# Local Employment Area Area Concept Plan

# Biophysical Assessment

**Prepared for:**
**Planning and Development Services, Strathcona County**

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# 1.0 INTRODUCTION

Strathcona County has initiated the planning and design for the Local Employment Area (LEA) Area Concept Plan (ACP) contained within the 5, 7, 8, 9 and 10 sections of 52-22 West of the 4th Meridian. To support that effort a biophysical assessment has been completed that characterizes landscape features of the Subject Area as mainly undulating and hummocky agricultural and forested rural residential lands, which includes wetlands, uplands, streams and riparian areas.

## 1.1 Scope

As per Strathcona County Policy SER-009-032 Biophysical Assessment, the purpose of this biophysical assessment is to provide a broad overview of significant natural and landscape features, identify fish and wildlife species observed and known to the subject area and to identify priority areas for conservation based on their local, regional and provincial significance within the Local Employment Area.

## 1.2 Development Project Description

On September 5, 2017, Council approved a new MDP. Section 5.8 is specific to the Local Employment Policy Area and sets the long term development goal as providing opportunities for local employment, ensuring the natural landscape will be retained and the area is viable for the long term. This policy area encompasses the entire LEA.

The next step in planning for the LEA is to develop an Area Concept Plan and detailed engineering plans. An Area Concept Plan is a statutory plan that provides a comprehensive planning framework and generalized future land use concept that guides subsequent development plans.

## 1.3 Objectives

In the interest of sustaining our natural environment, Strathcona County's goal is to protect the integrity of our heritage and natural resources while providing opportunities for appropriate forms of use that will benefit the community. The broad overview of landscape features and wildlife information provided in this report will be used to ensure that our goals, as laid out in Strathcona County's Strategic Plan, are met. These goals include:

- maintain viable, sustainable populations of native plants and wildlife in their natural habitats;
- preserve our agricultural heritage;
- maintain heritage resources and values, whether it be a building, monument or landscape feature;
- identify a network of conservation areas to promote the sustainable use of native habitat and heritage resources to enhance quality of life for all;
- restore and rehabilitate degraded ecosystems, where practical;
- develop and implement management plans to ensure long term viability of the natural and heritage resources; and
- educate the public on conservation and sustainability.

## 2.0 DEVELOPMENT CONTEXT

A Biophysical Assessment was conducted on the Subject Area located south of Hwy 16, north of the CN Railway between Highway 21 and Secondary Highway 824 in Strathcona County in 2014 in support of the Industrial Lands Strategy Summary Report (2013). The objective of that assessment was to identify the natural features and their functions and values in order to provide Strathcona County's Council, planners and residents with information to make sustainable planning decisions. That assessment was conducted in compliance with Municipal Policy SER-009-032 Biophysical Assessment.

That 2014 Biophysical Assessment has been updated to reflect the change in land use planning and to provide a finer level of detail for development of the ACP. This assessment was also conducted in compliance with Municipal Policy SER-009-032 Biophysical Assessment

### 2.1 Location

The Local Employment Area consists of approximately 4 sections of land under primarily private ownership. It is located directly east of Sherwood Park and directly south of the Bremner ACP Area. It is bounded by two primary highways; Highway 16 to the north and Highway 21 to the west. It is bounded by Secondary Highway 824 (Range Road 222) to the east and the CN Railway to the south.


**Figure 1: Local Employment Area ACP Area**

## 2.2 Physiographic Description and Climate

The Province of Alberta has been divided into specific units that reflect natural features through a process termed land classification. The land classification units are based on natural features – geology, landform, hydrology, soils, climate, vegetation and animals. All these natural features act as a unit and are termed an ecosystem.

The Natural Regions and Subregions classification developed in 1977 (Natural Regions Committee 2006) is specifically for natural area reserve planning. The purpose of the Natural Regions and Subregions classification is to account for the entire range of natural lands or ecosystem diversity in Alberta and is related to landscape and biodiversity conservation. This system has been adopted by the Alberta Parks Service. Based on the Natural Regions and Subregions classification, the Local Employment Area exists within a transition zone between the Boreal Forest Natural Region, specifically the Dry Mixedwood Subregion, and Parkland Natural Region, specifically the Central Parkland Subregion.

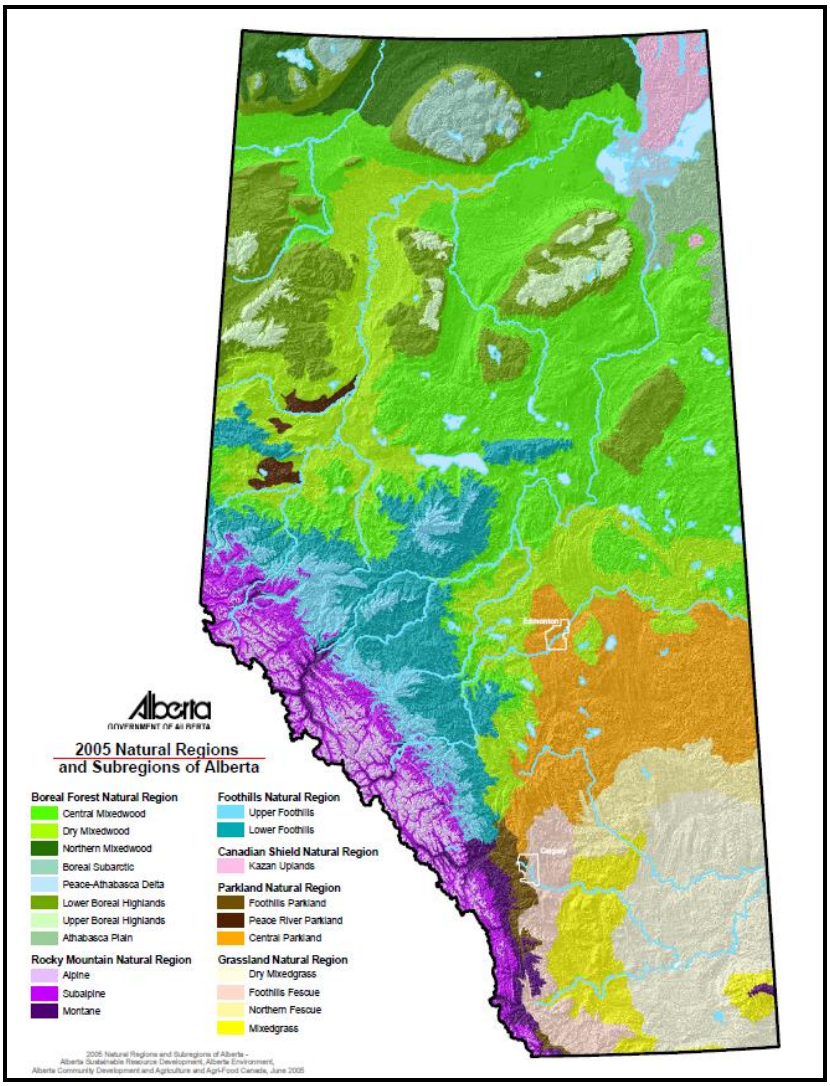


**Figure 2: Natural Regions and Subregions of Alberta.**

### 2.2.1 Boreal Forest Natural Region – Dry Mixedwood Subregion

The Boreal Forest Natural Region is the largest in Alberta. It is characterized by lowland plains and locally extensive hill systems. Major surficial features are lowland glaciofluvial and glaciolacustrine deposits and upland moraines. The southern portion of the Boreal Forest Natural Region drains primarily into the North Saskatchewan River system. Wetlands are a major characteristic of this Natural Region, specifically bogs, fens and marshes. There are six Subregions, including the Dry Mixedwood Subregion.

The Dry Mixedwood Subregion is characterized by level to undulating terrain with hummocky moraine landforms. The Cooking Lake moraine, which the subject property lies within, is a disjunct portion of this Subregion. Soils are Gray Luvisols in well-drained upland areas and Eutric Brunisols in coarse sandy uplands. Gleysols and Organics occur in wetland areas.

The climate of this Subregion is subhumid, continental with short, cool summers and long, cold winters. The mean May to September temperature is 13°C with a growing period of 90 days. Annual precipitation averages 350 mm, with the majority coming as rain in June and July. Winters are dry with approximately 60 mm of precipitation.

The typical vegetation within this Subregion is transitional between the Central Parkland and Central Mixedwood Subregions. The differences lie in the proportion of vegetation types and landscape features. Aspen (*Populus tremuloides*) occurs in pure and mixed stands, balsam poplar (*Populus balsamifera*) occurs on moister substrates. White spruce (*Picea glauca*) and balsam fir (*Abies balsamea*) are late successional species that replace poplar over time. Fire frequency, forestry and agriculture have largely resulted in pure deciduous stands in the southern areas of this Subregion. The associated understory species consist of a high number of shrubs and forbes.

Wildlife characteristic to this Subregion include migratory songbirds, woodpeckers and raptors. Migratory waterfowl are characteristic to the wetlands and associated uplands. Mammals include beaver (*Castor canadensis*), moose (*Alces alces*), hare (*Lepus* spp.), black bear (*Ursus americanus*), wolf (*Canis lupus*), and lynx (*Lynx canadensis*). Due to the human element and significant disturbance, white-tailed deer (*Odocoileus virginianus*) and coyote (*Canis latrans*) are abundant.

### 2.2.2 Parkland Natural Region – Central Parkland Subregion

The Parkland Natural Region can be applied to 10 to 15% of the landmass of Alberta. It forms a transition between the drier grasslands and the moister coniferous forests.

It is characterized by broad plains with deeply incised river valleys and rolling morainal terrain. The climate is influenced by prairie, boreal and mountain landscape and weather. A mix of aspen stands, shrubs and grasslands characterize the regional vegetation. There are three Subregions – Central, Foothills and Peace River.

The Central Parkland Subregion is characterized by level to undulating terrain with hummocky moraine landforms. Surficial deposits range from hummocky ground moraines to glaciolacustrine deposits. Moraines are most widespread. Numerous permanent streams, all part of the Saskatchewan River system, cut across the Subregion. Lakes and wetlands are slightly to strongly saline. Soils are Black and Dark Brown Chernozems under grasslands, and Dark Gray Chernozems and Luvisols under aspen forest stands.

The climate of this Subregion is subhumid, continental with short, cool summers and long, cold winters. The mean May to September temperature is 13°C with a growing period of 90 days. Annual precipitation averages

350 mm, with the majority coming as rain in June and July. Winters are dry with approximately 60 mm of precipitation.

The typical vegetation within this Subregion is Aspen (*Populus tremuloides*) occurring in pure and mixed stands, and balsam poplar (*Populus balsamifera*) occurring on moister substrates. The associated understory species consist of a high number of shrubs, specifically snowberry (*Symphoricarpos albus*), rose (*Rosa acicularis*), choke cherry (*Prunus virginiana*) and Saskatoon (*Amelanchier alnifolia*), often existing as belts of shrubs extending from the forest stands.

Wildlife characteristic to this Subregion include grassland and forest species. Migratory waterfowl are characteristic to the wetlands and associated uplands. Mammals include beaver (*Castor canadensis*), moose (*Alces alces*), hare (*Lepus spp*.), white-tailed deer (*Odocoileus virginianus*) and coyote (*Canis latrans*).

