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# Municipal Development Plan Growth Study

*Submitted by*

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*With input from*

**ISL Engineering and Land Services**

August 2006

**Municipal Development Plan  
Growth Study  
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# 1. INTRODUCTION

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## 1.1 Purpose

The purpose of this Discussion Paper is to consider options for growth and resulting land use policy implications for Parkland County. Three scenarios for growth are used to present the broadest range of potential policy options and implications. Each of the three scenarios is evaluated against the community's vision and principle goals. The goals have been determined through the public consultation process in Phase 1 of the Municipal Development Plan project. The background research articulated in the Environmental Scan and Land Use Trends and Best Practices reports is also considered in evaluating growth options and implications.

## 1.2 Vision

The vision statement contained in the County's 2006-2010 Strategic Plan states that *Parkland County is a desirable community in which to live and do business.*

The land use planning goal in support of that vision is that *Parkland County has planned sustainable growth in agriculture, residential and industrial/commercial sectors while balancing quality of life, environmental protection and natural resource use.*

The input provided by the public, combined with the Strategic Plan directions, suggest the following vision should be considered in evaluating growth options:

***Parkland County is a sustainable community that provides a high quality of life by balancing conservation of its natural environment with economic prosperity and lifestyle choices.***

A sustainable community allows for the needs of the present without compromising the ability of future generations to meet their own needs

## 1.3 Goals

The following goals provide the basis for assessing a suitable growth strategy for Parkland County that will encourage its vision to evolve. As is noted above, these goals are based on input from local residents and reflect the values most important to the County as it grows and changes.

1. **Support Environmental Sustainability** – *The County supports communities that are designed to minimize air, water, and soil pollution, reduce resource consumption and waste, and to protect natural systems that support life.*

Environmental sustainability and, in particular, protecting natural areas is the most important goal to most residents for managing future growth and for maintaining a high quality of life.

2. **Support Fiscal Sustainability** – *The County supports fiscally responsible development wherein the cost of building, operating and maintaining communities and their supportive infrastructure and services are affordable, and will not become a burden on future generations.*

Fiscal Sustainability is almost as important to residents as environmental sustainability and a desire for development to pay its own way is evident. However, this means that infrastructure constructed by the developer and then assumed by the County must also be sustainable over the long term and not become a financial burden to future generations. For example, if the length of road constructed in new development areas is reduced, associated operational and maintenance costs will be reduced.

3. **Support Social Sustainability** – *The County supports communities that are designed to be socially diverse, adaptable to changing lifestyles and to further the objective of providing people with access to affordable housing, education, healthcare, essential goods, public amenities and services, such that their basic needs are met.*

Although residents considered aging in place a desirable option, the desire was for more options within the current settlement pattern such as secondary suites or second dwellings on a lot. Social diversity and access to affordable housing is not a need for most residents. However, a desire for options to the traditional 2.5 acre country residential lot product is evident.

Access to basic needs is important but was expressed in terms of close proximity to Edmonton in particular, as well as to Spruce Grove and Stony Plain. However, public amenities in the form of recreational opportunities are important to County residents, particularly walking and ATV trails.

4. **Emphasize Economic Development** – *The County supports new industrial and commercial development that is compatible with its other goals.*

Such development is supported and should be encouraged and accommodated in appropriate locations to create jobs, attract investment and expand and diversify the tax base that is weighted towards residential assessment.

5. **Respect Community Character** – *Preserving the character of Parkland's communities, be it the secluded country residential subdivisions or mainly farming areas, is a highly valued by residents.*

Growth should be managed in a manner that respects the traditional community character while recognizing that new development can make its own positive contribution to the County's character.

6. **Land Use Certainty** – *The County supports maintaining a reasonable degree of certainty for its residents in terms of the future use and development of their lands and of surrounding properties.*

Growth will occur and, to the extent possible, should be managed in a manner that retains some certainty for existing residents that the status of their land will not dramatically change. Certainty for new residents in terms of what they're buying into is also important. Where change is proposed, residents must be provided opportunity to comment and give input that will be recognized.

