do have relatives in the community, they visit several times a week. One focus group participant stated, "we have created an environment where our grown children and their children meet at least once a week."

Heritage Estates

Heritage Estates is a large residential development located east of the Windsor Crossing Outlet Mall, north of Heritage Drive and west of Montgomery Drive. As Exhibit 7.5 illustrates, only a small portion of Heritage Estates is located within the ACA.

Community Character

Focus group participants had different attitudes about their community depending to some extent on where they were located; while some residents spoke of enjoying quiet areas outside in the Heritage Estates area, some residents along Homestead Lane felt less connected with their neighbours because their use of their outdoor space is curtailed due to existing noise levels from traffic on Highway 3.

Due to the diversity of land uses, some residents at the focus groups identified that they walk to work, recreational facilities, shopping, and to other amenities, thus reducing their dependency on the automobile and the need for a second car. Some residents also identified their proximity to St. Clair College as a unique feature.

Community Satisfaction

Focus group results indicated that residents had a range of satisfaction with their community from somewhat dissatisfied to very satisfied. When asked to comment on what they liked best about their community, residents listed:

- Walking distance to many amenities;
- Close proximity to church;
- Close proximity to major roadways, including Highway 401; and
- Safe neighbourhood.

The use and enjoyment of their property also contributes to their feelings of satisfaction. Residents use their property for a variety of purposes including social and recreational. Outdoor activities include children's activities, entertaining friends and relatives, gardening, nature appreciation, birdwatching, and relaxing. People indicated they enjoy outdoor activities during all seasons of the year and do so due to the convenience, and their property characteristics.

Residents were also asked to comment on what they liked the least about the community. Those residents that listed the things they like the least, listed:

- Truck traffic;
- Noise from traffic; and
- The mess and noise associated with the construction of new homes and shopping plazas.

Community Change

When asked what changes they have seen in their community in the last five to ten years, some the residents did not identify anything, while others indicated that they have lived in the community less than five years. Those that did respond indicated they have observed an increase in traffic along Huron Church, an increase in traffic with the expansion of Windsor Crossing Outlet Mall, the building of Heritage Plaza, a new school and many new homes in the area.

Community Cohesion

Some residents felt their community was very close-knit and enjoyed close relationships with neighbours, while others felt it was not very close knit and that they rarely (that is, once or twice a year) socialized with neighbours.

Oliver Estates

This community is located from Montgomery Drive to Howard Avenue. Several of the residential streets within the area provide access directly onto Talbot Road. As identified in Exhibit 7.5, the ACA encroaches into the periphery of a portion of the neighbourhood.

Community Character

This section of the ACA is located in LaSalle and is part of an older community with many long-term residents. The community is presently characterized by residents as a mixed demographic with young families and retired seniors. The area, bound by Montgomery, 6th Concession Road and Howard Avenue was described by residents as quiet, conservative, and peaceful. Several participants identified the community as a family oriented residential area, others described the area as busy and complained of truck traffic noise from Highway 3.

Unique features valued by residents include mature trees, little traffic on neighbourhood streets, the architectural mix of old and new homes, and large lot sizes. Focus group participants also identified the multi-generational aspect of their community as a unique feature contributing to the character of the Oliver Estates area.

None of the streets in the community have sidewalks; however, with the exception of Montgomery Street, low volumes of traffic utilize the local road network and consequently, residents feel safe walking and cycling on the road. Montgomery serves as a connecting route between Highway 3/Talbot Road and other LaSalle neighbourhoods. As such, is used by commuter traffic in the morning and afternoon. Residents living on Montgomery complain of heavy traffic and excessive speed during these times.

Community Satisfaction

Generally, the residents living in this area are very satisfied with their community. When asked to comment on what they liked best about their community, residents listed:

- Safe community;
- Convenient to shopping, entertainment, church, and schools;
- Mature trees and wildlife;
- Time spent outdoors (walking, enjoying nature);
- Quiet residential streets; and
- Wide lots (i.e. houses are not too close in proximity to one another).

Residents use their property for a variety of purposes including social and recreational. Outdoor activities include children's activities, entertaining friends and relatives, gardening, nature appreciation, bird watching, and relaxing. Participants indicated they enjoy outdoor activities during all seasons of the year and do so due to the convenience, and properties characteristics.

Residents, asked to comment on what they disliked about the community, identified noise and pollution from truck traffic on Highway 401 and Howard Avenue.

Community Change

When asked what changes they have seen in their community in the last five to ten years, residents identified increased noise level from trucks, increased traffic on both Highway 3/Talbot Road and Howard Avenue, and increased difficulty in accessing Huron Church Road. Residents also observed an in-fill of new homes on vacant lots and the demolition of older homes that are replaced with modern homes. Other changes include the development of a trail system and parks throughout the area.

Community Cohesion

Generally, people felt their community was close knit. Some enjoyed close relations with a few neighbours, while others enjoyed their privacy and rarely socialized with their neighbours. Some residents also enjoyed having relatives living in the community that they visit often, in some cases, daily.

Shadetree Court

The Shadetree Court is a new residential in-fill located north of Talbot Road immediately west of Howard Avenue. This new residential development is shown on Exhibit 7.5 and is located at the periphery of the ACA.

Community Character

Shadetree Court is part of a larger neighbourhood that is still being developed. Undeveloped lots are still available on Shadetree Court. Residents defined the character of this residential community as friendly, safe, and a beautiful place to live with churches, parks and shopping amenities in close proximity. Unique features identified include Mathew Rodzick Park, and Windsor Crossing Mall shopping and restaurants. The proximity to shopping and daily activities made the new subdivision attractive for retirement living for some residents.

Community Satisfaction

Generally, residents are very satisfied with their new community; however, some indicated that since the announcement of the proposed Practical Alternatives, they have become very dissatisfied. When asked to comment on what they liked best about their community, residents listed that they are close to the elementary school.

Residents were also asked to comment on what they liked the least about the community. Residents identified noise from truck traffic as a feature they liked least about the area.

Community Change

When asked what changes they have seen in their community in the last five to ten years, some focus group participants identified:

- The increase in truck traffic on Highway 3 and the associated increase in noise and pollution;
- A large number of homes for sale in last 12 months.

Some residents feel that the noise level from trucks has increased to the point where they feel they can no longer open the windows, or sit outside. Residents complained that the peace and relaxation they expect to enjoy in their home is disturbed by the increasing noise levels.

Community Cohesion

Some residents feel that their community is very close-knit. They enjoy visiting almost daily with relatives that live in the community and get together almost daily with neighbours as well. Those that felt the community was close-knit indicated that they know most of their neighbours, and they go out of their way to have close relationships with many of them. In contrast, other residents indicated that the community is not very close-knit and provided anecdotal evidence that since it is a new subdivision, it will take another ten years to establish itself.

Southwood Lakes

Southwood Lakes, located north of the existing Highway 401 right-of-way, includes a mix of housing, lakes and parkland. The community is located on the periphery of the ACA, as illustrated in Exhibit 7.5.

Community Character

Unique to this community, several residents identified the larger City of Windsor as their community, and as such characterized their community as a border community with Detroit, Michigan. The City of Windsor is a close knit small neighbourhood in a larger city setting (Detroit).

Unique features of the Southwood community include its friendliness, close proximity to the U.S.A., access to cultural and sporting events and restaurants on both sides of the border, and, their local neighbourhood social committee. Other features include the organized home ownership group, the similar lifestyles neighbours enjoy and the close proximity to all amenities.

Community Satisfaction

With the exception of the truck noise, generally, residents are very satisfied with their community. When asked to comment on what they liked best about their community, residents listed:

- Quiet, safe, comfortable and peaceful;
- Small community (Windsor) that has access to the larger community (Detroit);
- Friendly neighbours, beautiful surroundings; and
- Privacy.

Residents use their property for a variety of purposes including social and recreational. Outdoor activities include entertaining friends and relatives, gardening, nature appreciation, birdwatching, and relaxing. Residents indicated they engage in outdoor activities during all seasons for the pure enjoyment of it and the resulting beautifying effects. When asked to comment on what they like least about their community, very few had any; however, those that had dislikes identified noise and pollution from truck traffic.

Community Change

When asked what changes they have seen in their community in the last five to ten years, people identified increased traffic volume and noise levels, neighbourhood growth (new homes built), and the presence of "For Sale" signs. Focus group participants who addressed the broader City of Windsor community identified the loss of employment in the automobile industry, the emergence of high technology industry, significant changes in multicultural attitudes, and a general feeling that community activism related to social, environmental, political and economic issues has increased.

Community Cohesion

When asked about community cohesion, residents felt a range from 'somewhat close knit' to 'very close knit'. Several had relatives in the community that they visit either daily or several times a week. In terms of their relationship with neighbours, residents indicated that they have close relations with a few or in some cases, many of their neighbours. It appears that at a minimum, they know most of their neighbours and go out of their way to develop close relationships with many of them. Getting together with neighbours also varies, between daily visits to two or three times per month.

East of Howard Avenue

The neighbourhood south of the Highway 401/3 corridor and east of Howard Avenue within the Town of Tecumseh consists of strip residential development along Howard and a cluster of residential lots on Mero Avenue (see Exhibit 7.5). The remainder of the area is predominantly active agricultural land. There are few homes in this section of the ACA and even fewer people attended the focus group meeting, consequently, data collected in this area is limited.

Community Character

Residents from the Mero Avenue area described their neighbourhood as quiet, with limited traffic, but with easy access to the major transportation routes (Howard Ave, Highway 401 and Highway 3).

Community Satisfaction

Mero Avenue residents are very satisfied with their community as a place to live. When asked what they like best about the community as a place to live, people identified the area, and their specific property and all it offers.

Residents use their property for a variety of purposes including social and recreational. Outdoor activities include entertaining, gardening, nature appreciation, birdwatching, children's activities, and relaxing. People engage in outdoor activities during all seasons due to the property characteristics. When asked to comment on what they like least about their community, none were identified.

Community Change

Focus group participants identified an increase in the traffic volume as a change they have seen in their community in the last five to ten years.

Community Cohesion

People generally felt they were a close-knit with their neighbours, getting together often with neighbours, that is, at least one or two times a week.

BUSINESSES IN THE AREA OF CONTINUED ANALYSIS

Businesses in the Area of Continued Analysis provide a wide variety of services (e.g., accommodations, food, clothing, equipment, vehicular garage repair and gas facilities). The businesses serve both the local neighbourhood and the travelling public. The social impact assessment considered the displacement of businesses that serve the local community in terms of how such displacement may affect social patterns and community functions. Such businesses include:

- Golden Griddle Family Restaurant;
- King Kone Ice Cream (seasonal);

- Petro Canada;
- Daytona Car Wash Ltd.;
- Lambton Plaza (10 businesses);
- Tim Hortons;
- Fred's Farm Fresh Ltd.;
- Alibis Sports Bar and Music;
- Mac's Convenience Stores;
- XTR Gas and Convenience;
- Vachon Bakery Outlet; and,
- Wide array of stores in the Windsor Crossing Outlet Mall.

The *Economic Impact Assessment (May 2008)* addressed the economic impacts to the City and the region resulting from the displacement of businesses within the ACA.

Brighton Beach Industrial Park Area

Although not a "community", the Brighton Beach Industrial Park area is located between the Detroit River shoreline to Ojibway Parkway.

Community Character

Only a handful of homes still exist in this area as a result of the City land use designation to industrial uses and subsequent land purchase. Broadway Street is maintained with access off Ojibway Parkway, thus access to Broadway Park and Ojibway Black Oak Woods is maintained. Residents utilizing both parks drive to them via Broadway Street.

The community character of the neighbourhood is described as largely an industrial park area with few private dwellings in the south end near Ojibway Parkway and other private dwellings on the fringe of Sandwich Towne to the north. Industries present in the area include Hydro One, the Brighton Beach Power Station, the Windsor Power Plant, and the Nemark Plant among others.

Community Satisfaction

There is little community to speak of with respect to community satisfaction within the industrial park area.

Community Change

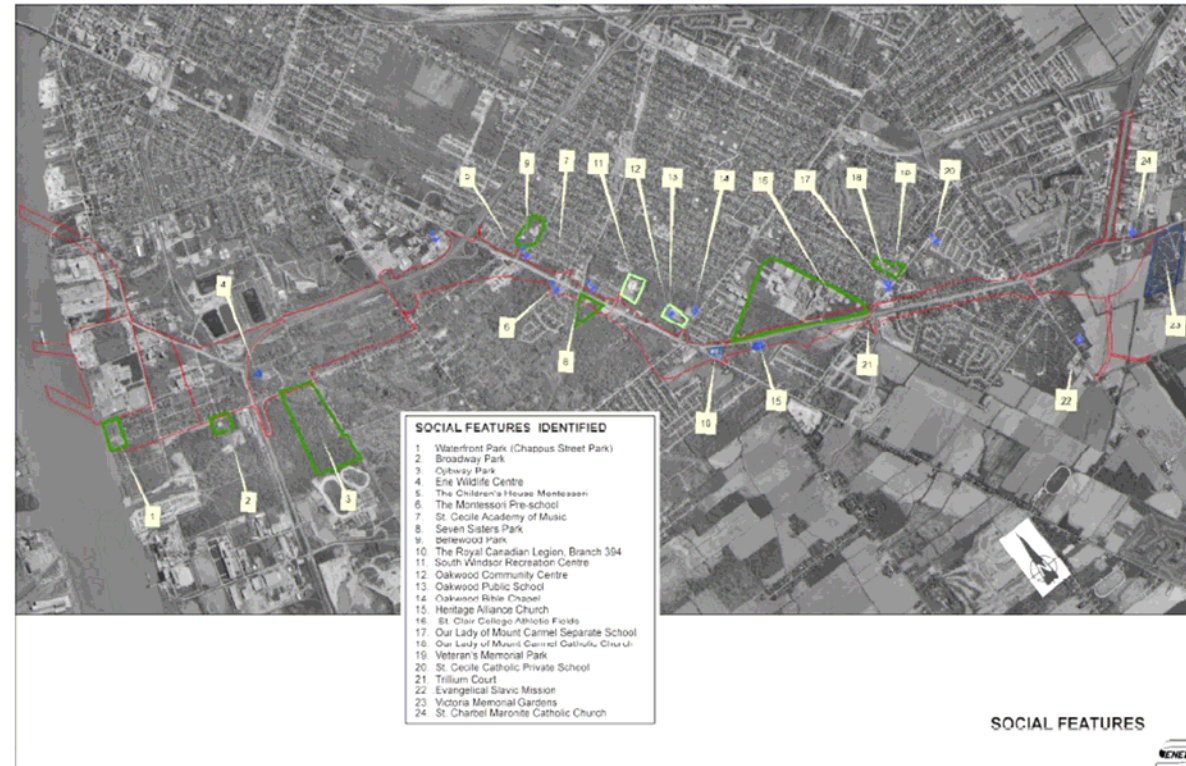
With respect to community change, function and community cohesion, there is little to speak of within this area of the ACA as the neighbourhood is characterized by industrial use. Although, ancillary effects to Sandwich Towne would be more appropriate to describe, displacement as a result of the plazas and crossings only affects two houses within this community and is not representative of the surrounding community at large. The potentially displaced dwellings are located in a land use transitional area where industrial land uses predominate.

SOCIAL FEATURES WITHIN THE AREA OF CONTINUED ANALYSIS

Social features identified within the Area of Continued Analysis, fall into either recreational (e.g., parks, community centres) or institutional (e.g., Churches, schools). Some of the features serve the

neighbourhood community while others serve the broader community. The social features described below are identified in Exhibit 7.7 which illustrates the location of each social feature. For discussion purposes, the social features are grouped and presented from west to east (i.e., from the Detroit River to Highway 401).

EXHIBIT 7.7 – SOCIAL FEATURES ASSOCIATED WITH THE ACA



Institutional Social Features

The Erie Wildlife Rescue (EWR) is located within the Area of Continued Analysis. It is a registered charitable organization dedicated to the treatment and temporary care of injured, diseased, or orphaned wildlife, and their subsequent release into appropriate habitats in the wild. The organization is based out of an old school building located on a cul-de-sac east of Ojibway Parkway on Chappus Street. The organization is situated on approximately 1ha of land surrounded by a natural bush-like setting. Although the organization has been around since 1979, it has occupied this present location for the last 10 years.

Membership is on a volunteer basis. Current membership is 80 people, with the addition of approximately 20 student volunteer staff. Core members, numbering 15 people, have been with the organization for more than 10 years. Many of the volunteers use the City of Windsor public transit to access the facility. At any one time six staff would be on hand providing services seven days a week during the months of May to August. During this period office hours run from 8 a.m. to 8 p.m. weekdays, and 12 p.m. to 4 p.m. on weekends. Operation from September to April is on an as-needed basis.

Current facilities on the property include a large school building, which houses an administrative office, scrub area, exam area, food preparation area, media rooms/education rooms, animal care rooms and a

nursery area. Approximately half the building is dedicated to animal care. There is one portable building on the premises which is used for fund-raising purposes. At least a quarter of an acre is occupied by an outdoor caging area that is used for pre-releasing conditions for animals.

Erie Wildlife Rescue provides two main services: a telephone advisory service for dealing with nuisance animals; and, wildlife rescue and rehabilitation of injured, diseased or orphaned wildlife. The service catchment area is all of Essex County. In 2006, the telephone advisory service received 4,000 calls, and during the same year, 700 animals were treated and rehabilitated. Activities or programs include: wildlife rehabilitation; education/orientation; fund-raising; and, volunteer development. Wildlife rehabilitation is year-round; however, the majority of the activity occurs from May to August. The education/orientation function consists of monthly meetings held for volunteers. As a non-profit organization, fund-raising is critical to their continued success; consequently, five fundraisers are held annually, three in the spring and two in the fall. Fund-raising activities include yard sales and bake sales, bingo, a walkathon in the spring, and frozen cookie dough sales in the Spring and Fall. Grant applications to funding organizations, such as the Ontario Trillium Foundation, also contribute to their revenue.

The Children's House Montessori, located adjacent to the ACA on LaBelle Street in Bellewood Estates, is a member of the American Montessori Academy. It has been in its current location for 20 years. The Children's House Montessori provides education and daycare services for children from infancy through to senior kindergarten (age five). This is the only facility that provides Montessori programming to infant children in Essex County. Enrolment is at capacity at 396 students, and the school manages roughly 210 students per day during its regular hours (6:30 a.m. to 6:00 p.m.) from Monday to Friday. Families utilizing this facility come from LaSalle and South Windsor. Approximately 400 vehicles access the facility during the morning drop-off period.

The school facilities include a cafeteria, resource room, staff room, parent room, a number of class rooms and administration offices. Outside, three fenced and segregated play areas provide jungle gyms with slides and other equipment for infants, toddlers and preschool children. Bellewood Park, a community park located across the street is also used for stroller walks on a regular basis.

In addition to the academic and structured activities that include music, dance, and art, special education programs are offered to learning and physically impaired children. Approximately 30 physically impaired students from seven different local schools attend the Children's House Montessori for care before and after their regular school hours. The school also provides internship opportunities for early childhood educators. Approximately 20 volunteers assist the full-time staff in this capacity.

The Montessori school has a unique relationship with nearby Bellewood Public School as it serves as a feeder school to Bellewood's kindergarten.

The Montessori Pre-school is located within the ACA in Lambton Plaza on the corner of Lambton and Huron Church Road. The Pre-school has been operating for nine years in the Lambton Plaza. Open to children ages three to five years, the Pre-school operates Monday to Friday from 8:45 am until 3:15 p.m. The Pre-school is closed for the month of August. The majority of students come from a catchment area defined by South Cameron Boulevard to the north, Howard Avenue to the east, Malden Road to the south-west, and the University of Windsor to the west.

Children attend the preschool either for the morning or afternoon session only. There are no full-day students permitted as there is not an outdoor play space associated with the school. Combined, there

are approximately 25 students and two full-time staff at the preschool. Enrolment has been steady over the past five years and is expected to remain steady over the next three years.

St. Cecile Academy of Music located outside the ACA on Grand Marais Road West, has been in its present location for 22 years. In addition to being a private music school, it also offers a year-round nursery school Monday to Friday from 7:30 a.m. to 5:30 p.m. for children aged 2.5 to 5 years of age. The nursery school serves a wide area including South Windsor, LaSalle and as far away as Bell River and Amherstburg. The proximity of the school to E.C.Row Expressway, Huron Church Road and Highways 3 and 401, provides convenient access to the facility regardless of the direction clients are traveling from.

The private music school offers a variety of music and dance programming for children starting at age 3 up to adults. The music program is run from 3:30 p.m. to 9:00 p.m. weekdays and from 8:00 a.m. to 6:00 p.m. on Saturdays. During the summer, music programs are also offered weekdays from 7:30 a.m. to 7:00 p.m. Enrolment for the 2006- 2007 school year was between 600 and 700 students (including the Nursery School). Projections for the next three years indicate that enrolment is anticipated to increase to facility capacity (900 students) in 2008.

The Royal Canadian Legion, Branch 394, is located within the ACA between Highway 3 and Huron Church Line. The Legion has been at this location since 1965. The Legion's membership of 700 comes from the City of Windsor, LaSalle, Tecumseh and parts of Essex County. With the exception of Christmas day, the Legion is open every day of the year from noon until 11 p.m. in the summer and 1 a.m. the rest of the year.

The facility includes a banquet hall with a capacity of 300 that is used for weddings, anniversaries, and dances; a sports room and bar; and, an all-purpose meeting room (with a capacity of 200). The lobby and hallway also serve as a memorial/museum with regiment displays and artifacts from the world wars. A cenotaph is located outside the entranceway. Annual Remembrance Day services are held at the Legion cenotaph.

Programming at the Legion includes themed meals and events, that draw approximately 150 members, daily summer time BBQs, All-you-can-eat Sunday Breakfast, dart leagues (ladies, men and mixed), pool leagues, euchre and cribbage nights, seniors day events where typically between 100 and 125 seniors attend, and senior dinner and dancing. A large screen television in the sports room and bar provides coverage of televised sporting events, typically drawing approximately 100 members to these events. In addition, the banquet hall and/or meeting room is rented on Friday and Saturday nights for weddings, showers, and the like. The membership general meeting and executive meet once a month on-site.

Oakwood Public School is located outside the ACA on Cabana Road West, north of Huron Church Road. The school has been operating out of its present location for 40 years. The enrolment for the 2005-2006 school year for classes ranging from junior kindergarten to Grade 8 is 317 students. School enrolment has been increasing; however, the school boundaries for Oakwood Public School were re-defined to accommodate a new public school opening; consequently, enrolment was down by approximately 100 students for the 2006-2007 school year. Enrolment is anticipated to increase, with the School Board projecting enrolment to reach 282 by 2010. The catchment area for Oakwood Public School includes areas both north and south of Huron Church Road. The area south of Huron Church Road includes the Spring Garden neighbourhood, and the area bound by Malden Road to Todd Lane. North of Huron Church Road the catchment area is bound by the Grand Marais Drain to the west,

Talbot Road to the east, Askin Avenue and Geraedts Drive to the north. Students from the neighbourhoods south of Huron Church Road are bused to the school, accounting for less than one-third of the student population.

Outdoor recreation facilities at the school include a baseball diamond, open playgrounds, playground equipment (swings, climbers, etc), and a soccer field. Adjacent to the school is the City of Windsor's Oakwood Bush that includes trails and a wildlife sanctuary. Learning opportunities provided by the bush are incorporated into the school curriculum by the teaching staff. The school adjoins the Oakwood Community Centre run by the City of Windsor. The Community Centre and School share facilities for programming purposes and have done so for many years. The school runs after school sport programs (soccer, track and field and cross country) in the spring and fall each year. Between 30 and 115 students participate in these programs. Community groups also use the school facilities (indoor and outdoor) on a regular basis throughout the year.

Oakwood Public School offers special education to 14 learning disabled students in the primary, junior and intermediate levels.

Oakwood Bible Chapel is located outside the ACA on Cabana Road West at Betts Avenue. The Bible Chapel has been in its present location since 1967 and draws parishioners from LaSalle and many parts of South Windsor. Membership is estimated at 350, with almost half of those consisting of youth and children. Hours vary throughout the week and are dependent on scheduled programming. The Bible Chapel does not have full-time office hours. The building itself includes a sanctuary, kitchen, eleven classrooms and finished basement. The Manse associated with the Oakwood Bible Chapel provides accommodation for a family in need in the community. Although outdoor facilities are not provided at the Chapel, the parking lot is used by local youth as a skateboarding facility.

Oakwood Bible Chapel maintains an active junior and senior church school during both worship services on Sunday. Prayer meetings and bible studies are held on Tuesday mornings and evenings. Other functions that occur at the facility include weddings, funerals, conferences and daily bible school for one week in August. For weddings, conferences, and the daily bible school in August the facility has a capacity of 300, and it is often filled during these events.

Other community groups regularly use the property, such as the Girls and Boys clubs, Revenue Canada outreach for Seniors, Gideons annual meeting and dinner, and IMPACT youth conference, all of which combined account for another 350 to 410 users.

The Heritage Park Alliance Church is located within the ACA on Highway 3, and was built at its present location in 1985. The Heritage Park Alliance Church consists of approximately 1300 families, accounting for the 1700 plus members and anticipates its membership to continue growing. The church members originate primarily in the City of Windsor and LaSalle; however, members come from throughout Essex County including Amhurstburg, Tecumseh, and Kingsville. Given the diverse geographic origin of its membership it is important to the Heritage Park Alliance Church that it maintain the existing access to Talbot Road/Highway 3.

The facility is open seven days a week and offers various programming most evenings. Three worship services are held each week: Saturday night and two Sunday morning. In addition, the facility also hosts an Indonesian worship service on Saturday that draws people from throughout Essex County. Other programs offered include an active nursery and children's program during worship services, a morning pre-school program for mothers and children during the week, various evening youth groups,

adult electives, various meetings and functions related to church business, and weddings and funerals. Special productions/services are held at Christmas and Easter that draw more than 2,500 people.

The Chartwell Classic Oak Park LaSalle retirement community facility is located on Thirteenth Street outside the ACA south of the Huron Church Road/Highway 3 corridor. The facility has been at this location since September 2005. It houses 125 residents that come from West Windsor, South Windsor, LaSalle, Amherstburg and Michigan State.

The facilities include 113 suite residences with three interior courtyards, a raised gardening bed (to allow residents to garden while standing), 5.5 acres of open grounds surrounding the facility perimeter, a hall/theatre, and a small library. Facility access is controlled during designated visitor hours, and the facility doors are locked at nightfall.

Programming includes meals preparation (three times daily), laundry and housekeeping services, hairstyling and foot care services, physical fitness classes and a variety of social activities and planned excursions for residents. A physician is available on a weekly basis and operates on-call and with a staff of nurses who are available 24 hours a day. The facility has programming to accommodate co-op students and nurses training programs from local institutions and organizations. They also provide an opportunity for high school students to attain their requisite community hours through volunteer work at the facility.

Our Lady of Mount Carmel Separate School is located along the ACA north of Huron Church Road off Cousineau Road and has been in this location, since 1949. School enrollment for 2005/2006 school year for junior kindergarten through grade 8 is 575 students. Enrolment has been increasing over the past five years and is projected to continue to increase over the next three years to 650 in the 2008/2009 school year. The catchment area for the school is bound by Talbot Road, Highway 401, Dougall Parkway and Villa Maria Blvd. Approximately 90 per cent of the students are bused, with the remaining walking via Cousineau Road and Mount Royal Drive.

In addition to the classrooms and administration office, facilities at the school include a library, and gymnasium inside the school. Outside facilities include an open playground, playground equipment, soccer field, and basketball area. The school does not offer any extra-curricular programmes after regular school hours; however, the school is used several times a week for community programs. Our Lady of Mount Carmel offers special education programming for students integrated in the regular classrooms. Approximately 10 volunteers assist at the school on a daily basis.

Our Lady of Mount Carmel Catholic Church is located along the edge of the ACA on Mount Royal Drive at Cousineau. The Church has been at this location for 52 years. Church parishioners come from between Spring Garden and Bouffard Road and Malden Road and Huron Church and Talbot Road. North of Talbot Road, Church parishioners come from between Cabana Road West and Highway 401, Provincial Road to Talbot Road. The Church is open 9 a.m. to 4:30 p.m. on weekdays, and 8:30 a.m. to 6:30 p.m. on Sunday.

Facilities at the Church include a meeting hall, church office and sanctuary. The Church does not have any outside facilities. Current membership for Our Lady of Mount Carmel Catholic Church is 5665 people, or 1872 families, 583 originating below Talbot Road and 1289 originating above Talbot Road. In addition to the weekday and Sunday masses, the Church is also used for weddings and funerals. Several community groups, primarily consisting of adults or seniors use the facility for meetings throughout the week.

St. Cecile Catholic Private School. A part of the school ground south of the school buildings lies within the ACA and as such was included in the initial data collection for the practical stage. Also at this site, Académie Ste. Cécile International School (ASCIS) is a coeducational, elementary and secondary school founded in 1993. Located on 27 acres of property off Cousineau Road for the last 10 years, the facilities include two main buildings with the larger building facility for secondary students and the smaller one for elementary school students. Aside from numerous classrooms and laboratories, the larger facility houses a cafeteria, hall, dance studio, chapel, and game room. The property also includes a number of sports and recreation facilities such as a baseball diamond, soccer fields, tennis courts, outdoor pools and open playground areas.

The school's facilities also serve as a boarding school for approximately 80 international students (from as far as Hong Kong, India and Korea). Locally, approximately 180 students come from as far as Belle River to Amherstburg.

Trillium Court is a Rent Geared to Income Housing community located partially within the ACA on the southwest corner of Highway 3 and Sandwich Parkway, across from the Windsor Crossing Outlet Mall. It is managed by River Park Non-Profit Housing and falls under the jurisdiction of the City of Windsor Housing Services. The City of Windsor is the designated Municipal Service Manager responsible for the administration of social housing in the City and within County of Essex.

The housing at Trillium Court has some geared-to-income units consisting of duplexes and row houses. Three units are wheelchair accessible, 22 units are rented at market value, and all units adjacent to the Highway 3 have central air conditioning. The co-operative was built in 1989-1990. Units are predominantly occupied by families. Trillium Court is located close to schools and a city bus route.

Residents of Trillium Court can typically wait up to five years for a house after applying on the Centre Housing Registry. Currently, the waiting list on this registry totals 2000 families for all of Essex County, while the total number of geared-to-income units in the City of Windsor is 8,700. Trillium Court has a variable turnover rate of 12 to 25 units per year. While the demand for geared-to-income housing in the area has been stable recently, it is expected to increase over the next three years.

The Evangelical Slavic Mission is located outside the ACA on Howard Avenue was identified as a social facility potentially disrupted by the project activities. It has been at its current location since 2001. The property includes a hall, church office, sanctuary, kitchen and dining areas, and two classrooms.

With a membership of roughly 50 people, the Mission provides services in funeral reception, marriage preparation counselling, and is a venue location for a variety of meetings (of religious and non-religious nature).

Victoria Memorial Gardens, a cemetery, is within the ACA along Highway 3. Recognizing that the junction where Highways 3 and 401 join Talbot Road will undergo some sort of re-alignment based on the access road alternatives, during the early data collection stage this Victoria Memorial Gardens was identified as a facility that may potentially become disrupted by project activities. The grounds hold approximately 8,000 funeral plots with some plots extending close to the property line boundaries. The Chapel and office area comprise the main building area. A funeral home is planned for the property lot abutting east of the Victoria Memorial Garden as permits for construction are forthcoming.

The St. Charbel Maronite Catholic Church is located adjacent to the ACA off Outer Drive in the Del Duca Industrial Park. The Church has been at this location for 16 years, a second property, 32 acres, located across Highway 3, is presently used for agriculture. Parishioners come from within a 15 km

radius that includes Old Castle, LaSalle and Windsor. The Church is open 24 hours a day, seven days a week, with a pastor always on call, the administration office; however, is open from 8:30 a.m. until 2:00 p.m. on Mondays and as needed throughout the rest of the week. Regular masses are held every Saturday evening drawing between 100 and 500 parishioners, and mid-day Sunday drawing between 500 and 2,000 people depending on the occasion. Special services held at Christmas and Easter typically draw additional people. In July the festival of St. Charbel is held, which draws between 3,000 and 8,000 people from the community over three days. Weddings typically occur on Saturdays and baptisms on Sunday mornings. Presently there are approximately 1,000 members registered at the church.

The facility consists of the sanctuary, administration offices, and meeting rooms. A house manse for the pastors is located on-site. There are no outdoor recreation facilities.

Recreational Social Features

The Waterfront Park, also known as Chappus Street Park is located on Chappus Street and Water Avenue near the waterfront. The park is located within the ACA, and it is not known how long this 1 ha park has been at its current location. The park is accessible daily from 5:00 a.m. to midnight, throughout the year, including holidays. Activities/programs that take place at the park include photography, non-motorized boat launches, hiking and walking, and birdwatching. This park is a significant public right-of-way access to the water on the west side of the City of Windsor. Patrons include the local community, and people from throughout the City of Windsor and Essex County.

Broadway Park is located adjacent to the ACA, south of Broadway Street between Linsell and Scotten Streets. Broadway was once a neighbourhood park with a baseball diamond prior to the area being re-developed as an industrial park. This 9.51 ha park has been at its current location since 1987. There are plans to expand the park by acquiring three lots on the south side of Page Street between Reed and Dupont Avenues.

The park also serves as an entrance to Black Oak Heritage Park. The Black Oak Heritage Park is discussed in the Natural Environment Assessment (April 2007) and is not carried forward in the social impact assessment. The park is accessible daily from 5:00 a.m. to midnight, throughout the year, including holidays. Activities/programs that take place at this park include an enclosed dog park, hiking and walking, parking centre and birdwatching.

Ojibway Park is located predominantly outside the ACA between Ojibway Parkway and Matchette Road south of Broadway Street. Designated as a community/regional park, Ojibway Park is the hub of activity at the 350 ha Ojibway Prairie Complex as most visitors initially visit here before exploring other regions of the Complex.

Ojibway Park features a Nature Centre and several well kept, self-guided nature trails. The Nature Centre provides educational programming to school groups, service clubs and the public. Ojibway Park is connected to the West Windsor Recreationway. The park is accessible throughout the year, including holidays. It is closed midnight to 5:00 a.m. and is open otherwise to the public. The park facilities include a baseball diamond, hiking trails, open play grounds, reception area with patio, ponds, dogpark, picnic areas, wildlife viewing areas, bike trails, and cross country ski paths. Activities/programs are extensive, ranging from fall and winter festivals, school field trips, nature guides, children camps, wildlife research to weddings, birthday parties and special functions. There are also activities for special needs groups such as the elderly and the handicapped. Patrons include the residents and non-residents of the City of Windsor and beyond.

Windsor Recreationway is a trail network that crosses through the ACA at several locations. The trail leads under Huron Church Road adjacent to the Grand Marais Drain and runs through the Spring Garden ANSI and Ojibway Park to connect with Malden and Mic Mac Parks north of E.C. Row Expressway via Malden Road. The trail permits cycling and walking. It is unknown how many use the trail system.

The Seven Sisters Park is a neighbourhood park located within the ACA west of Huron Church Road, parallel to the Grand Marais drain within the Spring Garden Natural Area. This greenbelt area was created over an eight-year period to capitalize on improvements made to the Grand Marais Drain. The park's name comes from the seven hills which were sculpted on the site using the excess fill from the widening of the drain. It was since left to naturalize and now covers 4.68 ha of land.

The park is connected to the West Windsor Recreationway and a bike path from California Street that leads through Spring Garden. There is a playground unit to serve the needs of the neighbourhood at Fazio Drive. The park has been at its location since 1970 and is accessible daily from 5:00 a.m. to midnight, throughout the year, including holidays. Activities/programs that take place at this park include walking, cycling, recreational play and jogging. Patrons include neighbourhood community residents and others from within Windsor.

Bellewood Park has been a neighbourhood park since 1985 and is located outside the ACA adjacent to Bellewood Public School on Labelle Street. Park development throughout the 1980s and early 1990s resulted in 6.39 ha of park facilities offering two double tennis courts, a basketball court, playground equipment, bike path, and a baseball diamond.

The park is accessible daily from 5:00 a.m. to mid-night, throughout the year, including holidays; however, access to the baseball diamonds and tennis courts are on a seasonal basis. Activities/programs that take place at this location are seasonal sports such as baseball, basketball and tennis, and year-round activities such as walking and open play. Park users originate predominantly from within Bellewood Estates neighbourhood; however, users do originate from throughout the City Windsor.

South Windsor Recreation Complex is located outside the ACA east of Huron Church Road, at Pulford Street. The Recreation Complex has been at its present location since 1970.

With the exception of June, when the centre is closed for annual maintenance, the core hours of operation are 8:00 a.m. to 11:00 p.m seven days a week. The complex includes two fully enclosed ice pads and associated change rooms, a reception area, canteen, central common area, an all purpose meeting room and auditorium. Based on bookings and regular program schedules provided by the City of Windsor Recreation Department, the South Windsor Recreation Complex is actively used throughout the year.

The majority of users come from Windsor; however, tournaments (e.g., hockey) and competitions (exhibit skating) would draw competitors from Essex County, the Province, and the United States. Regular programming includes minor hockey, exhibit skating, sledge hockey, college/university hockey, public skating and ice rentals. The auditorium is rented for various types of parties (e.g., wedding or baby showers, anniversaries etc.). During the summer hockey camps utilize the auditorium, and martial art lessons are offered twice a week in the evenings throughout the year.

Oakwood Community Centre, located outside the ACA off Cabana Road West has been in this location for 33 years. It is physically linked to Oakwood Public School. The majority of users of this

facility come from the local South Windsor neighbourhood, Heritage Estates, LaSalle and some sections of southwest Windsor. The Community centre is open daily including statutory holidays. Summer hours of operation are Monday to Friday 8:00 a.m. to 8:00 p.m.

The Centre consists of a gymnasium, various meeting rooms, kitchen, a common area or foyer and offices. The facility is wheelchair accessible and can accommodate up to 310 people. Numerous programs are provided seasonally by the City of Windsor Recreation department and include such activities as 'before and after' school programs, sports (e.g. indoor soccer, badminton, martial arts, floor hockey), dance, gymnastics, fitness classes, day camps, arts and crafts, preschool nursery, and educational programs. Numerous programs for seniors are also offered including wellness and fitness programs, and sedentary activities (e.g. cards, sewing etc). Facility room rentals are available for birthday parties, baby showers, workshops and church activities. More than 7,000 users frequent the community centre over the course of a year.

The facility includes, a large multi-purpose room with a stage and audio visual equipment that serves as both the worship centre and gymnasium, various classrooms and meeting rooms on two levels, administration area, a small chapel, three kitchens, washrooms on both levels, a library, supply/resource rooms and lobby. Due to the significant growth they have experienced in recent years, and the projection of continued growth into the future, plans have been developed to add an additional 100,000 square feet onto the existing facility. To support these expansion plans, adjacent property has recently been acquired.

St. Clair College Athletic Fields are adjacent to Huron Church Road between the College entrance and Cousineau Road and are partially located within the ACA. The Athletic Fields include soccer fields, football, baseball, and cricket fields. The Athletic fields are utilized by the City of Windsor Recreation Department to run some of their league games for soccer and baseball.

Veteran's Memorial Park is located along the edge of the ACA north of Huron Church Road, west of Cousineau Road. Veteran's Memorial Park is bound by Mitchell Avenue, Mount Royal and Casgrain Drives. Its official designation by the City of Windsor is a neighbourhood park, thus its catchment area is predominantly the local neighbourhood. The park facilities include three fenced baseball diamonds, two fenced tennis courts, a batting cage, open green space, a children's play area and equipment, and a building that serves as a clubhouse, canteen and washroom facility. Limited parking is available in a lot off of Cousineau, street parking is available on the neighbourhood streets around the park.

Delivery of Emergency Services

The ACA is served, in part, by the LaSalle fire, ambulance and police services. Further coverage within the ACA is provided by the City of Windsor fire and police services. The Ontario Provincial Police (OPP) jurisdiction includes Highway 401 and Highway 3 to the Todd Lane/Cabana Road West intersection, and the northbound side of Howard Avenue ending at the Highway 3 intersection. They also provide police services for the Town of Tecumeseh. The OPP will also have jurisdiction to respond to motor vehicle collisions on the proposed new freeway. Hospitals with emergency services are the Windsor Regional Hospital located at 1995 Lens Avenue, Windsor; the Windsor Hotel-Dieu Grace Hospital, located at 1030 Quellerie Avenue. These two hospitals provide emergency services to the residents within the ACA.