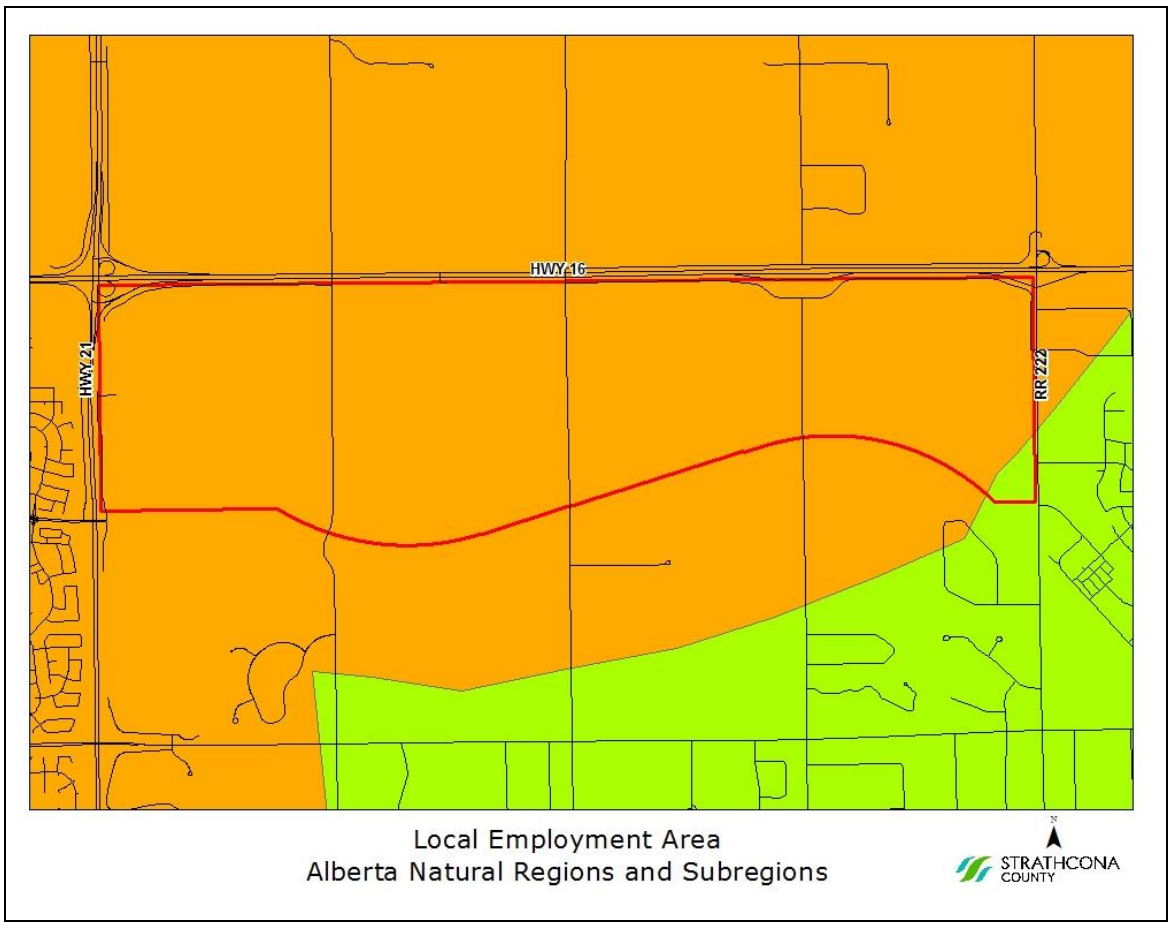


**Figure 3: LEA ACP Area within the Dry Mixedwood (green) and Central Parkland (orange) Subregions.**

## 2.3 Study and Assessment Methods

Permission to Enter Property Agreements were not requested at the time of this Biophysical Assessment, therefore all observations included in this report have been obtained using airphoto analysis, review of previous environmental reports and roadside observation techniques. As such, detailed Biophysical Assessments will need to be completed for each quarter section located within the Local Employment Area to support Area Structure Plan development. This will ensure more specific identification of existing natural and landscape features, including the classification of wetlands, further identification of fish and wildlife species in the area and the prioritization and dedication of future Environmental Reserve, Environmental Reserve

Easement, Municipal Reserve and Conservation Easement lands based on municipal, community and environmental needs.

Site surveys were completed by Jocelyn Thrasher-Haug, P.Ag, P.Biol. The survey was designed to determine site characteristics, through a floral and faunal survey and habitat identification. The surveys were conducted in August 2017, at which time the plant communities and overall habitat were assessed. Wildlife observations were completed which included direct visual observations and indirect observations, such as browse and bedding indicators, vocalizations, tracks, and scat.

### 2.4 Applicable Legislation

The following list includes legislation at the federal, provincial and municipal levels that is most common and applicable, but it is not an exhaustive list.

#### 2.4.1 Federal Policy on Wetland Conservation (1991)

The Federal Policy on Wetland Conservation complements the goals of the North American Waterfowl Management Plan, federal policies on water conservation and fish habitat conservation and the International Ramsar Convention (Government of Canada, 1991). The objective of the Policy is to "promote the conservation of Canada's wetlands to sustain their ecological and socio-economic functions, now and in the future."

In order to meet this objective, the following goals have been identified:

- ***maintenance*** *of wetlands functions and values derived from wetlands throughout Canada;*
- ***no net loss of wetland functions*** *on all federal lands and waters;*
- ***enhancement and rehabilitation*** *of wetlands where the continuing loss or degradation of wetlands and their functions have reached critical levels;*
- ***recognition*** *of wetland functions in resource planning, management and economic decision-making with regard to all federal programs, policies and activities;*
- ***securement*** *of wetlands of significance to Canadians;*
- ***recognition of sustainable management practices*** *in sectors such as forestry and agriculture that make a positive contribution to wetland conservation while also achieving wise use of wetland resources; and*
- ***utilization*** *of wetlands in a manner that enhances prospects for their sustained and productive use by future generations.*

The Policy defines a wetland as:

> *…land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation and various kinds of biological activity which are adapted to a wet environment.*

Although not a regulatory document, the Federal Policy on Wetland Conservation promotes wetland conservation through federal decision and responsibilities. The goals and objectives of the Federal Policy should be reflected in the management and development of the LEA ACP Area.

### 2.4.2 Environmental Protection and Enhancement Act

The *Environmental Protection and Enhancement Act* (2000) aims to protect Alberta's air, land, and water by detailing what sort of activities require approvals and the associated requirements. The Act supports and promotes the "protection, enhancement and wise use of the environment" while simultaneously recognizing the importance of:

- environmental protection for human and nature benefit;
- integrating environmental protection with economic decisions throughout the planning stages;
- sustainable development;
- preventing and mitigating the environmental impact development, government policies, programs, and decisions;
- government leadership; and
- shared responsibility to protect, enhance and wisely use the environment.

Depending on the type of activities proposed for the LEA ACP Area, this Act should be consulted prior to commencing. Development should proceed in a way where the protection, enhancement and wise use of the environment can work symbiotically with the proposed land use.

### 2.4.3 Municipal Government Act

The *Municipal Government Act* (2000) is responsible for providing operational framework and governance model for all forms of local government in Alberta including specialized municipalities. It also lays the basis for how municipalities operate, how their councils function and how residents work with their municipality.

The Municipal Government Act (MGA) has three main areas of focus:

- governance;
- planning and development; and
- assessment and taxation.

The MGA also defines and uses of Environmental and Municipal Reserves which are as follows.

Environmental Reserve

> *… a subdivision authority may require the owner of a parcel of land that is the subject of a proposed subdivision to provide part of that parcel of land as environmental reserve if it consists of*
> *(a) a swamp, gully, ravine, coulee or natural drainage course,*
> *(b) land that is subject to flooding or is, in the opinion of the subdivision authority, unstable, or*
> *(c) a strip of land, not less than 6 metres in width, abutting the bed and shore of any lake, river, stream or other body of water for the purpose of*
>
> > *(i) preventing pollution, or*
> > *(ii) providing public access to and beside the bed and shore.*
>
> *… environmental reserve must be left in its natural state or be used as a public park.*

Municipal Reserve

> *… a subdivision authority may require the owner of a parcel of land that is the subject of a proposed subdivision*
>
> > *(a) to provide part of that parcel of land as municipal reserve, school reserve or municipal and school reserve,*
> > (b) *to provide money in place of municipal reserve, school reserve or municipal and school reserve, or*

(c) *to provide any combination of land or money referred to in clauses (a) and (b).*

*Municipal reserve, school reserve or municipal and school reserve may be used by a municipality or school board or by them jointly only for any or all of the following purposes:*

*(a) a public park;*

*(b) a public recreation area;*

*(c) school board purposes;*

*(d) to separate areas of land that are used for different purposes.*

The MGA enables municipalities to govern the development of lands within their boundaries in a manner that is logical, timely, economical and environmentally responsible. The MGA requires that municipalities with a population more than 3,500 adopt a MDP. See Section 2.4.7 for more information on the MDP.

### 2.4.4 Public Lands Act

The *Public Lands Act* (2000) deals with two factors relating to the management of water bodies: the ownership of the beds and shores of permanent water bodies, and the prohibition of certain activities that may cause injury to the beds and shores of permanent water bodies. According to the act, the province owns the bed and shores of "all permanent and naturally occurring bodies of water, and all naturally occurring rivers, streams, watercourses and lakes".

The *Surveys Act* (2000) defines bed, bank and shore. The bank, being defined as the line along the upper limit of the bed and shore formed by the normal, continuous action of presence of surface water on the lands, limits the extent of the Province's ownership. This is a natural boundary between the bed and shore and privately owned land. The location of the bank is not affected by drought or flooding. The bed of a water body is defined as the land on which the water sits. The shore is defined as that part of the bed that is exposed when water levels are not at the normal level.

Section 54(1) of the Public Lands Act contains a general prohibition that no person shall do anything that:

- *…may injuriously affect watershed capacity;*
- *…is likely to result in injury to the bed and shore of any river, stream, watercourse, lake or other body of water or land in the vicinity of that public land; or*
- *…is likely to result in soil erosion.*

Any unauthorized use of public land may be subject to a variety of penalties, including fines, disposition cancellation, ministerial orders to restore disturbed areas, or legal action imposed penalties.

Due to the sensitive nature of shore resources, most activities on the bed and shore require at least two provincial approvals through the Public Lands Act and the Water Act. Conditions are placed on all authorizations: (1) to ensure that compatible activities and resources are used properly, (2) to limit the chance of degrading aquatic and shore environments, and where necessary, (3) to mitigate, reclaim or restore an area where disturbance is unavoidable.

### 2.4.5 Water Act

The *Water Act* (2000) is the primary legislation that deals with water and water management. Water management is necessary in order to address demands on aquatic resources while ensuring that a clean abundant supply of water is available, including for its own protection. There are multiple scales at which water management can occur, whether involving a small area, such as lake management, or at a larger area, such as an entire watershed. Regardless of the level, public participation is a necessity in successfully managing water.

Ownership, activity regulation, water allocation and use, and the licensing and approval system are all components described in the Act. Through the Water Act the Crown owns the resource of water. The Water Act applies over a water body's flood plain, bed and shore. The Water Act works to safeguard the aquatic environment which has been defined as:

> *…the components of the earth related to, living in or located in or on water or the beds or shores of a water body, including but not limited to*
>
> *(i) All organic and inorganic matter, and*
>
> *(ii) Living organisms and their habitat, including fish habitat, and their interacting natural systems.*

Section 36 of the Act describes which activities require approvals. Those activities that may impact water and the aquatic environment are required to obtain approval. It is an offence under the Water Act to commence or continue an activity unless an approval or other authorization under the Act has been issued; to contravene a term or condition of an approval or license; to contravene a water management order; or contravene an enforcement order. Penalties may include fines, water management orders, remedial orders, court orders and civil remedies.

### 2.4.6 Alberta Wetland Policy

The Alberta Wetland Policy looks at the entirety of Alberta, including crown land, white and green zones, and addresses all classes of wetlands. The new classification system was introduced in 2015 and describes five classes: bogs, fens, marshes, shallow open water, and swamps. These five classes align with the Canadian Wetland Classification System. Once categorized into one of five classes, wetlands are divided into **forms** based on vegetation structure. The forms are then divided into **types** based on the length of time that surface water is at or above the surface, along with basic water characteristics (acidity and salinity) as per Stewart and Kantrud classes for prairie wetlands.

Currently wetlands cover approximately 18% of the province, however it is estimated that 64% of wetlands in the White Area have been lost or impacted. The Alberta Wetland Policy in conjunction with the Water Act aim to protect the remaining wetland on private and public lands through the avoidance of damage or destruction of wetlands, the minimization of impact of wetlands, and/or the compensation for reclamation or development of wetlands.

Wetlands have a wide diversity of functions, including water quality improvement, flood and drought mitigation, shoreline protection, recreation activities, and habitat. Wetlands are defined as

> *land that is saturated with water long enough to promote the formation of water altered soils, growth of water tolerant vegetation, and biological activity adapted to a wet environment.*

The Policy strives to

> *maintain wetland areas in Alberta such that the ecological, social, and economic benefits that wetlands provide are maintained, thereby helping to ensure that Albertans have healthy watershed that provide safe and secure drinking water supplies, healthy aquatic ecosystems, and reliable, quality water supplies for a sustainable economy.*

However the Alberta Wetland Policy recognizes that wetlands vary in value due to differences in form, function, use, and location. Criteria include biodiversity, water quality improvement, flood reduction, human value, and abundance. The relative value of a wetland will impact wetland management decisions.