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## 2. CURRENT SETTLEMENT PATTERN

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### 2.1 Overview

Parkland County is a rural municipality located immediately west of the City of Edmonton that extends some 90 kilometres further west to the Pembina River. The North Saskatchewan River forms its south boundary and the Sturgeon and Lac Ste. Anne Counties border it on the north. Parkland County also contains numerous lakes, the largest being Wabamun Lake and Isle Lake. Both these lakes are located in the west half of the County.

The County comprises 246,652 hectares (609,469 acres) or 2,467 km<sup>2</sup> and had a 2005 population of 29,679 resulting in a population density of 11 persons per km<sup>2</sup>. This density is more than double that of Leduc County and 12% higher than Sturgeon County's.

### 2.2 Agriculture

More than 75% of the County comprises agricultural land. About ½ of the agriculture land base is used for crop production while the balance is pasture land. All of the *west country*, west, north and south of Wabamun Lake is used for farming, mostly pasture and ranching with some forage and specialty crop production such as saskatoons. Cereal crop production is prevalent south of Spruce Grove and Stony Plain and east of Wabamun Lake. This farming area is interspersed with hobby farms and market garden type activities.

The area of land farmed has been decreasing over the last 30 years such that the agricultural land base has decreased from 97% of the total County area in 1971 to 75% in 2001. This reduction is due to the growth of resource extraction and reclamation activities, as well as urban expansion and the use of agricultural lands for other uses such as country residential development and golf courses.

### 2.3 Residential

Most of the County's population resides in county residential subdivisions that are concentrated in the northeast and southeast close to the Edmonton, Spruce Grove and Stony Plain. These concentrations result from their proximity to the urban centres, particularly Edmonton, and to natural amenities including the North Saskatchewan River Valley, Big Lake, the Glory Hills and Atim Creek amongst others. Much of this county residential development is located on soils that exhibit limited capability for crop production and in areas characterized by wood lots, sloughs and rolling terrain.

Traditional large acreage type subdivisions with private water wells and sewage disposal systems are the dominant form of country residential development. However, piped water and sewer systems extend from regional trunks operated by Regional Commissions into the area south of Big Lake adjacent Edmonton. Subdivisions serviced by piped water and sewer are largely made up of ½ acre lots which is the minimum size permitted by the County's Land Use Bylaw for serviced subdivisions.

Parkland Village is the County's largest manufactured home park and is located ½ mile north of Spruce Grove. This park is significant in that its 2005 population of 1,579 accounts for 5.3 % of the County's population.

Entwistle, located in the *west country* on the Pembina River, is the County's largest hamlet with a 2005 population of 545. The population of the County's remaining hamlets of Fallis, Tomahawk, Duffied, Gainford, Keephills and Carvel total 589 (see Table 1). Total hamlet population is 1,134 or 3.82% of the County's population. This means that about 10% of the County's residents live in Parkland Village and hamlets. The remaining 90% live in acreage subdivisions or on agricultural farmsteads. All the hamlets are located in the west central and west segments of Parkland County while the vast majority of the country residential subdivisions are located in the east central and east segments.

*Table 1 - 2005 Hamlet Population*

<b>Hamlet</b>	<b>2005</b>
Carvel	27
Duffield	70
Entwistle	545
Fallis	259
Gainford	63
Keephills	43
Tomahawk	127
Parkland Village	1,579
<b>Total</b>	<b>2713</b>

## **2.4 Industrial/Commercial**

Industrial development is also concentrated close to Edmonton in Acheson Industrial Park. The park is serviced with piped water and sewer, is accessed by both Highway 16 and 16 A and straddles Highway 60 and the CN mainline.

A second industrial park, located north of Stony Plain up to Highway 16 was approved in 2001 and is referred to as the Fifth Meridian Business Industrial Park. Development in this park is limited by a lack of piped services. As well, the distance from Edmonton limits the market for some industrial developments.

Entiwistle provides a third option for the location of industrial/commercial developments. However, the hamlet is well removed from the Edmonton region and, therefore, caters to a different market.

Two ¼ sections located along Highway 16 in the Atim Creek Plan area are zoned Highway Commercial but are undeveloped. No other highway commercially zoned lands exist along Highway 16 although some lands are

designated for this use along the north side of Highway 16A west of Stony Plain, and a highway commercial strip is located in Entwistle along a slip ramp off the south side Highway 16.