Exhibit 7.8 illustrates the location of the various municipal emergency services. As noted in the exhibit, St. Clair College is a designated Evacuee Centre in the case of emergency resulting from the FERMI Nuclear Plant. The primary evacuation route is Regional Road 20 out of Amherstburg to E.C.Row

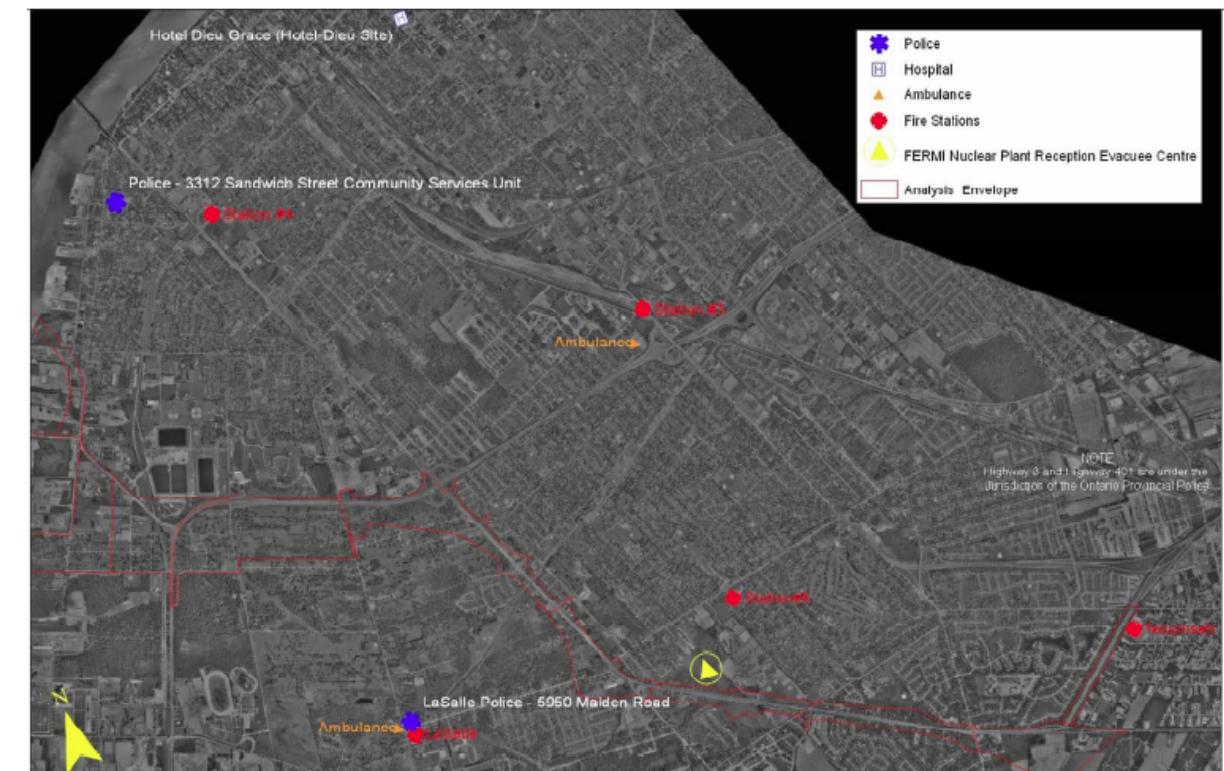
Expressway and along Huron Church Road. The secondary evacuation route is up Howard Avenue to Huron Church Road.

All communities within the ACA are serviced by the City of Windsor Police and Fire or LaSalle Police and Fire. Ambulance services are provided by the County of Essex. Windsor Fire District 5 station is located on Cabana Road West, east of the Huron Church/Talbot Road transportation corridor. Huron Church Road is used to access the service area in these communities in the ACA. Windsor Police are dispatched from their downtown headquarters on Goyeau Street. Windsor Police also rely on Huron Church Road to access adjacent neighbourhoods.

LaSalle Police and Fire are both dispatched from Malden Road complex. An ambulance dispatch is also located in the complex. Todd Lane or Sandwich Parkway are used by Emergency Services to access the LaSalle service area on Highway 3/Talbot Road.

The Windsor & Essex County Student Transportation Services provides school bus services to the area boards of education, the Greater Essex District School Board, the Windsor-Essex County Catholic District School Board, and Conseil Scolair de District des Ecoles Catholiques du Sud-Ouest.

EXHIBIT 7.8 – LOCATION OF EMERGENCY SERVICES WITHIN THE ACA



7.2.3 Economic Conditions

For the purposes of this study, a business is defined as any privately owned, for profit, entity that occupies a built space. Public utilities, such as the Windsor wastewater plant and the Ontario Power Generation (OPG) facility, and public institutions, such as schools and hospitals, were not considered businesses for the purpose of the economic impact assessment. However, it should be recognized that all possess attributes, such as employment and monetary revenues, like businesses. They are unique

facilities that need to be addressed in terms of their own attributes and the essential public services they provide.

A list of 119 businesses identified within the ACA is provided in Table 7.10. Businesses located within the Ambassador Industrial Park (principally located at the north-west intersection of Huron Church Road and the E.C. Row Expressway) and Del Duca Industrial Park (located south of Highway 401 between Talbot Road and Provincial Road), while partially located within the ACA, are not specifically included in the impact assessment as there are no significant economic impacts on any businesses within these business parks.

For further detail on the Economic Impact Assessment conducted within the ACA, the reader is referred to the *Draft Practical Alternatives Evaluation Working Paper – Economic Impact Assessment*.

TABLE 7.10 – BUSINESSES ASSESSED WITHIN THE ACA

Businesses Located Along Access Road Huron Church Road – Highway 3	Businesses Located Within Plaza-Crossing Combinations West Windsor
Century Fire Equipment Ltd Garry St. John 1996 Blue Bell Motel Comfort Inn Golden Griddle Family Restaurants Feelgood's Billiard's Sports Pub Rhythm & Grill King Kone Ice Cream Petro Canada Lambton Plaza A.C. Soccer & Sports First Choice Chinese Restaurant Gino's Pizza Lily's Nail Montessori Preschool C.K. Havana Shop Scholar's Choice Retail Store Second Edition Worldsource Financial Management Outbreak Sportz Aqua Turf Lawn Sprinkler Systems Euro Tech Auto Service Best Western Continental Inn Tim Hortons Fred's Farm Fresh Ltd. L.A. Collision South Windsor Ltd. Sandcastle Recreation Joe's Woodcraft Of Windsor Ltd. Mac's Convenience Stores Town & Country Animal Clinic Windsor Crossing Outlet Mall (45 stores) Aibis Sports Bar & Music	CTX Lafarge Canada Inc. CBM - St. Mary's Cement Sterling Marine Fuels Windsor Window Imaging Inc. K-Scrap Resources Ltd. Van De Hogen Investments Inc. Vollmer & Associates Ltd. The Auto Shop (Vollmer) Essex Aggregates Canadian Salt Company Ltd. Sure Seal Roofing & Siding Agency Fuels Ltd. Air-O-Systems Judrick's Enterprises Ltd. Standard Induction Castings Inc. Xcel Manufacturing Group Andlauer Transportation Services Inc. Harwood Windsor Auto Parts Shur Lok Products Globaltex 2000 Ltd. The Narmco Group Novelletto Rosati Complex Southwestern Sales Corporation Ltd. Karter Carriers Inc. Prism-Berlie Ltd. West Windsor Power – Suez Energy Generation NA Nemak of Canada Corp. A&P Metals Mayson Machining Ltd.

Businesses Located Along Access Road Huron Church Road – Highway 3	Businesses Located Within Plaza-Crossing Combinations West Windsor
Autobon Car Wash XTR Gas & Convenience Vachon Bakery Outlet Nature's Health Consulting Co. The Sleep Factory Dualflex Company Ltd. Weston Bakeries Ltd. Ontario Phillips Tool & Mould Ltd. Tyler Hard Chrome Inc. Hellenic Banquet Halls Daytona Car Wash Ltd.	Globe Manufacturing Kenwil Services Limited Howards Backhoe & Trucking & Bobcat Service

There are a number of distinct clusters of businesses in the ACA, following from Highway 401 through to the E.C. Row Expressway. As shown in Exhibit 7.9, these clusters, starting from the east, are:

1. Located at the current intersection of Highway 401 and Highway 3, west of Highway 3 along Outer Drive, is the primary concentration of industrial businesses.
2. Immediately north on Highway 3 there is a small concentration of commercial businesses at the intersection of Howard Avenue.
3. Further along Highway 3, after a largely residential section, at the intersection of Sandwich Parkway is the Windsor Crossing Outlet Mall, the single largest concentration of commercial businesses along the entire access road. There is one other commercial shopping plaza at this intersection.
4. Along Highway 3 from the Huron Church Line intersection area to Todd Lane / Cabana Road West is a node of industrial, commercial and travel-tourism businesses.
5. Further along Huron Church is a mix of commercial and travel-tourism businesses, including a major chain hotel and a coffee shop.
6. At Huron Church Road and Lambton Road is another large concentration of commercial businesses, including the Lambton Plaza.
7. Finally, along Huron Church Road, between Lambton Road and the E.C. Row Expressway is a concentration of commercial and travel-tourism businesses including two hotel/motels.

Because of the scale and detail of information required for this study and its reliance on information voluntarily provided data gaps do exist. In terms of the survey, a number of businesses within the ACA chose not to participate. The response rate, as illustrated in Table 7.5, was more than 60 per cent of the 75 businesses surveyed. While not complete, this is a reasonably high level of participation. The response rate was much higher for businesses along the access road in comparison to those businesses within the West Windsor industrial area. This is due primarily to the fact that most businesses within the ACA are smaller locally-owned establishments, whereas the majority of businesses within the West Windsor industrial area are large national and multinational companies that typically have more restrictions on providing business information.

EXHIBIT 7.9 – BUSINESS CLUSTERS ALONG PROPOSED ACCESS ROAD

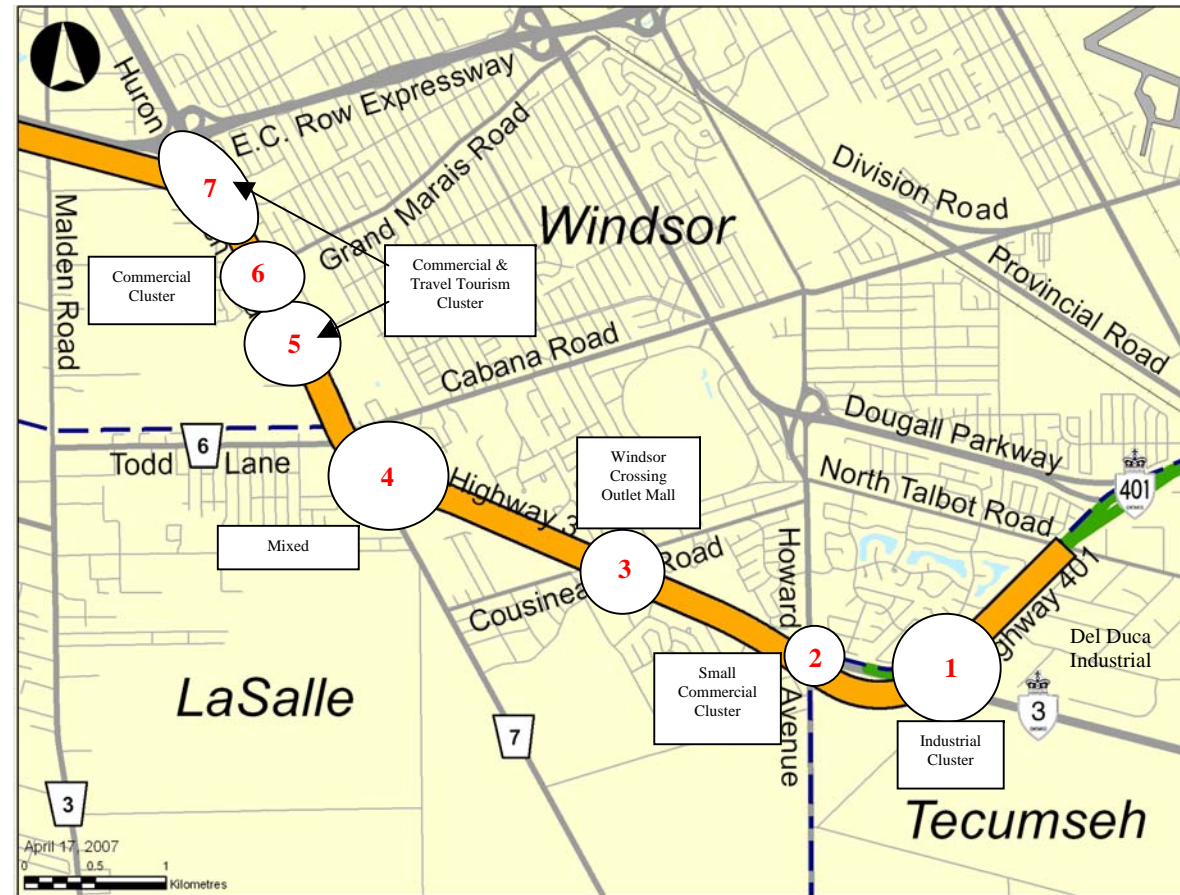


TABLE 7.11 – BUSINESSES SURVEY RESPONSE RATE WITHIN THE ACA

Section	Number of Businesses Contacted	Number of Businesses that Responded	Response Rate
Access Route	41	30	73%
West Windsor Industrial Area	34	17	50%
Total ACA	75	47	63%

Note: Windsor Crossing Outlet Mall is counted as one business within this table, as only one survey was administered on the basis that the mall is owned by a trust and reports as a collective business.

Furthermore, of the businesses that did respond, not all were willing to disclose certain pieces of information, such as gross revenues and employment. Where other sources of information were not available, estimates were made for employment and gross revenues in order to provide complete economic impact assessments for the entire ACA. Estimates of employment and revenues were arrived at through a variety of methods, which included comparisons to similar businesses for which that data was available; for publicly traded companies, estimations were based on information provided in public documents, such as annual reports; and, through a variety of sources specific to some of the business sectors represented by the individual firms in the ACA.

7.3 Existing and Planned Land Use

PROVINCIAL POLICY STATEMENT

The assessment of impacts to land use for the practical alternatives required consideration of provincial and local municipal policies and objectives pertaining to land use, as well as types of land uses impacted directly by the project.

This study has considered a broad range of legislative policies, including those that relate to the *Provincial Policy Statement* (PPS). The PPS was consulted throughout the illustrative alternatives and practical alternatives phase of the DRIC study, to ensure that alternatives being considered were in agreement with the policies developed in the PPS.

The PPS provides policy direction on matters of provincial interest related to land use planning and development. The PPS is issued under the authority of Section 3 of the *Planning Act*. The most recent PPS came into effect March 1, 2005. The PPS focuses growth within settlement areas and away from significant or sensitive resources and areas which may pose a risk to public health and safety.

Several policies within the Provincial Policy Statement are applicable to this study, and were taken into consideration during the development of the illustrative and practical alternatives. These include, policies related to healthy, liveable and safe communities; public space, park and open space; infrastructure and public service facilities; transportation systems; transportation, infrastructure corridors; natural heritage and cultural heritage and archaeology. These policies were taken into account in several other reports prepared by the study team, including the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*, the *Draft Practical Alternatives Evaluation Working Paper – Archaeology*, and the *Assessment of Practical Access Road Alternatives- Improve Regional Mobility Memorandum*.

The policies of the Provincial Policy Statement are intended to be used in conjunction with locally-generated policies regarding matters of municipal interest. Provincial plans and municipal official plans provide a framework for comprehensive, integrated and long-term planning that supports and integrates the principles of strong communities, a clean and healthy environment and economic growth, for the long term. Listed below are the various municipal plans and policies of the City of Windsor, the Town of LaSalle, and the Town of Tecumseh that pertain to this study.

7.3.1 City of Windsor Official Plan

The *City of Windsor Official Plan*⁸ was adopted on October 25, 1999 by By-law 350-1999. The OP was approved by the Ontario Ministry of Municipal Affairs and Housing, in part, on March 28, 2000. The remainder of the Plan was approved by an Ontario Municipal Board decision on November 1, 2002. Currently, the City of Windsor is reviewing the goals, objectives and policies stated in the official plan and undergoing a public consultation process to update the various sections of the plan.

In considering the *City of Windsor Official Plan* during the development of the illustrative and practical alternatives, a number of policy areas outlined in the Official Plan were considered. Each policy area is discussed separately.

⁸ www.citywindsor.ca

DEVELOPMENT STRATEGY

Pertains to the vision and growth concept envisioned for the next 10 to 20 years for the city. Recognizing that a new border crossing and access road could significantly influence future growth in the Windsor and Essex County region, the study team considered the vision and principles during the development of the illustrative and practical alternatives for the access road, plaza and crossing alternatives.

SUSTAINABLE, HEALTHY ENVIRONMENT

The sustainable, healthy environment policies pertain to achieving a sustainable transportation system where all modes of transportation play more of a balanced role. Providing greater opportunities to walk, cycle and take public transit are part of the goals for the sustainable, healthy environment policy section. Continuing to enhance the waterfront area, along with providing a Greenway System aimed at connecting Windsor's neighbourhoods and creating a greater harmony between human activities and natural systems.

HEALTHY COMMUNITY

The Healthy Community section of the *City of Windsor Official Plan* centres on policies related to Healthy Communities. As stated in the Official Plan, the healthy community philosophy is rooted in the belief that people's social, economic, cultural and psychological well being is influenced by the physical environment in which they live, work and play. Land use planning actions should provide for activities and facilities which will foster lifestyle habits that improve community health.

ENVIRONMENT

Some of the objectives of the Environmental policies of the *City of Windsor Official Plan* include protecting, conserving and improving the quality and quantity of Windsor's natural features and functions; to establish recreational and natural linkages between open space areas and natural areas, and to improve atmospheric air quality.

LAND USE

Land use policies outlined in the Official Plan promote an environmentally sustainable urban development, a variety of open spaces, protection and conservation of environmentally significant and sensitive heritage features, and policies pertaining to the development of residential, industrial, business park, commercial, major institutional, open space, natural heritage, mixed use, waterfront residential, waterfront recreational, and waterfront port.

INFRASTRUCTURE

Transportation policies outlined in the Official Plan call for a sustainable, effective, and efficient transportation system that meets the needs of all users in a manner consistent with a healthy environment and vibrant economy. Objectives outlined in this area of the Official Plan relevant to this study include:

- Protect long term transportation corridors
- Safe and efficient truck routes within and through Windsor
- Maintain a city-wide walking and cycling network
- Windsor's role as Canada's foremost international gateway.

In addition, the *City of Windsor Official Plan* speaks to "recreationways" which are defined as a network of multi-use pedestrian and cycling trails designed to serve recreational movements.

URBAN DESIGN

Urban Design policies are outlined in Section 8 of the Official Plan, and include policies and objectives aimed to:

- Achieve comfortable conditions along roads and in public spaces
- Achieve an attractive network of public spaces
- Encourage infrastructure undertakings to retain and incorporate natural features and functions

HERITAGE CONSERVATION

Heritage conservation policies outlined in the *City of Windsor Official Plan* centre on identifying, recognizing, protecting, enhancing and managing the existing heritage resources that exist within the city.

These policies were reviewed during throughout the development of the illustrative and practical alternatives.

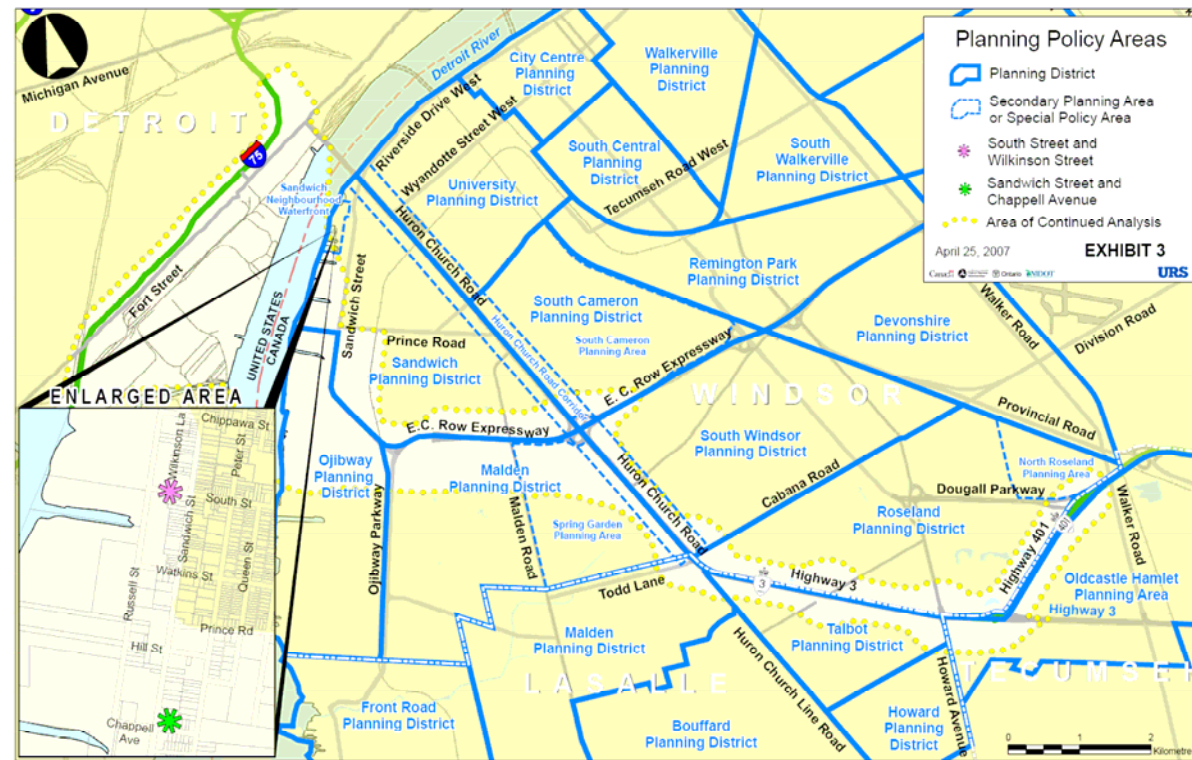
Exhibit 7.10 shows the planning policy areas and districts that are defined within the *City of Windsor Official Plan*. The City of Windsor is currently divided into a total of 19 planning districts, which are used to help facilitate future planning within the city. The 19 planning districts range in size from slightly more than 200 ha to almost 1135 ha in size. These planning districts are established to provide a basis for developing more detailed planning policies. Only those planning districts that contain special policy areas relevant to the practical alternatives developed for this study area are discussed in this section.

CITY OF WINDSOR SPECIAL POLICY AREAS

District Special Policy Areas are defined as areas where detailed policies are created for land use, infrastructure, transportation, environment, urban design or other areas are required beyond those that are provided within the Official Plan. In certain instances, where there is a conflict between a Special Policy Area provision and the Official Plan, the Special Policy Area will take precedence over the policies of an Official Plan.

The ACA includes all or a portion of four Special Policy Areas as defined in the Windsor Official Plan: Sandwich Neighbourhood Waterfront District, Sandwich Street and Chappell Avenue, South Street and Wilkinson Avenue, and the Huron Church Road Corridor. One Secondary Plan is affected by the ACA, the Spring Garden Planning Area. These Special Policy Areas and Secondary Plan areas are shown in Exhibit 7.10.

EXHIBIT 7.10 – PLANNING POLICY AREAS



Sandwich Neighbourhood Waterfront

The Sandwich Neighbourhood Waterfront is comprised of the area bounded by Chewitt Street on the north, Russell Street on the east, Brock Street on the south and the Detroit River on the west depicted in Exhibit 7.10. This special policy area allows for the development of Waterfront Recreation land uses, as well as residential development no greater than 15 storeys in height, on lands located at the south west corner of Mill Street and Russell Street. In addition, residential development is permitted no greater than three storeys in height on the southwest corner of Chewitt Street and Russell Street. As a condition of planning approval, lands will be required to be conveyed to the City for public open space purposes, where preference will be made for lands extending along the Detroit River for the continuation of the waterfront linear park system.

Sandwich Street and Chappell Avenue

The Sandwich Street and Chappell Avenue Special Policy Area is comprised of a property known as Lot 28, on the south side of Sandwich Street and part of Lot 28 on the north side of Peter Street, located on the southeast corner of Sandwich Street and Chappell Avenue, as depicted in Exhibit 7.10. This Special Policy Area allows for the development of Adult Entertainment Parlours, in particular the building located at 3885 Sandwich Street. The building located at 3885 Sandwich Street was destroyed by fire in the fall of 2006, and the site is presently vacant.

South Street and Wilkinson Street

The South Street and Wilkinson Street Special Policy Area is located on the northeast corner of South Street and Wilkinson Street. This area is designated as a business park, however the only business park use that is permitted on these lands is a warehouse.

Huron Church Road Corridor

The Huron Church Road Corridor includes an area along the east and west sides of Huron Church Road from the Ambassador Bridge to Highway 3, as depicted in Exhibit 7.10. The Huron Church Road Corridor Special Policy states that development along Huron Church Road must have specific landscaping setbacks for new residential uses, and it guides the location of new commercial uses along the corridor. The landscaping setback requirements are as follows:

- Where non-residential development fronts Huron Church Road there shall be a minimum landscaped setback of 10 m parallel to the road;
- Where residential development is proposed adjacent to Huron Church Road an open space corridor having a minimum width of 30 m shall be provided;
- Where lands are proposed for redesignation to commercial centre or commercial corridor, the lands shall be located at a signalized intersection or be contiguous to lands already designated commercial centre or commercial corridor with access to a signalized intersection by means of a service road.

This Corridor Special Policy Area allows for development on the Huron Church Road Corridor to be uniform in appearance and in keeping with its status as an international gateway route, through the use of a landscaped setback abutting the road. The City of Windsor Official Plan has designated Huron Church Road as a Class I Arterial, and it is identified as a connecting link by the Ministry of Transportation.

The Official Plan states that a Class I Arterial Road:

- Shall be designed to carry high volumes of both passenger and commercial traffic for intra-city travel at moderate speeds;
- Usually consist of four or more divided or undivided travel lanes, with right-of-way widths no more than 36 m;
- Intersections with major roads are permitted but local roads are discouraged;
- Direct access to abutting properties along Class I Arterial Roads is not permitted where other alternatives exist; and
- Commuter cycling lanes or bikeways are not permitted along the paved travel lanes, but may be permitted within the right-of-way.

Recently, an urban design master plan was developed for Huron Church Road. The *Huron Church Road Urban Design Master Plan and Development Guidelines* (February 2006) was developed to provide a design vision and framework for implementing design concepts on Huron Church Road between Cabana Road West and College Avenue. The scope and analysis of the report focuses on the Primary Study Area, between College Avenue and Tecumseh Road. Design elements, streetscape installations and guidelines developed within this report are also meant to be implemented in the Secondary Study Area which is between Tecumseh Road and Cabana Road West. This report presents design guidelines for lighting, planting, walkways, signage, public art, street furniture and property development.

As part of the current EA study, the study team incorporated some of the design guidelines and features suggested in this report into the Context Sensitive Solutions (CSS) concepts for this study. In

addition, the setback and landscaping policies put forth for the Huron Church Road Corridor will be taken into consideration during future design stages.

Spring Garden Planning Area

The Spring Garden Planning Area (Official Plan Area #5) is bounded by E.C. Row Expressway on the north, Malden Road to the west, Todd Lane to the south, and Huron Church Road on the east (Exhibit 7.10). It is approximately 283 ha in size, and is largely a residential community integrating an expansive natural area feature. The natural area was designated as an Area of Natural and Scientific Interest (ANSI) by the Ministry of Natural Resources (MNR) in 1984. As a result, the Spring Garden Planning Area has development restrictions placed upon it. The Secondary Plan allows for residential development only along the periphery of the natural area. The plan provides primarily for future residential development that complements the development that has already occurred within this planning area. Other land uses are permitted, in a limited capacity, as discussed below.

Permitted land uses in the Spring Garden Planning Area as defined by the Spring Garden Secondary Plan are as follows:

- a) Low profile residential development in designated areas; comprised of single detached, semi-detached, duplex and multiple units up to eight units; maximum density permitted is 30 units per gross hectare;
- b) Single detached residences are the primary residential type allowed;
- c) Low profile multiple use residences (e.g., semi-detached, row housing) are encouraged near E.C. Row Expressway and Huron Church Road;
- d) Neighbourhood commercial uses are permitted in residential areas;
- e) Minor institutional uses are permitted within residential areas; and
- f) Light industrial uses; restricted to the Grand Marais Drain area.

The Secondary Plan requires that a buffer be placed between the right-of-way on Huron Church Road, Malden Road, and E.C. Row Expressway and future permitted land uses in order to mitigate for potential noise impacts. In addition, any future roadway network would have to follow the grid patterns prescribed within the Secondary Plan in order to prevent any impacts to the adjacent ANSI areas.

CITY OF WINDSOR ZONING BYLAWS

A municipality regulates the use and development of land, buildings and other structures through the provisions of zoning bylaws under the *Ontario Planning Act*. The purpose of a zoning bylaw is to regulate different land uses and development standards, to ensure that development takes place in conformity with policies set forth in the *City of Windsor Official Plan*.

The City of Windsor has developed a comprehensive listing of zoning bylaws that apply to the entire City. Within the ACA, the zoning bylaw designations vary from low, medium, and high residential districts, commercial and industrial districts, and institutional and green districts. A cross section of all types of zoning is represented within the ACA. Each zoning bylaw dictates what type of land use is permitted within a particular area of the City, the units allowed to be developed, the setback requirements, and it prescribes the infrastructure requirements needed to develop the land uses.

It is important to note the current zoning for various parcels found within the ACA that are currently vacant or open. Often parcels that are vacant or open and that are zoned for either residential,

commercial, or industrial land uses will be developed once favourable market conditions exist. Within the ACA, lands that are currently vacant in the Brighton Beach Industrial Area are zoned for industrial land uses. These lands could be occupied by industrial uses if the economic market in Windsor requires such a use. Also, lands that are currently open or vacant in the Spring Garden Planning Area, are zoned for residential land use, with a hold provision which places a hold on the issuance of a building permit until specific development preconditions have been satisfied. Future residential demands would potentially require that residential development occur in this part of pending the stipulation as dictated in the zoning.

OLDE SANDWICH TOWNE COMMUNITY PLANNING STUDY REPORT

The *Olde Sandwich Towne Community Planning Study Report* was completed and adopted by Windsor City Council in the fall of 2006. The Report was developed with cooperation and input from Sandwich Towne residents along with business, government and other civic leaders. Participants formed task force subcommittees, which focused on six areas:

- Appearance and community image;
- Commercial development;
- Health care, education and community needs;
- Parks and open space and neighbourhood land use;
- Safety and crime; and
- Communications.

The *Olde Sandwich Towne Community Planning Study Report* was designed to provide direction for residents and business owners to actively participate in the plan making and priority setting process for the community. The Planning Study Report was adopted as the municipality's guide for future planning, capital budgeting and community improvement efforts in Sandwich. The Report was the result of an 18-month process and contains 29 recommendations to the community. Task Force members identified geographic realities, such as barriers, vacant lots, anchors of activity, connectors etc., that later were used to identify target areas within the study area to concentrate resources.

The plan outlines which organization should take the lead on each recommendation to develop an achievable timeframe and identify what resources are needed to achieve each recommendation. The plan outlines the continuation of industrial land uses in the waterfront area south of Watkins Road, as shown in Exhibit 7.10. The plan identified that the area south of Prince Road be changed to industrial from its current mix of residential and industrial land uses. It also suggests waterfront port improvements be made to existing industrial land uses to help facilitate and foster continued industrial viability within this area. Placing a new crossing within the waterfront port/industrial area of Sandwich is consistent with the prescribed land use of that area of Sandwich Towne, which is comprised of mostly industrial land uses.

7.3.2 Town of LaSalle Official Plan

The *Town of LaSalle Official Plan –LaSalle 2016- Healthy, Vibrant and Caring*⁹ was adopted on October 14, 1997. The Plan was approved by the Ontario Ministry of Municipal Affairs and Housing (MMAH) on May 18, 1998. The document used for this report is the November 4, 2003 Office Consolidation, which incorporates Official Plan Amendment No. 1, provincially approved on November 4, 2003.

Within the ACA, the *Town of LaSalle Official Plan* has designated the Highway 3 area as one of five planning districts developed for the town, called the Talbot Planning District. The planning districts are designed to provide a framework for the implementation and administration of the Official Plan. The Talbot Planning District consists of mostly residential land uses, with two distinct areas of commercial land use along Talbot Road southeast and northwest of Sandwich Parkway. There are recreational land uses located throughout this district, along with a community facility.

As growth continues within the Town of LaSalle, plans for future roadway expansions are included in the Official Plan. In particular, the Official Plan includes a proposed expansion of Laurier Drive from Malden Road to Howard Avenue.

As stated in the *Town of LaSalle Official Plan*, the 'greenway system' is a cornerstone of the Official Plan, and represents a major new land use planning and resource management approach for the Town of LaSalle, to be implemented over a 10 to 20 year planning horizon. The essence of the Town of LaSalle 'greenway system' approach is providing linkages, areas to connect wildlife habitat areas to each other, human settlements to other human settlements, urban and rural areas, waterfront to non-waterfront lands, and people to nature. All new developments within the Town of LaSalle will be required to incorporate the 'greenway system' elements within their respective development plans to the greatest degree possible.

The *Town of LaSalle Official Plan* acknowledges that a Bi-National Transportation Study has been underway since 2003, and that in the event that a route will be located in the Town of LaSalle, it is approved in accordance with all applicable Environmental Assessment legislation. Additional transportation policies may be required to amend the Town's Official Plan. Highway 3 is classified as a Provincial highway in the *Town of LaSalle Official Plan*.

TOWN OF LASALLE ZONING BYLAWS

The Town of LaSalle has developed a comprehensive zoning bylaw for the entire town. The Talbot Planning District area of LaSalle is zoned residential, with a few parcels zoned commercial.

7.3.3 Town of Tecumseh Official Plan

The Town of Tecumseh is governed by three separate Official Plans¹⁰. The three Official Plans represent the three former municipalities, which include Tecumseh, St. Clair Beach, and Sandwich South. These three municipalities existed separately prior to the January 1st, 1999 amalgamation of the three areas into the current Town of Tecumseh municipality.

At present, the three official plans have not yet been consolidated into a single official plan and still govern their respective lands prior to amalgamation. The purpose of the Official Plan is to set forth the general policies concerned with the shaping and guiding of the physical growth and arrangement of the Tecumseh Planning Areas. The general policies are developed being mindful of the social and economic needs of the community in order to obtain the most desirable physical environment for the present and future inhabitants of the Town of Tecumseh.

The southeastern portion of the ACA is located within the Town of Tecumseh. Land uses found within this area of Tecumseh include several manufacturing and business parks, including the Del Duca Industrial Park, located adjacent to Highway 401. This industrial park contains businesses that manufacture a variety of goods, including automotive stampings, plastic injection molding, dies, fixtures, automation systems, custom machining, custom fabrication, automotive seating systems, capsule machines and capsules, vinyl doors and windows, commercial printing, canned vegetables and frozen foods, breads and rolls.

TOWN OF TECUMSEH ZONING BYLAWS

The Town of Tecumseh is governed by three separate zoning bylaws, in addition to the three separate Official Plans, representing the three municipalities that existed separately prior to the January 1st, 1999 amalgamation of the three areas. Currently, the three bylaws have not yet been consolidated into a single bylaw for the town and still govern their respective lands prior to amalgamation. The zoning for the lands located within the ACA in Tecumseh is industrial.

7.3.4 Existing Land Use

The Highway 3/Huron Church Road corridor has served as an access road to the Ambassador Bridge for over 75 years. The land uses along this corridor vary, ranging from commercial and industrial to residential and recreational. Commercial uses include fast food restaurants, speciality stores, hotels and motels, shopping centres and convenience stores. Residential land uses include single-family residences and multi-family residences. In order to facilitate an accurate description of the land uses throughout the ACA, it has been divided into six sections. A description of each follows.

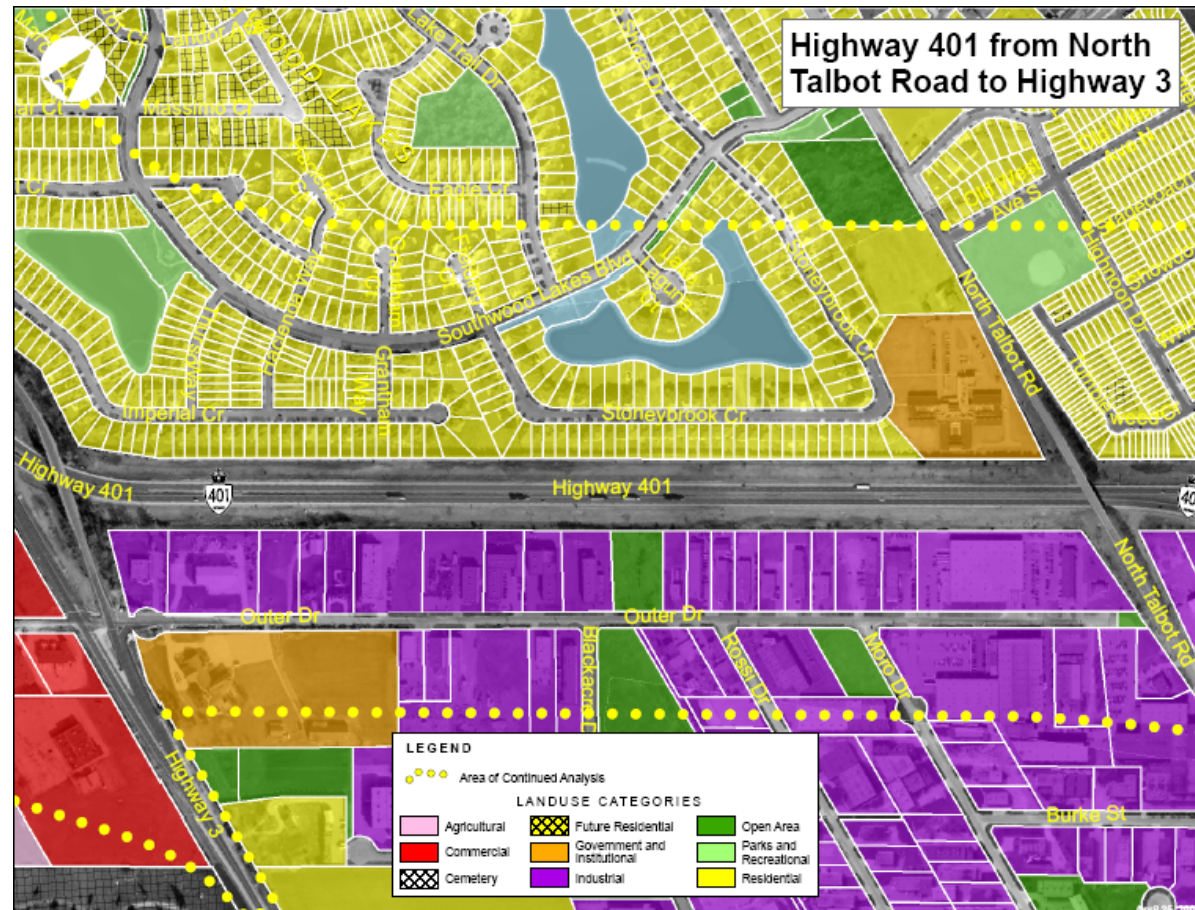
Highway 401 from North Talbot Road to Highway 3

Land uses located along the north portion of this segment includes a portion of residential subdivision, called Southwood Lakes, which was constructed in 1997 as a single family residential community that surrounds four small lakes and features several parks. There is one institutional land use, the Extencare Southwood Lakes Long Term Care Facility, located at the northwest corner of North Talbot Road and Highway 401. There are a number of parcels that are proposed for future residential development, located north of North Talbot Road along Highway 401. Land uses along the south side of Highway 401 include the Del Duca Industrial Park area in the Town of Tecumseh, where several automotive manufacturing related businesses operate (see Exhibit 7.11).