### 2.4.7 Municipal Development Plan

Strathcona County's Municipal Development Plan (MDP) Bylaw 20-2017 received third and final reading on September 5, 2017. The plan provides a comprehensive long term land use policy framework that guides present and projected growth and development over the next 20 years and beyond.

Section 5.8 is specific to the Local Employment Policy Area and sets the long term development goal as providing opportunities for local employment, ensuring the natural landscape will be retained and the area is viable for the long term.

### 2.4.8 Land Use Bylaw

Strathcona County's Land Use Bylaw (LUB) regulates the use, conservation and development of land, habitat, buildings and signs in pursuit of the objectives of Strathcona County's Municipal Development Plan.

The LUB's objectives are to maintain and enhance residents' quality of life by providing opportunities to attain individual and community aspirations to conserve and enhance the environmental quality in Strathcona County and to foster planned, efficient, economical and beneficial development that provides a diversity of choice, lifestyle and environment.

### 2.4.9 Municipal Wetland Conservation Policy

Strathcona County recognizes wetlands as important municipal infrastructure components for environmental, economic and social sustainability and will conserve their value for present and future generations. Conservation of the wetlands in urban and rural development areas is a priority for environmental, economic and human health. The Wetland Conservation Policy SER-009-036 has a goal of No Net Loss through the mitigation process of avoidance, minimization and compensation. The goal of No Net Loss of wetland functions is to balance the loss of wetland functions, through rehabilitation of former degraded wetlands or enhancement of healthy, functioning wetlands. As a last resort, compensation for lost functions will be sought through creation of wetlands where there was none before. The Policy strives to complement provincial legislation (*Water Act* and *Public Lands Act*) and the Federal Policy on Wetland Conservation.

Strathcona County will minimize or reverse wetland loss, conserve existing wetland resources, convey the importance of wetlands to developers, industry and the public through education initiatives, and restore watershed function through wetland restoration projects. All development initiated by a landowner or a third party must be compliant with the provincial Water Act and Public Lands Act as well as other provincial and federal laws and policies. All landowners are responsible for adherence to all relevant provincial and federal legislation/regulations.

### 2.4.10 Municipal Biophysical Assessment Policy

In order to meet the conservation goal as per the Strategic Plan, Strathcona County has developed the Biophysical Assessment (BA) Policy. A BA assesses the biological and physical elements of an ecosystem, including geology, topography, hydrology and soils. The County requires a BA of future development areas during the Area Concept Plan, Area Structure Plan, conceptual Scheme and/or subdivision application. The resulting report is used to prioritize and dedicate Environmental Reserve, Environmental Reserve Easement, Municipal Reserve and Conservation Easement lands based on municipal, community and environmental needs.

### 2.4.11 Municipal Dedication of Municipal Reserve, Environmental Reserve and Environmental Reserve Easement Policy

The Municipal Government Act provides authority to the Subdivision Authority of a municipality that it may require the dedication of Municipal Reserve and Environmental Reserve. The purpose of this Policy is to affirm that the Subdivision Authority of Strathcona County shall require the dedication of Municipal Reserve and Environmental Reserve when reserves are owing on lands that are the subject of a subdivision application.

Along with establishing the guidelines and roles and responsibilities for the dedication of Municipal Reserve, Environmental Reserve and Environmental Reserve Easements, the goals of this policy are to incorporate reserve land into the County's green infrastructure inventory for public benefit and to ensure long term sustainability of the natural landscape. It also states that the use of Environmental Reserve lands are required to meet Alberta Environment & Parks goal of having adequate riparian buffers established between development and adjacent lakes, rivers, watercourses or wetlands.

## 3.0 DESKTOP STUDY RESULTS

### 3.1 Historical Air Photo Review

Historical air photos of the Local Employment Area dating from 1950 to 2015 were available for review. Air photos from 1950 were reviewed using the Alberta Online Airphoto Collection (University of Calgary) and air photos from 1976 and 1987 were reviewed using historical hard copy images available in the Strathcona County Planning & Development Services Department. Copies of each of the remaining air photos (1996, 2001, 2003, 2005, 2007, 2009, 2011, 2013 and 2015) obtained from Strathcona County's digital collection. A descriptive historical air photo summary of the Local Employment Area has been provided below.

**Table 1: Air Photo Summary**

| Year | Description |
|---|---|
| **1950** | Oldman Creek and its tributaries are located in the western portion of the Local Employment Area and Pointe-Aux-Pins Creek and its tributaries are located in the eastern portion. There are several smaller ephemeral wetlands of various sizes throughout the subject area. Significant wetlands and upland forest areas can be identified in several parcels, particularly in NW/NE 9-53-22-W4 as well as in SW/SE 9-53-22-W4. Intermittent streams and ephemeral drainage channels can also be identified throughout the central portion of the subject area. Much of the land has been cleared for agricultural purposes and residential development is minimal. |
| **1976** | (NW/NE/SW/SE 7-53-22-W4 is not visible in this air photo). The subject area is similar to the previous air photo with the exception that residential development has increased slightly throughout the Local Employment Area. The significant wetlands located in both NE/SW 9-53-22-W4 have been modified as the forested areas appear to have been cleared for agricultural purposes.<br>of a sewage lagoon located in NE 10-53-22-W4 has also begun. |
| **1987** | The subject area is similar to the previous air photo with the exception that residential development has increased slightly throughout the Local Employment Area. Additional ephemeral wetlands can now be identified throughout the subject area and those identified in the previous air photo appear to be slightly wetter. Intermittent streams and ephemeral drainage corridors throughout NW/SW 10-53-22-W4 appear to be much more significant. The sewage lagoon development located in NE 10-53-22-W4 continues to expand. |
| **1996** | The subject area is similar to the previous air photo with the exception that the portion of Oldman Creek that runs through NE 7-53-22-W4 appears to be significantly wetter than in the previous air photo. Wetlands located in NW/SE 7-53-22-W4 and SE 8-53-22-W4 have expanded in size and appear wetter than in the previous air photo. |
| **2001** | The subject area is similar to the previous air photo with the exception that residential development has increased slightly throughout the Local Employment Area. The portion of Oldman Creek that runs through NE 7-53-22-W4 appears to be drier than in the previous air photo. The wetland located in SE 8-53-22-W4 appears to be significantly wetter than in the previous air photo. |
| **2003** | The subject area is similar to the previous air photo with the exception that additional ephemeral wetlands can now be identified throughout the subject area and many previously identified appear to be slightly wetter than in the previous air photo. |
| **2005** | The subject area is similar to the previous air photo with the exception that many of the ephemeral wetlands throughout the subject area appear to be slightly wetter than in the previous air photo. |
| **2007** | The subject area is similar to the previous air photo with the exception that many of the ephemeral wetlands throughout the subject area appear to be slightly drier than in the previous air photo. |
| **2009** | The subject area is similar to the previous air photo with the exception that many of the ephemeral wetlands throughout the subject area appear to be slightly drier than in the previous air photo. Several of the smaller ephemeral wetlands previously identified are no longer visible in this air photo. |
| **2011** | The subject area is similar to the previous air photo with the exception that many of the ephemeral wetlands located in the west half of the subject area appear to be slightly wetter than in the previous air photo. |
| **2013** | The subject area is similar to the previous air photo with the exception that many of the ephemeral wetlands located throughout the subject area appear to be slightly wetter than in the previous air photo, |

| Year | Description |
|---|---|
| | particularly in NE 7-53-22-W4. Additional ephemeral drainage corridors can now also be identified throughout the subject area. |
| **2015** | The subject area is similar to the previous air photo. |

## 3.2 Previous Environmental Assessments

### 3.2.1 Priority Environment Management Areas (Spencer Environmental Management Services Ltd. 2005)

In 2005, Strathcona County commissioned an Assessment of Environmental Sensitivity and Sustainability in Support of the MDP. The objective was to quantify and map environmental sensitivity of Strathcona County lands for future sustainable planning and development.

Landscape Management Areas were prioritized based on relative abundance of natural features and environmental sensitivity of lands. The abundance of resources is represented by one of four categories:

1. Protected Areas (Federal or Provincial designation)
2. High Sensitivity (> 3 natural resources)
3. Medium Sensitivity (1 – 2 natural resources), and
4. Low Sensitivity (0 natural resources).

The LEA ACP Area is comprised of areas of high, medium and low sensitivity. Areas of high sensitivity include wetlands, intermittent streams, riparian areas and mature forest stands. Deforested agricultural and rural residential lands account for the majority of areas designated as medium sensitivity and areas of low sensitivity are generally dominated by intensive agricultural operations.

In cases where relative abundance of natural resources is high or medium, development requires specific management. Both Oldman and Pointe-Aux-Pins Creeks, as well as the majority of the associated tributaries and riparian areas are identified as areas of high sensitivity and will require intensive planning consideration and management plans.

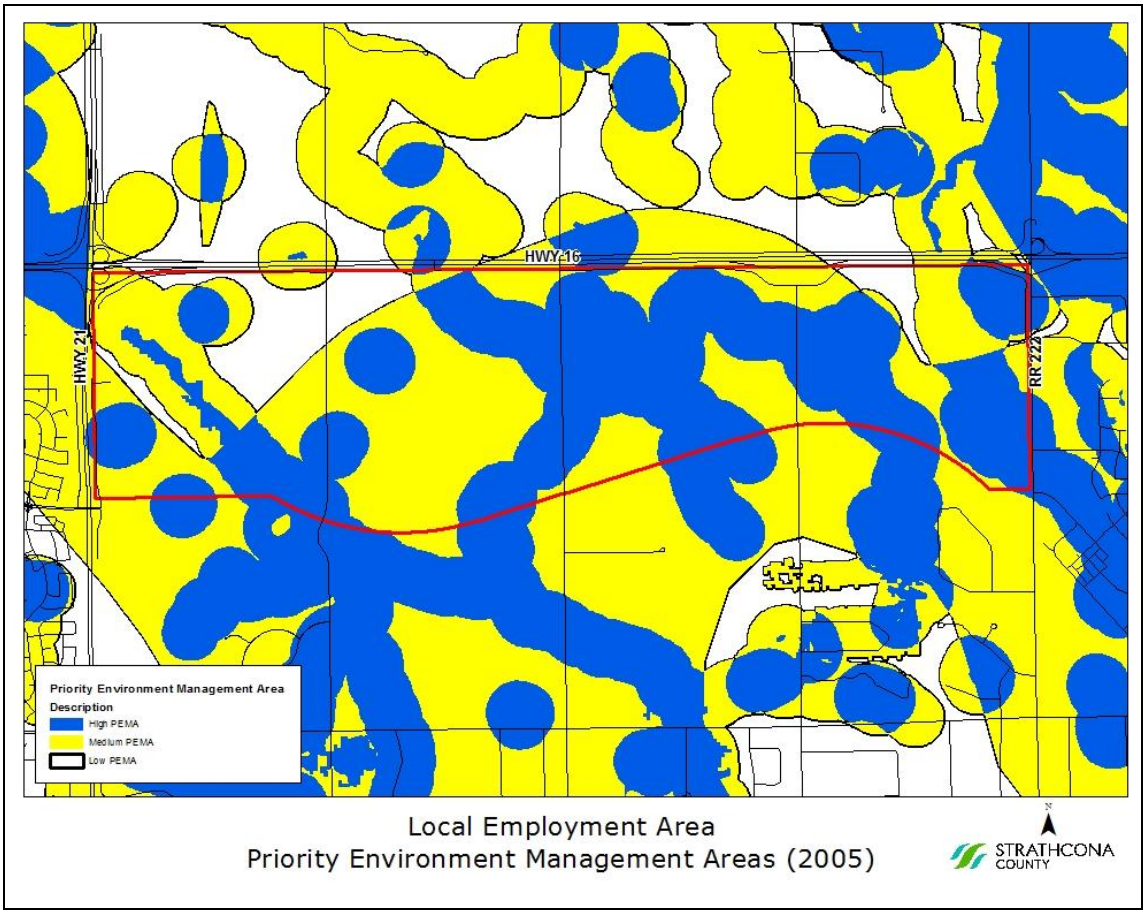


**Figure 4: LEA ACP Area within the Priority Environment Management Areas.**
**Blue indicates high environmental sensitivity, yellow indicates medium sensitivity, and white indicates low sensitivity.**

### 3.2.2 Prioritized Landscape Ecology Assessment of Strathcona County (Geowest Environmental Consultants Ltd. 1997)

In 1996, Strathcona County identified the need for a comprehensive identification of natural features and wildlife habitats that can be applied consistently across the County landscape. The overall goal of the landscape ecology study was to complete a prioritized landscape and wildlife habitat inventory to be incorporated into the County's planning process. The resulting Prioritized Landscape Ecology Assessment (Geowest Environmental Consultants Ltd. 1997) is used to guide new development and subdivisions and to direct future habitat and landscape restoration projects.