## **2.5 Recreation and Open Space**

Parkland County provides an abundance of recreational opportunities focused on its many water and other natural features. Recreational opportunities include eight (8) day use parks, the Meridian Sports Park, 14 campgrounds and RV parks, and 11 golf courses.

The County operates three parks including Chickakoo Lake Park, Hasse Lake Park and Jackfish Lake Park. At 480 acres, Chickakoo Lake Park is the largest of the three and is located north of Stony Plain in the Glory Hills.

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### 3. TRENDS AND ISSUES

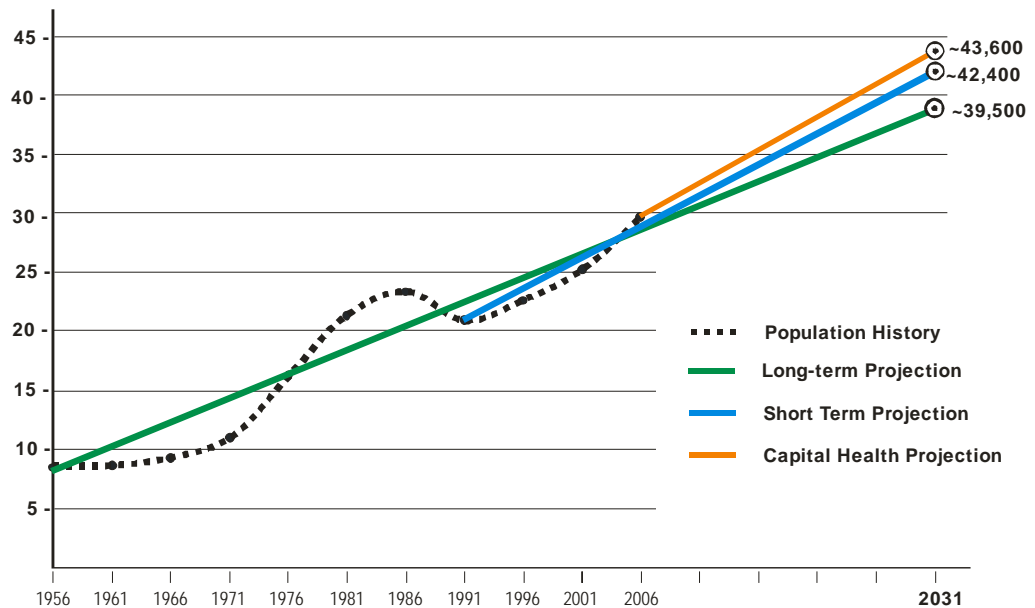
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#### 3.1 Population

The population history of the County is the basis for projecting population by using a simple trend line (regression) analysis (see Figure 1). Two trend periods are applied. The long term trend (1956 – 2005) includes several economic cycles. The short term trend (1991 – 2005) shows an accelerating upward trend and reflects the recent economic boom. Capital Health projections are also shown.

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*Figure 1 - Population Projections*



These population projections estimate modest growth for the County with growth averaging between 1.2 and 1.5% annually. While much lower than the 2.5 to 3.0% recently observed in the County, the projections reflect the cyclical nature of the economy and concomitant growth.

Statistics Canada, the Urban Futures Institute and the Conference Board of Canada all predict the long-term population growth rate for Alberta to be 1.1%. Overall provincial growth is predicted to slow to this average annual growth rate (the current rate is approximately 2%) caused by a decreasing national growth rate and an aging provincial population that will respectively limit the scale of inter-provincial migration and internal population growth rates.

Table 2 highlights the low, moderate and high population forecasts for the County.

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*Table 2 – Population Growth Rates*

	<b>2031 Population</b>	<b>Annual Growth Rate</b>
<b>Low Projection -</b> Based on Long Term Trend	39,500	1.2%
<b>Medium Projection -</b> Based on Short Term Trend	42,400	1.4%
<b>Capital Health –</b> Based on Provincial Forecast	43,600	1.5%

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The high population projection is based on the more optimistic projection prepared for the Capital Health Authority from the Alberta Ministry of Health. The higher population estimate projects strong short-term growth for at least the next few years, with the longer-term growth rate tapering off to a level above that expected for the province as a whole.