⁹ www.town.lasalle.on.ca

¹⁰ www.town.tecumseh.on.ca

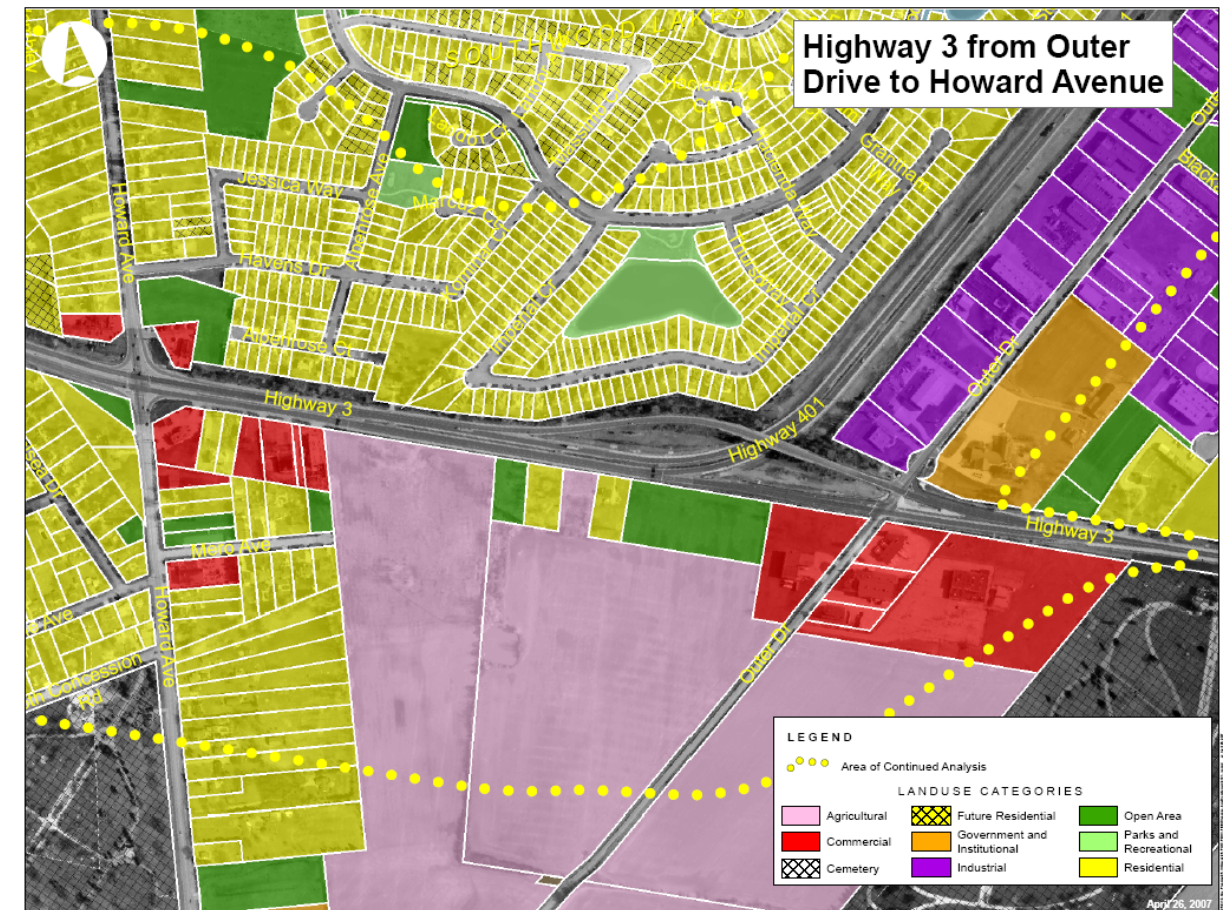
EXHIBIT 7.11 – HIGHWAY 401 FROM NORTH TALBOT ROAD TO HIGHWAY 3



Highway 3 from Outer Drive to Howard Avenue

This segment contains a mixture of residential, industrial, vacant institutional and commercial land uses. On the north side of Highway 3, the majority of land uses are single-family residential units, with the exception of a vacant and commercial land use located on the northeast corner of Highway 3 and Howard Avenue. On the south side of Highway 3, land uses consist of vacant lands, commercial land uses, and some single-family residential land uses. South of Highway 3 is a large vacant area owned by the Ontario government (see Exhibit 7.12).

EXHIBIT 7.12 – HIGHWAY 3 FROM OUTER DRIVE TO HOWARD AVENUE

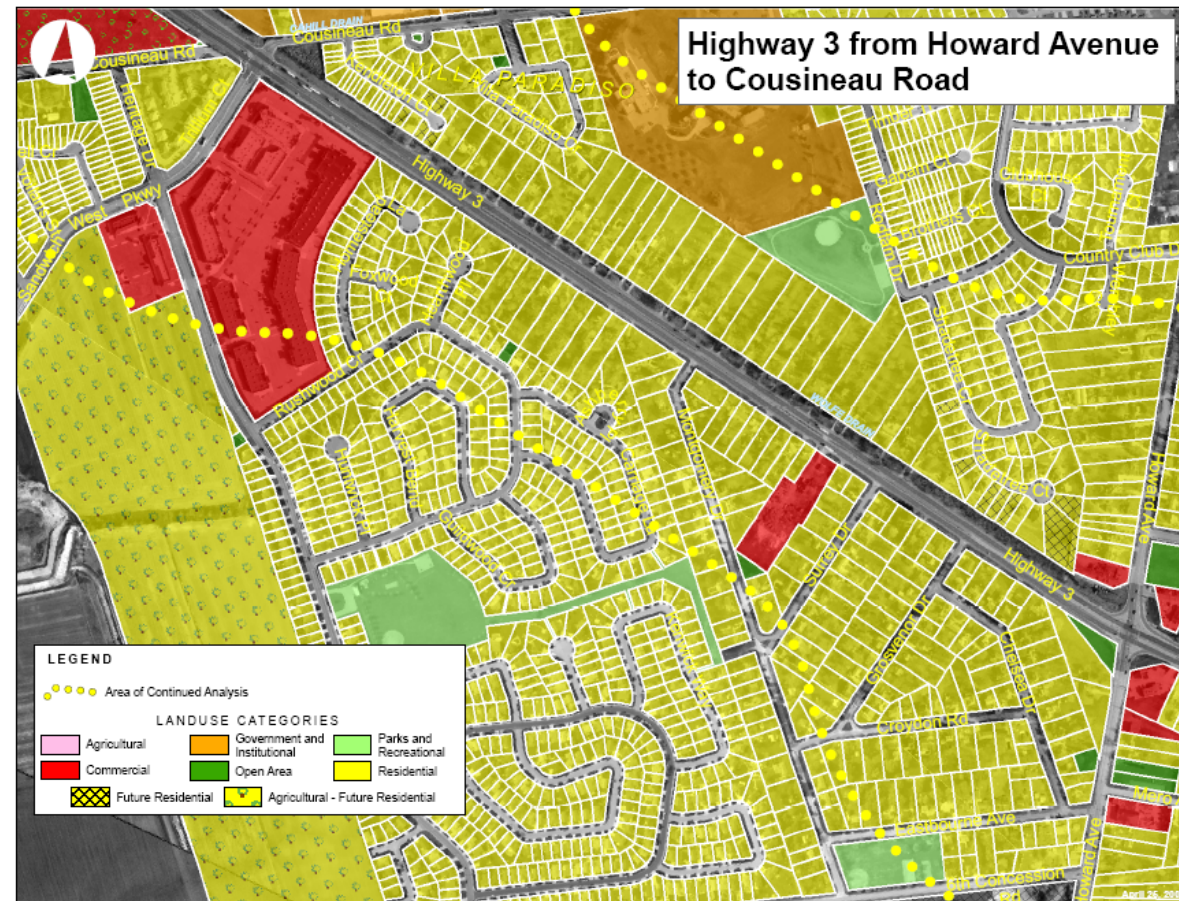


Highway 3 from Howard Avenue to Cousineau Road

This segment contains a mixture of residential and commercial land uses. Land uses found along the north side consist mostly of single-family residential units either fronting onto Highway 3 with direct highway access or backing onto Highway 3 without direct highway access. Land uses on the south side of Highway 3 between Howard Avenue and Cousineau Road consist mostly of single-family residential uses, with a few multi-family units, with driveways that connect directly to Highway 3.

There is no buffer between the residential land uses that exists in this section and Highway 3. This segment also contains the Windsor Crossing Outlet Mall, situated in the southeast corner of Sandwich West Parkway in the Town of LaSalle. The Windsor Crossing Outlet Mall is a 255,000 square foot open air mall that opened in 1999. It is a highway oriented commercial destination, catering to both local shoppers, and the traveling public. There is no buffer between the residential land uses that exist in this section and Highway 3. Included in this section are the Villa Paradiso residential subdivisions, consisting of mature and recently developed neighbourhoods surrounding the campuses of Academie Ste. Cecile Private School and Our Lady of Mount Carmel Separate School (see Exhibit 7.13).

EXHIBIT 7.13 – HIGHWAY 3 FROM HOWARD AVENUE TO COUSINEAU ROAD



Highway 3 from Cousineau Road to Lennon Drain

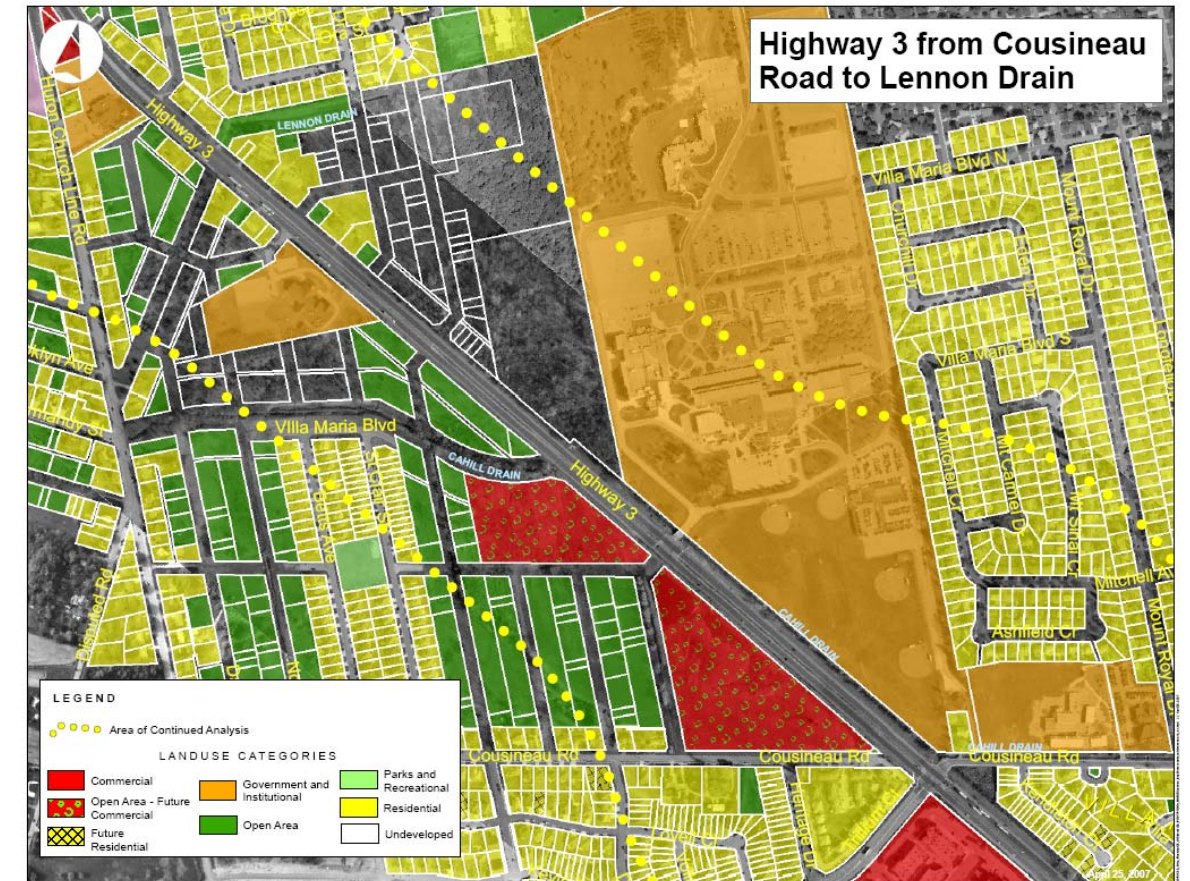
This segment contains residential, institutional, vacant and undeveloped land uses. St. Clair College opened in 1967 with 300 full-time students enrolled in applied arts and technology courses. Over the past 40 years, the college has grown and is an important community resource. Today, more than 20,000 students are enrolled in programs ranging from business programs, early childhood education, journalism, manufacturing engineering technology, and veterinary technologist. In 2004 the college completed construction on a 408 bed student residence.

St. Clair College features numerous athletic facilities such as sports fields (soccer, baseball, football) and fitness trails for joggers in the area of Cousineau Road and Highway 3. These athletic facilities are offered for rent the general public and community organizations.

Immediately to the west of St. Clair College are undeveloped parcels that are designated as an environmentally significant area (ESA). Land uses found on the south side of Highway 3 consist of mostly vacant, undeveloped areas, with a few single-family residences with direct access to Highway 3 east of the Lennon Drain. There is one parcel located within this segment that is undeveloped and currently for sale; it is zoned for commercial land uses. The Heritage Park Alliance Church is an institutional use located on the south side of Highway 3. The church has approximately 1,000 worshippers that attend from LaSalle, Windsor, and the surrounding region. The Heritage Park Alliance Church is also surrounded by undeveloped lands.

Lands south of Highway 3 are located in the Town of LaSalle. A portion of these lands are currently undergoing development to residential subdivisions. In the *Town of LaSalle's Official Plan*, Highway 3 is identified as the major transportation corridor serving this area of the Town. In addition, the Town's plan is to connect Normandy Street to Highway 3 at the St. Clair College main entrance, as outlined in the *Town of LaSalle Official Plan Transportation Plan* (see Exhibit 7.14).

EXHIBIT 7.14 – HIGHWAY 3 FROM COUSINEAU ROAD TO LENNON DRAIN



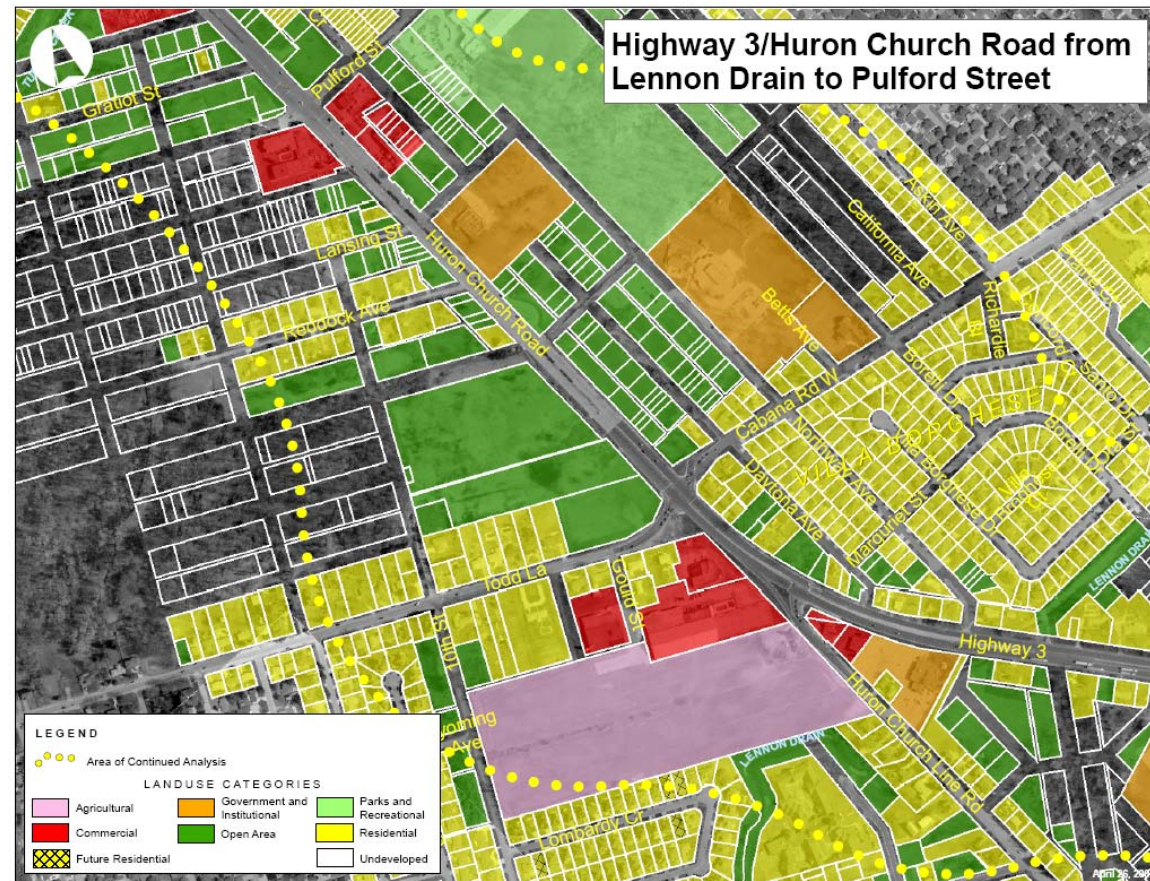
Highway 3/Huron Church Road from Lennon Drain to Pulford Street

This segment contain a mixture of single-family residential, open areas, commercial and governmental land uses. Land uses that dominate the northeast side of Highway 3/Huron Church Road include residential land uses, including the Villa Borghese residential subdivision, which consists of single-family residential homes constructed in the early 1990's. The primary intersection in this area is the Todd Lane- Cabana Road West intersection, which provides an important connection between LaSalle and southwest Windsor.

This segment also contains open, undeveloped parcels, an institutional land use (Ministry of Healthy and Long Term Care's Windsor Public Health Laboratory), and some commercial land uses. Located east of Huron Church Road and north of Cabana Road West is the Oakwood Public Elementary School, Oakwood Community Centre, and Oakwood Woods, a natural area that is used by the students and community to observe nature.

Land uses on the south side of the Highway 3/Huron Church Road corridor included an institutional use (Royal Canadian Legion), commercial uses, open lands, and a hotel. North of Todd Lane on the west side of Huron Church Road is the Spring Garden Planning Area. Reddock Street, Lansing Street and Gratiot Street are all predominantly residential streets that are located adjacent to Huron Church Road as part of the Spring Garden Planning Area (see Exhibit 7.15).

EXHIBIT 7.15 – HIGHWAY 3/HURON CHURCH ROAD FROM LENNON DRAIN TO PULFORD STREET

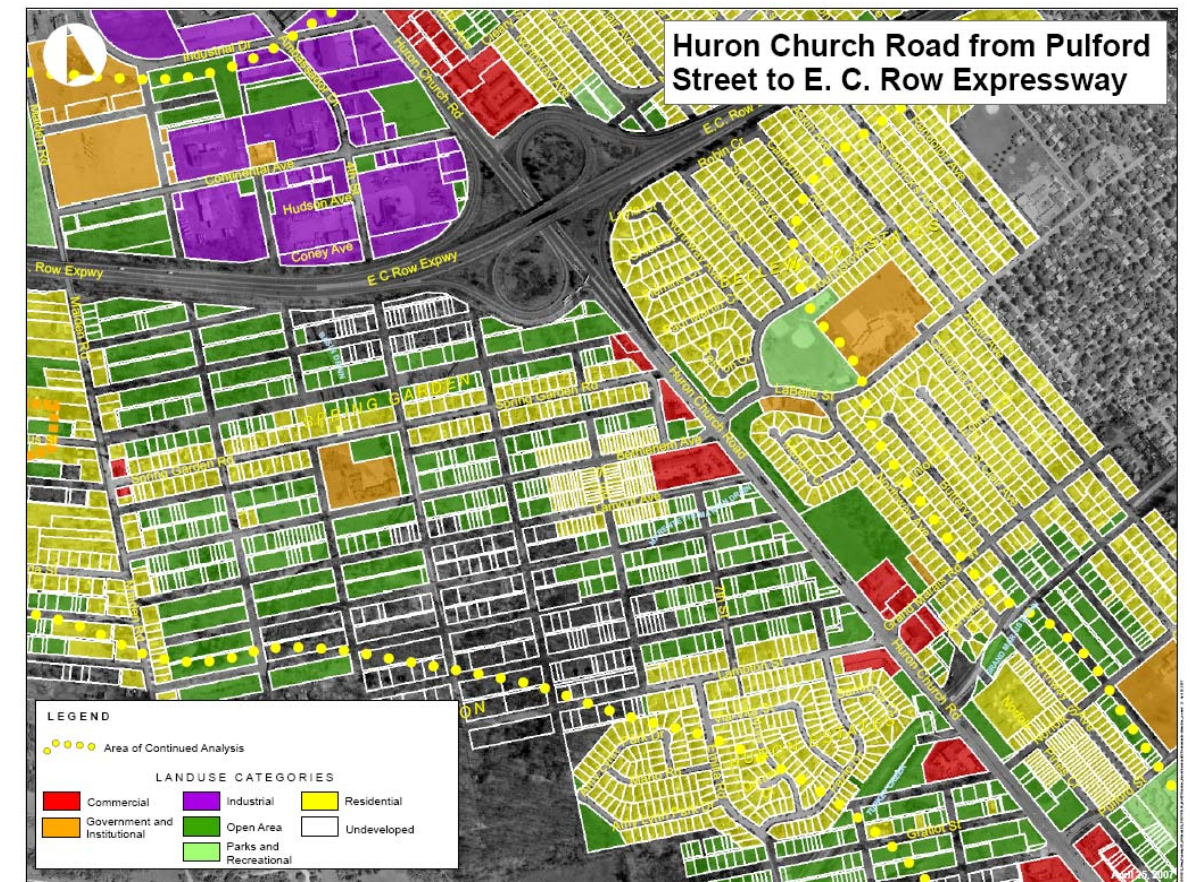


Huron Church Road from Pulford Street to E.C. Row Expressway

Land uses that exist on the east side of Huron Church Road consist of vacant areas between Pulford Street and Grand Marais Drain. On the east side of Huron Church Road, from north of the Grand Marais Drain to E.C. Row Expressway, there is a large residential subdivision constructed in the 1990's called Bellewood Estates, which consists of single family homes. Also located in the Bellewood Estates subdivision is the Bellewood Elementary School. In addition, the Children's House Montessori Pre-School is located in this area. Other land uses located between Grand Marais Drain and E.C. Row Expressway include open space and some commercial uses. Land uses on the west side of Huron Church Road between Pulford Street and Grand Marais Drain include vacant areas and commercial land uses. From south of Grand Marais Drain to E.C. Row Expressway, land uses include vacant areas, commercial land uses, including a hotel, and the Huron Estates residential subdivision, a single family residential subdivision constructed in the 1990s (see Exhibit 7.16).

North of the Huron Estates residential subdivision is a recently constructed new residential neighbourhood in the Lamont Avenue and Bethlehem Avenue neighbourhood. The majority of these homes are semi-detached and are constructed on approved lots in the Spring Garden Planning Area. Other single and multi-family homes are located on Spring Garden Road, between Huron Church Road and Malden Road. This area contains homes that were constructed over several decades, with some that were built in the 1930's and 1940's.

EXHIBIT 7.16 –HURON CHURCH ROAD FROM PULFORD STREET TO E.C. ROW EXPRESSWAY

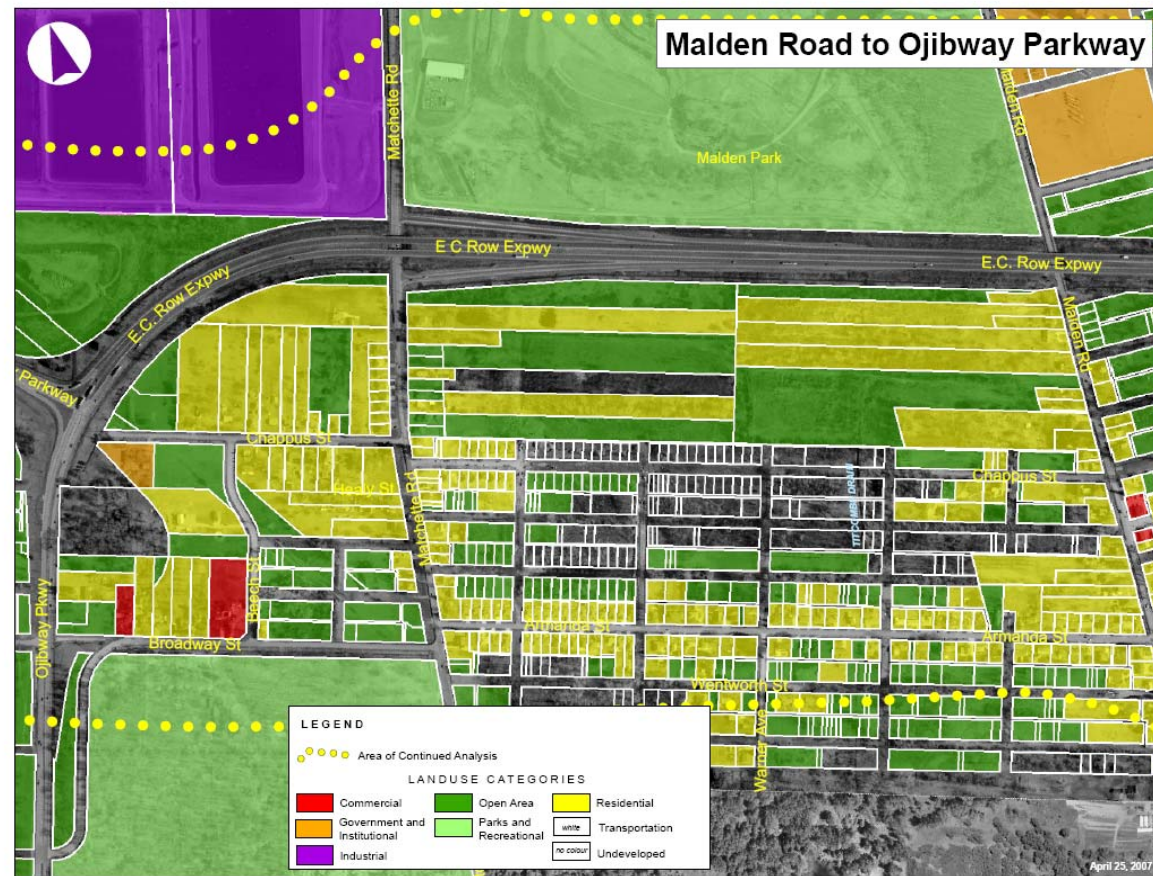


Malden Road to Ojibway Parkway

Land uses in this area include natural areas and single-family residential units. Armanda Street is an established residential neighbourhood that consists of mostly older, single family homes. In recent years, additional single family residences have been constructed at the east end of Armanda Street towards Matchette Road. Approximately 20 homes have been constructed between 2004 and 2006. A bed and breakfast business is located on Chappus Street.

North of E.C. Row Expressway is Malden Park, a 70-hectare park, originally a former city landfill consisting of a 90 metre hill that contains paved and wood chipped hiking and bicycle trails. The park also features a reception centre with enclosed patio, naturalized concert centre, additional hiking and walking trails and ponds and a toboggan hill. There are also picnic areas with tables and barbeques. The park features the highest elevation in Essex County (see Exhibit 7-17).

EXHIBIT 7.17 –MALDEN ROAD TO OJIBWAY PARKWAY

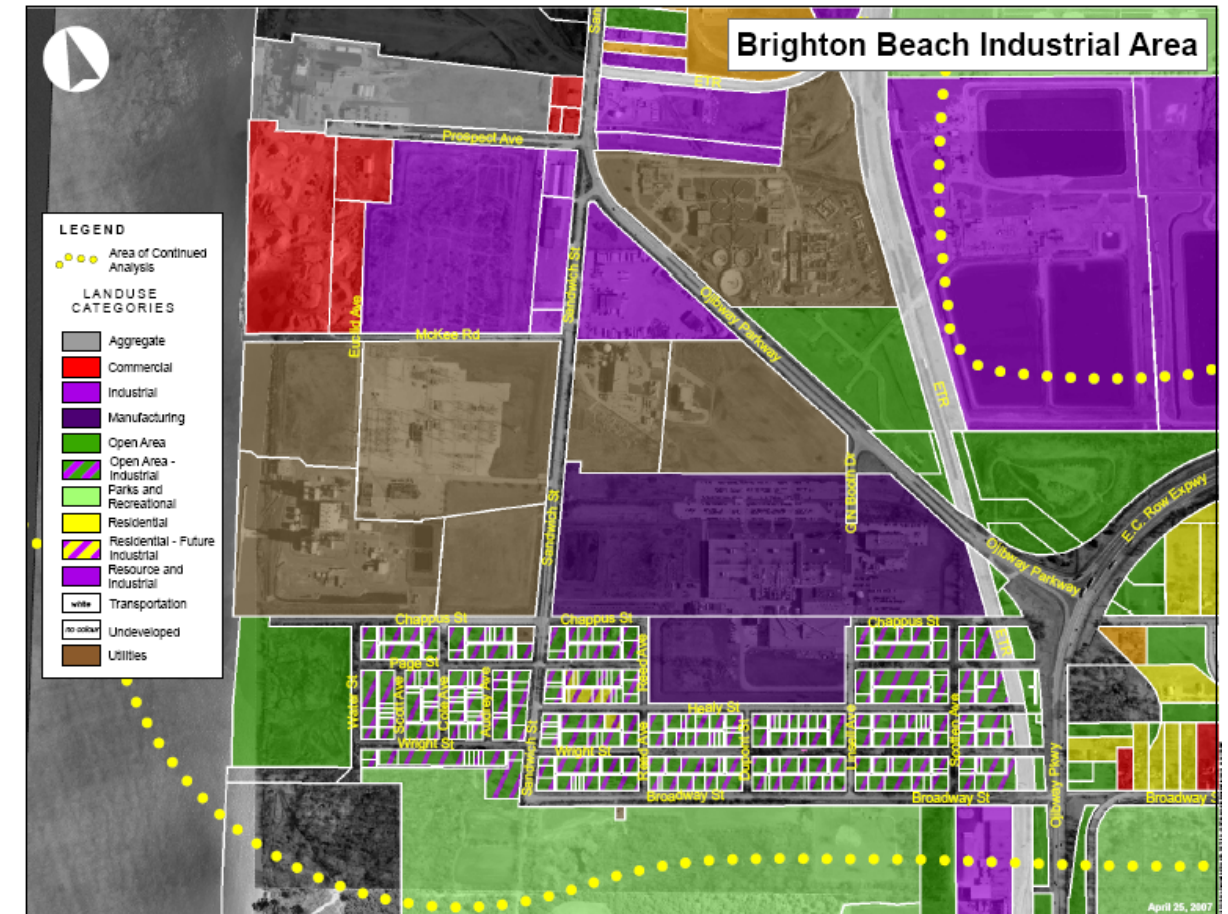


Brighton Beach Industrial Area

The Brighton Beach Industrial area is generally defined as the area bounded by Ojibway Parkway to the east, Broadway Street to the south, the Detroit River to the west, and Chappus Street to the north. The Brighton Beach area was a former residential neighbourhood, comprised of approximately 100 single-family homes surrounded by various industrial land uses. Beginning in the 1970's, the City of Windsor began purchasing the homes in the Brighton Beach area to assemble the land for a future industrial park. The Brighton Beach area is mostly vacant; however approximately half a dozen occupied homes and the original residential street network remains. The Brighton Beach area has been rezoned to allow for industrial uses.

North of the Brighton Beach area is the Nemark Plant, an automotive parts manufacturing facility, and the Windsor Power Plant. Northwest of Brighton Beach is the Ontario Power Generation Brighton Beach Power Station and Hydro One Keith Transformer Station. To the south is the Ojibway Black Oak Prairie, an Area of Natural or Scientific Interest (ANSI) that is protected from development (see Exhibit 7.18).

EXHIBIT 7.18 –BRIGHTON BEACH INDUSTRIAL AREA

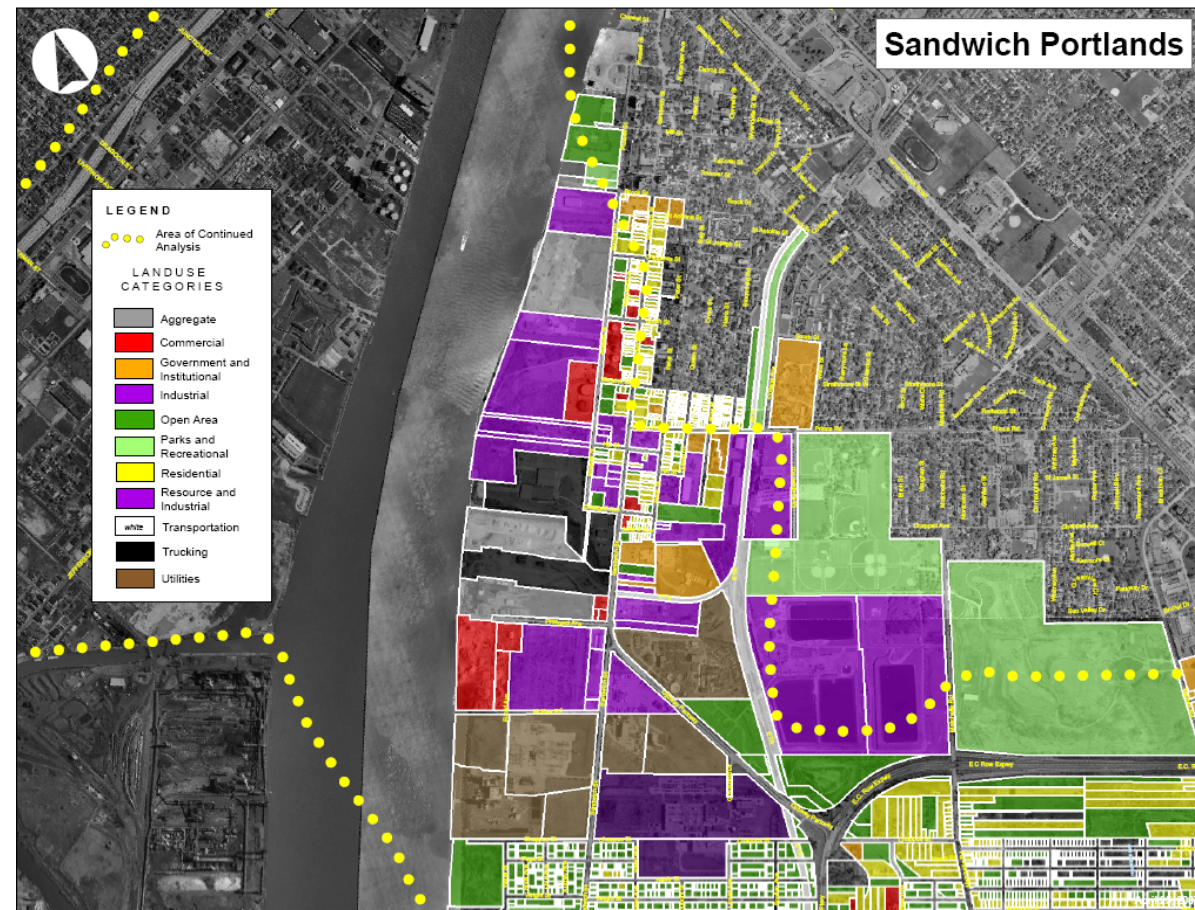


Sandwich Portlands

The Sandwich Portlands are located west of Sandwich Street, south of Brock Street, north of Prospect Avenue and adjacent to the Detroit River. The Portlands are adjacent to Sandwich Towne, a largely residential and historic area in the City of Windsor that was originally established in the early 1700s. The historic centre of Sandwich Towne is the intersection of Bedford and Brock Streets, where St. John's Church and Cemetery and Mackenzie Hall, built in 1796, are still located. The retail core area of Sandwich Towne (Mill Street and Sandwich Street) is an area identified within the Olde Sandwich Towne Community Planning Study as a priority area for heritage-compatible infill development. It is seen as an area where historic design guidelines could be developed to protect views and vistas, facades, streetscapes, and other features that area unique to Sandwich Towne.

Sandwich Towne is also surrounded by industrial land uses including the Nemark Plant, the Windsor Power Plant, Ontario Power Generation Brighton Beach Power Station, and Southwestern Sales, an aggregate storage company. Located along the waterfront is the Sandwich Portlands, an industrial area that contains several water-dependent businesses. The Sandwich Portlands are designated an industrial area that allows for industrial and business uses that require direct water access, multi-modal transportation facilities, docking facilities or dry docks (see Exhibit 7.19).

EXHIBIT 7.19 –BRIGHTON BEACH INDUSTRIAL AREA



major criteria: the degree to which a site will contribute to our understanding of the past (its cultural, historical or scientific value); the relative rarity or commonness of similar sites locally or regionally; its productivity or richness in terms of the artifacts it contains; and the degree to which it has been disturbed by more recent land uses or natural processes.

“Value as a public resource” refers to the degree that a site has intrinsic value to an enhanced understanding and appreciation of Ontario’s past on the part of the general public.

“Value to a community” refers to whether the site has intrinsic value to a particular community, First Nation or other group.

Stage 1 and preliminary Stage 2 archaeological assessments of the Area of Investigation were undertaken from 2006 to 2008. The Area of Investigation is located within the Area of Continued Analysis, but is focused on the practical crossing, plaza and access road alternatives discussed in Chapter 8 of this report.

The Stage 1 assessment documented the archaeological and land use history of the area and its current geography and topography, in order to assess the potential for archaeological resources. The Stage 2 systematic field assessment investigated all areas with archaeological potential within the Area of Investigation, and for which permission to enter had been obtained.

The lands that were subject to archaeological assessment were assigned survey priorities (Priorities 1 to 5, with 1 being the highest), as summarized below:

- Priority 1 lands were those lands in close proximity to the E.C. Row and Lucier sites at the intersection of Huron Church and E.C. Row, as well as two large ploughed properties at Highway 401 which, during the summer of 2006, were at optimum surface condition (minimal crop growth) for pedestrian survey.
- Priority 2 lands were lands with potential for the presence of pre-contact archaeological sites in core areas common to all alternatives.
- Priority 3 lands were those lands which could be surveyed without further prior research and which would enable archaeology to be considered meaningfully during the comparative evaluation of practical alternatives (i.e., areas that represent the real choice between practical alternatives).
- Priority 4 lands were generally located in the western portion of the Area of Investigation, plaza and crossing areas which required additional background historical/map research prior to the start of field survey, due to the long history and intensive land use of the properties. In the eastern portion of the area of investigation, Priority 4 lands were identified that have a potentially higher likelihood of site integrity (relative to Priority 5) that were not assigned to Priority 1, 2, or 3.
- Priority 5 lands were, for the most part, those with a lower potential for archaeological site integrity, together with some additional marginal lands in the eastern portion of the area of investigation.

The survey priorities were based on expert judgment with respect to potential for the presence of archaeological sites, the need to identify significant sites as soon as possible in areas common to all of the practical alternatives, and the need to gather sufficient information to contribute meaningfully to the evaluation of practical alternatives with respect to potential impact to archaeological sites and areas of archaeological potential. See Exhibit 7.20 for Priority 1 through 5 lands originally identified for Stage 2 archaeological assessment.

7.4 Cultural Heritage (Built Heritage and Cultral Landscapes) and Archaeology

This section provides an overview of archaeological and heritage resources that are existing within the Area of Continued Analysis. For further details, the reader is referred to the following reports:

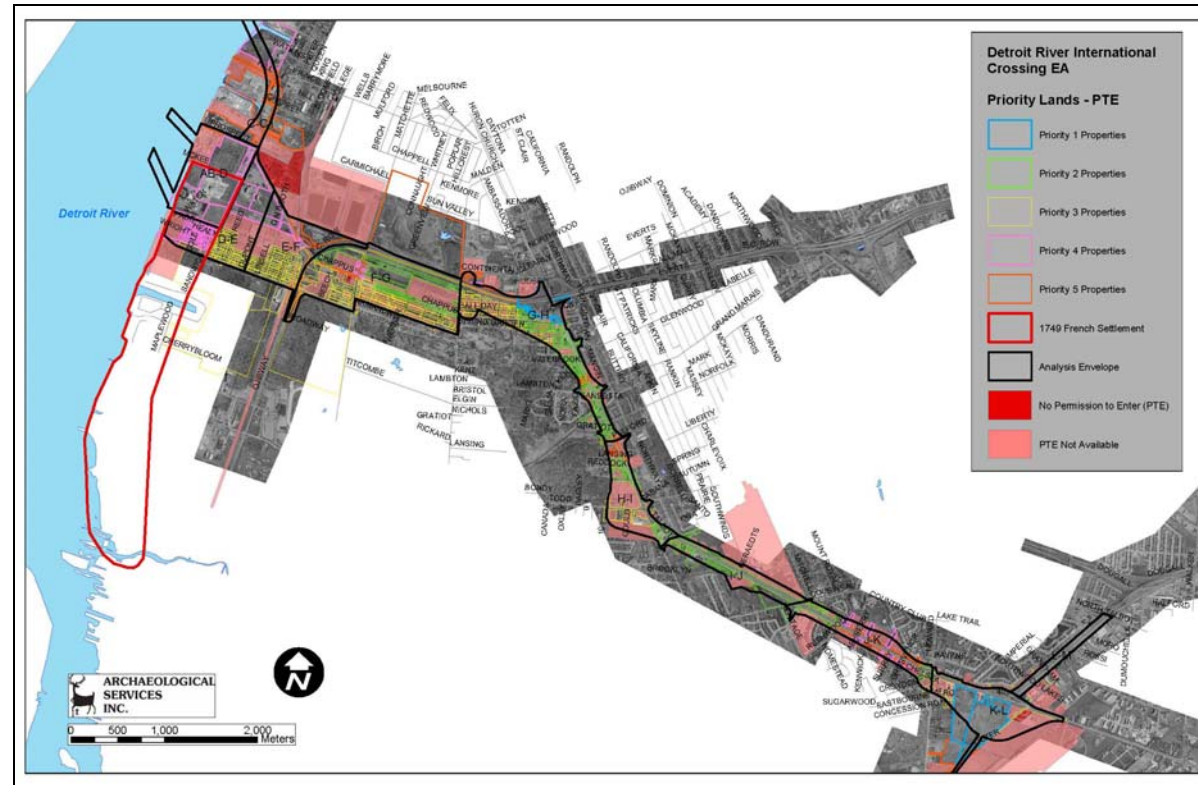
- *Draft Practical Alternatives Evaluation Working Paper – Archaeology (April 2008);*
- *Stage 2 Archaeological Assessment of the Detroit River International Crossing (October 2008); and*
- *Draft Practical Alternatives Evaluation Working Paper – Cultural Heritage (April 2008).*

7.4.1 Archaeological Resources

The process of assessing cultural heritage value is based on a number of overlapping considerations that are applied on a case-by-case basis. These considerations fall into three basic categories: information value, value as a public resource, and community value.