The Prioritized Landscape Ecology Assessment identifies the Local Employment Area as having a variety of significant features including: upland wildlife habitat which is identified as upland forest with small wetlands and upland poplar habitat; wetland wildlife habitat which is identified as drainage course, marsh and slough habitat; and wetland restoration wildlife habitat which is identified as drainage course habitat.

Within the LEA ACP Area, Oldman Creek, including the associated riparian area and drainage course, is identified as a significant wetland wildlife habitat corridor in the western portion of the subject area and Point-Aux-Pins Creek, including the associated riparian area and drainage course, is identified as a significant wetland wildlife habitat corridor as well as wetland restoration wildlife habitat corridor in the eastern portion of the subject area.

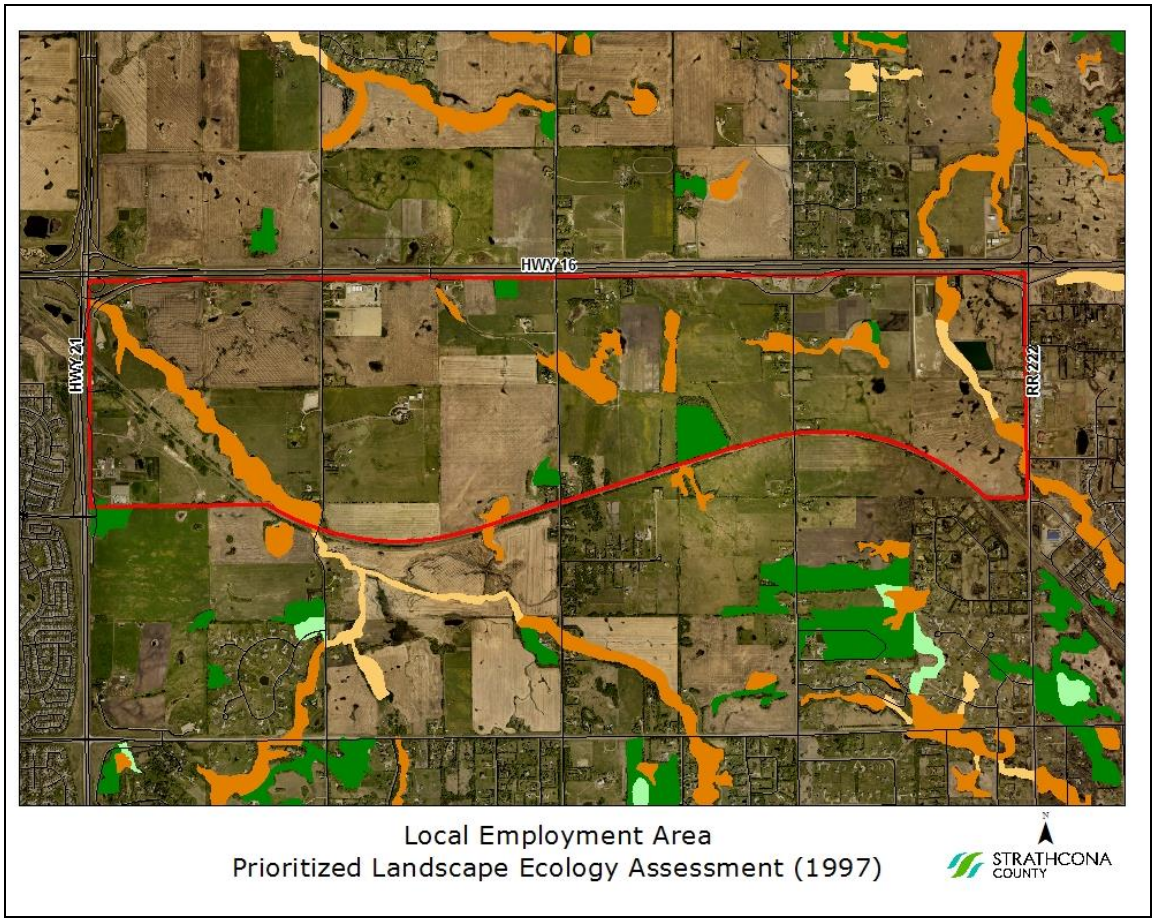


**Figure 5: LEA ACP Area within the Prioritized Landscape Ecology Assessment's Wildlife Habitat Unit Map. Green indicates upland forest and upland corridor habitat with light green representing where restoration of upland features is needed. Dark orange shows drainage corridor or wetland habitats and the light orange denotes wetland and drainage corridor habitats that need restoration**

### 3.2.3 Environmentally Sensitive Areas: County of Strathcona and M.D. of Sturgeon (Infotech Services 1989)

In 1988, the Edmonton Metropolitan Regional Planning Commissions (EMRPC) commissioned a study of environmentally sensitive areas within Strathcona County and the M.D. of Sturgeon. The resulting Environmentally Sensitive Areas: County of Strathcona and M.D. of Sturgeon (Infotech Services 1989) was used to:

- provide an inventory of environmentally sensitive and significant areas;
- evaluate and classify the relative sensitivity, and the significance of these areas as to their local, regional, provincial and national importance;
- formulate appropriate environmentally sensitive and significant areas land use planning principles, to guide the future planning and development; and
- refine, where necessary, the existing policies which deal with environmentally sensitive areas.

Only the lower reaches of Oldman Creek located north of Highway 16 were surveyed within this report but observations made during the site survey confirmed that some similar characteristics may be present within the section of Oldman Creek located within the Local Employment Area. The report classified Lower Oldman Creek as a locally significant feature based on its biophysical features which include the following:

- interesting ravine features;
- diverse vegetation communities;
- suitable wintering habitat for deer; and
- may contain sportfish in its lower reaches.

### 3.2.4 A Survey of Wetland Wildlife Resources Strathcona County, Alberta (Griffiths 1987)

In 1987, a survey was initiated to provide information on Strathcona County wetlands, specifically waterbird, muskrat and beaver habitat, and to assist with the Outdoor Master Plan. The resulting A Survey of Wetland Wildlife Resources (Griffiths 1987) was used to provide recommendations regarding wildlife conservation and management and recreational and educational uses to promote public appreciation of wetland resources.

The report rated Pointe-Aux-Pins Creek as a Critical Wetland and identified beavers, mallards, pintails, green-winged teals and blue herons all within the Creek and its riparian area as well as suitable nesting sites for bank swallows, kingfishers and two species of sandpipers. Critical Wetland habitat is defined as having one or more of the follow features:

- They are used by a considerable number of bird species of diverse affiliation (families), as well as muskrat and/or beaver; or by species which are relatively rare in the County and require specific habitat types.
- They are used by wetland wildlife, especially birds, for a variety of activities; or for one or two activities which are of great importance on a County or Regional basis because few or no other wetlands are suitable.
- They represent a type of wetland and associated birds which is not common in the County.
- They are presently not under pressure from human activity or development which would significantly lower their potential for wildlife.

The significant recommendations in relation to land use planning and development were as follows:

- the natural character and vegetation of the stream channel and its banks must be maintained; and
- in addition a buffer strip of 100 m along the top of each bank should be designated, and reforested with native vegetation if necessary; this should extend along the full length of the creek channel, not only in the named sections to provide a continuous wildlife corridor, and also protect the entire stream.

### 3.2.5 Significant Natural Features and Landscapes of Strathcona County (Westworth and Knapik 1987)

In 1987, a survey was initiated to provide information on outdoor recreation opportunities and to give protection to conservation resources. The resulting Significant Natural Features and Landscapes of Strathcona was used to:

1. provide an inventory of natural landscape and features of local, regional and provincial significance;
2. evaluate the relative sensitivity and importance of sites identified as significant landscapes and features; and
3. recommend guidelines for protection.

There were no significant natural features identified in the LEA ACP Area.

### 3.2.6 Part of the North Saskatchewan River Basin Regional Groundwater Assessment (Hydrogeological Consultants Ltd. 2001)

Groundwater in the LEA ACP Area comes mainly from the Bearpaw aquifer which is generally 80 to 100 meters thick and less than 100 meters below the surface. There is an estimated 10 to 50 meters cubed of water, per section, being pumped from this aquifer daily.

Within the County, groundwater in surficial deposits is generally high in total dissolved solids and sodium concentrations. The average total dissolved solids is 1164 mg/L and the average sodium concentration is 219 mg/L, both are above the Guidelines for Canadian Drinking Water Quality.

Most of the area between Oldman and Pointe-Aux-Pins Creeks is considered as an aquifer recharge area.

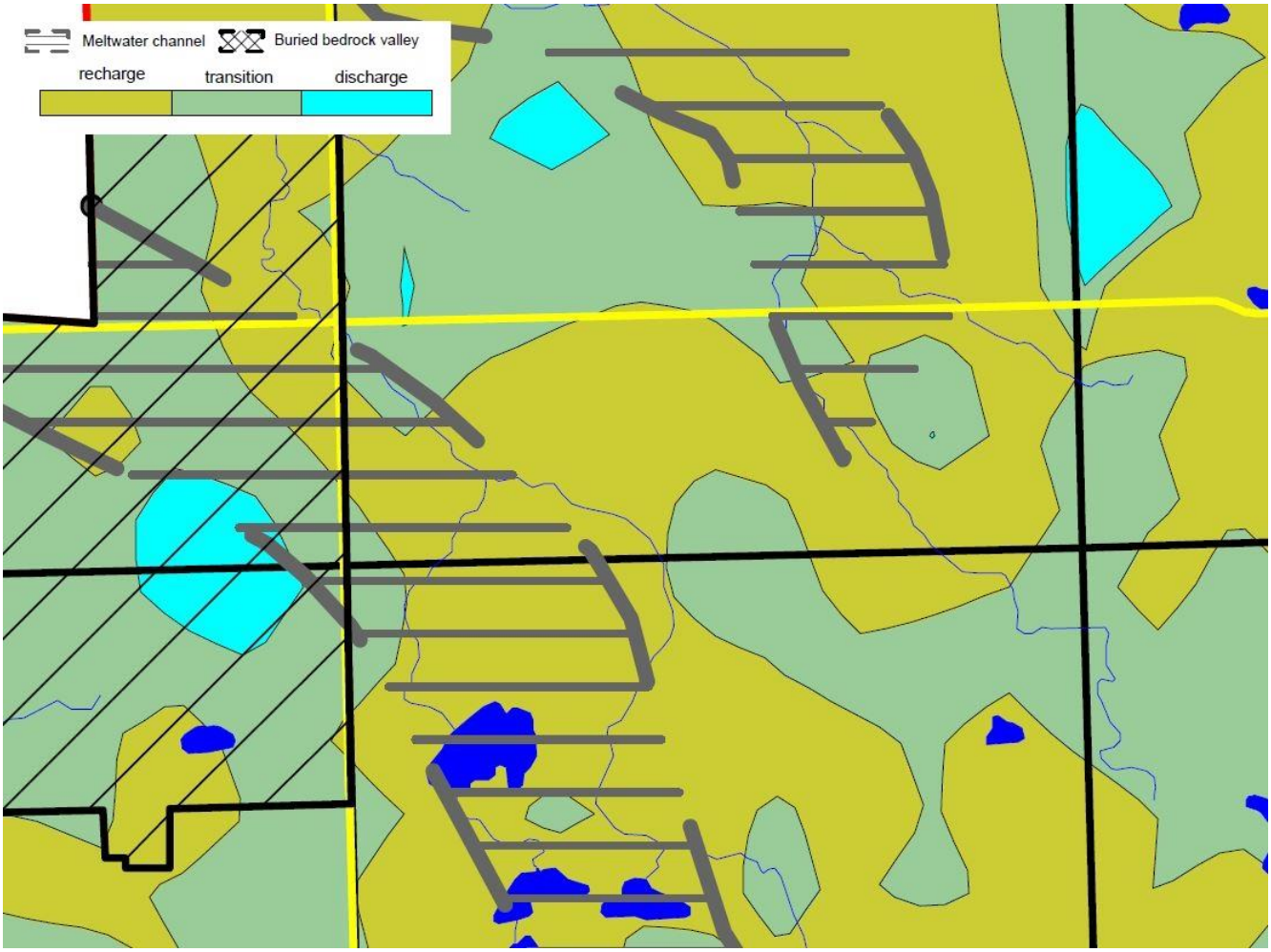


**Figure 6: Groundwater Recharge, Discharge and Transition Zone Map.**
**The yellow horizontal line is HWY 16 and the vertical yellow line is HWY 21. The dark blue lines running from the northwest are Oldman and Pointe-Aux-Pins-Creeks. The yellow represents recharge areas, the green represents transition areas, and the light blue indicates discharge areas. The dark blue indicates water bodies.**

### 3.2.7 Alberta Conservation Information Management System (ACIMS)

A search of the Alberta Conservation Information Management System did not identify any occurrences of sensitive or non-sensitive plants or wildlife species.