It should be noted that population projections are a best estimate only and address long-term average rates of growth. They are dependant upon many outside factors such as economic conditions, population mobility, immigration rates, and demographic shifts. The scenarios presented above are based largely on the assumption that Parkland County will receive a constant share of the expected one million additional residents expected in the Calgary-Edmonton corridor over the next 25 to 50 years. The reality is that policy decisions made by the County can significantly increase or decrease the proportion of regional growth that actually occurs.

An aggressive business attraction program within the County could drive stronger than expected job growth, leading to increased population gains. Lower population growth is possible if market forces move toward more urban lifestyles or the cost of commuting from rural acreages to urban jobs becomes prohibitive.

Recently announced proposals for significant capital investments in the region will move the economic centre of gravity for the region to the east.

### **3.2 Demographics**

Canada's communities are growing older. The Conference Board of Canada predicts that the share of Canada's population over 65 years of age will rise from its current level of 10.2% to between 20 and 22% by the year 2030.

In Alberta, currently the country's youngest province, the trend is identical. Alberta's senior population is projected to increase by 135% over the next 30 years, while the total population of the province will increase by only 37%. The Capital Health Authority demographic shift mirrors the provincial shift.

Although Parkland County's higher average age and larger cohorts 40 to 60 suggest that aging may be a larger issue, the lack of multi-family accommodation and extended care facilities means seniors requiring access to such facilities will migrate out of the County.

### 3.3 Municipal Finance

The value of total assessment has been rising at an accelerating rate for the last several years, with positive year over year increase of 8.6% and 7.6% for 2005 and 2004, respectively.

The addition of almost ½ billion dollars to the assessed value of land and developments over a two year period is significant.

Comparing the distribution of assessment with Parkland's neighbours (Table 3) highlights the residential assessment bias in Parkland County. The larger contribution made by commercial, industrial and institutional development (non-residential plus machinery and equipment assessments) in Leduc and Sturgeon Counties (34.3% and 36.6% respectively) offsets the smaller residential assessments.

*Table 3 - Assessment Distribution Comparison (2005)*

<b>Equalized Assessment (2005)</b>	<b>Parkland</b>	<b>Leduc</b>	<b>Sturgeon</b>
Residential	<b>61.7%</b>	30.3%	48.0%
Farmland	<b>1.4%</b>	4.3%	3.8%
Non-residential	<b>9.4%</b>	30.3%	15.6%
Non-residential linear	<b>23.4%</b>	31.0%	11.8%
Non-residential railway	<b>0.4%</b>	0.1%	0.1%
Machinery and Equipment	<b>3.7%</b>	4.0%	20.6%
<b>Total</b>	<b>\$3,173,997,013</b>	<b>\$2,189,955,938</b>	<b>\$2,163,343,786</b>

*Source: Alberta Municipal Affairs – Municipal Profiles*

Seeking a better balance in future between residential and non-residential types of municipal assessment will provide a more stable and reliable source of municipal revenue.

### 3.4 Status of Agriculture Land

Although the area of land being farmed is decreasing based on historic trends, agriculture remains the predominant land use in Parkland County. The number of farms is also decreasing while the average farm size is increasing.

However, about ⅓ of all farms are less than 129 acres in size and are deemed to be small farms by Alberta Agriculture. This number is significant because it suggests that small hobby farms and intensive horticultural and specialized livestock operations play a significant role in the County's agriculture industry.

Small farms may have a role to play in dealing with the volatility in the agriculture industry in recent years by allowing for greater flexibility in lifestyle and farm practices.

Farm operators are moving to smaller farm sizes that focus on higher intensity agriculture activities in part to compensate for decreasing commodity prices and vastly increasing operating costs, particularly fuel. This trend can be expected to continue. More intensive agricultural activities will increasingly involve high-value crop production for local consumption, greenhouses, commercial or industrial activities on agriculture land, or specialized exotic livestock operations.