“Information value” refers to the likelihood that investigation of a site will contribute to an increased understanding of the past. Such an assessment must be carried out through consideration of several

EXHIBIT 7.20 – PRIORITY 1 THROUGH 5 LANDS IDENTIFIED FOR STAGE 2 ARCHAEOLOGICAL ASSESSMENT



METHODOLOGY

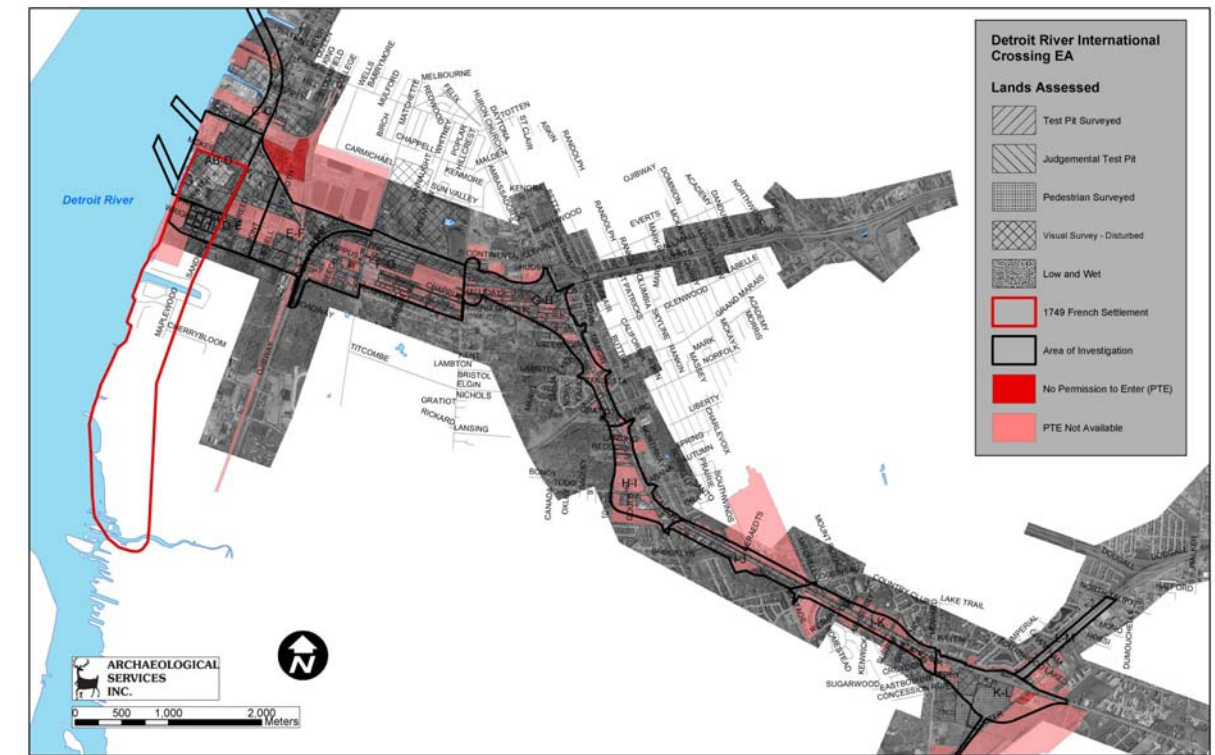
The Stage 2 archaeological assessment involved the documentation and inventory of archaeological resources within the Area of Investigation, and utilized two types of survey techniques: pedestrian and test pit. The lands assessed are mapped by survey method in Exhibit 7.21.

Pedestrian survey, employing a five metre transect interval, was conducted on lands with open surface visibility (e.g. lands that were ploughed, or with open, immature crops, and well-weathered), and it involved the location, mapping and collecting of artifacts observed on the surface. When artifacts were encountered, a 20 m radius was intensively surveyed at 1 metre intervals.

Test pit survey, employing a mixture of 5 m transect intervals and judgemental sampling, was conducted on lands with closed surface visibility (e.g. scrub farmland, windrows, lands within forest or valley floor, or with dense, mature crop), and it involved the location, mapping and collection of artifacts by shovel test pitting. Soil fills of all test pits were screened through 6-millimetre mesh to facilitate the recovery of artifacts and all test pits were back filled. When artifacts were encountered, the positive test pit was surrounded by additional test pits within 2.5 m in the eight cardinal directions.

The Universal Transverse Mercator (UTM) grid coordinates of all sites and findspots were recorded using a hand-held GPS unit tied to the 1927 North American Datum (NAD27).

EXHIBIT 7.21 – PRIORITY 1 THROUGH 5 LANDS ASSESSED BY METHOD OF SURVEY



SURVEY COVERAGE

Permission to Enter (PTE) was originally obtained for this EA study in May 2006. During 2006 and 2007, 100 per cent of all Priority 1 lands in the Area of Investigation were assessed. There were no outstanding properties that required permission to enter for Priority 1. One hundred percent of all Priority 2 lands with PTE were surveyed. Of the remaining Priority 2 lands identified, PTE was either not granted or the PTE form was not returned. Ninety-eight percent of all Priority 3 lands with PTE were surveyed. Of the remaining Priority 3 lands identified, PTE was either not granted or the PTE form was not returned. Ninety-nine percent of all Priority 4 lands with PTE were surveyed. Of the remaining Priority 4 lands identified, PTE was either not been granted or the PTE form was not returned. Ninety-nine percent of all Priority 5 lands with PTE were surveyed. Of the remaining Priority 5 lands identified, PTE was either not granted or the PTE form was not returned. In 2006 and 2007, there were a total of 496 properties surveyed.

In 2008, PTE was requested from properties that required further investigation based on previous testing and / or that were within the refined region of Technically and Environmentally Preferred Alternative. From this, there were 146 properties surveyed. There are 260 outstanding properties (29 per cent) that await permissions to enter or have other issues that require resolution prior to finalizing the assessment.

Table 7.12 summarizes the properties that were assessed from 2006 to 2008, as well as those that have not been surveyed.

TABLE 7.12: SUMMARY OF PROPERTY ASSESSMENTS TO SEPTEMBER 30, 2008

	2006/2007		2008		Total	
	#	%	#	%	#	%
Assessed Properties	496	55	146	16	642	71
Outstanding	0	0	260	29	260	29
Total Properties	496	55	406	45	902	100

HISTORICAL CONTEXT

Stage 1 archaeological assessment of Priority 4 and 5 lands in the western portion of the Area of Investigation included a review of the historical information available and a further review of the City of Windsor Archaeological Master Plan (CRMGL 2005). Historical information revealed that the shore of the Detroit River has a long history of human occupation. Euro-Canadian occupational history is well documented from the mid-eighteenth century to present times.

The first detailed French map of the south (Ontario) shore was not produced until the mid-eighteenth century. Entitled “Carte de la Riviere Du Detroit”, this map was published by Chaussegros De Lery in Paris in 1749. It showed the first “nouvelle habitation française de 1749” with the land divided along the river into the long, narrow “seigneurial” allotments characteristic of the French ancien regime. A few farms were somewhat larger, such as a tract of approximately 700 metres in width occupied by Mr. Le Chevalier de Longueuil. The main area of the “nouvelle habitation” was situated along the Detroit River south of the area that would later become the old town of Sandwich. This area was known as Petite Côte.

According to the City of Windsor Archaeological Master Plan (CRMGL 2005:2-16), “European settlement on the south shore of the Detroit River began in 1749 when the governor at Quebec sponsored the movement of farming families to the area in order to promote Detroit as a granary for more distant outposts.” The settlers initially took up lots fronted onto the river in the Petite Côte area between the communities of Sandwich and Turkey Creek. Within a few years, this settlement had extended south well past Turkey Creek.

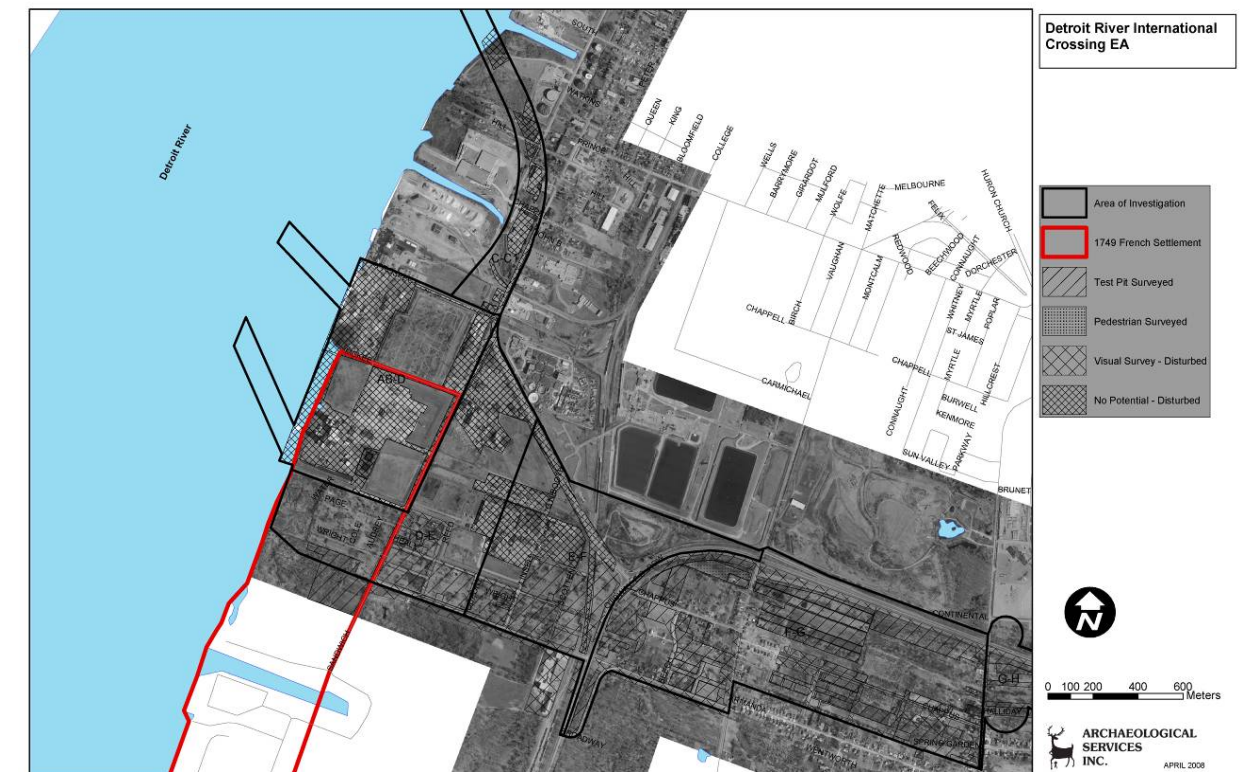
After the British Conquest of 1760 and after the American Revolutionary War, British names began to appear on landowners lists of the circa 1800 survey. Not until the nineteenth century were the inland areas of the township surveyed, using the standard British grid system where possible.

According to the City of Windsor Archaeological Master Plan (CRMGL 2005:2-17), although most of the French farmstead sites lie within areas that have undergone extensive nineteenth century development, none of them have ever been properly examined as archaeological sites. Furthermore, communities such as Brighton Beach, Ojibway and LaSalle may retain the most potential. As Windsor’s French settlement is the earliest of its kind in Ontario, the search for intact eighteenth century French sites, which may include the remains of building footings, foundations and the remnants of palisades, is of potentially significant heritage value and interest.

Exhibit 7.22 illustrates the location of the eighteenth century French Settlement in relation to the Area of Investigation, the identified Priority 2, 3, 4 and 5 lands, lands that have been assessed in relation to the general location of the plaza and crossing alternatives, and areas identified as having no potential due to disturbance. In addition, a series of later historical maps (1877 Walling Historical Atlas; the 1905 McPhillips City of Windsor Map; and the 1967 Pathfinder, Metropolitan Windsor Map) are used to

illustrate the changing landscape from the 1870s to 1960s within Priority 4 and 5 lands in the western portion of the Area of Investigation (Exhibits 7.23 to 7.25).

EXHIBIT 7.22 – LOCATION OF 1749 PETITE CÔTE FRENCH SETTLEMENT IN RELATION TO AREAS DEFINED AS HAVING NO POTENTIAL IN THE PLAZA AND CROSSING ALTERNATIVE LOCATIONS



Further investigation of the eighteenth century French settlement area, where it intersects with the Priority 3 and 4 lands, has narrowed the area of interest by confirming additional areas lacking archaeological integrity and subjecting residual areas to Stage 2 test-pit survey. The Area of Investigation is bounded in the north by McKee Avenue (now the northern limit of the Brighton Beach Generating Station), in the west by the Detroit River, in the south by the limits of the Area of Continued Analysis (essentially the westerly extension of Broadway Boulevard), and in the east by Sandwich Street. The land immediately to the south of this area has been designated as the Ojibway Industrial Park by the City of Windsor¹¹.

The northern half of this area, north of Chappus Street, is the Brighton Beach generating station. Opened in 2004, this facility was a joint project by ATCO Power Canada Ltd. and Ontario Power Generation Inc. to re-develop the former J. Clark Keith power plant site¹². The J. Clark Keith power plant was originally a coal-fired plant that began production in 1951¹³. Eventually refitted to burn

¹¹ Dillon Consulting Limited, Next Ideas Inc., EDP Consulting, and Lapointe Consulting. 2007 City of Windsor Official Plan Update: Looking Back Summary Report – Economic Conditions. <http://howardcorridoresr.city.windsor.on.ca/>

¹² ATCO Power Canada Ltd. 2004 Brighton Beach Power Ltd. Official Opening – October 22, 2004 – Background. http://www.atcopower.com/Media_Centre/News_Releases/2004/ATCOPower-BrightonBeach-Background.pdf

¹³ Ontario Power Generation Inc. 2007 Historical Timeline. <http://www.opg.com/education/whatwedo/HistoricalInfo%20-%20for%20merge.pdf>

natural gas, the plant was closed in 1984 and demolished in 1997¹⁴. In 1990, Hugh Daechsel, then with the Cataraqui Archaeological Research Foundation, carried out a "Phase 1 Evaluation of Heritage and Archaeological Resources" of the J. Clark Keith power plant site, concluding that the property was very disturbed and did not warrant any further archaeological investigation. A 1955 aerial photograph of the site (Exhibit 7.23) illustrates the original extent of disturbance on the property. When compared with the current extent of disturbance, associated with the Brighton Beach generating station (Exhibit 7.24), it becomes clear that only two small areas may have retained any archaeological integrity, and these were subjected to test pit survey, as illustrated in Exhibit 7.24. No archaeological remains were encountered in these areas.

South of Chappus Street, a combination of judgmental and systematic test pit survey has been carried out within the precincts of a former residential subdivision that also appears in the 1955 aerial photograph of the area (Exhibit 7.23). No archaeological remains were encountered therein. However, systematic test pit survey to the south of this subdivision has yielded archaeological remains. Designated sites H16 and H17, together with nearby site H18, yielded mid-nineteenth century artifacts that have been tentatively attributed to farmsteads established in that area circa 1861.

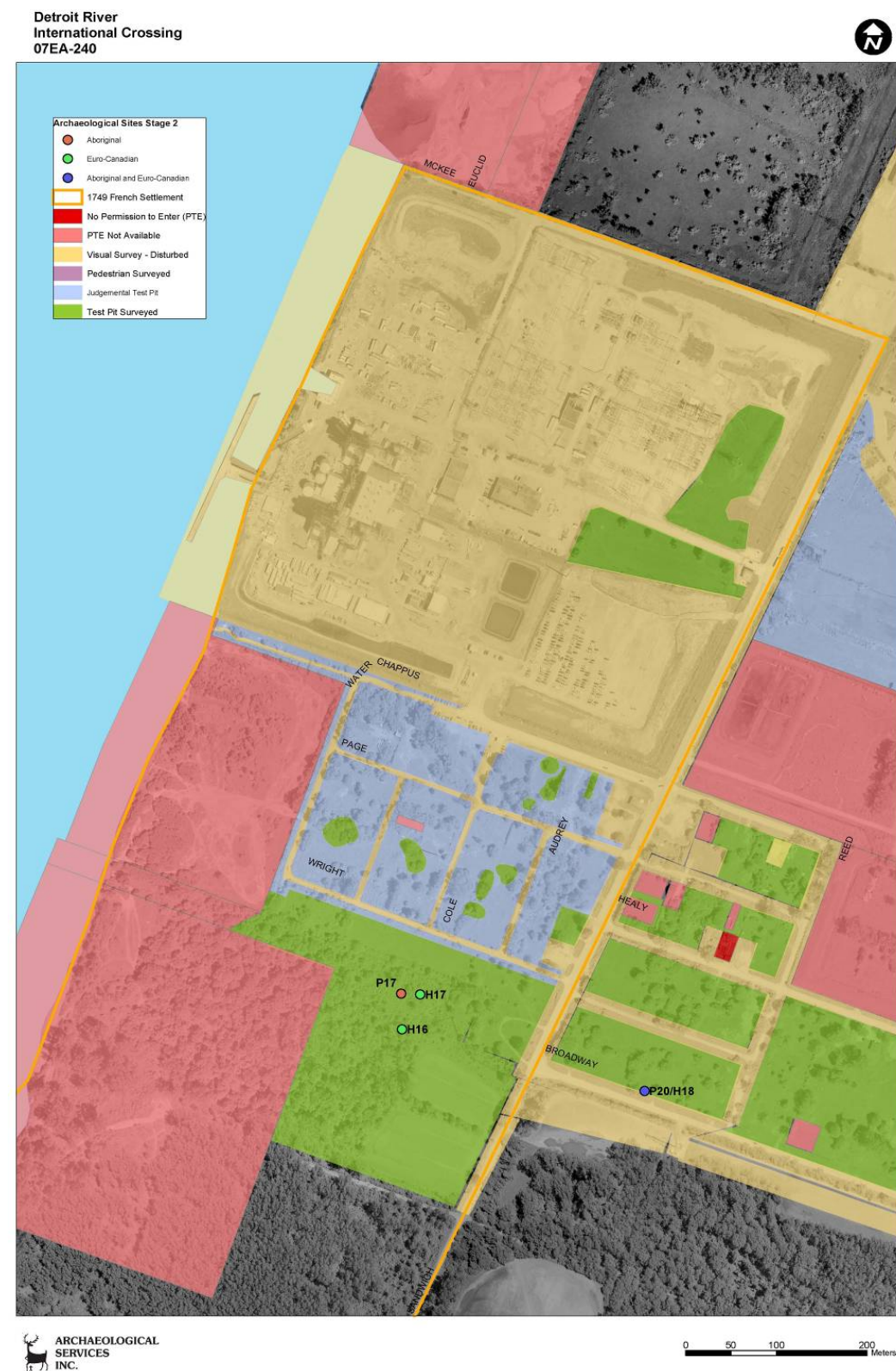
The remainder of the French settlement area, located south of Chappus Street and west of Water Street, comprises an area where there had also once been some modern residential occupation, as illustrated in Exhibit 7.23. Situated along the waterfront, this area exhibits the highest potential for both eighteenth and nineteenth century occupation, as suggested by early maps (see Exhibit 7.24).

¹⁴ ATCO Power Canada Ltd. 2004 Brighton Beach Power Ltd. Official Opening – October 22, 2004 – Backgrounder.
http://www.atcopower.com/Media_Centre/News_Releases/2004/ATCOPower-BrightonBeach-Backgrounder.pdf.

EXHIBIT 7.23 – J. CLARK KEITH POWER STATION AND ENVIRONS, 1955 (ONTARIO DEPT. LANDS & FORESTS 1955)



EXHIBIT 7.24 – FRENCH SETTLEMENT AREA SHOWING BRIGHTON BEACH GENERATING STATION (FORMER J. CLARK KEITH POWER PLANT)



SURVEY RESULTS

During the 2006 and 2007 surveys, there were 43 archaeological components located within the Area of Investigation, including 23 Euro-Canadian and 20 Aboriginal assemblages. Summary details on these sites are provided in Table 7.13. Appendix C of the *Draft Practical Alternatives Evaluation Working Paper – Archaeology (April 2008)* contains a summary description of each site identified during the 2006 and 2007 field seasons.

All artifacts recovered from these sites were processed. Data analysis includes the evaluation of each site with respect to those that require further investigation through additional surface or sub-surface testing in order to assess the cultural heritage value of the individual archaeological site. Included in the data analysis is the registration of archaeological sites within the *Ontario Archaeological Sites Database (OASD)* by assigning numbers within the Borden system.

Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 kilometres east to west, and approximately 18.5 km north to south. A four-letter designator references each Borden block, and sites within a block are numbered sequentially as they are found. The study area under review is located within the AbHr and AbHs Borden blocks.

During the recent 2008 surveys, there were 23 archaeological components located within the Area of Investigation (more specifically, within the location of the Recommended Plan), including nine Euro-Canadian and 14 Aboriginal assemblages. Summary details on these sites are provided in Table 7.14. *Stage 2 Archaeological Assessment of the Detroit River International Crossing (October 2008)* contains a summary description of each site identified during the 2008 field seasons.

Archaeological components identified throughout the fieldwork from 2006 to 2008 are of two principal types: indeterminate aboriginal sites with few diagnostic artifacts and Euro-Canadian domestic sites. The aboriginal sites consist almost exclusively of small amounts of lithic debitage. Indeed, to date only one diagnostic artifact has been recovered. This is a Middle Iroquoian period (*ca* 1350 A.D.) projectile point recovered in association with a small lithic scatter. The Euro-Canadian sites consist primarily of scatters of domestic refuse. Artifact analysis and archival research for these sites indicate that almost all are associated with the locations of 19th century British farming settlement.

TABLE 7.13: SUMMARY OF ARCHAEOLOGICAL SITES FOUND TO SEPTEMBER 30, 2008

	2006/2007		2008		Total	
	Aboriginal	Euro-Can	Aboriginal	Euro-Can	Aboriginal	Euro-Can
Recommended for Clearance	2	12	10	6	12	18
Stage 3 Recommended	18	11	4	3	22	14
Total Sites	20	23	14	9	34	32

7.4.2 Built Heritage and Cultural Landscapes

FIELD REVIEW RESULTS

The majority of the land adjacent to the Detroit River is currently being used for industrial purposes, with the exception of Black Oak Heritage Park and the land to the north and northwest of the park, in the Brighton Beach area. This land, extending to the west from Ojibway Parkway south of Chappus Street, north and west of Black Oak Heritage Park, is generally overgrown or wooded, and, in the northern part of it, between Chappus Street and Broadway Street and between Chappus Street and Wright Street, there is a subdivision-like arrangement of dirt streets surrounded by regenerated vegetation. This area, known locally as Brighton Beach (CLU 2), is an abandoned residential area that still contains a small concentration of nineteenth and early twentieth century heritage resources (BHF 15-17).

Within the industrial-use area north of Brighton Beach and south of Sandwich Towne, a cairn has been erected at the junction of Prospect Avenue and Sandwich Street / Ojibway Parkway by the *Historic Sites and Monuments Board of Canada* to commemorate a National Historic Event (BHF 12).

North of Ojibway Parkway, between Sandwich Street and the Essex Terminal Railway, and south of Sandwich Towne lies the Lou Romano Water Reclamation Plant. North of this industrial area, the landscape is a mix of industrial properties; relatively open areas of lawn, park, or less-intensive commercial/institutional/residential land use; and dense residential development. The southernmost part of Sandwich Towne is within the ACA, including two residential structures (BHF 13 and BHF 14) close to the shoreline.

Adjacent to the ACA is the core of Sandwich Towne (CLU 3) including the Sandwich First Baptist Church, a National Historic Site, at 3652 Peter Street, between Watkins Street and Prince Street. Two plaques have been placed at this site, one placed by the *Historic Sites and Monuments Board of Canada* and the other by the *Ontario Heritage Foundation*. The former Lido Venice Tavern at 3885 Sandwich Street was destroyed by fire in the summer of 2006. East of the Essex Terminal Railway and west of Huron Church Road north of Ojibway Parkway and E.C. Row Expressway the field review area features a variety of land uses.

The majority of the land immediately north of Ojibway Parkway and E.C. Row Expressway is currently used for industrial purposes and Malden Park, between Matchette Road and Malden Road south of Chappell Avenue is a former landfill site. East of Huron Church Road, south of E.C. Row Expressway, the land subject to field review is almost entirely an intensively-developed post 1960 residential area, with the exception of a number of small parks and institutional properties.

Huron Church Road itself is, for the most part, flanked by small industrial and commercial properties. There are a small number of heritage resources along the corridor including a 1961 Royal Canadian Legion Branch (BHF 2) and an early farmhouse perched on a rise above the convergence of Talbot Road and Huron Church Line (BHF 1). The land south of E.C. Row Expressway and west of Huron Church Road is predominantly open space, although residential development is evident on Spring Garden Road, Malden Road and Armanda Street. Two of the Malden Road properties are dated to the nineteenth century settlement of the area (BHF 10 and BHF 11) and one of them is on the Windsor Heritage Inventory. Within the relatively undeveloped area west of Huron Church Road and south of

E.C. Row Expressway, and in many places remnant tree lines indicate the boundaries of long, narrow agricultural fields laid out according to the French seigneurial system.

IDENTIFIED HERITAGE RESOURCES

The ACA is largely free of significant cultural heritage resources, with the exception of Sandwich Towne (CLU 3). The remaining features are considered to be low in significance.

Within the ACA there are twenty (20) built heritage features and three (3) cultural landscapes. Tables 7.14A and 7.14B provide a summary of identified heritage features while Exhibits 7-25A and 7-25B show their location. Of these, one property (BHF 11) is listed on the City of Windsor's Heritage inventory and one monument (BHF 12) was erected by the *Historic Sites and Monuments Board of Canada* to commemorate the Capture of Detroit. Eight BHF's pre-date 1900 (BHF 1, BHF 10, BHF 11, BHF 14, BHF 17, BHF 18, BHF 19 and BHF 20) and are related to agricultural settlement. Eight field-identified built heritage features were constructed in the first third of the twentieth century and are residences of the same general building type and era (BHF 3, BHF 4, BHF 5, BHF 6, BHF 7, BHF 8, BHF 9 and BHF 13). These houses represent the first suburban infill of rural agricultural lands in the early twentieth century. Also of interest is Branch 594 of the Royal Canadian Legion (BHF 2) which was constructed in the early 1960s.

The three cultural landscapes identified within the ACA comprise an unconfirmed tunnel associated with the underground railway in Sandwich Towne (CLU 1), the abandoned Brighton Beach subdivision (CLU 2) and the historic Sandwich Towne (CLU 3). Although no significant portion of the historic Sandwich Towne is within the ACA, Sandwich as a whole is heritage sensitive area. Therefore potential impacts such as the introduction of physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting are an important consideration for this area.

TABLE 7.14A – IDENTIFIED CULTURAL HERITAGE RESOURCES IN THE AREA OF CONTINUED ANALYSIS – CULTURAL LANDSCAPE UNITS (CLU)

FEATURE	ADDRESS	FEATURE TYPE	STATUS	APPROX. AGE
CLU 1	Chappel Street and Russel Street	Tunnels – unconfirmed oral report	Local lore	Pre-1900
CLU 2	Water Street to the west, Chappus to the north, Scotten to the east, and Broadway/Wright to the south	Brighton Beach housing subdivision	Field	Abandoned
CLU 3	Sandwich Towne	Historic settlement	Field	Pre-1900

TABLE 7.14B - IDENTIFIED CULTURAL HERITAGE RESOURCES IN THE AREA OF CONTINUED ANALYSIS – BUILT HERITAGE FEATURES (BHF)

FEATURE	ADDRESS	FEATURE TYPE	STATUS	APPROX. AGE
BHF 1	2746 Talbot Road	Farmhouse	Field	1860-1880
BHF 2	3920 Huron Church Line	Legion	Field	1961
BHF 3	3905 Huron Church Line	House	Field	1901-1939
BHF 4	3495 Huron Church Line	House	Field	1901-1939
BHF 5	2765 Reddock Avenue	House	Field	1901-1939
BHF 6	2261 Spring Garden Road	House	Field	1901-1939
BHF 7	2310 Spring Garden Road	House	Field	1901-1939
BHF 8	2290 Spring Garden Road	House	Field	1901-1939
BHF 9	2284 Spring Garden Road	House	Field	1901-1939
BHF 10	4784 Malden Road	House	Field	Pre-1900
BHF 11	4688 Malden Road	House	Windsor Inventory	Pre-1900
BHF 12	Ojibway Parkway at Sandwich Street	Monument	Federal	Plaqued in 1927
BHF 13	261 Hill Street	House	Field	1901-1939
BHF 14	3769 Russell Street	House	Field	Pre-1900
BHF 15	325 Page Street	House	Field	1901-1939
BHF 16	332 Healy Street	House	Field	Pre-1900
BHF 17	354 Healy Street	House	Field	Likely Pre-1900
BHF 18	2090 Spring Garden Road (moved from another location)	House	Field	Pre-1900
BHF 19	2369 Spring Garden Road	House	Field	Likely Pre-1900
BHF 20	1649 Chappus Road (original house integrated)	House	Field	Pre-1900

EXHIBIT 7.25A – CULTURAL HERITAGE FEATURES IN THE ACA

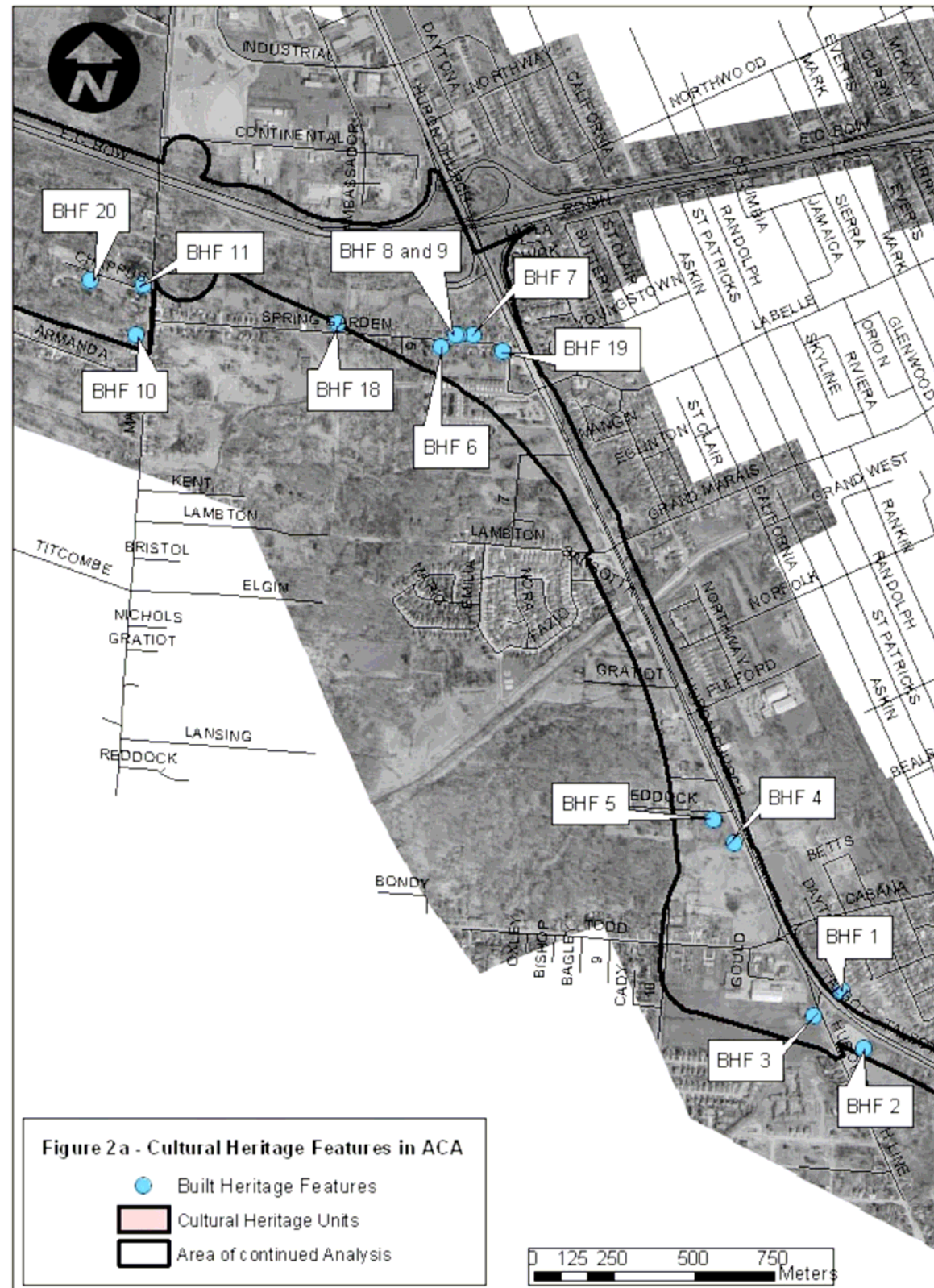
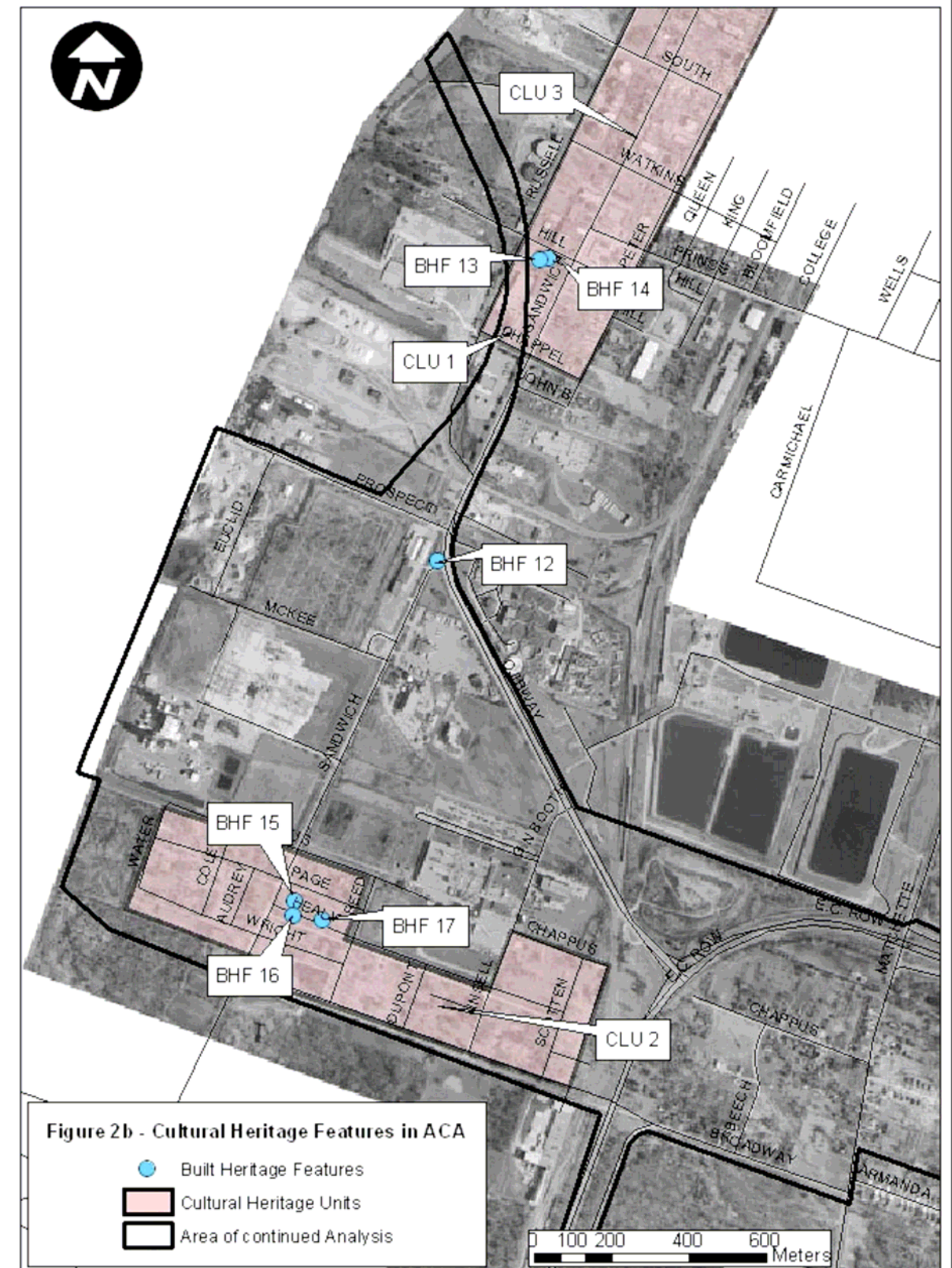


EXHIBIT 7.25B – CULTURAL HERITAGE FEATURES IN THE ACA



7.5 Natural Environment

Identification of natural heritage features such as fisheries, vegetation, wildlife, insects and designated natural areas was an important part of this study. The analysis of natural heritage features entailed collection and review of existing information, personal communications with local experts and detailed and multi-season field investigations. An Area of Investigation (AOI) located within the Area of Continued Analysis (ACA) was defined for each biological discipline based the level of detail of secondary source information, the area of influence of the project and the level of effort required for field investigations.

This section provides an overview of existing conditions of the natural environment within the Area of Continued Analysis. For further details, the reader is referred to *the Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*.

7.5.1 Vegetation and Vegetation Communities

DATA COLLECTION

The AOI for vegetation and vegetation communities includes all lands located within the maximum footprint area of the combined practical alternatives and adjacent lands located within 120 m of the right-of-way. This area corresponds approximately with the ACA. The study team investigated all vegetation communities located within the AOI to classify vegetation communities, inventory plants and confirm the presence or absence of species at risk.

The geographical extent, composition, structure and function of vegetation communities were identified through air photo interpretation and field investigations. Air photos were interpreted to determine the limits and characteristics of vegetation communities. In the office, a coding system was used to identify each polygon according to its general location. These polygons were confirmed, refined and classified through field investigations. Data collection sheets, including a checklist of vascular plants likely to occur in the AOI and vegetation community forms, were prepared in the office for completion in the field. Botanical inventories prepared previously for Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas (ESAs), Evaluated Wetlands and Candidate Natural Heritage Sites (CNHSs) were reviewed to familiarize the botanists with floral composition of the AOI and to assist with field identification. Information collected in the field was transcribed and verified in the office.

Field investigations of natural/semi-natural vegetation were conducted by LGL Limited on: April 17-21, 2006; May 15-19, 2006; June 12-16, 2006; July 24-28, 2006; August 21-24, 2006; and, October 2-6, 2006. Field crews typically consisted of two to four botanists working in tandem. Vegetation communities were surveyed several times throughout the year to capture the optimal growing season for the flora present.

Vegetation communities were classified according to the *Ecological Land Classification (ELC) for Southern Ontario: First Approximation and Its Application*¹⁵. The vegetation communities were sampled using a plotless method for the purpose of determining the general composition and structure of the vegetation. Plant species status was reviewed for Canada (Committee on the Status of

Endangered Wildlife in Canada (COSEWIC 2006), Ontario (Committee on the Status of Species at Risk in Ontario [COSSARO 2006] and for Essex County¹⁶. Vascular plant nomenclature follows Newmaster et al.¹⁷, with a few exceptions.

Every attempt was made to identify vascular plants in the field. Where a conclusive identification could not be made in the field, plant material was collected for examination in the laboratory. A GPS unit was used to record the location of species at risk whose identity could be confirmed in the field. Many species at risk and representative vegetation communities were also photographed for verification purposes.

DATA ANALYSIS

Vegetation Species

A total of 618 vascular plant taxa were recorded in the AOI. One-hundred and eighty-six taxa or 30 per cent of the recorded flora are considered introduced and non-native to Ontario. Sixty-three species are considered Extremely Rare, Very Rare or Rare within the province (S1-S3) and eight are regulated under the federal *Species At Risk Act* (SARA) and the new *Ontario Endangered Species Act* (OESA), 2007. A list of vascular plants identified in the AOI is presented in Appendix B of the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*.