A lack of records does not necessarily mean that there are no rare elements in the LEA ACP Area, it may indicate that no inventory or survey has been undertaken in that area. Detailed vegetation inventories will still need to be completed prior to Area Structure Plan and subdivision planning.

Both Pointe-Aux-Pins and Oldman Creek riparian corridors and forested uplands provide an abundance of healthy habitat for mammals, birds, amphibians and reptiles within the LEA ACP Area. An interview with an Alberta Environment and Sustainable Resource Development Wildlife Biologist confirmed that white-tail deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), and moose (*Alces alces*) are the most common ungulates in the area and that elk (*Cervus elaphus*) have also been identified during winter ungulate studies. These ungulates use Pointe-Aux-Pins Creek and the areas adjacent to the creek to travel to the North Saskatchewan River and beyond into their overwintering grounds.

In addition to the above mentioned species as well as those observed during the roadside observation survey, a review of previous environmental reports and supporting literature found that other mammals common to the area include: beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), snowshoe hare (*Lepus americanus*), coyote (*Canis latrans*), porcupine (*Erethizon dorsatum*), skunk (*Mephitis mephitis*), deer mouse (*Peromyscus maniculatus*), little brown bat (*Myotis lucifugus*), and red squirrel (*Tamiasciurus hudsonicus*). Furthermore, other important bird species previously identified in the area include: great blue heron (*Ardea herodias*), great horned owl (*Bubo virginianus*) and red-tailed hawk (*Buteo jamaicensis*). It is also important to note that over 120 species of birds are known to live in or frequent this area during migration.

### 3.2.8 Alberta Fisheries & Wildlife Management Information System (FWMIS)

A search of the Fish and Wildlife Management Information System (FWMIS) found that two fish inventories have been completed within the LEA ACP Area using various methods including electrofishing, aquatic habitat assessments, trap nets, minnow traps and dip nets.

Fish species that were indentified within the Oldman Creek inventory include: brook stickleback (*Culaea inconstans*), white sucker (*Catostomus commersonii*) and fathead minnow (*Pimephales promelas*). Brook stickleback (*Culaea inconstans*) was also identified using an aquatic habitat assessment method in an unnamed waterbody near the portion of Pointe-Aux-Pins within the LEA ACP Area.

A significant portion of the LEA ACP Area is also identified as a Sharp-tailed Grouse (*Tympanuchus phasianellus*) Wildlife Sensitivity Survey Area.

## 3.3 Topography

The topography in the LEA ACP Area is described as hummocky and undulating with both low and high relief landforms of varying elevations found throughout. Elevations range from approximately 670 to 685 m in the western portion of the LEA near Oldman Creek to approximately 680 to 695 m in the central portion. The area surrounding Point-Aux-Pins Creek shows significantly less variation in elevation and is approximately 700 m, which is consistent throughout the eastern portion of the LEA.

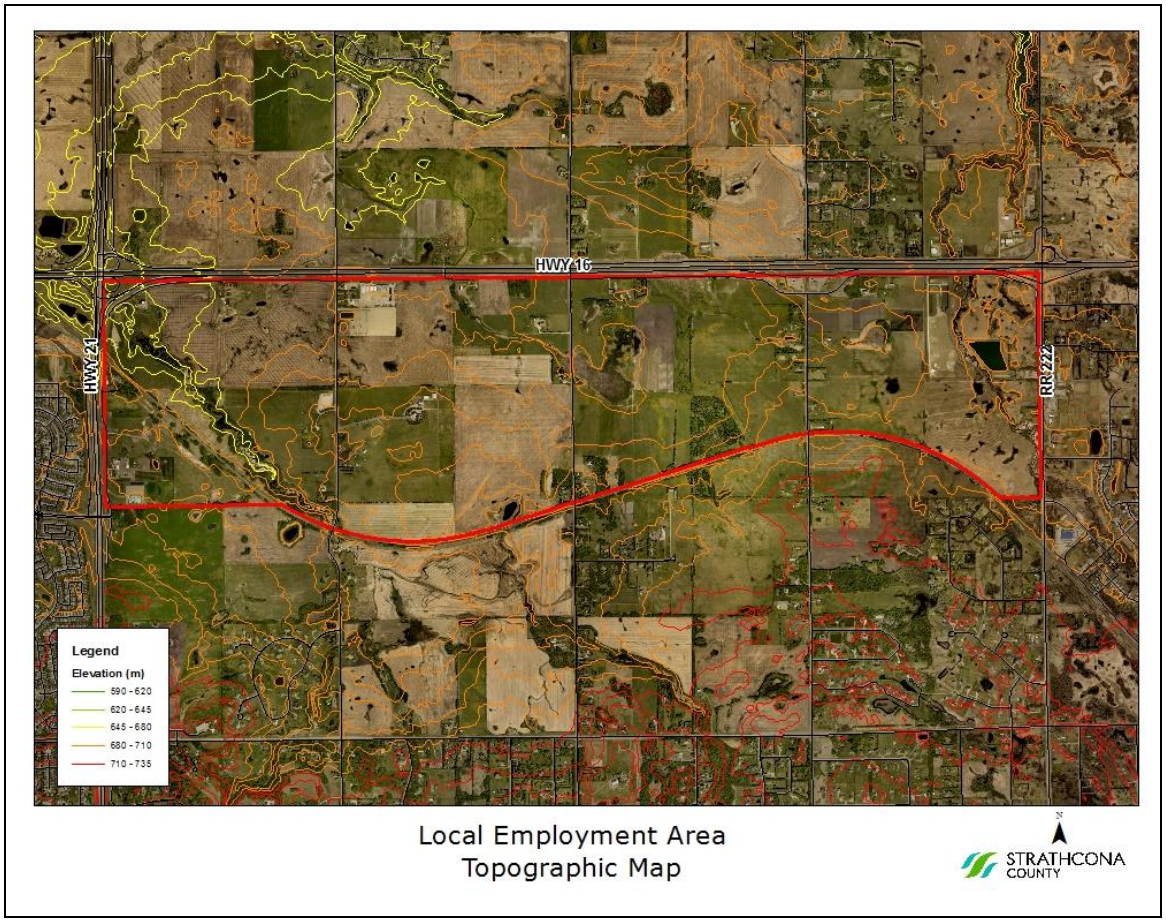


**Figure 7: LEA ACP Area Topographic Map. Contour map illustrated by a colour gradient.**

## 3.4 Surficial and Bedrock Geology

The bedrock geology of the Edmonton Formation consists of fine grained bentonitic sandstone, mudstone, shale; ironstone and coal beds (Green 1972) that were deposited by running water and till. Proglacial, lacustrine Lake Edmonton sediments can be found south of Highway 16 between Ardrossan and Sherwood Park. These sediments are fine to very fine and are generally impervious.

The surficial geology of the Local Employment Area consists of glacial deposits from the Late Cretaceous Edmonton Formation. The glacial deposits are ground moraine composed of clay, silt and sand with boulders and pebbles (Bayrock and Hughes 1962).

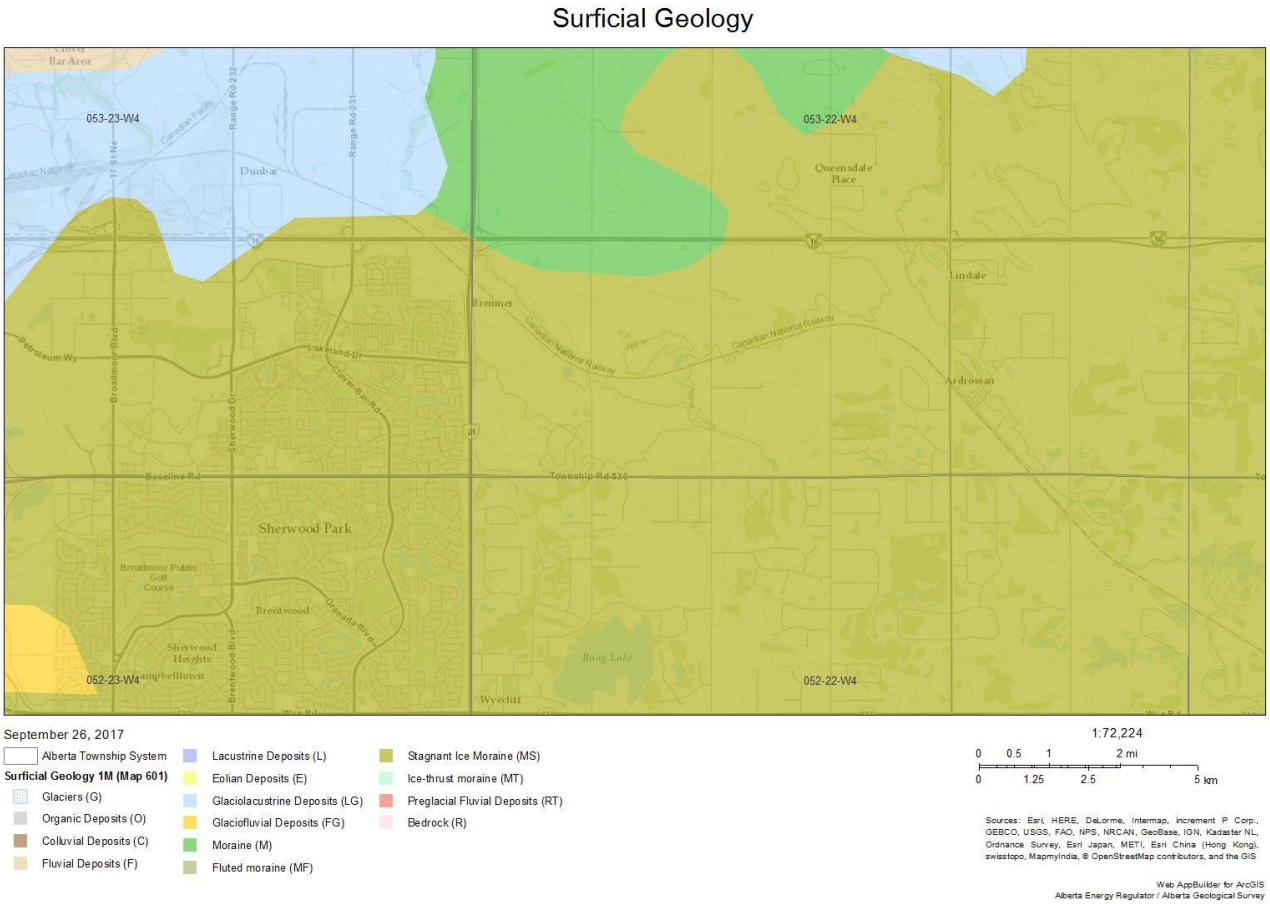


**Figure 8: LEA ACP Area Surficial Geology Map.**

## 3.5 Soil

The LEA ACP Area is located in the Thick Black Soil Zone of Alberta. There are two dominant soils located within the subject area: Eluviated Black Chernozems and Orthic Dark Gray Chernozems. Eluviated Black Chernozem soils within the LEA are developed on medium textured till throughout the majority of the subject area and on fine textured water-laid sediments in the northern portion of the subject area. Orthic Dark Gray Chernozem soils are developed over very fine textured materials and on medium textured till. Much of the LEA is located on undulating, high relief landform with a limiting slope of approximately 4% with the exception of two smaller portions located in the southeast and northeast which are located on hummocky, low relief landform with a limiting slope of approximately 6%.

The Canada Land Inventory Soil Capability for Agriculture identifies seven major classes of soils based on potential limitations for agricultural use. Within the LEA ACP Area, two dominant classes of soils are identified:

- Class 1: Soils in this class have no significant limitations in use for crops.
- Class 2: Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices.