Closer to the urban areas, rising land prices will increase the pressure on farmers to subdivide or sell to developers. The single parcel out of an agriculture ¼ section has assisted farmers in the past by allowing operators to redistribute or liquidate a portion of their land holdings for their retirement or as a source of bridge financing or investment in capital requirements such as equipment.

While this approach to subdivision has offered some stability to farmers in the past, it may be less sustainable in future as operating costs continue to rise and farmers look for viable investment opportunities. Going forward, it will be important for the County to promote productivity in agriculture by allowing for flexibility that will allow agriculture to be integrated into a diversified economy.

For areas further removed from urban areas and development pressures, subdivision flexibility is equally important as a means of remaining viable and potentially better populating the *west country*.

### **3.5 Status of County Residential Land**

Table 4 shows the development status of the County's country residential Area Structure Plans, as well as those concentrations of lands zoned country residential that are not affected by an Area Structure Plan.

It is important to note in considering future growth options for the County that all Area Structure Plan lands are pre-zoned for country residential use regardless of development status. This means that the settlement pattern is already largely established in advance of subdivision and, because of the large area of land affected, little opportunity remains to consider alternate patterns.

However, some opportunity to amend the existing Area Structure Plans to consider different types and densities of subdivision may be feasible and is considered by this growth study.

As is shown by Table 4, the area zoned Country Residential Core District is about 95,280 acres. The existing Municipal Development Plan states that county residential development will be directed to the Core District.

An additional 21,143 acres is zoned Country Residential Future District for a total of 116,423 (95,280 + 21,143) acres. The current Municipal Development Plan policy related to Country Residential Future District states that *a location may be considered if the site is adjacent to an existing multi-lot residential subdivision, the land is not highly productive farmland and the multi-lot residential uses will not unduly affect agriculture uses in the area.*

*Table 4 - Country Residential ASP Areas*

ASP	CR Core			CR Estates			CR Future	TOTAL
	Developed	Undeveloped*	Total	Developed	Undeveloped	Total	Total	
Woodbend Gramina	11,960	14,920	26,880				3,200	<b>30,080</b>
Glory Hills	6,720	14,400	21,120				2,560	<b>23,680</b>
Atim Creek	3,740	18,660	22,400					<b>22,400</b>
Jackfish Mayatan	5,120	2,400	7,520				8,160	<b>15,680</b>
Wabamum Isle Lake	2,080	3,840	5,920				2,400	<b>8,320</b>
Big Lake	80	1,680	1,760	320	640	960		<b>2,720</b>
Hwy 16/43 NW	1,680	1,520	3,200					<b>3,200</b>
Hwy 16A W of Stony Plain	4,800	1,680	6,480				4,000	<b>10,480</b>
<b>Fifth Meridian**</b>					344	344	823	<b>1,167</b>
<b>TOTAL</b>	36,180	59,100	95,280	320	984	1,304	21,143	<b>117,727</b>

\* Assumes those quarter sections subdivided into four or less parcels are undeveloped or under developed.

\*\* As per the gross areas listed in the ASP. Areas are not pre-zoned

*Table 5 - Population Capacity in Country Residential Areas*

	Undeveloped (Acres)	Net Developable 70%	# of Lots (1 lot/5ac)	Population (3p/hh)
<b>CR Core</b>	59,100	41,370	8,274	24,822
<b>CR Future</b>	21,143	14,800	2,960	8,880
<b>CR Total</b>	80,243	56,170	11,234	33,702
<b>Estate</b>	984	689	1,378	4,134
<b>TOTAL</b>	81,227	56,859	12,612	<b>37,836</b>

Of the total area zoned Country Residential Core, about 59,100 acres are undeveloped or *under developed*. Assuming first, that only 70% or 41,370 acres of this total is suitable for development and, second, the average density of in existing multi-lot subdivisions of one lot per five acres of gross area, the undeveloped Country Residential Core lands may potentially be subdivided into 8,274 lots (see Table 4).

By applying the same two assumptions to the 21,143 acres zoned Country Residential Future, another 2,960 lots may potentially be created for a total of about 11,234 lots. Assuming an average household size of 3.0, the undeveloped Core and Future Country Residential zoned lands may potentially accommodate a population of 33,702. This is more than double the County's 2005 population of 29,670.