Vegetation Communities

Vegetation communities located in the AOI consist primarily of recently disturbed communities, including Cultural Woodlands (CUW1), Cultural Meadows (CUM1-1), Cultural Thickets (CUT1) and Cultural Savannahs (CUS1). In the past, these areas would have been dominated by a mixture of tallgrass prairie and natural savannah. As a result of anthropogenic influences, there has been a reduction in the frequency of fire, and an increase in agricultural activities and urban development. Non-prairie herbaceous plant species have invaded and now dominate the meadows and ground cover. Woody species have increased due to the lack of fire and now dominate in the form of CUW1, CUT1 and CUS1 communities. Despite the influence that humans have had on the composition and structure of the vegetation communities located within the AOI, remnant patches of Tallgrass Prairie (TPO2-1) exist on the periphery of the Ojibway Prairie Complex. The location of vegetation communities is presented in Exhibit 7-26. A detailed description of community types and their corresponding polygon codes is presented in Appendix C of the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*. The general structure and composition of the predominant vegetation community types are described.

Wooded Cultural Communities

CUW1 communities are dominated by a mixture of adventive woody species such as eastern cottonwood (*Populus deltoides* ssp. *deltoides*), Freeman's maple (*Acer X freemanii*) and Manitoba maple (*Acer negundo*) and they have less than 60 percent tree cover. CUS1 communities have a lower per cent tree cover at less than 35 percent and are made up of Manitoba maple, black walnut (*Juglans nigra*) and eastern cottonwood. CUT1 communities are clusters of shrubs, including gray dogwood (*Cornus foemina* ssp. *racemosa*), staghorn sumac (*Rhus typhina*) and common buckthorn

¹⁵ Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. OMNR, Southcentral Sciences Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

¹⁶ Oldham, M.J. 1993. Distribution and Status of the Vascular Plants of Southwestern Ontario. OMNR, Aylmer District Office, Aylmer Ontario.

¹⁷ Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray and M.J. Oldham. 1998. Ontario. Plant List. OMNR, Ontario Forest Research Institute, Sault Ste. Marie, Ontario, Forest Research Information Paper No. 123.

(*Rhamnus cathartica*). All three community types have a high percentage of species that are considered introduced and non-native to Ontario. Three Cultural Plantations (CUPs) are present in the AOI including planted red oak (*Quercus rubra*), eastern white cedar (*Thuja occidentalis*) and Scots pine (*Pinus sylvestris*).

Cultural Meadow

CUM1-1 communities consist of species that are typical of disturbed sites. Based on the species composition of these sites, it is likely that they are regularly mown (manicured) or ploughed. Grasses and invasive forbs, such as wild carrot (*Daucus carota*), common reed (*Phragmites australis*), tall goldenrod (*Solidago altissima* var. *altissima*), orchard grass (*Dactylis glomerata*), Canada goldenrod (*Solidago canadensis*) and Kentucky bluegrass (*Poa pratensis* ssp. *pratensis*) are dominant. Colonization of these areas by woody species is limited. Some of the cultural meadow communities were cultivated in the past.

Deciduous Forests

There was a wide range of successional stages in the deciduous forest communities in the AOI. Communities ranged from young through mid-aged to mature. Many of the forests contained a high percentage of native species, while others were dominated by non-native species. Deciduous forests occurred in both upland and lowland areas. Forests with dry to fresh soil conditions were dominated by black oak, white oak, shagbark hickory (*Carya ovata*), Manitoba maple and black locust (*Robinia pseudo-acacia*). Forests with fresh to moist soil conditions were dominated by American elm (*Ulmus americana*), red ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), black walnut, eastern cottonwood, sassafras (*Sassafras albidum*), pin oak, swamp white oak (*Quercus bicolor*) and Freeman's maple. Natural succession and anthropogenic disturbances have resulted in high forest diversity with a total of 12 ELC forest community types.

Tallgrass Prairie

A proportion of the meadow communities contains a greater abundance of early successional tallgrass prairie species. These meadows have the potential to be classified as either meadow or forb prairie, but there is no classification within the ELC manual for early successional forb prairie communities. Thus, a criterion was used to classify forb prairies as either CUM1-1 or TPO2-1 communities. This criterion was the amount of anthropogenic disturbance and the ratio of introduced to tallgrass species. The forb prairies in the AOI contain wild bergamot (*Monarda fistulosa*), ironweed (*Vernonia gigantea*), Canadian tick-trefoil (*Desmodium canadense*), gray-headed coneflower (*Ratibida pinnata*), rough-headed bush-clover (*Lespedeza capitata*), tall tickseed (*Coreopsis tripteris*), tall wild sunflower (*Helianthus giganteus*) and spiked blazing star (*Liatris spicata*). Conversely, the forb prairies contained a lesser proportion of tallgrass than in the tallgrass prairie communities. TPO2-1 communities have experienced the least amount of anthropogenic disturbance of the open communities found in the AOI. They contain a mixture of native tall grasses and prairie forbs, including Indian grass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Virginia culver's root (*Veronicastrum virginicum*), colic-root (*Aletris farinosa*), ironweed and tall cord grass (*Spartina pectinata*). Past fire occurrence is evident in many of the healthy TPO2-1 communities.

Groundwater is known to play an important role in sustaining the tallgrass prairie communities. Hydrogeological conditions in the AOI consist generally of shallow surficial sand, silt and fill over unsaturated clayey silt over saturated silty clay over bedrock. The tallgrass prairie communities are sustained by the surficial sand, silt and fill layer (surface aquifer) that is saturated by rainfall.

Percolation downwards from the surface aquifer through the unsaturated clayey silt (aquatard) to the deep aquifer (saturated clayey silt and bedrock) is very slow. The groundwater table in the surficial aquifer is located approximately 2 to 3 m below ground surface, depending on site-specific conditions and the amount of rainfall.

Oak Savannah and Woodland

One oak savannah community was found in the AOI and it was dominated by pin oak (*Quercus palustris*) and bur oak (*Quercus macrocarpa*). Two types of oak woodlands were encountered and they consist of black oak, white oak and pin oak. These communities contain many native drought resistant grasses and sedges, plus numerous tallgrass prairie forb species.

Wetlands

The wetlands in the AOI include swamps, marshes and open aquatic communities. The deciduous swamps are dominated by pin oak, Freeman's maple and eastern cottonwood. The meadow marshes are composed of common reed, European beggar-ticks (*Bidens tripartita*) and devil's beggar-ticks (*Bidens frondosa*), while the shallow marshes are made up of narrow-leaved cattail (*Typha angustifolia*). There was one small Open Aquatic (OAO) community that had an algal bloom in the mid-summer, which cleared up by the late summer.

Species at Risk

Eight species listed as Special Concern, Threatened or Endangered by COSEWIC or COSSARO and regulated under the SARA and the new OESA were recorded during field investigations (colic-root, willowleaf aster, Kentucky coffee-tree, spiked blazing star, Shumard oak, prairie rose, Riddell's goldenrod and butternut). Two species, summer snowflake, considered Globally Very Rare (G2) and butternut, considered Globally Rare to Uncommon (G3), were also recorded during field investigations. Sixty-three species considered Extremely Rare (S1), Very Rare (S2) and Rare to Uncommon (S3) according to the NHIC were observed during field investigations. S-ranks are a ranking system for a species status in Ontario and are also applied by the NHIC. Species with an S-rank of S1 to S3 are considered extremely rare, very rare or rare within the province and were used to limit the scope of the investigation.

A list of provincially rare plant species located in the AOI is presented in Section 2.3.1.3 of the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*.

Many of the vegetation communities identified in the AOI are considered Provincially Extremely Rare (S1), Provincially Very Rare (S2) or Provincially Rare to Uncommon (S3), while others and/or the same communities are considered Globally Extremely Rare (G1) or Globally Very Rare (G2) (NHIC 1997). Notable communities include:

- 24 Fresh-Moist Tallgrass Prairies (TPO2-1) (G2 and S1);
- Four Pin Oak Mineral Deciduous Swamps (SWD1-3) (G2 and S2S3);
- Three Dry-Fresh Black Oak Deciduous Forests (FOD1-3) (S3);
- Two Dry-Fresh Mixed Oak Deciduous Forests (FOD1-4) (S3S4);
- Two Fresh-Moist Black Walnut Lowland Deciduous Forests (FOD7-4) (S2S3);
- Two Fresh-Moist Black Oak-White Oak Tallgrass Woodlands (TPW2-1) (G2 and S1);

- One Dry-Fresh Oak-Hickory Deciduous Forest (FOD2-2) (S3S4);
- One Fresh-Moist Pin Oak-Bur Oak Tallgrass Savannah (TPS2-1) (G1 and S1); and
- One Fresh-Moist Pin Oak Tallgrass Woodland (TPW2-2) (G1 and S1).

A list of provincially significant vegetation communities located in the AOI ordered by S-rank is presented in Section 2.3.1.3 of the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*. Based on a review of secondary source information, it is likely that most of these rare vegetation communities and species are represented in the designated Ojibway Prairie Complex ANSI, although further field investigations in areas located outside of the AOI would be required to substantiate this opinion.

There were numerous vegetation communities that contain a high diversity of provincially rare (S1 to S3) species. Twenty-one vegetation communities contained 10 to 18 S1 to S3 species. Forty-three vegetation communities contained one to four S1 to S3 species. A complete list of vegetation communities and the species of rare plants identified in these communities is presented in the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*.

EXHIBIT 7.26 – VEGETATIVE COMMUNITIES WITHIN THE ACA



7.5.2 Molluscs and Insects

DATA COLLECTION

The Area of Investigation for molluscs and insects included the ACA and its vicinity. The study team screened the AOI and its vicinity for the presence or absence of rare molluscs and insects.

The mollusc and insect investigation was based on secondary source information collected in 2006 through literature searches, review of databases and personal communications with local experts. Data was requested and obtained via email, fax, letter, personal communications, and from published and unpublished literature. The following organizations were contacted directly for data:

- Department of Fisheries and Oceans Canada – Sarnia District Office and Burlington District Office (Great Lakes Laboratory for Fisheries and Aquatic Sciences);
- Environment Canada – Karner Blue Recovery Team;
- Ontario Ministry of Natural Resources – Natural Heritage Information Centre (NHIC), Peterborough and Chatham Area Office;
- Essex Region Conservation Authority;
- Ojibway Nature Centre;
- Toronto Entomology Association (Ontario Insects);
- Toronto Zoo;
- University of Guelph – insect collection, and entomology and mollusc researchers; and
- University of Windsor – fisheries and mollusc researchers.

Background data collected was reviewed and compiled into two databases (molluscs and insects), since all of the data received related to these two invertebrate groups. Nomenclature and taxonomy follows the *University of Guelph Insect Collection Ojibway Prairie Species List*, recent journal articles and the *Natural Heritage Information Centre (NHIC)*.

Federal and provincial rankings administered by COSEWIC and COSSARO were considered during the species review. Due to the lack of evaluations of invertebrate species by COSEWIC and COSSARO, “S-ranks” were also considered during the investigation as many more invertebrates have received an S-rank.

DATA ANALYSIS

Molluscs are among the most conspicuous and familiar invertebrate animals and include such forms as clams, squids, octopods and snails. Data was reviewed and obtained on two classes of Mollusc phyla, the Bivalves (clams) and the Gastropods (snails).

Freshwater mussels (Unionids) are a type of Bivalve and are benthic sedentary animals with a life expectancy of 10 to 80 years depending on the species. Unionids spend the bulk of their life residing in the sediment of watercourses. However, as part of the larvae (glochidia) development, the offspring must attach to the gills of a host fish (or salamander for one species) and parasitize the host until they are sufficiently mature to drop off as juveniles. Many species of Unionids require specific host fish

species for development. Unionids are among the most endangered organisms in North America¹⁸, and considerable research has been done in Ontario to investigate our native species. In Ontario, 28 of 41 native species are showing signs of decline¹⁹, and 10 species are ranked federally and/or provincially as Endangered or Threatened. For further detail, the reader is referred to the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*.

Much less is known of the terrestrial and aquatic Gastropods of Ontario. Gastropods are divided into three groups: the Prosobranchs, Opisthobranchs and the Pulmonates. The Prosobranchs and Opisthobranchs possess gills and are purely aquatic, but only the Prosobranchs are a freshwater species. Pulmonates have lungs that enable them to respire oxygen from freshwater and/or the air. There are approximately 485 species of Gastropods in North America, none of which are ranked federally or provincially in Ontario.

Screening for Mollusc Species of Significance

Mollusc investigations in the Windsor area have been largely limited to the Detroit River, and very little data is available on the terrestrial Gastropods or the Unionids and Gastropods inhabiting the inland watercourses. Historically, numerous native species of Unionids were known to inhabit the Detroit River, however recent studies indicate that no native Unionids remain in the Detroit River due to pollution, habitat loss and competition with zebra mussels (*Dreissena polymorpha*)^{20, 21, 22, 23}. Screenings for the presence of native Unionids within the watercourses in the AOI and its vicinity were unable to confirm the presence of any federally or provincially ranked species. No known recent mollusc investigations have been conducted in the AOI and its vicinity (aside from the Detroit River). However, Snuffbox (*Epioblasma triquetra*) is known to occur within the County of Essex according to the NHIC.

Currently, nine species are listed as Endangered and one species is listed as Threatened by COSEWIC, and eight species are listed as Endangered by COSSARO with two species pending a Threatened listing. For further detail the reader is referred to the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*. All Unionids are regulated under the Fisheries Act and eight of the ten listed species are regulated under the SARA and the new OESA, with two species pending regulation under SARA. There is the potential that these species may occur in the AOI and its vicinity as no comprehensive field investigations have been conducted of the Windsor area, and several of these species likely occurred in the Detroit River historically.

Data obtained from the MNR also indicates that two significant species of Gastropod occur in the AOI and its vicinity. For further detail the reader is referred to the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*. These two species (*Mesodon pennsylvanicus* and *Mesodon zaletus*) are ranked S1 and S1S2 respectively, meaning that they are Extremely Rare to Very Rare in Ontario. An additional eight provincially rare species are known to occur in the County of Essex and may occur in the AOI and its vicinity. There is the potential that these species and other rare

¹⁸ Metcalfe-Smith, J. A. MacKenzie, I. Carmichael, D. McGoldrick. 2005. Photo Field Guide to the Freshwater Mussels of Ontario. St. Thomas Field Naturalist Club Incorporated. St Thomas. Ontario.

¹⁹ Ibid.

²⁰ Morris, T. Species at Risk Research Biologist. Department of Fisheries and Oceans Canada, Great Lakes Laboratory for Fisheries and Aquatic Sciences. Personal communications, May to August 2006.

²¹ Ciborowski, J. Researcher, Department of Biological Sciences, University of Windsor. Personal communication, April 2006.

²² Corkum, L. Researcher, Department of Biological Sciences, University of Windsor. Personal communication, April 2006.

²³ Mackie, G.L. Mollusc Biologist. Zoology Department, University of Guelph. Personal communication, May to December 2006.

Gastropods may occur in the AOI and its vicinity as no comprehensive field investigations have been conducted of the Windsor area. All aquatic Gastropods are regulated under the *Fisheries Act*.

Insects

There are an estimated 30,000 known species of insects in Canada and more than 2,055 species of insects have been reported in the Ojibway Prairie Complex alone. Insects are the most abundant fauna in the world, and there are more than 26 Orders of insects, including mayflies, damselflies and dragonflies, grasshoppers, cockroaches, termites, earwigs, stoneflies, lice, true bugs, thrips, beetles, fleas, true flies, caddisflies, moths and butterflies, and wasps and ants. Insects are present in all habitats and have a wide variety of forms and life cycles. Insects are generally under-investigated and under-protected; however, some research has been conducted in the Ojibway Prairie Complex area by researchers from the University of Guelph and other institutions. Considerable data has been gathered on the insects of the Ojibway Prairie but a lot of research still remains to be done. This area is known for its high species diversity and many rare species due to its geographic location and significant habitats.

Screening for Insect Species of Significance

The Ojibway Prairie Complex area has recently been relatively intensively investigated by entomologists, and there are several recent publications documenting researchers' findings. Given the sheer number of species present, most of the research efforts and publications have focused on select groups of insects. Records of insect species captured are maintained by the Ojibway Nature Centre and a database of insects of the Ojibway Prairie is maintained by the University of Guelph. In addition, there are several regular entomological activities organized at the Ojibway Prairie including an annual butterfly count organized by the North American Butterfly Association and a dragonfly count organized by the Toronto Entomology Association, in conjunction with the Ojibway Nature Center.

The *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage* presents the insects listed by COSEWIC and COSSARO and regulated under the SARA, the new OESA and the FWCA that were reviewed to determine if they were potentially present in the AOI and its vicinity. Of these species, the Monarch is known to occur in the AOI and its vicinity; however, it is highly unlikely that the remainder of the above mentioned species occur in proximity to the AOI and its vicinity given their current distributions and habitat requirements.

Much of the data recently published on the insects in the vicinity of the AOI is documentation of new species for Canada, Ontario or the region. Compilation of this data and other records indicates that there are at least 113 species of conservation concern known in this area. This includes one species of Diptera (true flies), 22 species of Auchenorrhyncha Hemiptera (hoppers), 13 species of Heteroptera Hemiptera (true bugs), 41 species of Hymenoptera (bees and wasps), 17 species of Lepidoptera (moths and butterflies), 13 species of Odonata (damselflies and dragonflies), and six species of Orthoptera (grasshoppers, crickets and katydids). Seven other species of Odonata may also be present based on data from the NHIC Odonata Database indicating that they occur in the County of Essex, Town of Tecumseh and/or extreme southern Ontario.

Of the 120 species present (or potentially present), 69 species have been assigned an S-rank of S1 to S3 indicating that they are Extremely Rare, Very Rare or Rare to Uncommon within the province and five species have a rank of S4 or S5. A further 46 species are ranked SNR as there is insufficient data to rank the species. Since many of these species are new records for Ontario or Canada and are

under-documented, there is a strong likelihood that many of these species ranked SNR are also provincially rare.

The Monarch is listed as of Special Concern by COSEWIC and COSSARO and regulated under the SARA and the new OESA. The Monarch and five other species of butterflies are also regulated under the FWCA, due to their interest to collectors. Monarchs are known to inhabit and migrate through the Windsor area; however, there are no known Monarch staging (stopover) areas in the vicinity of the AOI.

The *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage* provides a summary of significant insect species potentially present in the AOI and its vicinity.

The Entomological Importance of the Ojibway Prairie Complex and its Vicinity

The Ojibway Prairie Complex and its vicinity is a unique area composed of tallgrass prairies, savannahs, Carolinian zone vegetation, wetlands and forests. The diversity of rare habitats and plant species contributes to the high diversity and rarity of insect species present.

Since the Ojibway Prairie is located partially in the AOI and similar habitats exist outside of the Ojibway Prairie Complex, efforts should be made to determine what further insect species of significance occur in the area. Sensitive species and locations should be identified through field investigations, further research and correspondence. Areas falling within the AOI should also be further investigated to determine if significant populations or habitat exist. Members of the entomology community should be further consulted to ascertain additional sensitivities. Impacts to Monarchs should also be further evaluated and efforts should also be taken to identify the main areas used by Monarchs for protection and/or mitigation.

The Ojibway Prairie Complex is truly one of the most entomologically unique and important areas in Canada. A review of recent publications on new records for Ontario and Canada indicates that there are many species which can only be found in the Ojibway Prairie, or at a few other locations that are provided in the *Draft Practical Alternatives Evaluation Working Paper*.

New records include 16 new species for Canada and six new species for Ontario, which have only been found at the Ojibway Prairie. A further 37 new records for Canada and 29 for Ontario have only been found at the Ojibway Prairie and a few other sites. Amazingly, a new species to science was recently discovered at the Ojibway Prairie²⁴. This insect, *Loxocera ojibwayensis*, is a small Psilidae fly (Diptera) that has been named after the Ojibway Prairie, which is the only known site in the world for this species.

Refer to the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage* for a summary of recent significant records from Ojibway Prairie Complex vicinity, which includes four new local records of significant Orthoptera (grasshoppers).

7.5.3 Fish and Fish Habitat

DATA COLLECTION

Fish and fish habitat were surveyed at several stations located within the ACA and its vicinity. All watercourses and waterbodies located within the AOI were investigated to determine the presence or

²⁴ Buck, M. and S.A. Marshall. 2006. Revision of New World *Loxocera* (Diptera: Psilidae), with Phylogenetic Redefinition of Holarctic Subgenera and Species Groups. *European Journal of Entomology*. 103: 193-219.

absence of fish habitat and the characteristics of the fish community present. Field investigations were conducted on May 3-5, 2006; September 18-21, 2006; and October 5, 2006.

The fish community was surveyed by visual observation or by fish collections using a backpack electrofishing unit, dip net or minnow trap at a total of 58 stations. The location of sampling stations is presented in Exhibit 7.27 and described in Table 7.15. Prior to field investigations, a Permit to Collect Fish for Scientific Purposes was obtained from the MNR Area Office in Chatham and the Department of Fisheries and Oceans was contacted to determine if a Species at Risk Permit was required. All fish captured were identified in the field or preserved in alcohol for laboratory identification.

Fish habitat was characterized along each stream reach located within the AOI. Stream reaches were delineated using the boundary of the ACA, road or highway crossings or the confluence with another watercourse. The habitat survey was carried out following the *MTO Environmental Manual - Fisheries (MTO 1994)*, the *Draft Environmental Reference for Highway Design (MTO 2002)* and in accordance with the *MTO/MNR Fisheries Protocol*²⁵. Physical features were surveyed in sufficient detail to enable mapping and identification of key habitat types. The physical habitat attributes assessed included:

- Stream dimensions and flow conditions;
- Water quality, including conductivity, pH, temperature and water colour;
- Stream morphology;
- Groundwater discharge areas;
- Substrate characteristics;
- Stream bank stability;
- In-stream cover;
- Riparian vegetation;
- Stream canopy cover;
- Stream gradient;
- Macrophytic (aquatic) vegetation;
- In-stream barriers to fish movement;
- Critical habitats; and
- Potential fish habitat compensation measures.

TABLE 7.15 – FISH SAMPLING STATIONS

Station No.	GPS Coordinates	Drains	Habitat
1	0328333 4684598	Large Bay	Fish habitat
2	0328042 4683627	McKee Creek	Fish Habitat
3	0327835 4683101	Ditch	Not Fish Habitat
4	0327675 4682830	Healy Drain	Not Fish Habitat
5	0327582 4682648	Healy Drain	Seasonal Fish Habitat

²⁵ Ministry of Transportation of Ontario (MTO)/Ministry of Natural Resources of Ontario (MNR). 1993. Fisheries Protocol for Protecting Fisheries Resources on Provincial Highway Undertakings.

Station No.	GPS Coordinates	Drains	Habitat
6	0327120 4682805	Healy Drain	Seasonal Fish Habitat
7	0327060 4682524	Broadway Drain	Seasonal Fish Habitat
8	0327564 4682464	Healy Drain	Not Fish Habitat
9	0327433 4682299	Broadway Drain	Not Fish Habitat
10	0327491 4682145	Pond	Not Fish Habitat
11	0328028 4682098	Broadway Drain	Not Fish Habitat
12	0328099 4682253	Healy Drain	Not Fish Habitat
13	0328421 4681784	Susan Drain	Not Fish Habitat
14	0328591 4681910	NoName Drain	Not Fish Habitat
15	0328976 4681555	Susan and NoName	Not Fish Habitat
16	0328467 4682497	McKee Creek	Fish Habitat
17	0328823 4682421	McKee Drain	Fish Habitat
18	0329205 4682444	McKee Drain	Fish Habitat
19	0329110 4682267	McKee Drain	Fish Habitat Downstream Only
20	0329305 4682215	McKee Drain	Not Fish Habitat
21	0329696 4681545	Titcombe Drain	Seasonal Fish Habitat
22	0330185 4682207	Vernal pool	Not Fish Habitat
23	0329759 4681811	Titcombe Drain	Seasonal Fish Habitat
24	0330594 4681942	Basin Drain	Not Fish Habitat
25	0330569 4681911	Basin Drain	Not Fish Habitat
26	0330562 4681875	Basin Drain	Fish Habitat
27	0331273 4681458	Youngstown Drain	Seasonal Fish Habitat
28	0330924 4681537	Youngstown Drain	Seasonal Fish Habitat
29	0330822 4681556	Youngstown Drain	Seasonal Fish Habitat
30	0330700 4681553	Basin Drain	Fish Habitat
31	0330714 4681496	Basin and Youngstown	Fish Habitat
32	0330778 4681487	Youngstown Drain	Seasonal Fish Habitat
33	0330352 4681030	Basin Drain	Fish Habitat
34	0331391 4681255	Marentette Drain	Not Fish Habitat
35	0331082 4680897	Marentette Drain	Not Fish Habitat
36	0331256 4680379	Marentette and Turkey	Not Fish Habitat
37	0330880 4680589	Wetland	Not Fish Habitat
38	0331652 4680693	Turkey Creek	Fish Habitat
39	0331543 4680078	Standing water	Not Fish Habitat
40	0332332 4679259	Lennon Drain	Fish Habitat
41	0332477 4678862	Cahill Drain	Fish Habitat
42	0332915 4678928	Cahill and Talbot	Fish Habitat
43	0333348 4678533	Talbot Drain	Not Fish Habitat
44	0335132 4676696	Howard Ave, Noname, Dickson	Not Fish Habitat
45	0335166 4676667	Burke, NoName	Not Fish Habitat
46	0335467 4676542	Dickson, Benson	Fish Habitat
47	0335900 4677241	Burke Drain	Fish Habitat
48	0336718 4677364	Collins Drain	Seasonal Fish Habitat
49	0336309 4677566	Collins and Wolfe	Fish Habitat (Wolfe)
50	0336072 4677640	NoName	Not Fish Habitat
51	0335714 4677723	Wolfe Drain	Fish Habitat
52	0335269 4677923	NoName and Wolfe	Fish Habitat (Wolfe)
53	0334095 4678714	Cahill Drain	Fish Habitat

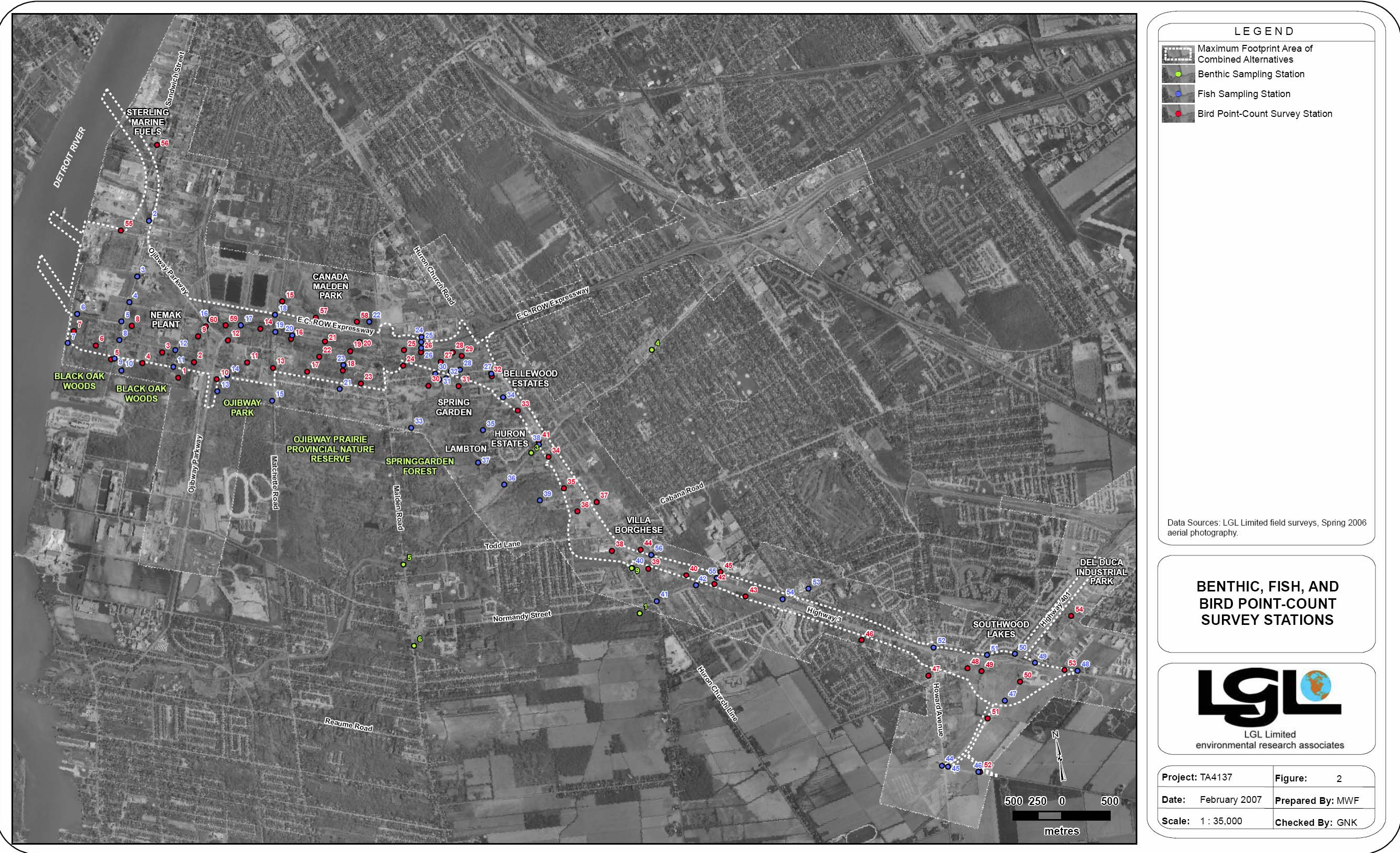
Station No.	GPS Coordinates	Drains	Habitat
54	0333789 4678642	Cahill and Wolfe	Fish Habitat
55	0333191 4678972	Cahill and Wolfe	Fish Habitat
56	0332540 4679315	Lennon Drain	Fish Habitat
57	not recorded	pond	Fish Habitat
58	not recorded	McKee Creek	Fish Habitat

Data was recorded in the field using the standard MTO Field Collection Record forms and representative photographs were taken.

In addition, benthic samples were collected from six stations in the AOI (Stations 3 and 9) and its vicinity (Stations 1, 4, 5 and 6). Stations 2, 7 and 8 are located on watercourses located outside the AOI. The location of benthic sampling stations is presented in Exhibit 7-27. Samples were collected on March 9, 2005 (Stations 1 and 3), and March 10, 2005 (Station 4, 5, 6, and 9) using the traveling kick and sweep transect method. Three samples were taken at each station, two from riffles and one from a pool. Benthic organisms from each transect were identified separately and then replicate samples from each station were combined to achieve sufficient populations for analysis.

A habitat and substrate survey of the Detroit River at the locations of possible bridge piers in Canadian waters was conducted on October 5, 2006 using an underwater video camera and Ekman dredge. At each possible pier location, a SeaViewer underwater camera was deployed over the side of the boat and data recorded to a hand-held video recorder. GPS coordinates along transects were recorded simultaneously through a feature on the video camera system. Once all of the video runs were completed at the sites, the substrate was investigated using an Ekman dredge.

EXHIBIT 7.27 – BENTHIC, FISH AND BIRD POINT COUNT SURVEY STATIONS



DATA ANALYSIS

Fish Species

Based on fisheries information provided by the Essex Region Conservation Authority (ERCA) and field investigations, a total of 21 species of fish inhabit streams located in the AOI, excluding the Detroit River. The fish community located in inland watercourses/waterbodies is comprised of resident warmwater sport and bait fish. Northern pike were observed spawning in several small drains located in the Chappus Road area. Table 7.16 presents the fish occurrence records for the watercourses containing fish as well as the historical fish records provided by ERCA.

Fish species in the Detroit River were recently sampled by four gear types (seine net, boat electrofishing, hoop net and Windemere trap) in the shallow offshore water of the Detroit River during July and August 2003²⁶. The reach of the Detroit River sampled included Canadian waters from the confluence with Turkey Creek to the confluence with the River Canard. A total of 38 species of fish were captured. Based on this recent survey and historic fish records, a total of 69 species of fish are reported from the Detroit River. Table 7.17 presents the fish species known to inhabit the Detroit River.

Tables 9 and 10 in the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage* provide a list of fish species occurrence records for the Area of Continued Analysis excluding and including the Detroit River.

Fish Habitat

Drainage within the AOI is provided by a number of municipal agricultural drains that flow towards the Detroit River. The major drains include Cahill Drain, Lennon Drain and Grand Marais Drain (Turkey Creek) and Wolfe Drain. The following watercourses and waterbodies are located in the AOI:

- Detroit River;
- Basin Drain;
- Benson Drain;
- Broadway Drain;
- Burke Drain;
- Cahill Drain;
- Collins Drain;
- Dickson Drain;
- Grand Marais Drain (Turkey Creek);
- Healy Drain;
- Lennon Drain;
- Marentette Drain;
- McKee Creek;
- No Name Drain associated with Benson Drain;

- No Name Drain associated with Susan Drain;
- No Name Drain tributary of Wolfe Drain (at Highway 401);
- No Name Drain tributary of Wolfe Drain (at Howard Ave);
- Susan Drain;
- Talbot Drain;
- Titcombe Drain;
- Wolfe Drain;
- Youngstown Drain; and
- Unnamed pond.

All of the above listed waterbodies were surveyed for fish habitat potential. The watercourses and fish habitat located in the AOI are presented in Exhibits 7.28A to 7.28D.

²⁶ Lapointe, N.W.R., L.D. Corkum and N.E. Mandrak. 2005. A Comparison of Methods for Sampling Fish Diversity in Shallow Offshore Waters of Large Rivers. *North American Journal of Fisheries Management* 26:503-513.

EXHIBIT 7.28A – WATERCOURSES AND FISH HABITAT LOCATED IN THE AREA OF INVESTIGATION



LEGEND

- Maximum Footprint Area of Combined Alternatives
- Drainage
- Drainage - Important Fish Habitat
- Drainage - Marginal Fish Habitat
- Drainage - Not Fish Habitat
- Fish Habitat
- Seasonal Fish Habitat
- No Fish Habitat

Data Sources: LGL Limited field surveys, Essex Region Conservation Authority, Spring 2006 aerial photography

WATERCOURSES AND FISH HABITAT LOCATED IN THE AREA OF INVESTIGATION



Project: TA4137	Figure: 4a
Date: February 2007	Prepared By: MWF
Scale: 1 : 10,000	Checked By: GNK



EXHIBIT 7.28B – WATERCOURSES AND FISH HABITAT LOCATED IN THE AREA OF INVESTIGATION



LEGEND

- Maximum Footprint Area of Combined Alternatives
- Drainage
- Drainage - Important Fish Habitat
- Drainage - Marginal Fish Habitat
- Drainage - Not Fish Habitat
- Fish Habitat
- Seasonal Fish Habitat
- No Fish Habitat

Data Sources: LGL Limited field surveys, Essex Region Conservation Authority, Spring 2006 aerial photography.

WATERCOURSES AND FISH HABITAT LOCATED IN THE AREA OF INVESTIGATION

LGL Limited
environmental research associates

Project: TA4137	Figure: 4b
Date: February 2007	Prepared By: MWF
Scale: 1 : 10,000	Checked By: GNK

EXHIBIT 7.28C – WATERCOURSES AND FISH HABITAT LOCATED IN THE AREA OF INVESTIGATION



EXHIBIT 7.28D – WATERCOURSES AND FISH HABITAT LOCATED IN THE AREA OF INVESTIGATION



The Detroit River and the inland watersheds within the AOI fall under the jurisdiction of the Essex Region Conservation Authority (ERCA), the Ontario Ministry of Natural Resources (OMNR) Aylmer District and the Department of Fisheries and Oceans (DFO). Most of the inland watercourses located in the AOI have been classified as drains by the ERCA using the Agricultural Municipal Drains Class Authorization System²⁷. A single unconnected pond is located at the eastern limits of the AOI. Water courses that were confirmed to support fish habitat are described below.

Basin Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is permanent and supports a warmwater baitfish community downstream of the E.C. Row Expressway. Here the channelized watercourse flows through a muck and clay-lined channel. Riparian vegetation consists of trees, shrubs and herbaceous vegetation. This fish habitat is considered marginal. Upstream of the E.C. Row Expressway the watercourse is mostly piped underground with a pool of open water upstream of the expressway. This upstream reach of Basin Drain is not fish habitat as the buried culvert under the expressway is a barrier to fish migration.

Benson Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is likely intermittent as flows were low in May and September 2006. It was determined that this watercourse likely supports a warmwater baitfish community as central mudminnow were captured downstream of South Talbot Road in Dickson Drain. This channelized watercourse flows through a clay-lined channel. Riparian vegetation consists of trees, shrubs and herbaceous vegetation. This fish habitat is considered marginal.

Broadway Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is likely intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse likely supports a seasonal fish community when flows in the Detroit River are high enough to allow fish to migrate upstream over the gravel beach barrier. Only the reach downstream of Sandwich Street was determined to be fish habitat as the hot water entering the channel from a pipe at Sandwich Street likely presents a thermal barrier to fish movement. This channelized watercourse flows through a detritus-lined channel. Riparian vegetation consists of trees, shrubs and fragmites. This fish habitat is considered marginal.

Burke Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is likely intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse supports a warmwater sportfish community. This channelized watercourse flows through a detritus and muck-lined channel. Riparian vegetation consists of cattails.

This fish habitat is considered marginal. Downstream of South Talbot Road this watercourse was dry and is not fish habitat.

Cahill Drain

Cahill Drain is separated into two reaches, one upstream of the confluence with Wolfe Drain, the other downstream of the confluence with Wolfe Drain. The upstream reach is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. The upstream reach is listed as a type E drain, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. It was determined that this watercourse is permanent warmwater fish habitat. Only baitfish were captured in Wolfe Drain between the two reaches, however habitat potential exists for sportfish. Upstream of Wolfe Drain this channelized watercourse flows through a clay-lined channel with herbaceous riparian vegetation. This fish habitat is considered marginal. Downstream of Wolfe Drain the channel is much larger and flows over a muck substrate. Here there is some channel definition and habitat heterogeneity. Riparian vegetation consists of trees, shrubs, and herbaceous vegetation. This fish habitat is considered important.

Collins Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is likely intermittent as flows were low in May and September 2006. It was determined that this watercourse likely supports a warmwater baitfish community as fathead minnow were captured downstream in Wolfe Drain, and no barrier to fish migration exists. This channelized watercourse flows through a clay and silt-lined channel. Riparian vegetation consists of cattails and fragmites. This fish habitat is considered marginal.

Dickson Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is likely intermittent as flows were low in May and September 2006. It was determined that this watercourse supports a warmwater baitfish community. This channelized watercourse flows through a clay-lined channel. Riparian vegetation consists of trees, shrubs and herbaceous vegetation. This fish habitat is considered marginal. The reach upstream of South Talbot Road was determined to be ephemeral and not fish habitat.

Grand Marais Drain (Turkey Creek)

This watercourse is listed as a type E municipal drain downstream of Huron Church Road, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. The reach upstream of Huron Church Road is unclassified. It was determined that this watercourse is permanent and supports a warmwater sportfish community. This watercourse flows through a concrete-lined channel. Even though fish habitat is homogenous, it supports a relatively diverse warmwater community. There is no riparian vegetation throughout this reach as the banks are also concrete-lined. This reach is regularly cleaned out to maintain flood control. Despite the presence of sportfish, this fish habitat is considered marginal as the habitat exists in a concrete-lined channel.

Healy Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is

²⁷ Department of Fisheries and Oceans Canada (DFO). 1999. A Class Authorization System for Agricultural Drains in the Southern Ontario Region.

likely intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse likely supports a seasonal fish community when flows in the Detroit River are high enough to allow fish to migrate upstream over the gravel beach barrier. Only the reach downstream of Sandwich Street was determined to be fish habitat as the buried culvert under Sandwich Street is a barrier to fish movement. This channelized watercourse flows through a detritus-lined channel, which is choked with fragmites. This fish habitat is considered marginal.

Lennon Drain

This watercourse is listed as a type E municipal drain downstream of Huron Church Road, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. It was determined that this watercourse is permanent and supports a warmwater sportfish community. Upstream of Talbot Road, the channelized watercourse flows through a silt, clay and geotextile substrate, with manicured grasses and a few trees as riparian vegetation. Between Talbot Road and Huron Church Line, the channelized watercourse flows through a riprap-lined channel with herbaceous vegetation and a few shrubs providing shade to the channel. Downstream of Huron Church Line the watercourse flows through a clay channel with manicured grasses and a few trees as riparian vegetation. This fish habitat is considered important.