With best management practices, Class 1 and 2 soils are considered ideal for agricultural use to produce a healthy, high yielding range of crops, therefore intensive planning consideration should be given to the conservation of significant portions of such land within the LEA ACP Area.

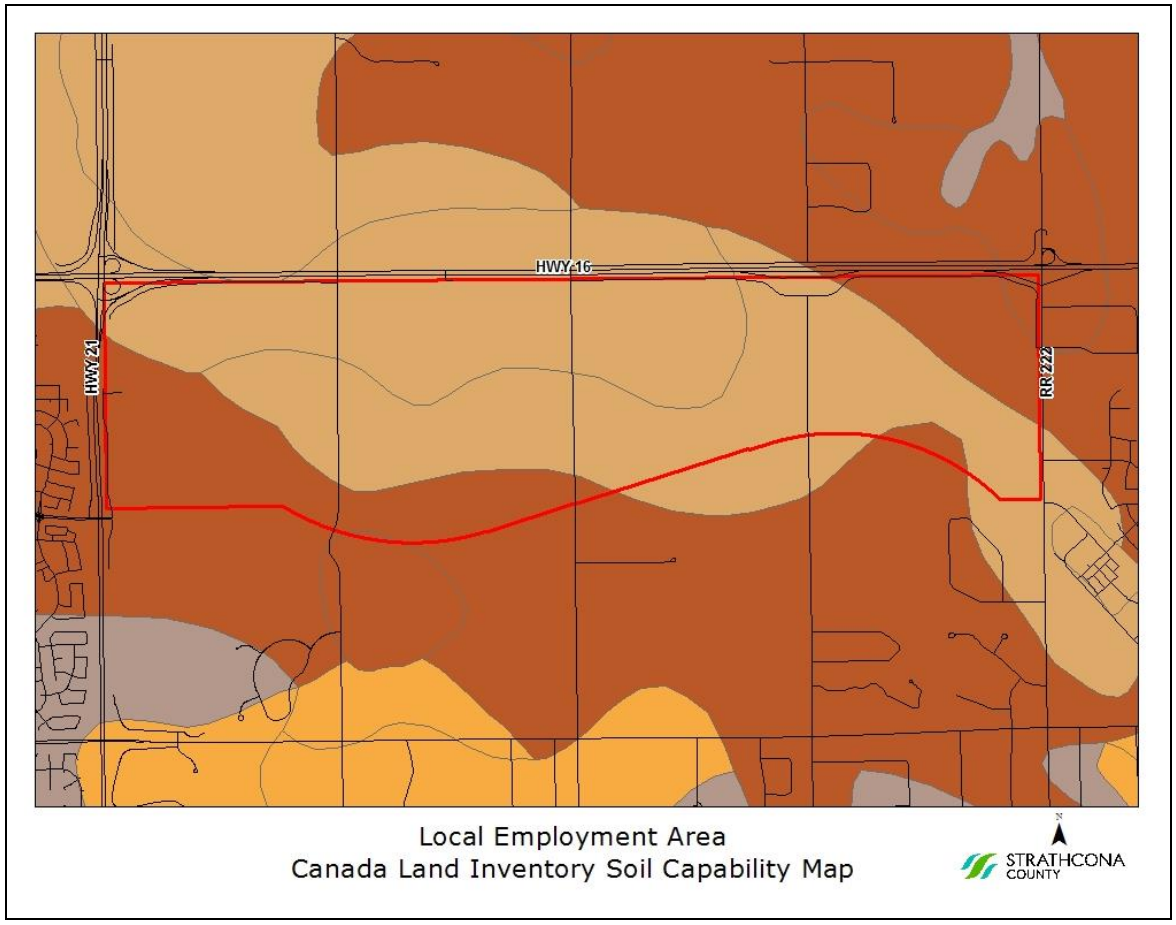


**Figure 9: LEA ACP Area within the Canada Land Inventory Soil Capability Map. Tan represents Class 1 soils and red represents Class 2 soils.**

## 3.6 Hydrology

The surface water drainage divide within the LEA ACP Area is located between Range Roads 223 and 222. The majority of surface water drainage is therefore generally directed towards Oldman Creek and its tributaries and the remaining surface water drains towards Pointe-Aux-Pins Creek and its tributaries (Figure 10).

Figure 11 more clearly shows the vertical red line indicating the surface water drainage divide within the LEA ACP Area. To the east of the divide (shown in red) surface water generally drains toward the Pointe-Aux Pins Creek basin and to the west of the divide (shown in blue) surface water generally drains toward the Oldman Creek basin.

Wetlands that do not appear to have surface water connections to the Oldman Creek basin, Pointe-Aux-Pins Creek basin or other water bodies within the Local Employment Area likely serve as localized groundwater recharge points. Groundwater within the Local Employment Area generally flows northwards and northwestwards under Highway 16 before turning west northwest towards the North Saskatchewan River.

According to the Hydrogeology of Edmonton Area (Northeast Segment), groundwater flows northwest towards the North Saskatchewan River with probable estimated yields of 0.4 - 2 litres per second throughout the Local Employment Area. There are two known springs, with unknown flow rates, located just west of Range Road 222 and approximately 800 to 900 meters south of Highway 16 (Stein 1976).

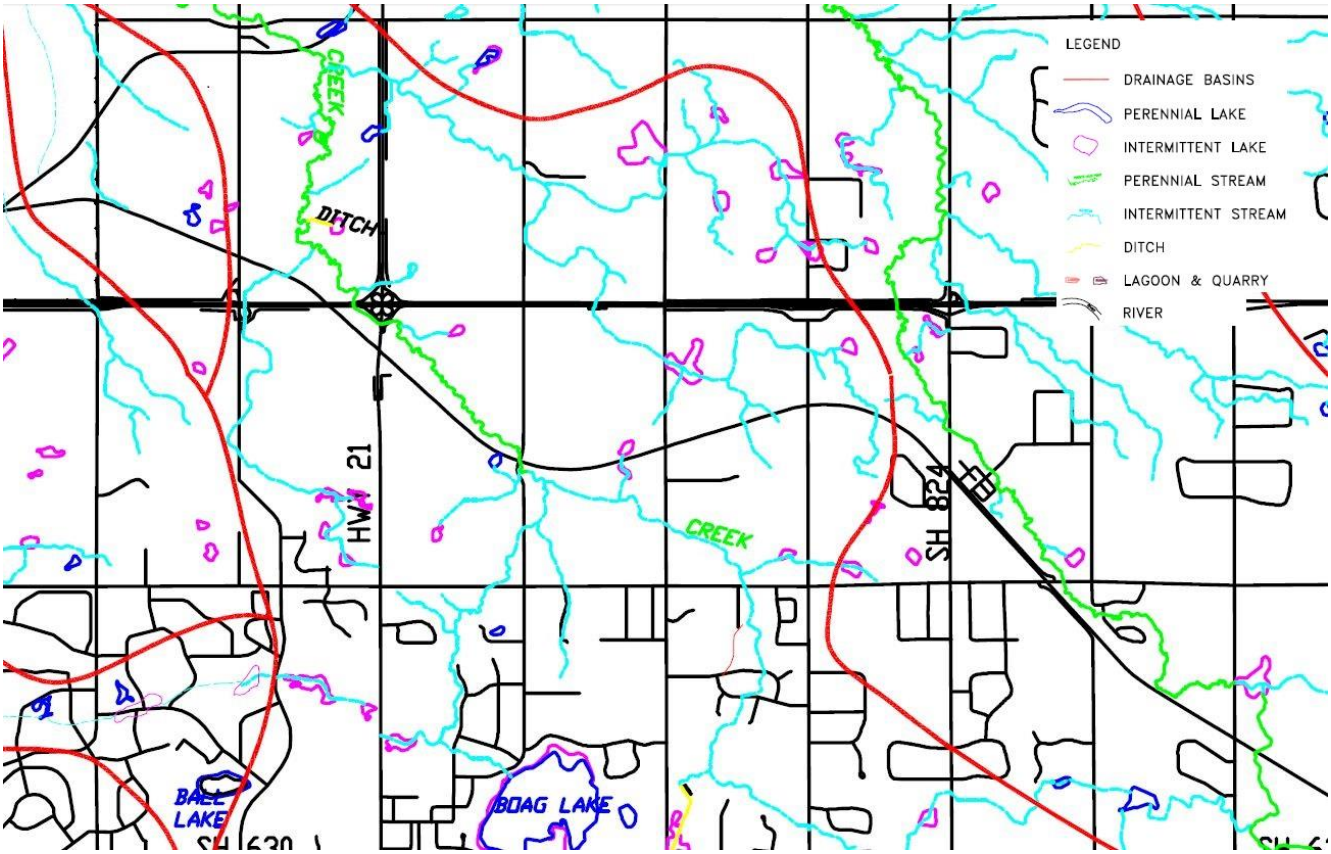


**Figure 10: Drainage Basin Map.**
**The red lines denote drainage basins corresponding to the two creeks.**

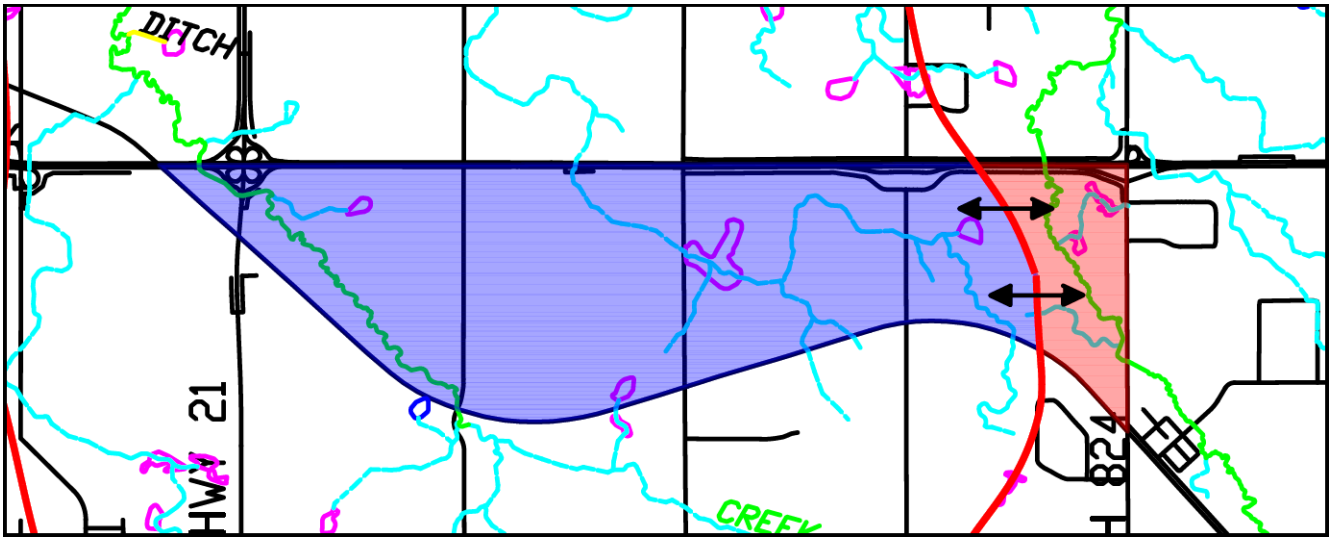


**Figure 11: LEA ACP Drainage Basin Map.**
**The red lines denote drainage basins corresponding to the two creeks. To the east of the divide (red) surface water generally drains toward Pointe-Aux Pins Creek and to the west of the divide (blue) surface water generally drains toward Oldman Creek.**

## 3.7 Wetlands

### 3.7.1 Wetland Definition

Wetlands are lands where saturated soils are the dominant factor in plant and wildlife diversity. The most important feature distinguishing wetlands from other habitats is that the soils are consistently or periodically saturated with or covered by water. The saturated soils and/or standing water creates physiological problems for vegetation and wildlife and typically only those plants and animals adapted to these specific conditions are dominant (hydrophytes).

> "Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil: and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year." (Cowardin et al. 1971).

As defined by the province, wetlands are low-lying areas of land covered by water long enough to support aquatic plants and wildlife for part of their life cycle. Wetlands can be peatlands or non-peatlands but can also be characterized by their permanence. Peatlands, as the name suggests, accumulate peat, which is the partially decomposed organic vegetation. Non-peatlands do not accumulate peat.