About 984 acres of Country Residential Estate land are undeveloped in the Big Lake and Fifth Meridian Area Structure Plans. Again assuming 70% of this area is developable, and recognizing that the minimum lot size permitted under the Land Use Bylaw is 0.5 acres, some 1,378 estate lots may potentially be subdivided in future. The resulting population based on a household size of 3.0 is about 4,100.

This means that the undeveloped Country Residential Core, Residential Future and Residential Estate Districts may potentially accommodate a population of 37,800 persons.

The number of new country residential lots approved for the four year period 2002 to 2005 is 1,206 or 302 lots per year. Projecting the subdivision of 302 lots per year into the future, the potential 12,612 Country Residential Core, Residential Future and Estate Residential lots will be subdivided in 42 years.

It is important to note that subdivision activity does not represent absorption rates. Absorption rate is the number of lots developed annually. Historic absorption rates are not available.

However, some 92% of all building permits issued in 2005 were for residential permits suggesting residential activity comprises most of the County's building activity. Of the total 263 residential permits issued, 72% or 189 were for single detached or single wide manufactured homes.

This data provides at least some indicator of absorption although information on the type of lots being built upon is not readily available. Regardless, assuming an annual absorption of 189 lots, the 12,612 lots that may be subdivided within zoned and designated country and estate residential areas will be absorbed in 67 years.

Going forward, the County should consider other options for accommodating new types of smart growth communities rather than relying solely on absorption of the current land inventory, most of which can be developed only for traditional country residential housing. Equally important in going forward is the need to maintain the rural quality of life that is so highly valued by County residents.

### 3.6 Status of Industrial/Commercial Land

#### 3.6.1. Acheson Industrial Park

The Acheson Industrial Park comprises about 10,240 acres and is centred on the Highway 16A/60 interchange. Of that area, 3,520 acres are zoned Industrial/Commercial Core while a further 3,520 acres are zoned Industrial Reserve (see Table 6). The balance of the Acheson lands is zoned Agriculture Reserve District.

*Table 6 - Industrial/Commercial Lands*

ASP	Industrial/Commercial Core			Industrial Reserve	Future Ind/Comm*	Total
	Developed	Undeveloped	Total			
<b>Acheson</b>	640	2,880	3,520	3,520		7,040
<b>Fifth Meridian*</b>					662	662
<b>Entwistle*</b>					208	208
<b>Total</b>	640	2,880	3,520	3,520	870	7,910

\* As per ASP's.

Most of the existing industrial development in Acheson is concentrated in the three ¼ sections located in the northwest quadrant of the Highway 16A/60 interchange and include Sherwin, West Acheson and Ellis Parks.

Kalwin Business Park is a relatively new park located in the southwest quadrant of the Highway 16/60 interchange and is partially developed.

Two ¼ sections located on the east side of Highway 60 and south of Highway 16 are partially subdivided and available for development, and large lot subdivisions exist along Highway 16 west of Kalwin.

In total, 1,280 acres in Acheson are subdivided for industrial development and about ½ or 640 acres of this area is developed so that 640 acres of subdivided industrial land remains to be developed. This means that of the 3,520 lands zoned Industrial/Commercial Core District, about 2,880 acres are available for future development. A further 3,520 acres are zoned Industrial Reserve so that a total of 6,400 acres will be available to meet the County's future industrial lands needs in Acheson.

Industrial absorption rates are not readily available for the County but building permits valued at about 6.5 million dollars suggest that Parkland County is experiencing a healthy degree of economic activity prevalent throughout the Edmonton region and Alberta, and most of this activity is concentrated in Acheson.

A local realtor has indicated that in the last year, about 160 acres of land was sold for industrial development in Acheson. By comparison, 350 acres were absorbed in the City of Edmonton.

Assuming an absorption rate of ¼ section per year, Acheson alone will potentially meet the County's demand for the next 40 years.

Services will continue to be extended by accessing the capital Regional Parkland Water Services Commission (CRPWSC) and the Capital Region Sewage Commission (CRSC) water and sewer trunks.