McKee Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is likely intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse likely supports a seasonal fish community as a northern pike was observed upstream of the E.C. Row Expressway in May 2006. This channelized watercourse flows through a muck and detritus-lined channel, which is choked with fragmites. Upstream of Matchette Road the watercourse is piped under a residential property. This pipe is a barrier to fish migration and the watercourse upstream of this pipe is not fish habitat. This fish habitat is considered important.

McKee Creek

This watercourse is listed as a type E municipal drain downstream of Sandwich Street, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. The reach upstream of Sandwich Street is listed as a type F drain, indicating that it is intermittent, the temperature regime and potential fish species are unknown. It was determined that this watercourse is permanent and supports a warmwater sportfish community. This channelized watercourse flows through a muck-lined channel. The banks upstream of Sandwich Street are lined with sheet piling. The riparian vegetation consists of fragmites, cattails and herbaceous vegetation. Downstream of Sandwich Street, the channel flows through a series of double culverts and flows into a canal. A local fisherman indicated that in the spring walleye and perch often migrate upstream but are limited by the size of the double culverts and most cannot make it past this barrier. The removal of this barrier presents an excellent opportunity for habitat enhancement. This fish habitat is considered important.

Titcombe Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is intermittent as there was no flow, and only standing pools of water in September 2006. It was determined that this watercourse likely supports a seasonal fish community as a northern pike was

observed in May 2006. This channelized watercourse flows through a silt and detritus-lined channel. Riparian vegetation consists of trees, shrubs, herbaceous vegetation and manicured grasses. This fish habitat is considered important.

Wolfe Drain

Downstream of the confluence with Cahill Drain, the watercourse is listed as a type E municipal drain, indicating that it is permanent, the temperature regime is warmwater and sportfish are present. Upstream of the confluence with Cahill Drain, the watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse supports permanent warmwater baitfish habitat as flows were moderate in May and September 2006. Only baitfish were captured upstream of Talbot Road, however habitat potential exists for sportfish. This channelized watercourse flows through a clay-lined channel. There is very little habitat heterogeneity. Riparian vegetation consists of shrubs, trees, and herbaceous vegetation. This fish habitat is considered important.

Youngstown Drain

This watercourse is listed as a type F municipal drain, indicating that it is intermittent, and the temperature regime and potential fish species are unknown. It was determined that this watercourse is likely intermittent as there was little flow in May and September 2006. It was determined that this watercourse likely supports a seasonal fish community. This channelized watercourse flows through a silt-lined channel. Riparian vegetation consists mainly of herbaceous species. This fish habitat is considered marginal.

Unnamed Pond

This waterbody is unclassified. It was determined the waterbody to be permanent and to support a warmwater sportfish community. It appears to be man-made and it is not connected to any nearby drains. Substrate in the pond appears to be clay and muck. A few riparian trees and shrubs are found around the pond. This fish habitat is considered important.

Detroit River

Previous reports indicate that at least 69 species of fish inhabit the Detroit River²⁸. These species are listed in the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*, which includes many sportfish as well as migratory species that use the river to move between Lakes Erie and St. Clair. Diverse habitat exists within the river, especially in the wetlands which are used by warmwater species for many of their life functions (spawning, nursery, foraging). Several provincially significant wetlands exist within the river or are associated with tributary river mouths. These wetlands cover an area of 462.5 ha. As reported in MDNR and MOE (1991)²⁹, 41 fish species have been reported to spawn within the Detroit River and an additional seven species are suspected of spawning. Manny et

²⁸ Manny, B. A., T. A. Edsall and E. Jawarski. 1988. The Detroit River, Michigan: An ecological profile biological report. U.S. Fish and Wildlife Service, U.S. Department of Interior. Contribution No. 683 of the National Fisheries Research Centre - Great Lakes. Ann Arbor, MI. (in MDNR and MOE 1991)

²⁹ Ontario Ministry of the Environment and the Michigan Department of Natural Resources. 1991. Detroit River Remedial Action Plan. Stage 1. Sarnia, Ontario and Lansing, Michigan. June 3, 1991. 504 pp.

al.³⁰ reported that 25 species use the river as nursery habitat, including both warm and coldwater species.

The investigation in the vicinity of possible bridge piers was compromised by turbid water conditions. Strong northeast winds stirred up sediment in Lake St. Clair; the sediment was conveyed downstream in the Detroit River. As a result, visibility was reduced to less than 20 cm. For this reason, the camera, which is equipped with strong LED lights, did not record many features of the Detroit River bottom as it requires relatively clear water to operate. The strong current also made proper deployment difficult. Despite these problems, some substrate features were recorded intermittently by the underwater camera. These included short aquatic vegetation which was rooted to the substrates and details that enabled the camera to discern clay, sand and gravel substrates. No large or distinct habitat features (i.e., boulders, logs, etc.) were observed. The Ekman dredge did not deploy correctly due to the strong current and great depth (10-15 m). As a result, no full grab samples were taken. However, some substrate was attached to the Ekman as it was on the bottom of the river and consisted of clay and a clay-sand mix. The low-lying aquatic vegetation seen on the underwater video was also attached to some of the grab samples. The fish habitat in the Detroit River in the vicinity of the potential bridge piers is considered important.

Benthic Invertebrates

The Hilsenhoff Biotic Index (HBI) was used to evaluate water quality at benthic sampling stations. HBI values provide an indication of the levels of organic pollution in the water. Other metrics were also used to interpret water quality and habitat conditions at these stations, such as species richness and percentage of intolerant species. Table 7.16 provides a summary of the metrics and HBI values for combined replicates for sampling stations. Results from individual replicates are not shown as they had too few organisms in each sample to analyze HBI values. Stations 2, 7 and 8 are located on watercourses found outside the AOI; therefore, they are not described.

The benthic surveys reveal that the habitat quality at all sampling stations is poor. All stations have been highly altered. Stations 1 and 6 in Cahill Drain have been channelized. Stations 3 and 4 in Turkey Creek have been straightened and have a concrete channel. Station 5 in Turkey Creek has had gabion reinforcement of the bank. Station 9 in Lennon Drain has been channelized and filled with rip rap material.

TABLE 7.16 - SUMMARY OF BENTHIC DATA FOR STATIONS LOCATED IN THE AOI

	Station 1 Cahill Drain	Station 3 Turkey Creek	Station 4 Turkey Creek	Station 5 Turkey Creek	Station 6 Cahill Drain	Station 9 Lennon Drain
Date sampled	9March05	9March05	10March05	10March05	10March05	10March05
Abundance	338	256	196	125	293	347
Richness	16	15	4	7	8	14
EPT abundance	5	0	0	2	0	0
EPT richness	2	0	0	1	0	0
% EPT	1.48%	0.00%	0.00%	1.60%	0.00%	0.00%
# intolerant	2	3	1	1	0	2
% tolerant	80.00%	73.73%	75.00%	80.00%	100.00%	75.00%
% oligochaetes	26.63%	50.78%	0.00%	2.40%	6.83%	6.63%

³⁰ Manny, B. A., T. A. Edsall and E. Jawarski. 1988. The Detroit River, Michigan: An ecological profile biological report. U.S. Fish and Wildlife Service, U.S. Department of Interior. Contribution No. 683 of the National Fisheries Research Centre - Great Lakes. Ann Arbor, MI. (in MDNR and MOE 1991)

	Station 1 Cahill Drain	Station 3 Turkey Creek	Station 4 Turkey Creek	Station 5 Turkey Creek	Station 6 Cahill Drain	Station 9 Lennon Drain
% grazers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HBI	6.80	6.14	5.98	7.43	6.18	7.36
Water quality	Fairly Poor	Fair	Fair	Fairly Poor	Fair	Fairly Poor

Station 1 – Cahill Drain Downstream of Huron Church Line

Habitat conditions at this station were homogeneous. Substrate consisted of mainly silt. Riparian vegetation was composed of old field species with some shrubs and trees.

Water quality rating from the HBI value for this station was Fairly Poor. This indicates that there is significant organic pollution at this station. One species of mayfly (Ephemeroptera), and one species of caddisfly (Trichoptera) were found at this station. These organisms are usually indicators of good water quality, however the mayfly genus *Caenis* found at this station is tolerant of degraded habitat conditions. The percentage of tolerant organisms at this station was very high indicating that while species richness is average, the species present are tolerant of poor habitat and water quality conditions. Oligochaetes (worms) are found in habitats with fine sediments and a higher oxygen demand. The high percentage of oligochaetes at this station is an indicator of the poor habitat conditions. The lack of grazers at this station is an indicator of the lack of allochthonous material (such as leaf litter) in this system.

Station 3 - Turkey Creek Downstream of Huron Church Road

Habitat conditions at this station were homogeneous. Substrate consisted of a concrete channel with some gravel, sand, and silt. Riparian vegetation was limited to old field species along the concrete banks. Upstream of the sample station, there is no riparian vegetation as the banks are concrete.

Water quality rating from the HBI value for this station was fair. This indicates that there is fairly significant organic pollution at this station. No mayflies (Ephemeroptera), stoneflies (Plecoptera), or caddisflies (Trichoptera) were found at this station. These organisms are usually indicators of good water quality. Their absence may indicate that water quality at this station is poor. The percentage of tolerant organisms at this station was very high indicating that while species richness is average, the species present are tolerant of poor habitat and water quality conditions. The high percentage of oligochaetes at this station is an indicator of the poor habitat conditions. The lack of grazers at this station is an indicator of the lack of allochthonous material (such as leaf litter) in this system.

Station 4 - Turkey Creek Downstream of Dominion Boulevard

Habitat conditions at this station were homogeneous. Substrate consisted of a concrete channel with some sand and silt deposits. There was no riparian vegetation as the banks were concrete.

Water quality rating from the HBI value for this station was fair. This indicates that there is fairly significant organic pollution at this station. Species richness was low at this station indicating that habitat diversity is low and conditions are degraded. No mayflies, stoneflies or caddisflies were found at this station. Their absence may indicate that water quality at this station is poor. The percentage of tolerant organisms at this station was very high indicating that while species richness is average, the species present are tolerant of poor habitat and water quality conditions. Chironomids accounted for 99.5 per cent of the sample. These organisms occupy the same habitat niche as the oligochaetes indicating the poor habitat conditions at this station. The lack of grazers at this station is an indicator of the lack of allochthonous material (such as leaf litter) in this system.

Station 5 – Turkey Creek Downstream of Malden Road

Habitat conditions at this station were more diverse than the rest of the stations. Substrate consisted of mainly silt with some cobble. Riparian vegetation was composed of old field species with some shrubs. Only one replicate was taken at this station, as only one transect downstream of the bridge was shallow enough to wade. Water depth was high upstream and downstream of the bridge.

The water quality rating from the HBI value for this station was fair. This indicates that there is fairly significant organic pollution at this station. Species richness was low at this station indicating that habitat diversity is low and conditions are degraded. One species of caddisfly was found at this station that is somewhat intolerant of degraded habitat conditions. The percentage of tolerant organisms at this station was very high indicating that the species present are tolerant of poor habitat and water quality conditions. The lack of grazers at this station is an indicator of the lack of allochthonous material (such as leaf litter) in this system.

Station 6 – Cahill Drain Downstream of Malden Road

Habitat conditions at this station were homogeneous. Substrate consisted of mainly sand and silt. Riparian vegetation was composed of old field species with some shrubs.

Water quality rating from the HBI value for this station was fair. This indicates that there is fairly significant organic pollution at this station. Species richness was low at this station indicating that habitat diversity is low and conditions are degraded. No mayflies, stoneflies or caddisflies were found at this station. Their absence may indicate that water quality at this station is poor. The percentage of tolerant organisms was 100 per cent, indicating that the species present are tolerant of poor habitat and water quality conditions. The lack of grazers at this station is an indicator of the lack of allochthonous material (such as leaf litter) in this system.

Station 9 – Lennon Drain Downstream of Huron Church Line

Habitat conditions at this station were homogeneous. Substrate consisted of riprap. Riparian vegetation was composed of old field species with some shrubs.

Water quality rating from the HBI value for this station was fairly poor. This indicates that there is significant organic pollution at this station. No mayflies, stoneflies, or caddisflies were found at this station. Their absence may indicate that water quality at this station is poor. The percentage of tolerant organisms at this station was very high indicating that while species richness is average, the species present are tolerant of poor habitat and water quality conditions. The lack of grazers at this station is an indicator of the lack of allochthonous material (such as leaf litter) in this system.

Species at Risk

Six species of fish are listed as Endangered, Threatened or Special Concern by COSEWIC and COSSARO and eight are regulated under the new OESA. No species at risk are reported from inland watercourses located within the AOI. Spotted gar (*Lepisosteus oculatus*) is ranked S2 and is listed as Threatened by both COSEWIC and COSSARO. Its general provincial status is “at risk” likely due to its restricted range within Ontario, and it is tracked by the NHIC. Lake sturgeon (*Acipenser fulvescens*) is ranked as S3 and is currently listed as Not at Risk by COSEWIC and COSSARO; however, lake sturgeon is regulated under Schedule 5 of the new OESA. Longnose gar (*Lepisosteus osseus*) is ranked S4 and is not currently listed by COSEWIC or COSSARO, however, longnose gar is regulated under Schedule 3 of the new OESA. Two cyprinid species reported from the Detroit River are also considered to be at risk: silver chub (*Macrhybopsis storeriana*) and pugnose minnow (*Opsopoeodus*

emiliae). Both are ranked S2 and are considered of Special Concern by COSEWIC and COSSARO and regulated under Schedule 5 of the new OESA. Both are currently tracked by the NHIC and have a general provincial status of “sensitive”. The last three species of concern are in the sucker family: bigmouth buffalo (*Ictiobus cyprinellus*), spotted sucker (*Minytrema melanops*) and river redhorse (*Moxostoma carinatum*). The bigmouth buffalo is ranked SU, meaning that it is unrankable at this time as more data is needed. The spotted sucker and river redhorse are both ranked S2. All three of these fish species are listed as Special Concern by COSEWIC and COSSARO and all three are regulated under Schedule 5 of the new OESA. The general provincial status of the bigmouth buffalo is “undetermined” and the river redhorse general provincial status is “sensitive”. The location of the possible bridge piers does not support critical habitat for any of these known species at risk.

7.5.4 Wildlife and Wildlife Habitat

DATA COLLECTION

The AOI for wildlife and wildlife habitat included all lands located within the maximum footprint area of the combined practical alternatives and adjacent lands located within 120m of the right-of-way. This area corresponds approximately with the ACA. The study team investigated all wildlife habitats located in the AOI to identify important habitat for wildlife, inventory wildlife and confirm the presence/absence of species at risk.

The purpose of the field investigations was to document wildlife habitat and wildlife occupation and to characterize the nature, extent and significance of animal usage within the AOI. Existing information on wildlife species previously found within the AOI came from various sources. The *Ontario Herpetofaunal Summary Database of the Natural Heritage Information Centre (NHIC)* provided amphibian and reptile lists, locations and status. The *Ontario Breeding Bird Atlas (OBBA)* program provided up-to-date lists of birds breeding within specific areas of Ontario while information from *The Conservation Priorities for the Birds of Southern Ontario* provided lists of migratory bird species in Essex County designated as species for habitat protection by local municipalities. It also ranks bird species highly sensitive to disturbances of their breeding habitats. The *Atlas of the Mammals of Ontario* provided locations of species found in Essex County. More specific information about wildlife previously documented in the AOI came from communications with personnel of the Ontario Ministry of Natural Resources and the Ojibway Prairie Nature Centre in Windsor.

Wildlife habitat was delineated on air photos and refined through ground-truthing. The Ecological Land Classification (ELC) system was used to describe wildlife habitat, where appropriate. In many cases, similar wildlife habitat polygons were combined into a single polygon to reduce duplication, while in others cases new wildlife habitat polygons were delineated in areas not classified according to ELC. For this reason, the wildlife habitat polygons do not correspond exactly with the vegetation community polygons. Several areas, including factories, retail outlets and residential areas with high density could not be accessed or do not support wildlife habitat; hence, these areas were not investigated. The methods described in the *Significant Wildlife Habitat Technical Guide (MNR 2000)* were used to establish the significance of wildlife habitat.

Methods used to collect in-field information were tailored to each vertebrate class (i.e., amphibians, reptiles, birds and mammals). Once the specific wildlife units within the AOI were mapped and the methods of investigation were established, diurnal and nocturnal investigations took place. Data was collected by a field crew of one or two biologists working in tandem using aerial photo maps, a GPS

unit, binoculars, cameras, a headlamp, field notebooks and a laptop computer. Field investigations were conducted on: April 12-14 and 18-21, 2006; May 1-4, 2006; June 4-7, 11-16, 18-24 and 29-30, 2006; July 1, 2006; September 17-21, 2006; November 22-23, 2006; and, February 21-23, 2007.

Herpetofauna (reptiles and amphibians) were inventoried using the Visual Encounter Survey (VES) method³¹. Data was collected by simply searching for animals in a likely habitat at a likely time. Reptile investigations started in late spring and early summer after species came out of their hibernacula. Following the VES methodology, early morning searches for snakes in suitable habitats included flipping over rocks, logs, boards, shingles or any material snakes would hide under through the night. From mid to late morning, rocks, logs and asphalt pathways, used for basking areas, were also investigated. By the afternoon, searches turned to habitats considered as snake hunting and feeding areas, like cultural meadows and areas in and around wetlands. Also, sheets of wood, laid out in different habitats to attract snakes for use as cover and warmth, were checked in the morning and late afternoons for activity.

Turtles were found by investigating their potential habitats, such as creek drains or ponds, and observing them basking on logs in ponds during late mornings, swimming on the bottom of ponds in search of food or crossing over roads and pathways when moving from pond to pond during the day.

For amphibians, in the spring and early summer season when frog and toad activity was at its peak, nightly road cruises by vehicle and breeding call surveys were employed. By identifying frog and toad breeding calls during evening road cruises, locations of important breeding areas were found. Daytime searches of wetlands identified as potential amphibian breeding areas were also made. After the breeding season, wetlands were searched for amphibian egg masses and/or tadpoles to identify any frog or toad species found in these locations.

Prior to conducting bird surveys, aerial photos of the AOI and its surroundings were checked to see if there were areas of continuous forests, cultural thickets, etc. that could potentially be used as spring and fall migration corridors. These maps were also used to determine where preferred nesting habitats could exist during the breeding season. Any potential areas were then ground-truthed by simply observing and recording species in chosen habitats at the right time of year. During the spring and fall seasons, specific habitats throughout the AOI were monitored for areas of large bird movements and stopover points.

Two inventory methods were used to determine the breeding bird composition and locations of breeding activity in the AOI: the point-count method^{32, 33}; and, nest surveys. Due to the large size of the AOI and the need to represent as many of the habitats as possible, non-random locations were selected for point-counts. These specific locations, selected in areas that maximized the amount of habitats covered per count, increased the number of species recorded in as short of time as possible. Each point-count station was recorded using a hand-held GPS unit. A total of 60 point-count stations were censused twice, a minimum of seven days apart, for a total of 120 point-count surveys. Point-counts were started 30 minutes before dawn and stopped by 0900 to 0930 hours. Five minutes of suitable bird observation and bird call listening times were standard per station (time increased to 10

minutes in areas of high environmental noise such as traffic or industrial activities). Station locations were at least 125 m or more apart to prevent bird identification overlap. The criteria of the *Breeding Bird Atlas (BBA)* breeding bird survey was used for identifying breeding bird behaviour (e.g., carrying food to young, territorial song, etc.) as evidence of birds breeding within a location. Evening spot checks were also made in habitats considered to have owl species. Tape recordings of owl calls were played to induce a response for species identification.

The second method used to identify species composition consisted of a nest survey performed in the summer and fall seasons. This was undertaken as a secondary method of data collection to determine breeding bird occurrence in particular habitats. In the summer season, most nests were located by focusing on the breeding behaviour of particular bird species. Early morning observations of female returning to their nests after morning forages were used to identify their nest location. Observations of other behavioural signals (e.g., carrying nest-building materials, copulations, territorial disputes, etc.) were used to lead an observer to areas of high nest probability or directly to the nest itself. In the fall, when breeding season was over and tree foliage disappeared, clumps of structured grasses in trees or fecal deposits under tree nest holes were used to identify nests. Nest locations were recorded and habitat types noted.

Mammals were inventoried using a variety of methods, such as the identification of tracks, trails, sounds, scats, smells and individual species behavioral signs, such as plant cuttings, nest sites, lodges, etc.³⁴. As many habitats as possible were searched using the VES method. The investigator simply walked through an area searching for mammals using the variety of methods mentioned above. Evening road cruises by vehicle were made to spot mammals crossing roadways. Early morning walks just before sunrise and late afternoon walks just before dark were also made to catch mammal movements to and from their daytime haunts. These investigations were repeated in the same wildlife areas more than once to increase the accuracy of the species composition recorded. Species locations and the habitats they were sighted in were recorded. Daily mammal movement corridors which showed important connections between habitats were also recorded. Bats, however, being volant mammals of the night, were difficult to identify in the field without the proper equipment. Since high frequency bat detectors were unavailable, secondary source information was relied upon to determine the bat species present in the AOI.

Any species at risk found in the field had its location recorded with a GPS unit and a photograph taken for verification, where possible. Data collected in the field from each of the vertebrate class investigations was transferred into a laptop computer on a daily basis. Field notes, GPS coordinates and photographs were downloaded into wildlife tables for future analysis. This data was analyzed and used to determine the locations of sensitive habitats in the AOI.

DATA ANALYSIS

Wildlife Species

The natural heritage features of the AOI were divided into 124 wildlife habitat units. These units formed the basic habitats around which most of the terrestrial vertebrates were recorded. SARA species were searched for and priority species of conservation concern were noted. Four continuous seasons of data collection and in-field wildlife investigations within and around these wildlife units resulted in the compilation of 139 species (11 herpetofauna, 108 birds and 20 mammals). A list of terrestrial

³¹ Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek and M.S. Foster. 1994. Measuring and Monitoring Biological Diversity. Standard Methods for Amphibians.

³² Ralph, C.J., J.R. Sauer and S. Droege. 1995. Monitoring Bird Populations by Point Counts. Pacific Southwest Research Station, Albany, California.

³³ Bibby, C.J., N.D Burgess, and D.A. Hill. 1992. Bird Census Techniques. Published for the British Trust for Ornithology and The Royal Society for the Protection of Birds.

³⁴ Wilson, D.E., F.R. Cole, J.D. Nichols, R. Rudran and M.S. Foster. 1996. Measuring and Monitoring Biological Diversity. Standard Methods for Mammals.

vertebrates recorded in the AOI is presented in Appendix F of the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*.

Four amphibian species and seven reptile species were recorded in the AOI. Amphibians include frogs and toads since no salamanders were located anywhere in the the AOI. The absence of salamanders from the AOI was expected based on discussions with local experts and review of secondary information.

The majority of the amphibians were found at specific vernal ponds and creek drains during the breeding season. As a result, these locations were identified as important amphibian breeding areas. American toad (*Bufo americanus*) and/or western chorus frog (*Pseudacris triseriata*) were found in most of the breeding areas recorded. Only one pond, located near the east limits of the AOI, had green frog (*Rana clamitans*) egg masses. Chorus frogs were located predominantly in or around vernal pools within woodlots, whereas American toads and green frogs preferred ponds or creek drains in open areas. No leopard frog egg masses were found in any of the ponds investigated although adults were seen around creek drains throughout the summer.

Of the reptiles observed, snakes were recorded most often. The eastern foxsnake (*Elaphe gloydi*) was recorded on numerous occasions in wooded areas, along creeks, under buildings or under log piles in residential backyards. The other four species were located in tallgrass prairies, cultural meadows and cultural thickets under boards, tiles, rocks, or whatever they could hide under during the evenings and early mornings. Of these, Butler's gartersnake (*Thamnophis butleri*) was recorded only in the open tallgrass prairie (TPO2-1) habitats. Both the eastern foxsnake and Butler's gartersnake are regulated under the Fish and Wildlife Coordination Act (FWCA), as well as Schedule 1 under SARA and Schedule 4 under the new *Ontario Endangered Species Act (ESA), 2007*. These species are discussed along with other species at risk in a later part of this chapter.

Based on discussions with local experts, Butler's gartersnake was present in Malden Park prior to the construction of the E.C. Row Expressway and conversion of Malden Park into parkland. However, this population has been extirpated from Malden Park. This species has a strong affinity to prairie communities and a very small home range; therefore, it is very sensitive to habitat loss. A migrating painted turtle (*Chrysemys picta*) was found along Broadway Street just north of the Black Oak Woods. A snapping turtle (*Chelydra serpentina*) was observed in a creek drain north of Armanda Street near the east Chappus Road extension.

Birds comprised 108 of the 139 wildlife species recorded, with representatives in every habitat. Field survey data showed that 50 of these species were breeding birds that nested in about 75 per cent of the designated wildlife habitat units. Most of the remaining 58 species, observed primarily in the spring and fall seasons, were considered non-residents or migrants. These migrants were observed moving through the western two-thirds of the AOI, using the Detroit River, Black Oak Woods, Ojibway Park, Ojibway Prairie Provincial Nature Reserve, Spring Garden Forest, the deciduous forests around Reddock Avenue and the St. Clair College Prairie ESA as migration corridors. Many of the forests, woodlots and cultural thickets, north of these major natural heritage features and within the AOI, were being used as continuations of these major north-south migration corridors. Areas like the forests, woodlots and cultural thickets of Brighton Beach, the Malden Park forest connecting with the woodlots and cultural thickets around Chappus Street, the woodlots around E.C. Row Expressway just north of Spring Garden Park and the woodlots and cultural thickets on the south side of Talbot Road opposite St. Clair College, all contained hundreds of migrating birds during the spring and fall seasons and contributed to the continuation of a series of bird migration corridors going through the AOI. The entire

AOI is located within two continental bird migration corridors associated with the Atlantic and Mississippi Flyways. The large forest on the west side of Huron Church Road, just south of Turkey Creek (north and south of Reddock Avenue) was identified as a stop-over area for birds of prey on migration. Hundreds of Broad-winged Hawks (*Buteo platypterus*), Red-tailed Hawks (*Buteo jamaicensis*), Coopers Hawk (*Accipiter cooperii*), Goshawk (*Accipiter gentilis*) and Turkey Vultures (*Cathartes aura*) stopped in this forest to roost while on their journey southward.

Two species of swallows were located on the Turkey Creek Bridge on Huron Church Road. Up to 20 nests were found on the ceiling cross beams but only 11 were considered active at the time of investigation. Eight Barn Swallow (*Hirundo rustica*) nests, located on the ceiling beams at the center of the bridge, and three Cliff Swallow (*Petrochelidon pyrrhonota*) nests, located on the outside ceiling beams, were recorded.

Two wildlife units contained a large number of migratory bird nests as compared to most of the other units. W-BBA9 and W-NSG7 contained multiple nests from species such as Brown Thrasher (*Toxostoma rufum*), Gray Catbird (*Dumetella carolinensis*), American Robin (*Turdus migratorius*), American Goldfinch (*Carduelis tristis*), Willow Flycatcher (*Empidonax traillii*), Yellow Warbler (*Dendroica petechia*) and Mourning Dove (*Zenaida macroura*). The diversity of migratory bird species centralized in such small areas makes these habitats highly important.

Based primarily on evidence from signs such as trails, tracks, scats, smells, sounds, etc., evidence for mammal activity was recorded in every habitat type. Incidental observations were made of red fox (*Vulpes vulpes*) carrying food to their pups in wildlife unit W-BBA9 and three fox pups playing in the early morning hours opposite W-BBA4. The only European hare (*Lepus europaeus*) recorded was spotted in the cultural meadow of W-BBA20 whereas eastern cottontails (*Sylvilagus floridanus*) were observed in open areas throughout the AOI. Individuals were seen moving through the cultural meadows in W-CH12 and W-LAM6 or feeding around human habitations such as St. Clair College or the residence front lawns along Montgomery Drive just west of Talbot Road. Grey squirrel (*Sciurus carolinensis*) dreys were found in nearly every forest and woodlot. The abundance of raccoons (*Procyon lotor*) was recorded primarily from observing their trails and tracks going from habitat to habitat. White-tailed deer (*Odocoileus virginianus*) was also recorded in nearly every habitat type. Tracks, trails, scats, bedding areas and direct observations indicated their presence in cultural meadows, cultural thickets, marshes and forests throughout the AOI. Road kills were another method used to determine mammal presence in particular habitats. Opossums (*Didelphis virginianus*) were found along Broadway Street just east of Ojibway Parkway and along Talbot Road next to a meadow marsh on the south side of the Heritage Park Alliance Church.

Migration corridors for mammals were seen through every habitat and connecting each of the habitat types. Of particular note, the Cahill Drain, connecting the St. Clair College Prairie ESA on the north side of Highway 3 to the deciduous swamp located on the south side of Highway 3 was heavily traveled by mammals in both summer and winter. Tracks of small mammals, muskrat (*Ondatra zibethica*), red fox, coyote (*Canis latrans*) and raccoon were recorded along Cahill Drain and under Highway 3 going in both directions. White-tailed deer showed no evidence of travel through the culvert but used the creek drain for travel on the north side of Highway 3. The fact that corridors were so abundant indicated high mammal activity and the importance of the remaining natural heritage features found in the AOI.

Winter investigations indicated that most of the AOI had a limited amount of wildlife activity. Herpetofauna were in hibernation and most of the breeding bird species had left the area. Only a few

winter bird species remained using particular habitats as winter feeding areas. Trails and tracks showed that a few mammal species used certain portions of the AOI for travelling and bedding down. Fox and coyote used frozen creek drains, open fields and human-made paths through woodlots for winter travel. Raccoons, especially during their late winter breeding season, travelled from woodlot to woodlot. Random white-tailed deer travel corridors, to and from feeding areas, existed in the forests and cultural thickets between Turkey Creek and Cabana Road West, between Spring Garden Road and E.C. Row Expressway and between Armanda Street and E.C. Row Expressway. Only a few deer bedding areas found in the AOI were located in the forested area of wildlife unit W-CH2 around Chappus Road north of Armanda Street. Most of the deer bedding areas appeared to be outside the AOI, concentrated in the Spring Garden Forest ANSI, while most of the feeding areas appeared to be in the AOI.

Wildlife Habitat

All the wildlife units contained one or more of 13 habitat types recognized in the AOI. These habitat types are described below. A detailed assessment of the significance of each wildlife habitat unit is presented in the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*. By analyzing each of the habitat types throughout the AOI, a pattern of species composition per habitat type became evident. The location of wildlife habitat units located in the AOI is presented in Exhibit 7.29.

Deciduous Forests and Cultural Woodlots

Many wildlife species used the deciduous forests (FOD) and cultural woodlots (CUW) as migration corridors, living spaces and breeding areas. Besides their use for the seasonal migration of birds (noted above), mammals regularly used these habitats as corridors for daily movements to and from their feeding and resting areas in various habitats. Small mammals, red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*) are a few species that used FODs and CUWs as a food source. Raccoons and other small mammals also used specific trees within the habitat for hibernation den sites while white-tailed deer used certain areas for winter deer yards protecting them from the elements. Forests and woodlots were also important breeding areas for wildlife. Chorus frogs were recorded calling and breeding at many of the vernal ponds found within some of these woodlots. Up to 23 species of migratory birds, many considered species of conservation priority, were recorded using the forests and woodlots for nest sites. Red-tailed Hawk, Eastern Wood Pewee (*Contopus virens*) and Baltimore Oriole (*Icterus galbula*) nested in the forest canopies while the understory contained nests of Indigo Bunting (*Passerina cyanea*), Wood Thrush (*Hylocichla mustelina*) and American Robin to name a few. Cavities in the trunks of dead standing trees were used by Tree Swallows (*Tachycineta bicolor*) and Black-capped Chickadees (*Poecile atricapillus*), whereas Downy Woodpecker (*Picoides pubescens*) and Northern Flicker (*Colaptes auratus*) excavated their own cavities in the trunks of live trees. Many of the woodlot trees were also used as den sites by small mammals and raccoons and dreys were constructed in them by gray squirrels (*Sciurus carolinensis*) for raising their young.

Cultural Thickets

Being continuations of the some of the larger fragmented FOD and CUW migration corridors, cultural thickets (CUT) were also used by migratory birds as stopover areas for feeding while on their seasonal migrations. Many CUTs surrounded creek drains and provided protection from the elements for amphibian species breeding there. Numerous garter snakes (*Thamnophis sirtalis*) were recorded using

this habitat for hunting during the day and hiding through the night. CUTs also linked larger habitats together so mammals used them as daily movement corridors from feeding areas to resting areas. Track evidence through corridors showed heavy use of CUTs by raccoon, red fox, coyote (*Canis latrans*) and white-tailed deer. Of most importance, CUTs provided a large number of breeding birds with a well protected habitat for their nests. Up to 14 species of migratory birds were recorded to use CUTs in the AOI for breeding. For example, wildlife unit W-NSG7 recorded numerous Gray Catbird nests, plus nests of Yellow Warbler, American Goldfinch and American Robin. Breeding bird evidence then accounted for another three to four species added to this unit.

Cultural Meadows

Cultural meadows (CUM), found in more wildlife units in the AOI than any other habitat, were used by wildlife as migration corridors, feeding and breeding areas. American toads were recorded many times in the habitat using it as a food source while Dekay's brown snakes (*Storeria decayi*) were recorded migrating through it to get to a wetter forest environment. Grassland bird species were recorded using these CUMs for food sources with increased numbers recorded during the migration periods. This habitat is also a breeding area for bird species such as Field Sparrow (*Spizella pusilla*), Savannah Sparrow (*Passerculus sandwichensis*) and Eastern Kingbird (*Tyrannus tyrannus*). White-tailed deer bedding areas were found throughout numerous CUMs in the area of investigation as were trails and tracks of raccoon, fox and coyote, which were using these habitats as travel corridors and feeding zones.

Cultural Savannahs

Ten cultural savannahs were identified as wildlife habitat units. Breeding evidence for at least 12 species of migratory birds, such as Orchard Oriole (*Icterus spurius*), Gray Catbird, American Goldfinch, Willow Flycatcher and Yellow Warbler, was found. Numerous mammal corridors extended through these habitats connecting feeding areas and dwelling areas in surrounding habitats.

Tallgrass Prairies

Although represented in numerous wildlife units within the area of investigation, the area each tallgrass prairie (TPO) represents is relatively small in comparison to other habitats. However, they contain some of the most unique wildlife species. Every snake species recorded in the AOI was found in the TPO habitats. Snakes used this habitat for hunting their prey and as corridors to neighboring habitats. Bird nests and breeding bird behaviours indicated that species, such as Willow Flycatcher and Field Sparrow, nested in this habitat. Trail evidence also indicated that the TPO's were used by mammals as potential feeding areas and as movement corridors among surrounding habitats.

Meadow Marsh and Shallow Marsh

These meadows (MAM and MAS) attract wildlife species dependant on a greater amount of water during their life cycle. Many snake species, like foxsnakes, are attracted to these habitats for a food source. Up to 15 species of birds were recorded within MAMs and MASs of the AOI. Some species recorded, like American Woodcock (*Scolopax minor*), Yellow Warbler and Common Yellowthroat (*Geothlypis trichas*), prefer to breed in this type of habitat. Numerous mammal species, like cottontail (*Sylvilagus floridanus*), opossum (*Didelphis virginianus*), raccoon and deer used these habitats for feeding. Numerous trails throughout these habitats also showed their use as movement corridors among surrounding habitats.

Deciduous Swamps

Four wildlife units contained deciduous swamps (SWD). A combination of both forest and wetland species, such as Baltimore Oriole, Common Grackle (*Quiscalus quiscula*), Carolina Wren, Cooper's Hawk, Common Yellowthroat and Song Sparrow, were recorded. Trails and tracks from deer, coyote and raccoon were also observed.

Cultural Plantations

Not known for their biodiversity, cultural plantations (CUP) recorded a limited variety of wildlife. Foxsnakes were recorded moving through these habitats when located next to human residences. No breeding birds were recorded within these habitats but several species were observed using them as feeding areas. Mammals used them as protective migration corridors moving to and from surrounding habitats.

Open Water

The only open water (OAO) found was a pond in one of the agricultural areas. Trails leading to the pond indicated its use as a water and food source for mammals. Amphibians, such as green frog, bred there because it is a permanent water source. Birds, such as tree swallows, fed over the water and appeared to be nesting in the dead trees located on the northwest side of the pond.

Agricultural Areas

These areas are not recognized by the ecological land classification system (ELC), but were recorded as wildlife habitat units because of their uniqueness as breeding habitats to many species of birds. Found predominantly at the east end of the AOI, bird species such as Horned Larks (*Eremophila alpestris*), Killdeer (*Charadrius vociferus*), Spotted Sandpiper (*Actitis macularius*) and Vesper Sparrow (*Poocetes gramineus*), used these tilled open fields to nest in. The edges of these agricultural fields consisted of tree rows, thickets and creek drains that provided additional nesting habitats. Kingbirds, Savannah Sparrows, Song Sparrows (*Melospiza melodia*), Canada Geese (*Branta canadensis*) and Mallard (*Anas platyrhynchos*) were all recorded nesting on the periphery of these agricultural fields.

Residential Areas

Also not recognized by ELC, these wildlife habitat units contained wildlife species particularly adapted to human presence. Snakes, such as the foxsnake, were recorded dwelling in backyard wood piles or under garages of individual homes. Birds, like Catbirds, Chipping Sparrows (*Spizella passerina*) and Mourning Doves, nested on or in close proximity to the residences themselves. Opportunistic mammals, like white-tailed deer, raccoon, striped skunk (*Mephitis mephitis*) and eastern chipmunk (*Tamias striatus*) used residential areas for foraging and den sites.

Species at Risk

None of the amphibians recorded in the AOI are listed by COSEWIC or COSSARO or regulated by legislation. Four of the reptile species are regulated under the FWCA. Two of these species, Butler's gartersnake and eastern foxsnake, are also regulated as Schedule 1 under the SARA and Schedule 4 under the new OESA. Butler's gartersnake was found in two separate locations on the south side of E.C. Row Expressway. Three foxsnakes were observed in two different field locations while another three were reported by local residents in two separate residential areas. Two of the three foxsnakes found during the investigations were located along the shoreline of Turkey Creek just west of the Huron Church Road Bridge. The other was found basking on the asphalt walkway just south of Spring

Garden Road at the northwest corner of wildlife habitat unit W-LAM1. Two of the residential reports were in the woodlot and a residence backyard on the north side of Armanda Street, while the other was reported dwelling under the back corner of a garage next to a residence along the north side of Reddock Street just west of Huron Church Road. Both of these residential locations were verified by local biologists. The eastern Massasauga (*Sistrurus catenatus catenatus*) and the eastern hognosed snake (*Heterodon platirhinos*), both listed as Threatened by COSEWIC and COSSARO and regulated under the FWCA, Schedule 1 of SARA, and Schedule 4 of the new OESA, occur in the Ojibway Prairie Complex, but none were observed during field investigations.

The Migratory Birds Convention Act (MBCA) regulates 90 of the 108 bird species recorded. The FWCA regulates eleven species, primarily the birds of prey. The only avian species regulated by SARA is the Red-headed Woodpecker found in the Black Oak Woods between Ojibway Parkway and Matchette Road. The Red-headed Woodpecker is listed as Threatened by COSEWIC and Special Concern by COSSARO and regulated under Schedule 3 of SARA and Schedule 5 of the new OESA. The Red-headed Woodpecker is about to be uplisted to Schedule 1 of SARA. The Golden-winged Warbler, which was observed as a migrant in the AOI is regulated under Schedule 5 of the new OESA. Locally, 38 bird species are considered priority species of conservation concern by Bird Studies Canada for Essex County. Of these, 32 species are ranked as highly sensitive to any disturbances in or around their habitat.

Fifteen of the mammals recorded are regulated under the FWCA. No mammal species found in the AOI are regulated under SARA or the new OESA. The status of terrestrial vertebrate species recorded in the AOI is presented in the *Draft Practical Alternatives Evaluation Working Paper – Natural Heritage*.

EXHIBIT 7.29 – WILDLIFE HABITAT UNITS ASSOCIATED WITH THE AREA OF INVESTIGATION



LEGEND

- Maximum Footprint Area of Combined Alternatives
- Wildlife Habitat Unit

Data Sources: LGL Limited field surveys, Spring 2006 aerial photography.