### 3.7.2 Wetland Function, Values and Benefits

Wetland functions and benefits refer to the natural processes associated with wetland ecosystems, including ecological, social, and economic functions.

Wetlands have been called “nature’s kidneys” due to their ability to filter entities such as bacteria, nutrients, sediments and metals. They can also mitigate flood and drought effects due to their ability to retain water. Other ecological functions of wetlands include water recharge, habitat for wildlife, natural sinks for pollutants, nutrient source for connected waters, and soil and water conservation. Wetlands and the associated drainage corridors are often integrated into engineered hard infrastructure…then termed green infrastructure or low impact development opportunities.

Recreational activities such as fishing, hunting, bird watching, hiking, and photography are examples of the social value of wetlands. The productivity of wetlands, leading to fish populations and recreational activities is one example of how wetlands exhibit economic benefits as well.

### 3.7.3 Alberta Wetland Classification System

The Alberta Wetland Classification System recognizes five **classes** of wetland: bogs, fens, marshes, shallow open water and swamps (ESRD, 2015). These five classes align with the Canadian Wetland Classification System. Once categorized into one of five classes, wetlands are divided into **forms** based on vegetation structure (wooded – coniferous, - mixedwood, - deciduous, shrubby, graminoid and aquatic). The forms are then divided into **types** based on the length of time that surface water is at or above the surface, along with basic water characteristics (acidity and salinity) as per Stewart and Kantrud classes for prairie wetlands.

**Table 2. Alberta Wetland Classification System.**

| Class | Form | Type |
|---|---|---|
| **Bog** | Wooded, coniferous<br>Shrubby, graminoid | Acidic, freshwater |
| **Fen** | Wooded, coniferous<br>Shrubby<br>Graminoid | Poor fen, freshwater<br>Moderately-rich fen, freshwater<br>Extremely-rich fen, freshwater to slightly brackish |
| **Marsh** | Graminoid | Temporary hydroperiod; freshwater to slightly brackish<br>Seasonal hydroperiod; freshwater to moderately brackish<br>Semi-permanent hydroperiod; freshwater to brackish |
| **Shallow Open Water** | Submersed and/or floating aquatic<br>Unvegetated | Seasonal hydroperiod; freshwater to moderately brackish<br>Semi-permanent hydroperiod; freshwater to subsaline<br>Permanent hydroperiod; slightly brackish to subsaline<br>Intermittent hydroperiod; saline |
| **Swamp** | Wooded, coniferous<br>Wooded, mixedwood<br>Wooded, deciduous<br>Shrubby | Temporary; freshwater to slightly brackish<br>Seasonal; freshwater to slightly brackish<br>Seasonal; moderately brackish to sub-saline |

### 3.7.4 Wetlands in the LEA ACP Area

Similar to the results of the aerial photograph review, wetlands are a significant landscape feature across the LEA ACP Area. According to Alberta’s wetland inventory, there are marsh, open water and swamp wetlands within the LEA ACP Area. While this inventory is not entirely comprehensive, it gives a good idea of the state of the wetlands within the area.

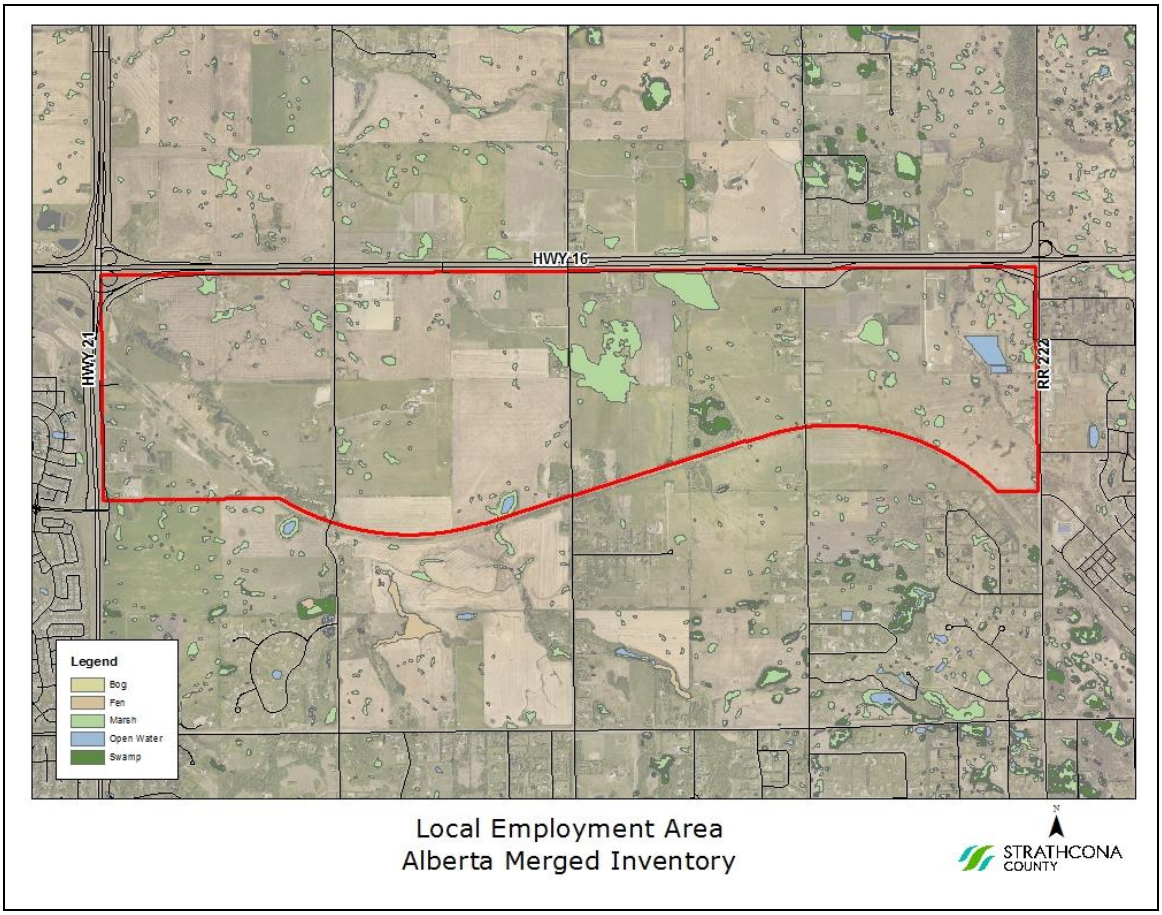


**Figure 12: LEA ACP Area within the Alberta Wetland Inventory Map.**

## 4.0 FIELD RECONNAISSANCE

Field reconnaissance took place on July 11 and August 29, 2017. Due to access constraints, most quarter sections were observed from the roadsides and creeks. Given the large size of the study area and the purpose of this biophysical assessment, detailed species lists were not completed, rather observations specific to habitat complexity and connectivity were the focus.

Detailed biophysical assessments will need to be completed at the Area Structure Plan level to provide more detail and address site specific conditions.

### 4.1 Landscape Characteristics

The landscape within the LEA ACP Area consists mainly of undulating and hummocky land which includes various classes of wetlands, streams, riparian areas and uplands. Oldman Creek and Pointe-Aux Pins Creek are significant features of the landscape and will require special planning consideration prior to the commencement of development. Large portions of the lands within the LEA ACP Area have also been previously cleared for intensive agricultural operations, residential and operational developments.

### 4.2 Vegetation & Wildlife

Approximately 90 % of the LEA ACP Area has been cleared of vegetation primarily for agricultural use and roads. Therefore, the clearings are large and the fragmented habitat patches are relatively small and poorly connected.

Pointe-Aux-Pins Creek is the only relatively undisturbed regional wildlife corridor (in comparison to other corridors in the region) connecting the North Saskatchewan River to the Beaver Hills Moraine. The Beaver Hills Moraine is an area recognized for its distinct landscape that supports a diverse population of plants and animals including 48 different mammals, 152 species of birds and 8 different amphibians (Geowest Environmental Consultants Ltd. 1997). Wildlife corridors are routes that allow wildlife to travel between different habitats. Wildlife move between large unfragmented habitat areas to locate suitable mates, dens and to exploit seasonal fluctuations in climate and food. Corridors provide various wildlife and vegetation species the opportunity to expand their home range, which provides the genetic diversity required to ensure sustainable populations over large areas.

A Survey of Wetland Wildlife Resources (Griffiths 1987) and Significant Natural Features and Landscapes of Strathcona (Westworth and Knapik 1987) both recognize the significance of Pointe-Aux-Pins Creek as wildlife corridor of regional importance. A minimum 100 m protected setback from top of bank is recommended to provide an adequate buffer to ensure the effectiveness of the wildlife corridor and to protect the creek itself.

Oldman Creek is similar in form and function to Pointe-Aux-Pins. It is situated in the west portion of the LEA ACP Area. This portion of the creek is a localized wildlife corridor, while the overall connection to Oldman Creek north of Highway 16 supports a regionally important wildlife corridor. A minimum 50 m protected setback from top of bank is recommended to provide an adequate buffer to ensure the effectiveness of the wildlife corridor and to protect creek form and function.

Overall, the diversity of landscape and plant communities across the LEA ACP Area is low to moderate. The one relatively large remaining mature mixedwood forest stand in SE 9-52-22 provides important local wildlife habitat, while the permanent wetlands and drainage corridors offer habitat for reptiles, amphibians, and birds. The priority habitat primarily occurs along the two creek systems.

The mixedwood forest stand exists as an insular component within the LEA ACP Area and is characterized by an established community of aspen (*Populus tremuloides*) and poplar (*Populus balsamifera*) with spruce (*Picea glauca*). A diverse shrub and forb understory, including currant (*Ribes* spp.), high-bush cranberry (*Viburnum trilobum*), red osier dogwood (*Cornus stolonifera*), rose (*Rosa acicularis*) and sarsaparilla (*Aralia nudicaulis*) is expected. The forest stand is associated with a drainage corridor, supplementing its function as a habitat patch.

Several wildlife species were observed directly or indirectly during the site reconnaissance. Direct wildlife sightings of significance included red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), red-sided garter snake (*Thamnophis sirtalis parietalis*) and boreal chorus frogs (*Pseudacris maculate*). Indirect sightings of significance included coyote (*Canis latrans*) (scat, prints), moose (*Alces alces*) (scat), porcupine (*Erethizon dorsatum*) (girdling) and tropical migrant songbirds (vocalization). All of these significant observations were associated with the creek corridors.

**Photo 1: View looking east across Oldman Creek within NW 7-53-22.**

**Photo 2: View looking east across Oldman Creek within NW 7-53-22.**

**Photo 3: View looking southeast across the drainage corridor within NE 8-53-22.**

**Photo 4: View upstream of Oldman Creek at CN Railway crossing on Range Road 225.**

**Photo 5: View of Oldman Creek at CN Railway crossing on Range Road 225.**

**Photo 6: View downstream of Oldman Creek at CN Railway crossing on Range Road 225.**

**Photo 7: View of drainage corridor associated with mixedwood forest stand in SE 9-52-22.**

## 5.0 CONSERVATION RECCOMMENDATIONS

### 5.1 Local Employment Area Conservation Recommendations (2014)

The following is a list of conservation recommendations for the Local Employment Area:

1. As recommended by an ESRD Wildlife Biologist, a minimum of a 100 meter setback from the top of bank of the Pointe-Aux-Pins Creek must be established for all development within the Local Employment Area. This setback distance may be reassessed upon further environmental analysis that may occur during detailed planning stages.

2. Due to lack of data within the Local Employment Area, a flood hazard identification study must be undertaken near the Point-Aux-Pins Creek prior to development in order to determine and identify any potential flood hazards.

3. A minimum of a 36 meter setback from the top of bank of the Oldman Creek and its tributaries must be established for all development within the Local Employment Area as per Strathcona County's Municipal Development Plan Bylaw 1-2007. This setback distance may be reassessed upon further environmental analysis that may occur during detailed planning stages.

4. A minimum of a 30 meter setback from the top of bank of all other lakes, waterbodies and watercourses must be established for all development within the Local Employment Area as per Strathcona County's Municipal Development Plan Bylaw 1-2007. This setback distance may be reassessed upon further environmental analysis that may occur during detailed planning stages.

5. A minimum of a 300 meter setback is required from the existing limits of the sewage lagoon currently located within NE 10-53-22-W4.

6. A detailed soil survey must be undertaken within the Local Employment Area prior to the commencement of development in order to determine sustainable agricultural lands which should be conserved.