The southwest and southeast segments of the Acheson Industrial Area are zoned Agricultural Restricted since these lands cannot be economically serviced with water and sewage. The economics of servicing these segments may change in the very long term given proximity to Edmonton and the provincial highway grid. However, the lands are not required for the foreseeable future.

### **3.6.2. Fifth Meridian Business Industrial Area**

About 600 acres are designated for future business industrial development by the Fifth Meridian Area Structure Plan. The plan also designates about 50 acres for future highway commercial along Highway 16A. Development activity has been limited in this area in part because of a lack of piped municipal services although water can be provided by tying directly into the Capital Region Water Services Trunk or into the Town of Stony Plain's system. Similarly, the Capital Region Sewage Commission Trunk extends through part of the area so that sewage service is available. The County Office that is located in the Fifth Meridian Plan Area as well as some lands along Highway 779 are serviced by a force main connection to the trunk and a lift station.

### **3.6.3. Entwistle Business Park**

As was previously noted, highway commercial development extends along the south side of Highway 16 in the Hamlet of Entwistle directly east of the Pembina River. A partially developed industrial area is located south of the commercial strip, and the Entwistle Business Park is located further south along the west of Highway 22. Although the park is not currently serviced with piped water and sewer systems, the opportunity to extend services from the hamlet's current systems exists. The Business Park provides for 208 net acres of future industrial/commercial lands although it is significant to note that no service road is contemplated along Highway 22 so that highway commercial development opportunities may be restricted.

## **3.7 Infrastructure**

Municipal water and sewer infrastructure information is most relevant for determining future growth opportunities. This information has been collected and analyzed by ISL Engineering and Land Services and its accuracy has been verified by the County.

### **3.7.1. Existing Water and Sewer Servicing**

Existing communities in Parkland County with water and sewer systems may provide cost effective opportunities for future population growth. The amount of growth that could be supported would depend on the magnitude of available unused capacity within their existing systems, or expansion of the systems, if feasible.

Community water and sewer systems are comprised of a number of components. Any one or combination of these components can limit overall system capacity. In water systems, the components typically are: supply, treatment, storage, pumping, and distribution system.

In sewer systems, the components typically are:

- Collection system
- Lift stations
- Pumping
- Force mains
- Treatment

In general, these systems can be expanded, usually at considerable cost, to meet increasing demands and loadings. Following expansion, there is usually a period during which excess capacity exists within the systems.

Four such communities with water and/or sewer systems exist in Parkland County including:

- Duffield
- Tomakawk
- Entwhistle
- Acheson

In three of these communities (Duffield, Tomakawk, and Entwhistle) the water and/or sewer utilities are independent, and they are described in Section 3.7.3. The Acheson Service Area is unique in that its water supply and wastewater treatment are provided by regional commissions.

### **3.7.2. Acheson Water Supply and Wastewater Treatment**

Treated water in Acheson is supplied by the Capital Region Parkland Water Services Commission, and wastewater is treated by the Alberta Capital Region Wastewater Commission. These commissions are further discussed below.

#### **1. Capital Region Parkland Water Services Commission**

Capital Region Parkland Water Services Commission obtains treated water from EPCOR in Edmonton, and co-operates with other water commissions that also obtain water from EPCOR, in the distribution of available supplies.

Currently, available supply rates sometimes do not meet peak demands in the Edmonton region, resulting in conservation measures in some locations. The Capital Region Parkland Water Services Commission conveys water to 3 primary customers / commission members including Parkland County, Spruce Grove, and Stony Plain.

The water is supplied at average daily flow rates, so the communities are required to construct storage, pumping and distribution facilities to meet daily peak demands and needed pressure levels. The distribution pipes are connected to local individual users. The Commission also directly supplies water at operating pressure levels to approximately 20 users within the City of Edmonton, and 20 individual users within Parkland County, which represent a small part of the total demand.

Regarding future demand increases, population and industrial growth is considered to be a reality by EPCOR and the commissions supplied by it. Consequently, EPCOR is expanding its treatment and supply capabilities on an ongoing basis, and the commissions submit 5-year demand projections annually to assist in planning for future supplies.