WILDLIFE HABITAT UNITS LOCATED IN THE AREA OF INVESTIGATION



Project: TA4137	Figure: 5a
Date: February 2007	Prepared By: MWF
Scale: 1 : 10,000	Checked By: GNK



EXHIBIT 7.29 – WILDLIFE HABITAT UNITS ASSOCIATED WITH THE AREA OF INVESTIGATION (CONT'D)



EXHIBIT 7.29 – WILDLIFE HABITAT UNITS ASSOCIATED WITH THE AREA OF INVESTIGATION (CONT'D)

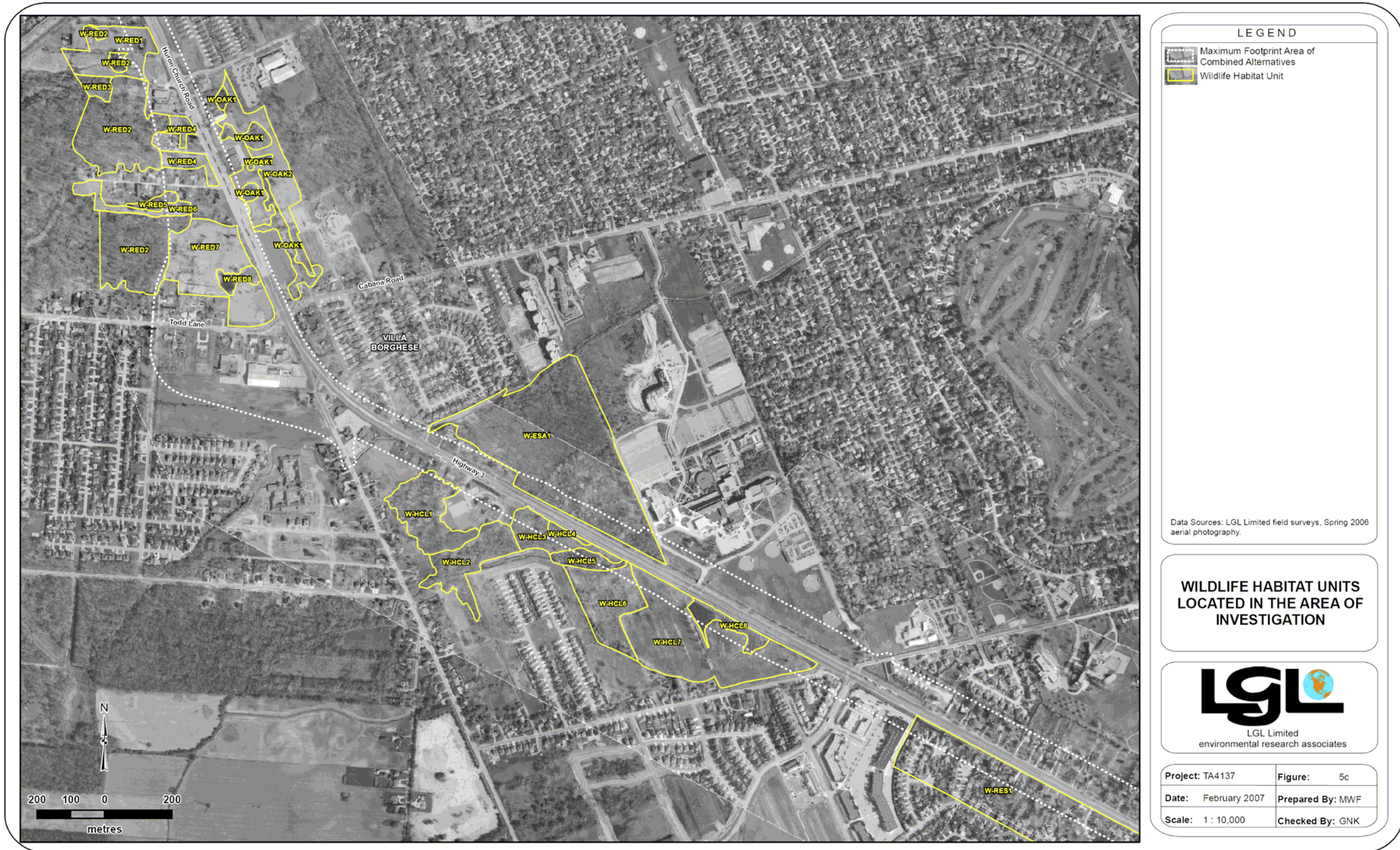
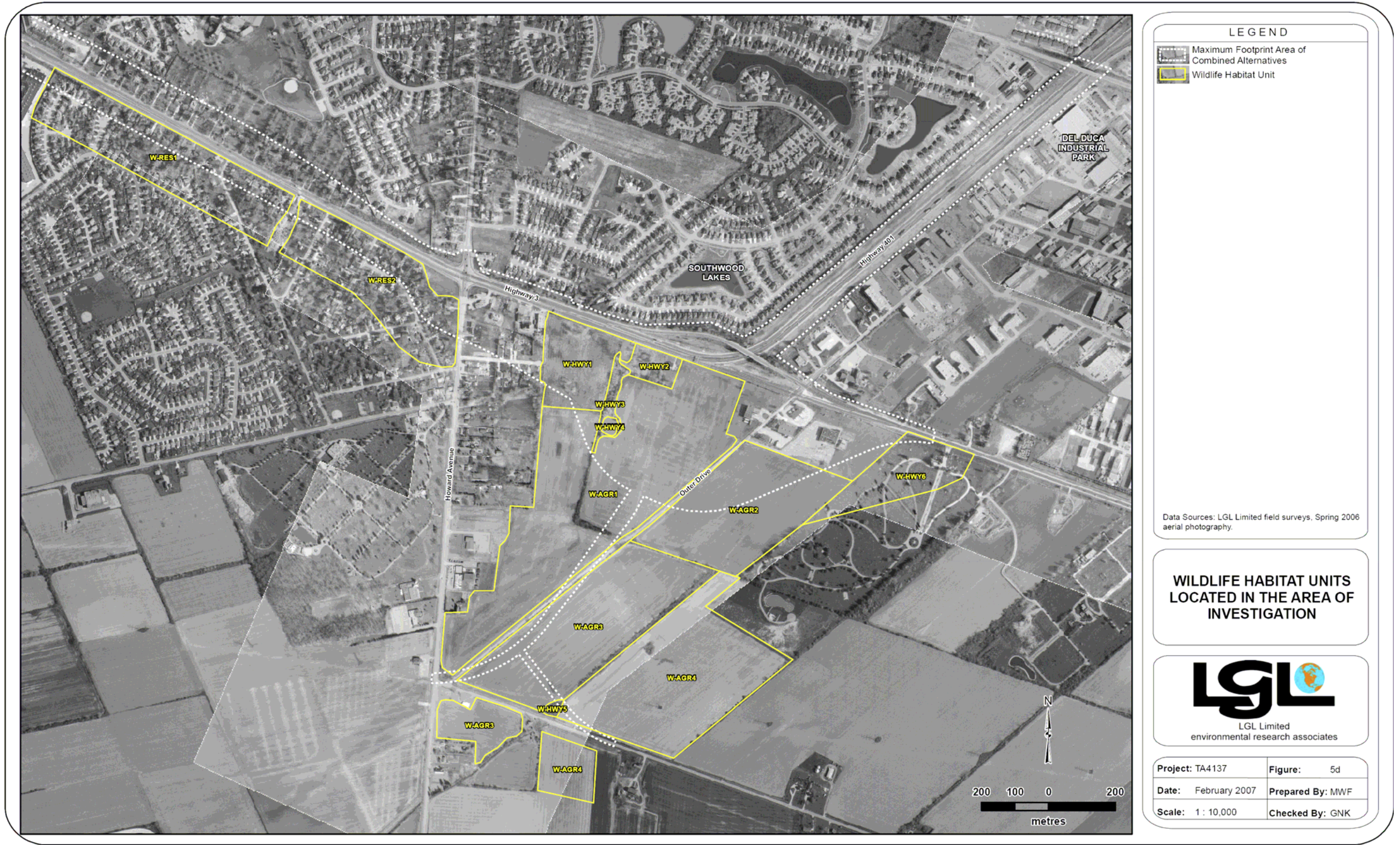


EXHIBIT 7.29 – WILDLIFE HABITAT UNITS ASSOCIATED WITH THE AREA OF INVESTIGATION (CONT'D)



7.5.5 Designated Natural Areas

DATA COLLECTION

The AOI for designated natural areas includes the ACA and its vicinity. The study team investigated all designated natural areas in the AOI and its vicinity. Information on designated natural heritage areas was derived from the secondary sources consulted during the preparation of the *Environmental Overview Paper – Canadian Existing Conditions Volume 2 (Natural Sciences)*. The information contained in the *Environmental Overview Report* was reviewed, updated and augmented to reflect the revised AOI.

DATA ANALYSIS

A number of Areas of Natural and Scientific Interest (ANSIs) and Environmentally Significant Areas (ESAs) and one Provincial Nature Reserve are located within the AOI. One of these natural heritage features has also been evaluated by Carolinian Canada. In addition, the City of Windsor and the Town of LaSalle have both undertaken biological inventories of the remnant forest and prairie habitat features not already designated and afforded some form of protection in planning documents to determine if these areas should be included under an Open Space/Greenway system policy. These areas are referred to as Candidate Natural Heritage Sites (CNHSs). This section provides a summary of these designated natural areas located in the AOI and its vicinity. The location of designated natural areas is presented in Exhibit 7.30.

Provincial Nature Reserve

Provincial Nature Reserves are areas selected to represent the distinctive natural communities and landforms in Ontario. Ojibway Prairie is a 65 ha Provincial Nature Reserve that was regulated under the *Provincial Parks Act* in 1977 to protect one of the largest remnants of tallgrass prairie and oak savannah in Ontario³⁵. The dominant feature of this nature reserve is the tallgrass prairie plant community. Within the Ojibway Prairie Provincial Nature Reserve, 533 flowering plant species have been documented, of which more than 60 are of prairie and western affinity. It is home to more than 60 plants that are rare in Ontario as well as a number of animal species representative of prairie habitats³⁶.³⁷ The Ojibway Prairie Provincial Nature Reserve forms one component of the Ojibway Prairie Complex ANSI.

Vegetation communities in the Provincial Nature Reserve include Old Field (27.5 ha), Forb Prairie (17 ha), Tallgrass Prairie (11.5 ha), Thickets (3 ha), Oak Savannah (4.5 ha), and Black Oak/Red Hickory Forest (1.5 ha). While some early successional tallgrass prairie species occur in Old Field communities, the majority of species with a prairie affinity are located within the remaining vegetation communities. The Provincial Nature Reserve contains two vegetation communities that are globally and provincially rare.

Moist-Fresh Tallgrass Prairie Type (TPO2-1) and Moist-Fresh Black Oak Tallgrass Savannah Type (TPS2) both have a global rank of G1 (Extremely Rare – having less than five occurrences in the

overall range) and a provincial rank of S1 (Extremely Rare in Ontario – having less than five occurrences in the province).

The Provincial Nature Reserve provides habitat for three nationally and provincially Threatened wildlife species regulated under SARA and the new OESA including eastern foxsnake (*Elaphe gloydi*), Butler's gartersnake (*Thamnophis butleri*) and eastern hognosed snake (*Heterodon platirhinos*). Purple twayblade (*Liparis liliifolia*) and eastern prairie fringed orchid (*Platanthera leucophaea*), both nationally and provincially Endangered and regulated under SARA and the new OESA, are present in the reserve.

Colic-root (*Aletris farinosa*) and willowleaf aster (*Symphotrichum praealtum*), both nationally and provincially Threatened and regulated under SARA and the new OESA, are present in the reserve. Several provincially, regionally and/or locally significant species are also present in the Provincial Nature Reserve.

Evaluated Wetlands

There are no evaluated wetlands located in the AOI.

Areas of Natural and Scientific Interest

ANSIs in the AOI include several provincially and regionally significant Life Science ANSIs. According to the OMNR^{38, 39}, the Ojibway Prairie Complex provincially significant Life Science ANSI is comprised of the following areas:

- Ojibway Prairie Provincial Nature Reserve;
- Prairie Remnants (Ojibway Park) Life ANSI;
- Prairie Remnants (Titcombe Road North) Life ANSI;
- Prairie Remnants (Spring Garden Road) Life ANSI;
- Prairie Remnants (Black Oak Woods) Life ANSI; and
- Prairie Remnants (Southeast of Nature Reserve) Life ANSI.

These areas are identified on Exhibit 7.40.

Ojibway Prairie Provincial Nature Reserve

A summary of the features of the Ojibway Prairie Provincial Nature Reserve is discussed in Chapter 4.

Ojibway Park

Ojibway Park is a 64 ha site dominated by a Swamp White Oak Mineral Deciduous Swamp (SWD1-1), which has a provincial rank of S2S3 (Very Rare to Uncommon in Ontario – having five to 100 occurrences in the province). Prairie, savannah and woodland communities are also present. At least three different prairie communities have been identified in the park based on differing herbaceous layer species assemblages.

³⁵ Ontario Ministry of Natural Resources. 2002. Ojibway Prairie Park Management Plan. Ontario Ministry of Natural Resources, Chatham Area Office. 9 pp.

³⁶ Ibid.

³⁷ Pratt, P. D. 1979. A preliminary life science inventory of the Ojibway Prairie Complex and surrounding area. Unpublished report prepared for the City of Windsor and the OMNR. 163 pp.

³⁸ Ontario Ministry of Natural Resources. 1998. Natural Resources and Values Information System. Digital data for the City of Windsor and the Towns of LaSalle, Tecumseh and Amherstburg. Provided to LGL Limited on April 4, 2005.

³⁹ Ontario Ministry of Natural Resources. 2004a. Natural Resources and Values Information System. Digital data for the City of Windsor and the Towns of LaSalle, Tecumseh and Amherstburg. Provided to LGL Limited on April 4, 2005.

Woody species in savannah and woodland communities include pin oak, swamp white oak, black oak (*Q. velutina*), and red maple. Slender bush-clover (*Lespedeza virginica*), which is listed as Endangered by COSEWIC and COSARO and regulated under the SARA and the new OESA, is present in Ojibway Park. Several provincially, regionally and/or locally significant species are also present in Ojibway Park⁴⁰.

Titcombe Road North

This 40 ha site consists of tallgrass prairie and oak woodland communities. At least three different prairie communities have been identified in the Titcombe Road North ANSI based on differing herbaceous layer species assemblages. Woody species in woodland communities include black oak, white oak (*Quercus alba*) and red hickory (*Carya ovalis*).

Data collected by LGL Limited to date does not provide details as to the presence/absence of significant species in this portion of the Ojibway Prairie Complex provincially significant Life Science ANSI⁴¹.

Spring Garden Road

This 165 ha site consists of tallgrass prairie and oak savannah communities, all of which have a provincial rank of S1 (Extremely Rare in Ontario – having less than five occurrences in the province). Other vegetation communities present in Spring Garden Road ANSI include a large wetland and old field communities. The wetland was originally an artificially constructed lagoon and is presently the largest remaining wetland in the City of Windsor⁴².

Spring Garden Road ANSI is home to approximately 475 species of plants, 66 species of breeding birds, 14 species of mammals, 10 species of reptiles, four species of amphibians and 66 species of butterflies. Many of the plant species have a prairie affinity (Woodliffe 1994). Purple twayblade, listed as Endangered by COSEWIC and COSSARO and regulated under SARA and the new OESA, is present in Spring Garden Road ANSI. Two species listed as Threatened by COSEWIC and COSSARO and regulated under the SARA and the new OESA are present including colic-root and spiked blazing star (*Liatris spicata*). American chestnut (*Castanea dentata*), listed as Threatened by COSEWIC and COSSARO and regulated under SARA and the new OESA, and prairie rose (*Rosa setigera*) and Riddell's goldenrod (*Solidago riddellii*), listed as Special Concern by COSEWIC and COSSARO and regulated under the SARA and the new OESA, are also present in Spring Garden Road ANSI. Several provincially, regionally and/or locally significant species are also present in Spring Garden Road ANSI⁴³.

Black Oak Woods

This 46 ha site is dominated by a Moist-Fresh Black Oak-White Oak Tallgrass Woodland community (TPW2-1). This community type has a global rank of G1 (Extremely Rare – having less than five occurrences in the overall range) and a provincial rank of S1 (Extremely Rare in Ontario – having less than five occurrences in the province). Dominant tree species include black oak and white oak, with some particularly large specimen trees situated at the north end of the woodland.

This ANSI is home to at least 24 prairie indicator species. Purple twayblade, listed as Endangered by COSEWIC and COSSARO and regulated under the SARA and the new OESA, willowleaf aster (*Symphotrichum praealtum*), listed as Threatened by COSEWIC and COSSARO and regulated under SARA, and American chestnut, listed as Threatened by COSEWIC and COSSARO and regulated under SARA and the new OESA are all present in Black Oak Woods ANSI. Several provincially, regionally and/or locally significant species are also present in Black Oak Woods ANSI⁴⁴.

Southeast of Nature Reserve

This 40 ha site located to the southeast of Ojibway Prairie Provincial Nature Reserve contains species and communities with a prairie affinity⁴⁵. Data collected by LGL Limited to date does not specify the communities located within this portion of the Ojibway Prairie Complex provincially significant Life Science ANSI, nor does it provide details as to the presence/absence of significant species.

Environmentally Significant Areas

A number of ESAs are located in the AOI and its vicinity. Sixty-three (63) potential ESAs were inventoried in 1981 and/or 1982 and summarized by Oldham⁴⁶. These ESAs were evaluated based on several physical, ecological and social criteria, including:

- Significant Landforms;
- Linkage System;
- Migratory Stopover;
- Significant Communities;
- Hydrological Significance;
- Diversity;
- Significant Species;
- Size;
- Research/Education; and
- Aesthetic/Historical.

A location was deemed to be an ESA if at least two of the ten criteria were met. At that time, two ESAs were established within the AOI, including:

- Ojibway Black Oak Woods ESA (ESA #19); and
- Spring Garden Road Prairie ESA (ESA #29). An update of ESAs within Essex County was undertaken in 1991 to evaluate supplementary sites, including previously considered sites and newly identified candidate ESA sites. At that time, a resolution was passed that all PSWs and ANSIs in Essex County be included as ESAs (information on ESAs that are also ANSIs was provided previously). The Ojibway Prairie Complex ESA was designated as ESA #3 through this

⁴⁰ Ontario Ministry of Natural Resources. 2002. Ojibway Prairie Park Management Plan. Ontario Ministry of Natural Resources, Chatham Area Office. 9 pp.

⁴¹ Ibid.

⁴² Woodliffe, P. A. 1994. Spring Garden Road Prairie. OMNR, Chatham. Unpublished letter. 3 pp. + map.

⁴³ Oldham, M. J. 1994. Spring Garden Road Plant List. Natural Heritage Information Centre, Peterborough. Unpublished list. 7 pp.

⁴⁴ Ontario Ministry of Natural Resources. 2002. Ojibway Prairie Park Management Plan. Ontario Ministry of Natural Resources, Chatham Area Office. 9 pp.

⁴⁵ Ibid.

⁴⁶ Oldham, M. J. 1983. Environmentally Significant Areas of the Essex Region. Essex Region Conservation Authority, Essex, Ontario. 426 pp.

decision. An ESA update report was prepared by ERCA⁴⁷, which detailed the criteria met by locations not already designated as a PSW or ANSI. In addition to the above-referenced ANSIs, the following ESAs were identified in the AOI and its vicinity:

- St. Clair College Prairie ESA (ESA #49); and
- Sandwich West Woodlot/LaSalle Woods ESA (ESA #18).

A brief description of these ESAs is presented in Table 7.17.

Carolinian Canada Sites

Carolinian Canada is a coalition of groups, agencies and individuals working to halt the loss of and achieve a substantial increase in the size and quality of natural communities characteristic of Carolinian Canada. Members include Conservation Authorities, Federation of Ontario Naturalists, Ontario Stewardship, federal and provincial departments and ministries, Canadian Botanical Association, Ontario Federation of Agriculture, and other groups.

TABLE 7.17- SUMMARY OF ENVIRONMENTALLY SIGNIFICANT AREAS IN THE AOI AND ITS VICINITY

ESA Name/ Number	Significant Landforms	Linkage System	Migratory Stopover	Significant Communities	Significant Habitats/ Hydrological Significance	Diversity	Significant Species	Size	Research/ Education	Aesthetic and/or Historical Values
Ojibway Prairie Complex (#3)										
Sandwich West Woodlot / LaSalle Woods (#18)		Linkage with Turkey Creek and Ojibway		Species assemblages include species with prairie affinity	Prairie Habitat	Good	Six SARA, Schedule 1 species, one SARA, Schedule 2 species, several provincially and locally significant species	115 ha	Associated with Brunet Park. Potential for scientific research on prairie flora and fauna	
Ojibway Black Oak Woods (#19)		Linkage with Ojibway Prairie		Species assemblages include species with prairie affinity			One SARA, Schedule 2 species, several provincially and locally significant species			
Spring Garden Road Prairie (#29)		Linkage with Ojibway Prairie		Considered to be one of the best prairie remnants remaining in Essex County	Prairie Habitat		Three SARA, Schedule 1 species, one SARA, Schedule 2 species, several provincially and locally significant species			Impressive display of fallblooming prairie wildflowers
St. Clair College Prairie (#49)					Species assemblages include species with prairie and savannah affinities	Good	Three SARA, Schedule 1 species, several provincially and locally significant species		The St. Clair College of Applied Arts and Technology is adjacent to this ESA	

In 1984, 38 sites were identified as critical natural areas in a study by the identification sub-committee of Carolinian Canada. One of the 38 Carolinian Canada sites is present within the AOI, the Ojibway Prairie Remnants (Site #31). The Ojibway Prairie Remnants site is now encompassed within the Ojibway Prairie Complex ANSI.

⁴⁷ Essex Region Conservation Authority. 1994. Environmentally Significant Areas Status Update. Unpublished report. Essex Region Conservation Authority, Essex, Ontario.

Candidate Natural Heritage Sites

The City of Windsor and the Town of LaSalle have both undertaken biological inventories of the remnant forest and prairie habitat features to determine their local significance. These Candidate Natural Heritage Sites (CNHSs) are summarized in Town of LaSalle⁴⁸ for the Town of LaSalle and in City of Windsor⁴⁹ for the City of Windsor.

In the Town of LaSalle, CNHSs were evaluated based on several physical and ecological criteria, including:

- Significant Ravine, Valley, River, and Stream Corridors;
- Habitat of Endangered, Threatened, and Vulnerable Species;
- Significant Woodlands;
- Significant Wildlife;
- Significant Wetland;
- Significant Ecological Function;
- Diversity;
- Significant Species;
- Significant Communities;
- Significant Earth Feature; and
- Condition.

In the City of Windsor, CNHSs were evaluated based on several physical and ecological criteria, including:

- Significant Ecological Function;
- Diversity;
- Significant Communities;
- Significant Species;
- Size;
- Representation;
- Condition; and
- Significant Earth Science Features.

Canadian Heritage Rivers System

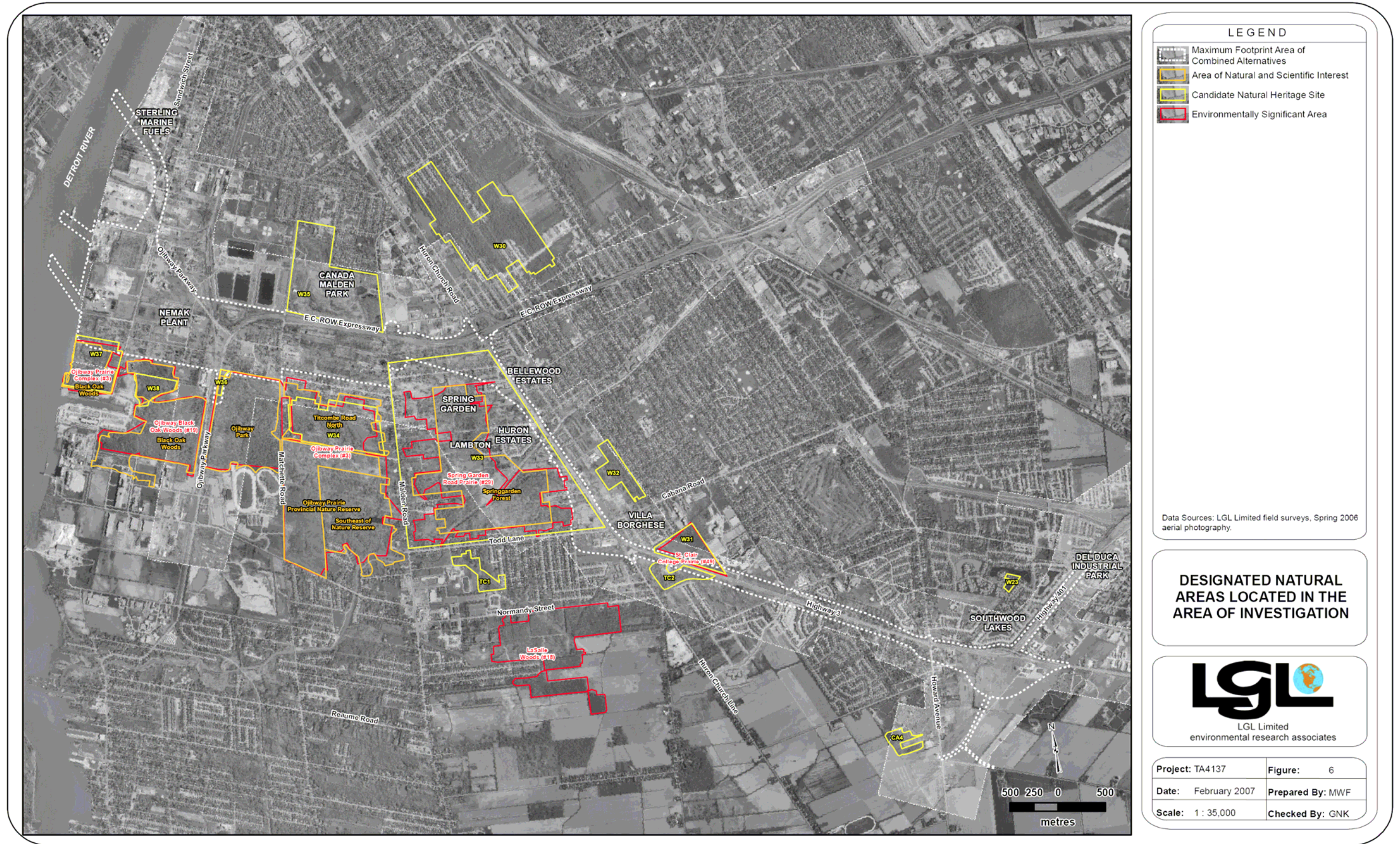
The Detroit River flows in a north-south direction connecting Lake St. Clair in the north to Lake Erie in the south. Acting as an international border, the river connects American and Canadian communities

⁴⁸ Town of LaSalle. 1996. Candidate Natural Heritage Area Biological Inventory and Land Use Planning Policy Direction Discussion Paper No. 1. Prepared by Prince, Silani and Associates Limited. April 1996. 103 pp.

⁴⁹ City of Windsor. 1992. City of Windsor Candidate Natural Heritage Site Biological Inventory Evaluation Report. Prepared by Essex Region Conservation Authority and the City of Windsor Department of Planning and Department of Parks and Recreation. December 1992. 212 pp.

culturally and economically. It also serves many ecological functions as part of the Great Lakes watershed.

The importance of the Detroit River as a natural heritage feature is only one component of its function. Parks Canada designated the Detroit River as a Canadian Heritage River, which recognizes its importance to Canadian history and culture. The Detroit River received American Heritage River designation in 1998 and Canadian Heritage River designation in 2001, making it the first river with dual designations.



7.5.6 Municipal Land Use Designations

TOWN OF LASALLE

Legal Status of Plan

The *Town of LaSalle Official Plan – LaSalle 2016 – Healthy, Vibrant and Caring*⁵⁰ was adopted on October 14, 1997. The Plan was approved by the Ministry of Municipal Affairs and Housing (MMAH) on May 18, 1998.

Environmental Designations

Section 2 identifies general development policies for various uses, including: woodlots; developments along inland watercourses; re-use of potentially contaminated sites; and, special policy area – species at risk.

Section 3 provides the land use designations for natural heritage sites, including permitted uses and other restrictions in the Town.

Two areas within the AOI are designated as Natural Environment: the Southeast of Nature Reserve ANSI and the Spring Garden Forest ANSI. The LaSalle Woods, located in the vicinity of the AOI, is also designated as Natural Environment. Areas designated as Natural Environment include: woodlots; wetlands; and prairie communities. These areas are recognized as playing an important role in keeping people physically, mentally and spiritually healthy. Permitted uses in these areas include: passive recreation; wildlife management; conservation uses; and, buildings/structures associated with these uses. The official plan states that utility corridors and inland watercourses should be used as linkages between natural heritage sites, and should be enhanced and maintained as wildlife habitat areas, recreational trails, bikeways and walkways. Preservation and management of areas designated Natural Heritage shall be via public purchase, private stewardship, conservation easements and management agreements.

Level of Protection

The Town of LaSalle, through its Official Plan has set a goal of creating a Greenway System, which will comprise trails, parks and woodlots for the benefit and enjoyment of wildlife and residents alike. As a municipal planning policy, this provides a reasonable level of protection for natural features within the proposed Greenway System.

Environmental land use designations within the Town of LaSalle are regulated by the Official Plan, which is approved under the *Planning Act*. The Official Plan, the Provincial Policy Statement and the *Planning Act* afford protection for provincially, regionally and locally significant designated natural areas.

CITY OF WINDSOR

Legal Status of Plan

The *City of Windsor Official Plan (2004)*⁵¹ was adopted on October 25, 1999 by By-law 350- 1999. The Plan was approved by the Ontario Ministry of Municipal Affairs and Housing (MMAH), in part, on March 28, 2000. The remainder of the Plan was approved by an Ontario Municipal Board decision on

November 1, 2002. This is an office consolidation of the Plan which incorporates the approved Plan plus subsequent Amendments.

Environmental Designations

Section 5, Volume 1 of the Official Plan identifies designations as being part of the 'Greenway System' on Schedule B of the City's Official Plan.

Section 6.8, Volume 1 of the Official Plan identifies permitted uses for each of the land use designations in the City. The Natural Heritage designation governs natural heritage areas located in the City.

Permitted uses within the Natural Heritage designation include nature reserves and wildland management. Ancillary uses may include recreation and leisure activities and facilities, provided the use is secondary and complementary to the main permitted use. If development is proposed, an *EER* is required to demonstrate that features and functions will not be adversely impacted. *EERs* are also required for any development on lands adjacent to those designated Natural Heritage.

Several overlays are subcategories to the land use designations and are identified as 'Development Constraint Area' on Schedule C of the City's Official Plan. These Constraint Areas, including Natural Heritage, Environmental Policy Areas and Candidate Natural Heritage Sites, afford various levels of protection to the City's natural environmental features.

Natural Heritage Policies identify areas under provincial protection (ie. Provincially Significant Wetlands and ANSIs). Environmental Policy Areas identify areas of significance that may permit development, subject to criteria, including: biological diversity; significant natural community; vulnerable, threatened or endangered species; low levels of disturbance; significant earth science features; and, visual, aesthetic or recreational importance to the City. Candidate Natural Heritage Sites contain potentially significant and/or sensitive environmental features or functions, which are subject to an *ERR* to determine if development is appropriate.

Several natural heritage land use designations are identified in the Schedules to the Official Plan. Three areas located in the AOI are designated as Natural Heritage: Ojibway Prairie Complex, Oakwood Bush and the eastern section of Malden Park. Two areas of the Titcombe Road North ANSI, a section of the Spring Garden Forest ANSI and the St. Clair College Prairie ESA are designated as Special Policy Area "A".

Secondary Planning Areas

The Official Plan – Volume 2 contains several Secondary Plans, some of which have natural feature components. The Spring Garden Planning Area is located in the AOI.

Spring Garden Planning Area

- Features in this area are recognized as significant, including Spring Garden Natural Area Complex (Schedule SG-1) and shall be conserved. Development must adhere to the Spring Garden Complex Management Plan.
- All lands within the Spring Garden Natural Area Complex shall be acquired in stages, by means of exchanges, parkland conveyance provisions (Planning Act), purchase by City based on independent appraisal, or purchase by appropriate government agencies.

⁵⁰ www.town.lasalle.on.ca

⁵¹ www.citywindsor.ca

Level of Protection

Lands included as part of the Greenway System may be protected via: conveyance/dedication as part of the planning system; land purchase; partnership arrangements with the ERCA or other group; conservation as a condition of planning approval; leases with private property owners to protect parts/all of the identified area; land exchange; donations/gifts/bequeaths from individuals/corporations; conservation easements; stewardship agreements; and other measures.

Environmental land use designations in the City of Windsor are governed by the Official Plan, the *Provincial Policy Statement and the Planning Act*. These laws, policies and plans afford protection to provincially, regionally and locally significant natural heritage areas.

7.5.7 Drainage and Stormwater Management

Within the ACA there are nine recipient drainage systems: McKee Drain, Titcombe Drain, Basin Drain, Marentette Mangin Drain, Turkey Creek, Lennon Drain, Cahill Drain West Tributary, Cahill Drain and Wolfe Drain. The watercourse locations within the ACA are shown in Exhibit 7.31 A to C. All the drainage systems are part of the Turkey Creek system, which ultimately outlets to the Detroit River. All of the existing drainage systems have been impacted upon by urbanization, with Turkey Creek, Cahill Drain and Wolfe Drains being significantly altered. As an example, Turkey Creek upstream of Huron Church Road has been concrete-lined to Dougall Avenue.

A number of hydrologic and hydraulic investigations have been completed on the existing drainage systems. However, as the investigations were conducted between the 1970s and the early 1990s, updates were required in order to refine the peak flows associated with each. The updated models would incorporate stormwater management plans that have been implemented in support of development.

For further information on existing drainage conditions within the Area of Continued Analysis, the reader is referred to the *Draft Practical Alternatives Evaluation Working Paper – Stormwater Management Plan*.

7.5.8 Groundwater

Measured groundwater levels indicate that in the eastern part of the project area, east of St. Clair College, the groundwater exhibits a downward gradient. In this general area, pressure levels within the clayey silt to silty clay overburden do not exhibit hydrostatic pressures throughout the soil and rock profile. This condition is consistent with the generally low-permeability clayey silt to silty clay soils that will inhibit downward seepage of water from the ground surface to the static groundwater level.

It is considered that the upper soils within the “crust” are fissured and likely of higher permeability than the native soils below the groundwater level. Within the weathered crust, there will be transitions in soil

saturation from near-surface soils that become saturated with stormwater, down through the fissured, unsaturated soils (that exhibit mottled colouring), to the fully saturated soils below (grey in colour). Near-surface clayey silt and silty clay soils may also tend to pool stormwater in local surface depressions.

Within the overburden soil, groundwater levels were measured about 2 m to 3 m below the ground surface, with the level to the north and west between St. Clair College and Turkey Creek being lower than the level to the south and east.

Measured groundwater levels within the bedrock were close to about Elevation 177.5 m, though there appears to be a trend of increasing levels from south and east to north and west, opposite the trend that may be indicated for those piezometers within the overburden.

Between St. Clair College, water levels within the overburden soils drop slightly from about Elevation 180 m to about Elevation 179.5 m, while levels within the bedrock increase from about Elevation 177.5 to about Elevation 179.5 m.

Further to the west, near Ojibway Parkway, the groundwater levels within the overburden remains relatively consistent near about Elevation 179 m to 179.5 m and, in this area, close to the ground surface.

Within the bedrock, however, the groundwater level rises, such that at this location, the groundwater within and near the bedrock surface is artesian with respect to the ground surface, with a pressure head at about Elevation 180.5 (or about 1.5 m above ground surface).

The observation well data indicate, therefore, that there may be a general trend along the potential project alignment of groundwater levels within the overburden soils decreasing from southeast to northwest while bedrock groundwater levels exhibit the opposite trend. It is considered that the trend of decreasing groundwater levels within the overburden is generally reflective of the weathering profile and inhibited infiltration of surface water through the low-permeability clayey silt and silty clay soils, combined with generally declining ground surface elevations from southeast to northwest along the ACA.

The trend in groundwater elevation within the bedrock is also considered generally consistent with groundwater flow patterns between Lake St. Clair, the Detroit River, and areas to the northwest flowing southeast, toward the Lake Erie basin.

Though there is evidence supporting these general conclusions, project-specific hydrogeological conditions within the overburden and bedrock will be dependent upon local variations in soil permeability, surface watercourses (or municipal drains such as the Lennon, Cahill and Grand Marais Drains), surface topography and bedrock topography. Additional explorations and testing will be required during future design phases to refine these general conclusions.