7. Detailed Biophysical Assessments must be completed for each quarter section located within the Local Employment Area prior to the commencement of development. This will ensure more specific identification of existing natural and landscape features including the classification of wetlands, further identification of fish and wildlife species in the area and the prioritization and dedication of future Environmental Reserve, Environmental Reserve Easement, Municipal Reserve and Conservation Easement lands based on municipal, community and environmental needs.

8. Sufficient and accurate data regarding wetland class, subclass and cover type must be collected in order to complete the classification of wetlands prior to the commencement of development within the Local Employment Area.

9. As per Strathcona County's Municipal Development Plan Bylaw 1-2007, potential environmental and municipal reserve locations shown below are based on the minimum setback distances of 36 meters from Oldman Creek and its tributaries and 30 meters from all other lakes, waterbodies and watercourses within the Local Employment Area.

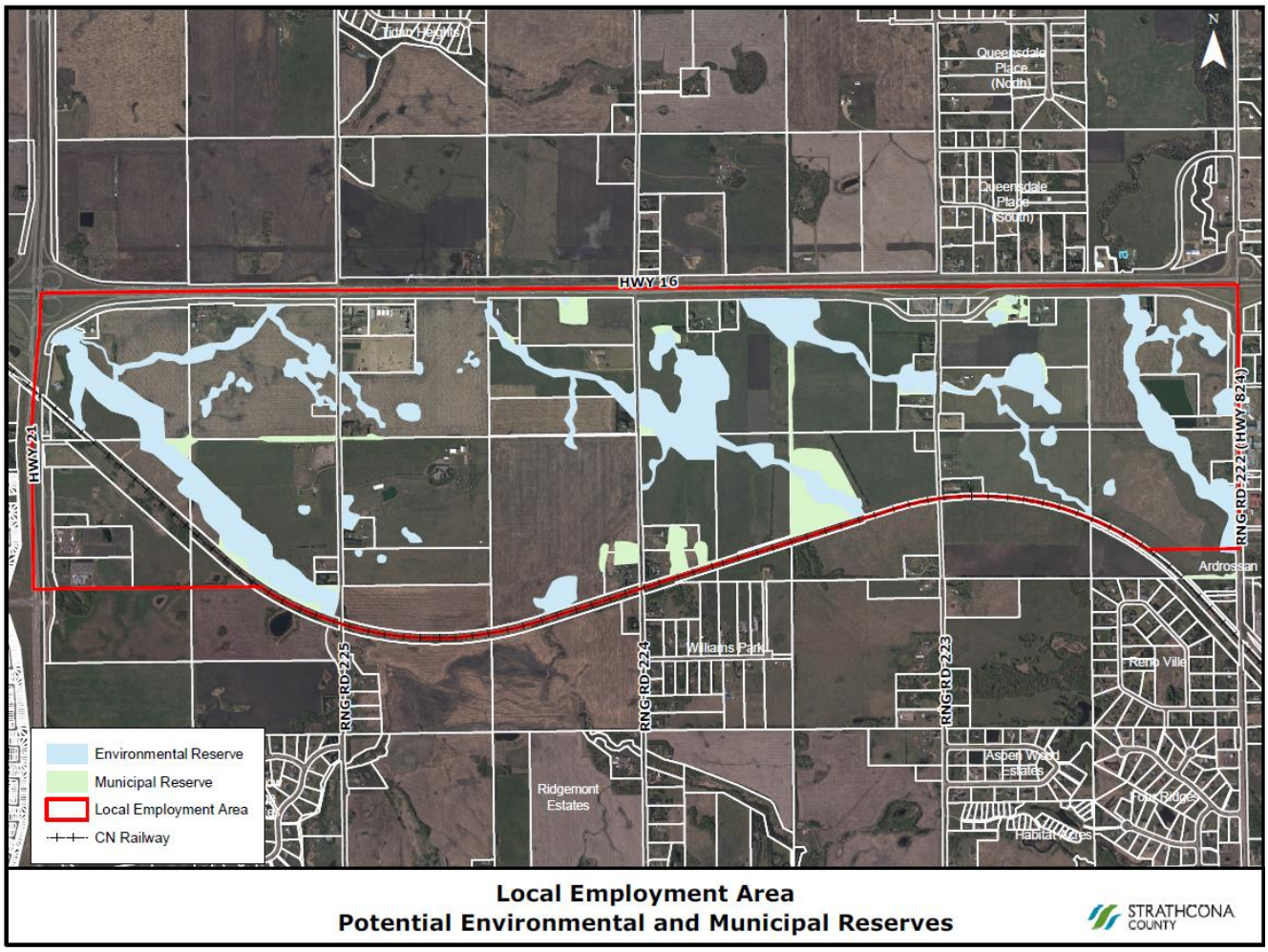


**Figure 13: LEA Potential Environmental and Municipal Reserves.**

## 5.2 LEA ACP Area Conservation Recommendations

The following is a list of recommendations for conservation planning with respect to the LEA ACP Area.

1. A minimum 100 meter setback from the top of bank from Pointe-Aux-Pins Creek should be established for all development.

2. Any development proposals near Pointe-Aux-Pins Creek should be accompanied by an ungulate impact study identifying mitigation measures to ensure connectivity across the landscape and decrease human/wildlife interactions.

3. A minimum 50 meter setback from the top of bank from Oldman Creek should be established for all development.

4. A detailed Biophysical Assessment should be completed prior to planning at the Area Structure Plan level when full land access is available.

5. Wetlands with distinct connections to the creeks and upland habitats were prioritized for conservation. This is a subset of the existing wetlands observed and identified through aerial

photographs and provincial mapping. Planning at the Area Structure Plan level will require compliance reporting for both the municipal and provincial wetland policies.

6. Uplands with distinct connections to the creeks and wetland habitats were prioritized for conservation. These uplands should be conserved and integrated into the open space system.

7. Incorporating natural landscape features (drainage corridors, wetlands, planted shelter belts) for green infrastructure should be considered.

As per the MDP, top of bank is defined as "the top of a water body's valley or ravine. Where a bank is not well defined (i.e. in the case of lakes and wetlands) the top of bank shall be equivalent to the 1:100 year floodplain."

The following map identifies priority creek, wetland and upland habitats for conservation based on size, connectivity and diversity. The specific planning tools to be assigned as per the MGA can be determined in coordination with the open space component.

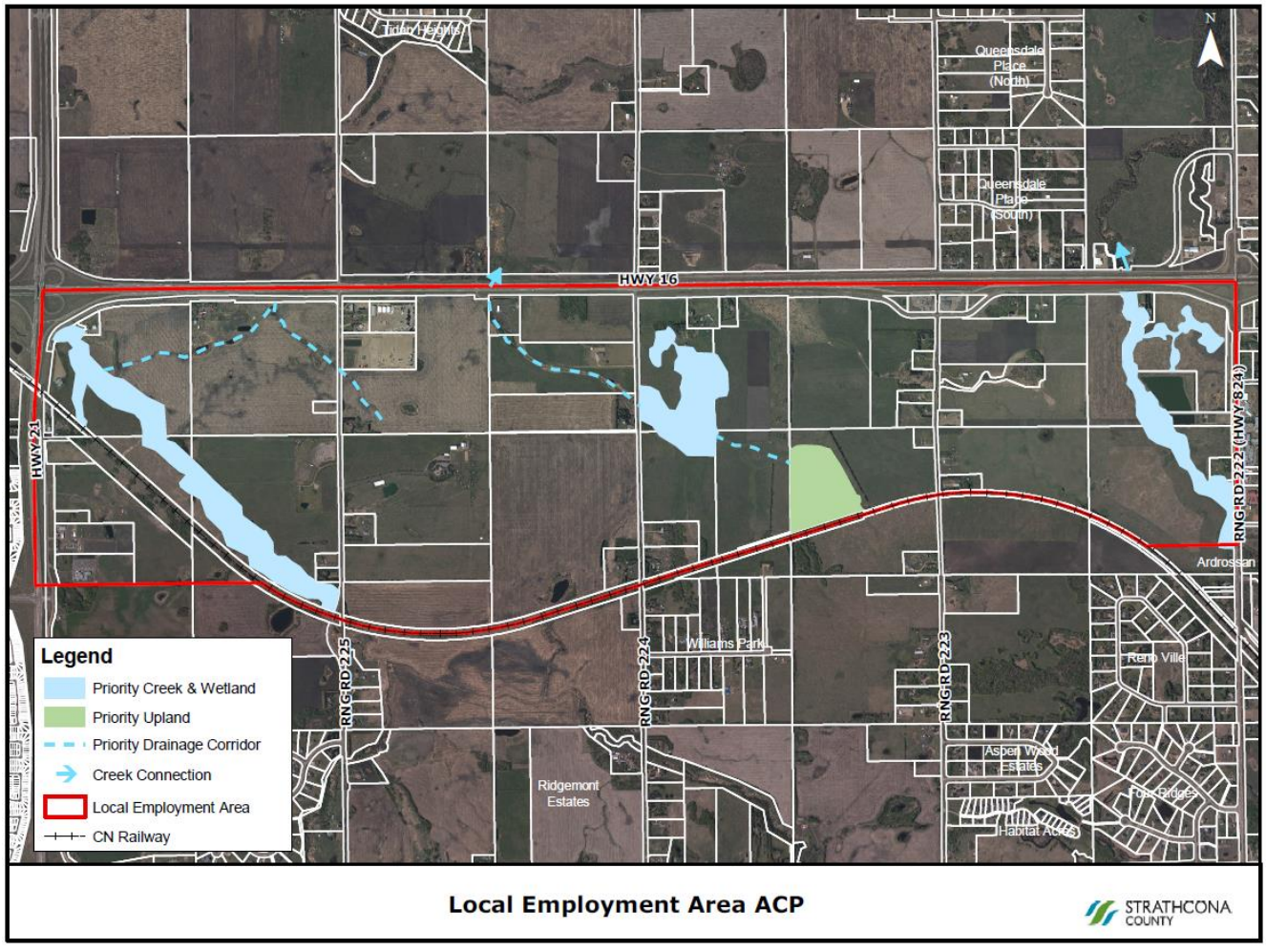


**Figure 14: LEA ACP Conservation Priorities**

## 6.0 LIMITATIONS AND QUALIFICATIONS

In conducting the investigation and rendering our conclusions, Strathcona County gives the benefit of its best judgment based on its experience and in accordance with generally accepted professional standards for this type of investigation. This report was submitted with the best information to date and on the information provided. The conclusions made within this report are a professional opinion, not a certification of the sites environmental condition, no other warranty, expressed or implied is made. This report has been prepared for the exclusive use of Strathcona County for the purposes of assessing the current state of the natural areas at the subject property. Any use which any third party makes of this report, or any reliance on or decisions to be made on it, are the responsibility of such third parties. Strathcona County accepts no responsibility for damages, if any, suffered by any other third party as a result of decisions made or actions based on this report.

Our conclusions are limited by the following:

- Site assessments were completed at the time specified;
- The investigation was limited to those parameters specifically outlined in this report; and
- Most observations were made from the roadsides as access was not available to the majority of the study area.

Jocelyn Thrasher-Haug, M.Sc., P.Ag., P. Biol.
Biologist, Manager Environmental Planning
Planning & Development Services
Strathcona County
September 2017

## 7.0 REFERENCES

Bayrock, L.A. and Hughes, G.M. 1962. Surficial Geology of the Edmonton District, Alberta. Research Council of Alberta.

Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe., 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm (Version 04DEC98).

Geowest Environmental Consultants Ltd. 1997. Prioritized Landscape Ecology Assessment.

Griffiths, Deirdre E., 1987. A Survey of Wetland Wildlife Resource, Strathcona County, Alberta. Prepared for the CO. of Strathcona.

Hydrogeological Consultants Ltd. 2001. Part of the North Saskatchewan River Basin Parts of Tp 050 to 057, R20 to 24, W4M Regional Groundwater Assessment.

Infotech Services., 1989. Environmentally Sensitive Areas: County of Strathcona and M.D. of Sturgeon. Prepared for Edmonton Metropolitan Regional Planning Commission.

Natural Regions Committee 2006. Natural Regions and Subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852.

Spencer Environmental Management Services Ltd. 2005. Assessment of Environmental Sensitivity and Sustainability in Support of the Strathcona County MDP Review.

Westworth, D.A. and L.J. Knapik, 1987. Survey of Significant Natural Features, Strathcona County. Prepared for CO. of Strathcona.