EXHIBIT 7.31A: EXISTING DRAINAGE CONDITIONS – OJIBWAY PARKWAY TO GRAND MARAIS ROAD WEST

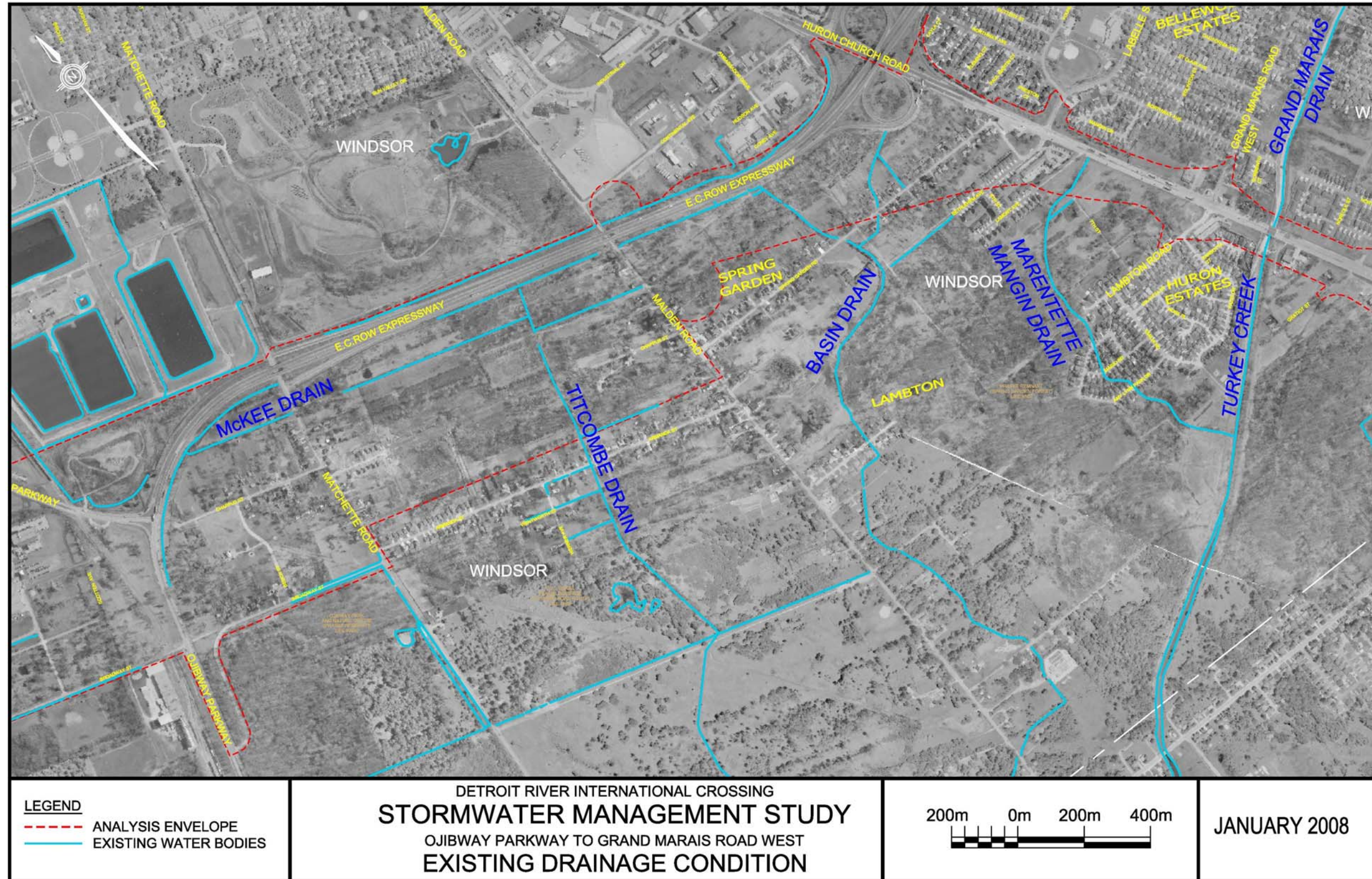


EXHIBIT 7.31B: EXISTING DRAINAGE CONDITIONS –GRAND MARAIS ROAD WEST TO COUSINEAU ROAD

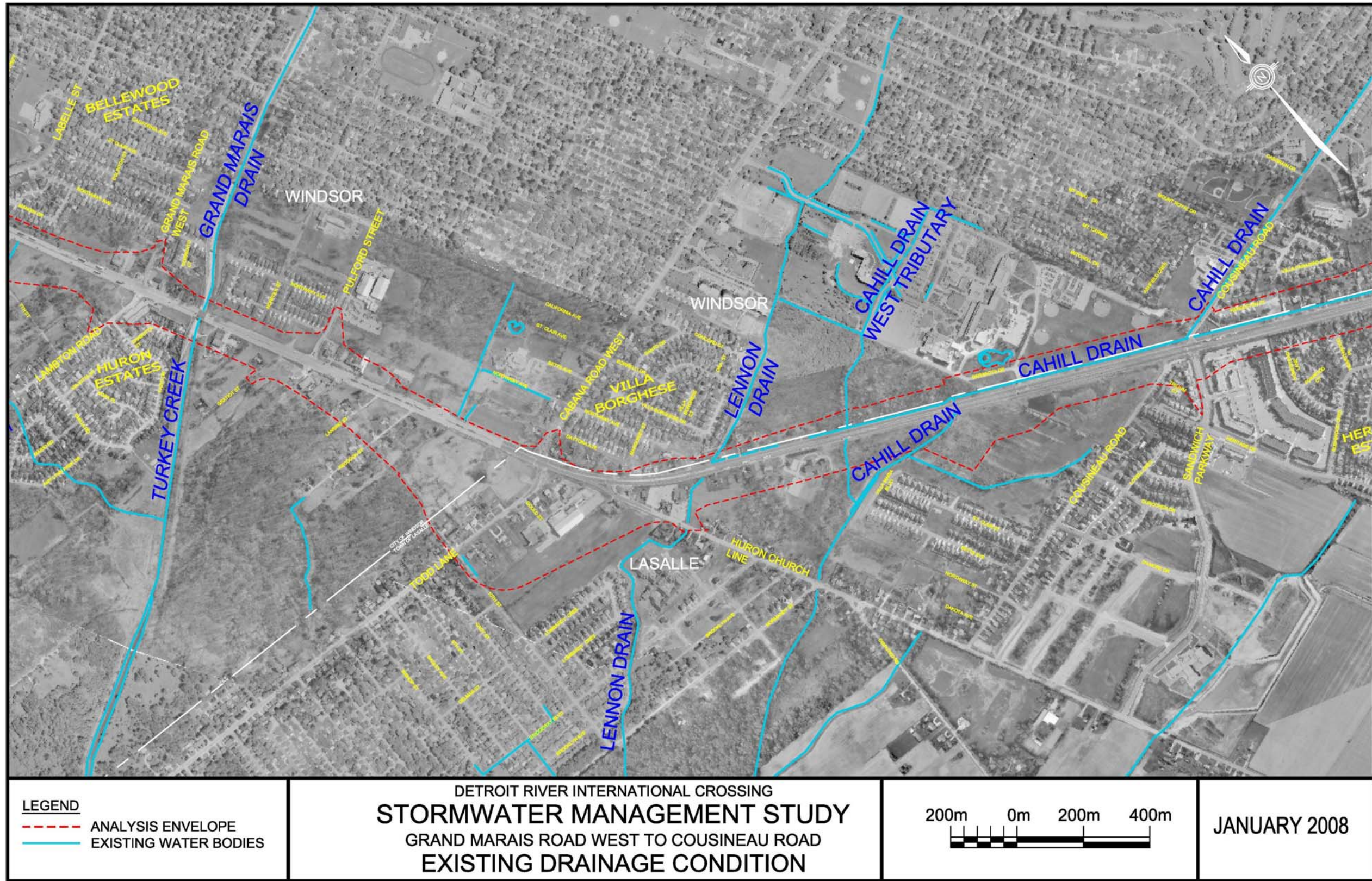
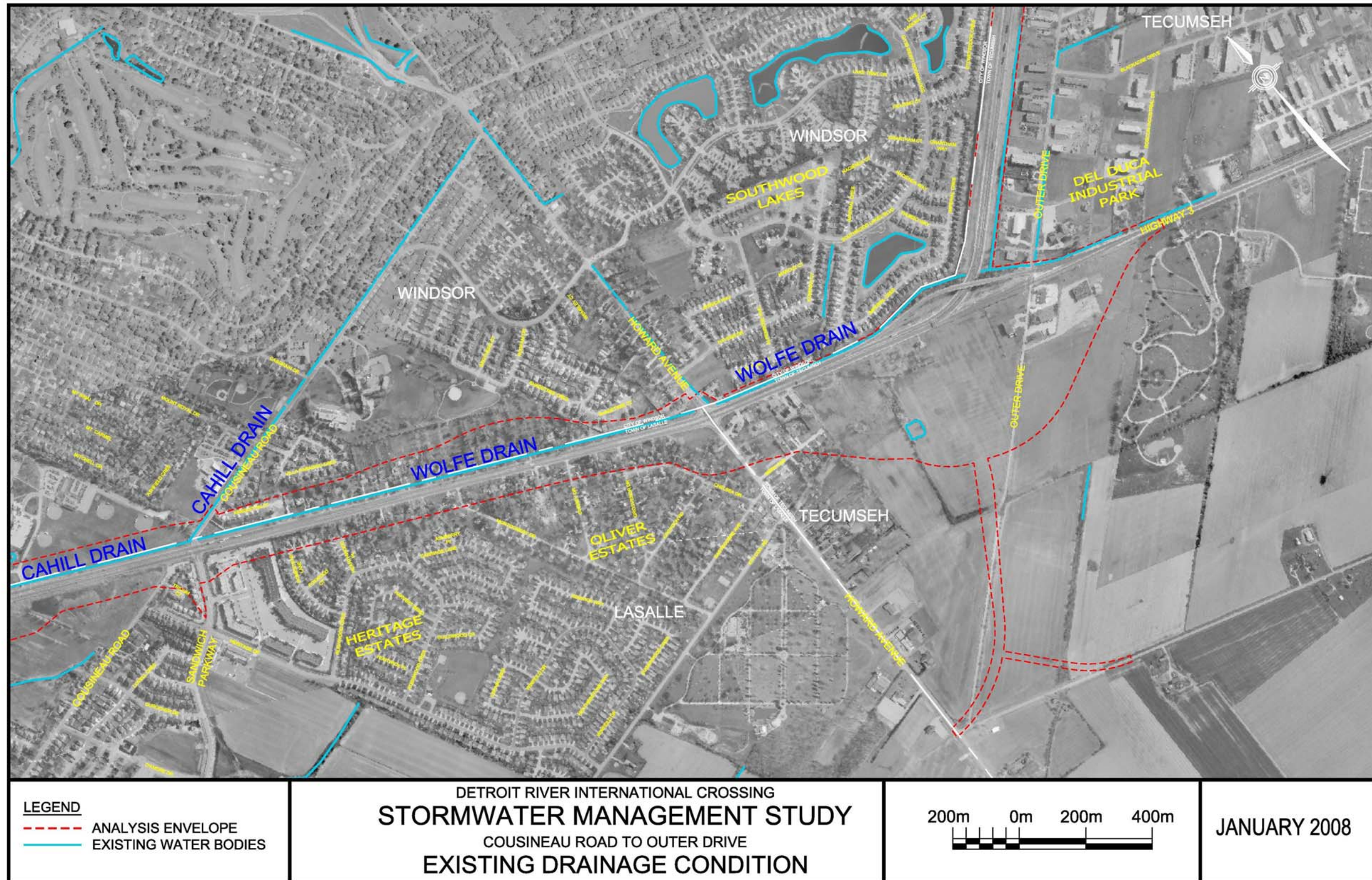


EXHIBIT 7.31C: EXISTING DRAINAGE CONDITIONS – COUSINEAU ROAD TO OUTER DRIVE



7.6 Transportation Network

This section provides an overview of existing traffic conditions within the Area of Continued Analysis. For further details, the reader is referred to the *Level 2 Traffic Operations Analysis of Practical Alternatives*.

7.6.1 Existing Traffic Operations

The existing traffic operations within the ACA were characterized based on operations at existing intersections as well as on operations for the various roadways within the ACA.

INTERSECTION ANALYSIS

Traffic operations at existing intersections were described in terms of level-of-service (LOS). LOS evaluation uses a six-letter grade scale (A to F) to rank the overall traffic handling ability of an intersection or a road network based on delays experienced by vehicles. LOS A indicates excellent traffic operations with minimal delays, while LOS F represents failing conditions with long delays. Levels of service E and F are generally considered undesirable. Tables 7.18 and 7.19 summarize the associated delays and description of each level of service for signalized and unsignalized intersections, respectively.

TABLE 7.18 – LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service	Control Delay per Vehicle (s/veh)	Description
A	0 – 10	Operations with very low delay
B	> 10 – 20	This LOS generally occurs with good progression.
C	> 20 – 35	These higher delays may result from fair progression.
D	> 35 – 55	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, longer cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. This level is considered by many agencies to be the limit of acceptable delay.
E	> 55 – 80	These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
F	> 80	This level, considered to be unacceptable to most drivers, often occurs with over-saturation; that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and cycle lengths may also be major contributing causes to such delay levels.

TABLE 7.19 – LEVEL OF SERVICE CRITERIA FOR TWO-WAY STOP-CONTROLLED INTERSECTIONS

Level of Service	Control Delay per Vehicle (s/veh)	Description
A	0 – 10	Little or no delay
B	> 10 – 15	Short traffic delays
C	> 15 – 25	Average delays
D	> 25 – 35	Long delays
E	> 35 – 50	Very long delays
F	> 50	Extremely long delays with significant queuing and congestion

In addition to assessing level-of-service and delays, volume-to-capacity (V/C) ratios at the studied intersections were also determined. A V/C ratio is a measure of effectiveness that measures the ability of a roadway facility (typically a link or intersection) to accommodate its associated demand. It is calculated by dividing the actual demand on the facility by its theoretical capacity. A V/C ratio less than 0.85 generally indicates that the facility has the capacity to accommodate the existing demand, and vehicles will not experience undue congestion and delay. A V/C below 0.85 also indicates that the facility likely has the excess capacity to accommodate future demand. As the V/C ratio approaches 1.0, delay and congestion may begin to occur, along with traffic instability. Finally, when the V/C ratio exceeds 1.0, it indicates that the facility is operating over capacity, with no accommodations for future growth. Motorists will typically experience undue delay and congestion, and may have to wait through multiple signal cycles before proceeding through an intersection.

Tables 7.20 and 7.21 summarize Synchro output for peak direction LOS, delay per vehicle, V/C ratio and overall intersection LOS for the AM (Northbound) and PM (Southbound) peak hour, respectively.

TABLE 7.20 – EXISTING AM PEAK HOUR & DIRECTION (WESTBOUND/NORTHBOUND) INTERSECTION LEVEL OF SERVICE, HURON CHURCH ROAD/HIGHWAY 3 CORRIDOR

Intersection	LOS, Peak Through Movement (WB/NB)	Delay per Vehicle(s), Peak Through Movement (WB/NB)	V/C Ratio, Peak Through Movement (WB/NB)	Overall Intersection LOS
College Ave.	A	2.9	0.59	B
Girardot St.	B	11.0	0.54	B
Tecumseh Rd.	C	28.7	0.75	C
Dorchester Rd.	A	2.3	0.49	A
Prince Rd / Totten St.	A	2.8	0.65	A
Malden Rd.	B	10.7	0.86	B
Northwood St. / Industrial Dr.	A	9.5	0.81	B
E.C. Row Ramp North	A	1.8	0.53	A
E.C. Row Ramp South	A	4.0	0.48	A
Labelle St.	A	7.7	0.76	B
Grand Marais Rd. / Lambton St.	B	13.9	0.73	B
Pulford St.	B	12.8	0.58	B

Intersection	LOS, Peak Through Movement (WB/NB)	Delay per Vehicle(s), Peak Through Movement (WB/NB)	V/C Ratio, Peak Through Movement (WB/NB)	Overall Intersection LOS
Cabana Rd. / Todd Ln.	C	33.9	0.80	D
Huron Church Line	B	13.7	0.74	C
St. Clair College	B	12.4	0.56	A
Cousineau Rd.	C	22.4	0.74	C
Howard Ave.	C	27.3	0.75	C

TABLE 7.21 – EXISTING PM PEAK HOUR & DIRECTION (SOUTHBOUND/EASTBOUND) INTERSECTION LEVEL OF SERVICE, HURON CHURCH ROAD/HIGHWAY 3 CORRIDOR

Intersection	LOS, Peak Through Movement (SB/EB)	Delay per vehicle (s), Peak Through Movement (SB/EB)	V/C Ratio, Peak Through Movement (SB/EB)	Overall Intersection LOS
College Ave.	C	27.6	0.87	C
Girardot St.	A	6.3	0.66	A
Tecumseh Rd.	B	15.8	0.73	C
Dorchester Rd.	A	2.6	0.62	A
Prince Rd / Totten St.	A	4.8	0.69	A
Malden Rd.	B	11.9	0.85	B
Northwood St. / Industrial Dr.	A	6.2	0.76	B
E.C. Row Ramp North	A	8.3	0.81	B
E.C. Row Ramp South	A	2.9	0.62	A
Labelle St.	B	11.8	0.70	B
Grand Marais Rd. / Lambton St.	B	13.8	0.76	B
Pulford St.	A	8.3	0.54	A
Cabana Rd. / Todd Ln.	D	45.5	0.86	D
Huron Church Line	B	14.5	0.52	B
St. Clair College	A	5.6	0.56	B
Cousineau Rd.	C	27.4	0.75	C
Howard Ave.	D	39.6	0.90	C

During the AM peak hour, only the intersection of Highway 3 and Todd Lane/Cabana Road West is operating at an overall LOS below LOS C. There are no peak-direction through movements operating below LOS C. The peak through movement (northbound) at the intersection of Huron Church Road and Malden Road is currently operating with a V/C ratio of 0.86, indicating that it is approaching its theoretical capacity.

For the PM peak hour, the intersection of Highway 3 and Cabana Road West/Todd Lane is again operating below LOS C, with the eastbound through movement also operating at LOS D. This indicates

that all traffic at this intersection is beginning to experience delay that is approaching unacceptable levels. There are four intersections within the studied corridor where southbound through movements are currently operating with V/C ratios of 0.85 or above, indicating that they are approaching their theoretical capacity.

TRAFFIC OPERATIONS ALONG EXISTING ROADWAYS

Travel time and arterial LOS are other means of evaluating traffic operations along a corridor. For the entire corridor between Highway 401 and the Ambassador Bridge, the existing morning peak hour northbound travel time was calculated to be 13 minutes (800 seconds). The afternoon peak hour southbound travel time is nearly 13 minutes (770 seconds). These times are generally consistent with travel times observed in the field.

Table 7.22 shows arterial level of service. Generally, roadway links along the corridor operate with arterial LOS of C or better, supporting the overall corridor LOS. However, deficiencies were found around Tecumseh Road, Malden Road, Todd Lane/Cabana Road West, Huron Church Line and Howard Avenue, which report lower LOS ranging from D to F. The arterial operating conditions on these links are consistent with the traffic volumes, turning movements, capacity and delay found at their associated intersections.

TABLE 7.22 – EXISTING ARTERIAL LEVEL OF SERVICE, HURON CHURCH ROAD/HIGHWAY 3 CORRIDOR

Segment	AM Peak Hour		PM Peak Hour	
	WB/NB	SB/EB	WB/NB	SB/EB
Ambassador Bridge-College St.	B	N/A	B	N/A
College St.-Girardot St.	B	B	A	B
Girardot St.-Tecumseh Rd. W	F	B	E	C
Tecumseh Rd. W-Dorchester St.	C	B	C	C
Dorchester St.-Prince Rd.	C	C	C	C
Prince Rd.-Malden Rd.	B	C	B	D
Malden Rd.-Industrial Rd.	C	B	B	B
Industrial Rd.-E.C. Row (north ramp)	B	B	C	C
E.C. Row (north ramp)-E.C. Row (south ramp)	B	B	B	B
E.C. Row (south ramp)-Spring Garden Rd.	B	C	B	C
Spring Garden Rd.-Lambton St.	C	B	C	C
Lambton St.-Pulford St.	B	B	B	B
Pulford St.-Todd Lane	F	C	F	D
Todd Lane-Huron Church Line	A	D	A	D
Huron Church Line-St. Clair College	A	A	A	A
St. Clair College-Cousineau Rd.	A	A	A	B
Cousineau Rd.-Howard Ave.	C	A	D	B
Overall	B	B	B	C

SUMMARY

Overall, the results indicate that corridor operations are constrained at select intersections throughout its length. These intersections create bottlenecks at critical locations, resulting in the degraded traffic operations shown at intersections such as Tecumseh Road and Todd Lane/Cabana Road West. It should also be noted that the results presented in this section represent a snapshot of traffic conditions in February 2006, when traffic data was collected for this study.

Seasonal variations in traffic and other factors may result in different operating conditions at other times of the year. However, regardless of season, traffic operations have improved considerably since July 2004 when U.S.-bound border processing capacity was added at the bridge, even though truck traffic has continued to increase. The improvements from pre-July 2004 traffic operations are due mostly to this expanded border processing capacity.

7.7 Constructability Issues

GEOLOGY / SUBSURFACE ENVIRONMENT

Further to the information presented in Chapter 4, an intensive geotechnical deep drilling program was initiated as part of this EA study to confirm the integrity of the underlying bedrock. This program was initiated due to an area of known historical solution mining of salt in the vicinity of two of the practical crossing alternatives (Practical Crossing Alternative B and Practical Crossing Alternative C) which are described in more detail in Chapter 8.

A Geotechnical Advisory Group, consisting of international experts on geotechnical engineering, was commissioned to provide technical guidance and review of this deep drilling program.

The findings of the deep drilling program identified significant risks in the vicinity of the approach structure for Crossing C (refer to Section 8.1.3).

Further details with regard to the results of the program are summarized in the *Draft Practical Alternatives Evaluation Constructability Report - Plaza and Crossing Alternatives*.

7.8 Utilities

As part of the existing conditions investigations within the Area of Continued Analysis, the study team contacted utility companies and the municipalities to obtain information with regard to existing utility locations as well as future planned utilities. Based on this information obtained a composite utility plan was developed and is illustrated in Exhibit 7.32A to 7.32G.

EXHIBIT 7.32A – EXISTING UTILITY CONDITIONS (OJIBWAY PARKWAY TO MALDEN ROAD)

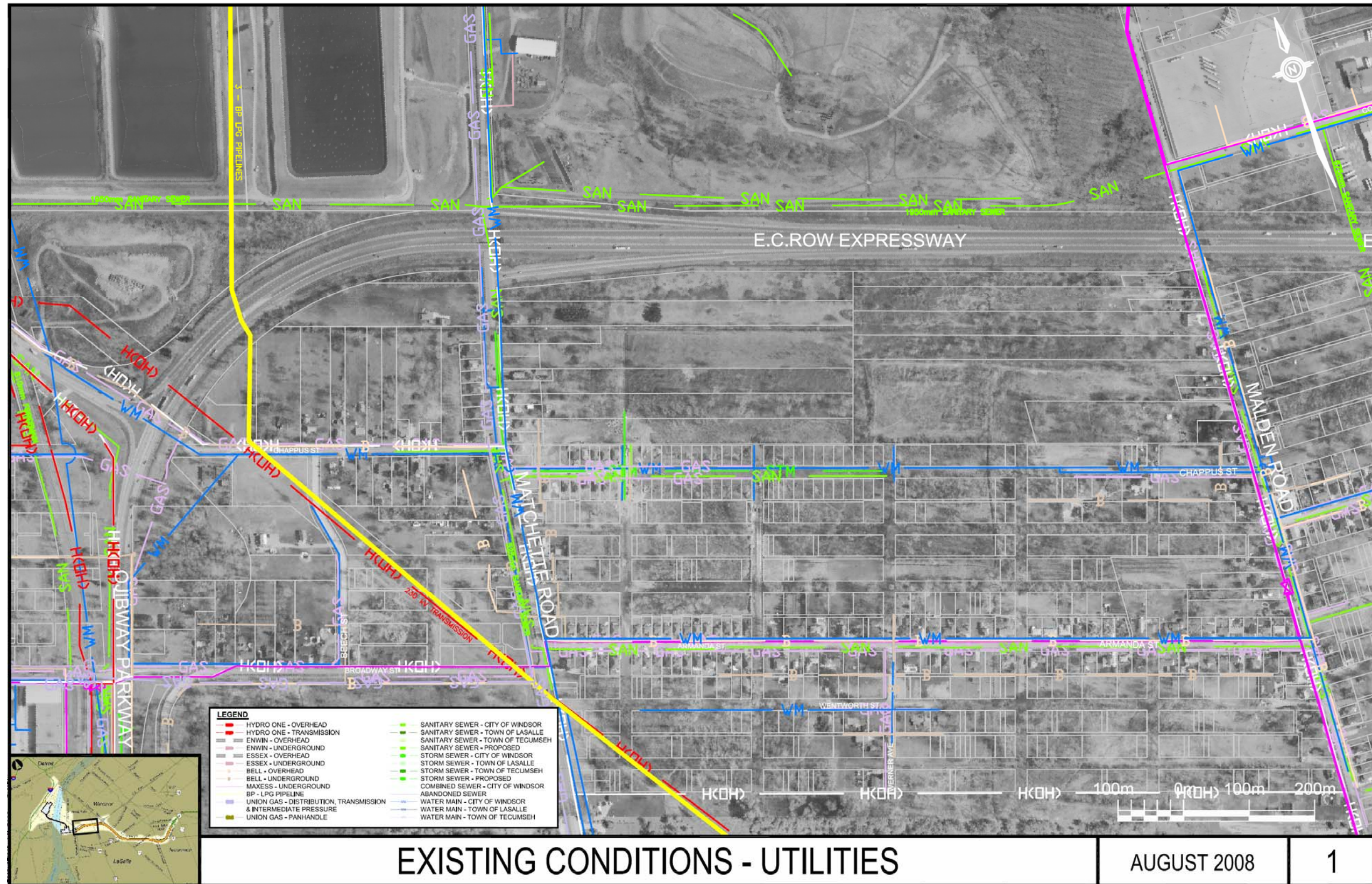
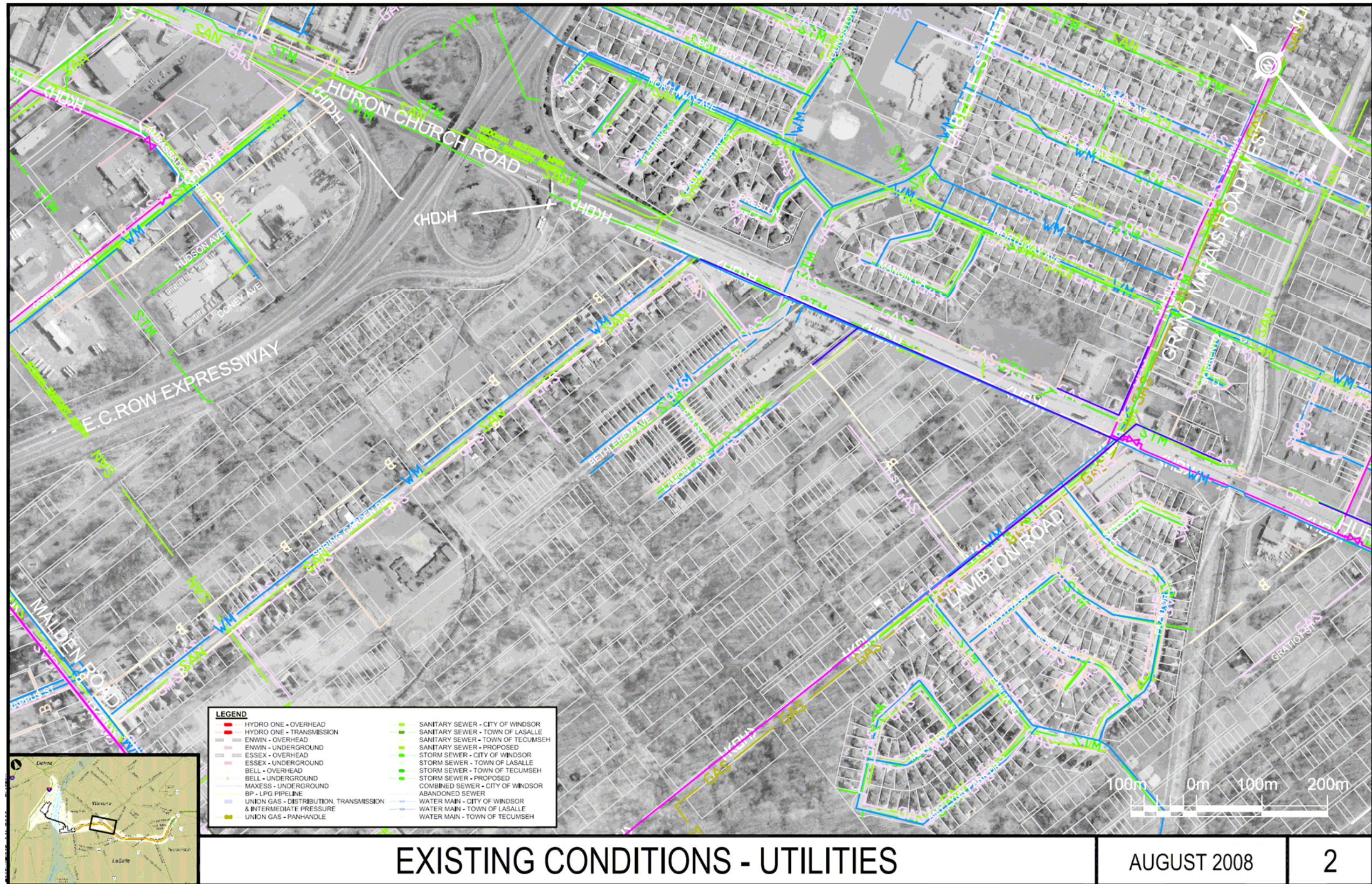


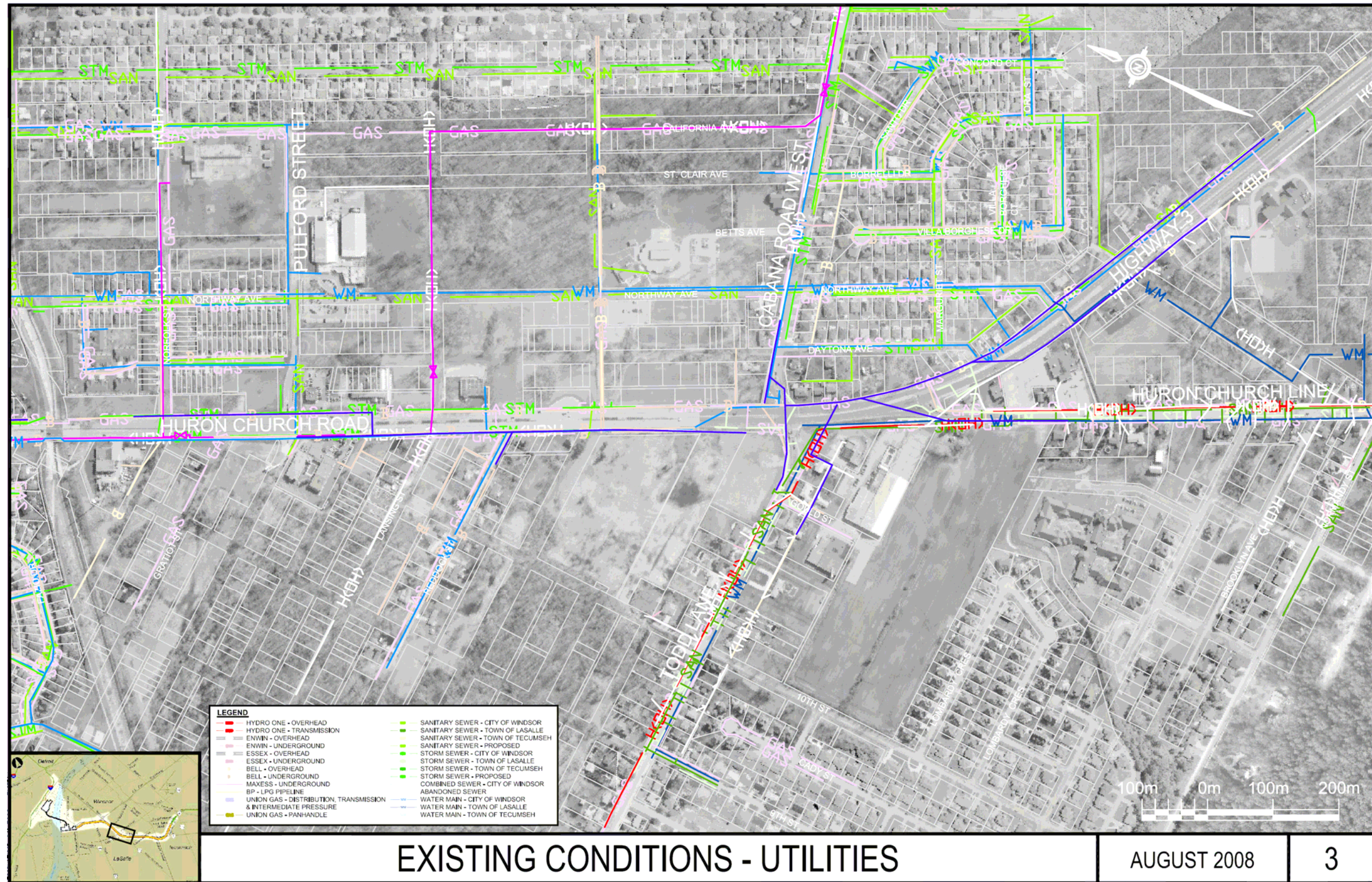
EXHIBIT 7.32B – EXISTING UTILITY CONDITIONS (MALDEN ROAD TO GRAND MARAIS ROAD WEST)



EXISTING CONDITIONS - UTILITIES

AUGUST 2008

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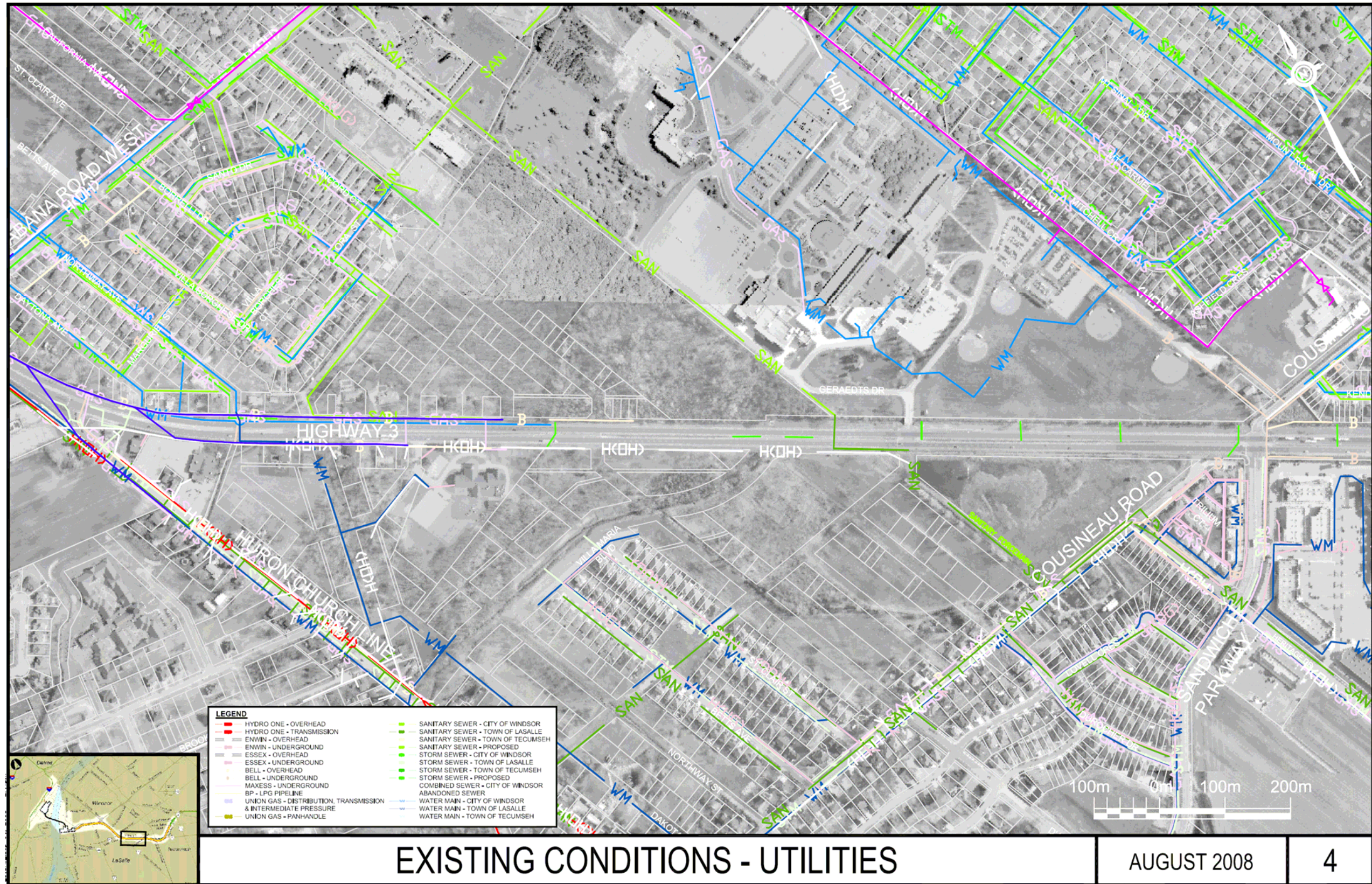
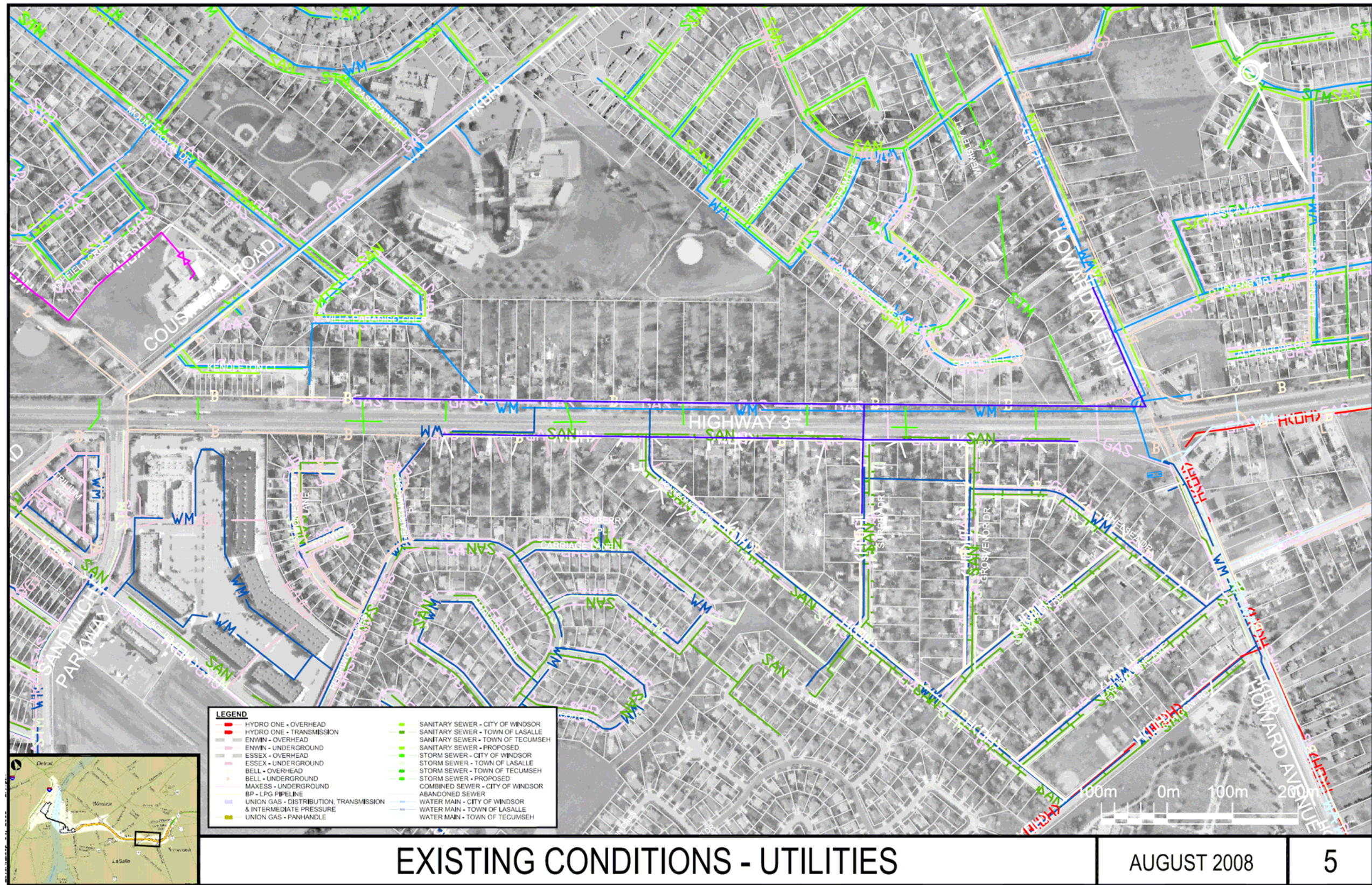


EXHIBIT 7.32E – EXISTING UTILITY CONDITIONS (COUSINEAU ROAD TO HOWARD AVENUE)



EXISTING CONDITIONS - UTILITIES

AUGUST 2008

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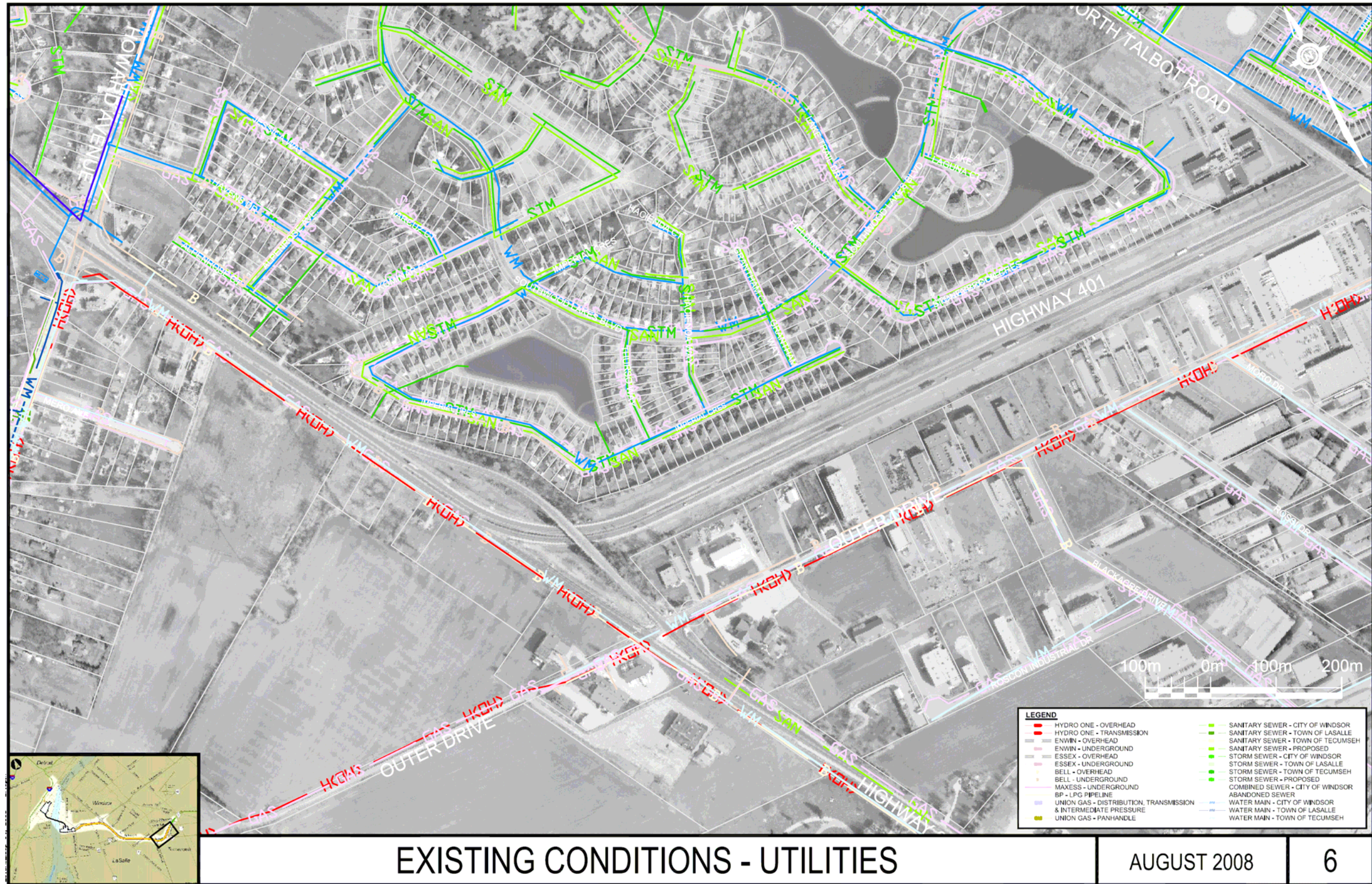


EXHIBIT 7.32G – EXISTING UTILITY CONDITIONS (NORTH TALBOT ROAD TO OUTER DRIVE)