A recent study for the Parkland Commission recommended that all future connections be *trickle feed* type, meaning that cisterns and pumps will be required by customers connected directly to the commission's mains. Larger connections would continue to be based on average daily flow rates.

In summary, future development located near the Parkland Commission's supply system, in the Acheson area can be serviced with water by:

- Utilizing available capacity in the local distribution systems that are already connected to the Parkland Commission system; and
- Making new connections to the Parkland commission mains, as approved by the commission.

Two types of new connections to the Parkland Commission system are feasible:

- Connections with new storage reservoirs, pumping facilities, and distribution mains that provide full pressure service to numerous customers, and
- Connections that *trickle feed* to one or more customers, each of which uses a private cistern and pump.

Regardless of the type of connection, water supply is not an issue for future growth in the Acheson area.

## **2. Alberta Capital Region Wastewater Commission**

Wastewater is treated by the Alberta Capital Region Wastewater Commission (ACRWC), which also conveys the wastewater a considerable distance to a regional treatment plant located near Fort Saskatchewan. ACRWC also services numerous other communities in the Capital Region area surrounding Edmonton.

ACRWC policy is to not limit growth in any of its member municipalities, including Parkland County. The commission allows only *large* connections to its transmission mains, which precludes individual service connections.

ACRWC recently adopted a *level-of-service* policy that limits flow rates into its system based on the size of population or industrial/commercial areas connected. Therefore, municipalities with leaky sewer systems that do not meet the level-of-service criteria would have to upgrade those systems, or construct storage facilities in order to reduce peak flow rates to the acceptable levels. Such areas are typically older, existing developments. New infrastructure which is constructed to current standards would meet the ACRWC's level of service requirements.

In summary, future development located near the ACRWC's system, in the Acheson area, can obtain wastewater servicing either by:

- Utilizing available capacity in the local collection systems that are already connected to the ACRWC system, or
- Making new connections to the ACRWC system, in accordance with the criteria that have been established.

A description of the existing municipal servicing facilities in Acheson is contained in Appendix A.

### **3. Future Regional Servicing Changes**

In recent months, discussions and studies have been undertaken to assess the feasibility of expanding existing regional commissions, or creating new ones, in areas that include the western and northern portions of Parkland County. If implemented, servicing opportunities in other parts of the County could be increased. However, because of the considerable costs, political processes, and time for planning, design and construction, these opportunities are considered to be not applicable to this study.

#### **3.7.3. Hamlet Water Supply and Wastewater Treatment**

Appendix A contains a detailed breakdown of the capacity of each component of the municipal water and sewer systems in those hamlets where such services exist. Carvel, Fallis, Gainford and Keepphills are not serviced with piped systems. Population capacities based on the existing systems in the remaining hamlets are listed in Table 7.

##### **1. Hamlet of Entwistle**

The limiting factor in terms of capacity for Entwistle is the water distribution system. This system is at capacity although the water treatment plant has capacity to treat water for an additional 185 persons. Entwistle's 2005 population was 545.

A new lagoon was built in 2002 with a capacity for an additional 140 to 200 persons. It is assumed that the collection system and the two lift stations match this capacity. The limiting factor in accommodating new population growth in Entwistle, therefore, is the water distribution system.

**2. Hamlet of Duffield**

The design of the lagoon and collection system in Duffield allows for a total capacity of 130 persons. Duffield's 2005 population was 70. This means that another 70 persons can be accommodated.

Water supply is by individual wells.

**3. Hamlet of Tomahawk**

The existing lagoon in Tomahawk has the capacity to service 82 persons. The hamlet's 2005 population was 127 so that the capacity has been exceeded. Interestingly, the sewage collection system is designed for a capacity of 950 persons.

Similar to Duffield, water supply is by individual wells

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## 4. GROWTH OPTIONS

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### 4.1 Overview

Three options are proposed for managing growth in Parkland County. The three options will result in different future settlement patterns and are evaluated based on the six goals listed in Section 1.3. Each option is also considered in the context of the Policy Implications Discussion Paper. All three options can accommodate the projected populations. However, the land use pattern will vary over time based on how population is distributed. The options are presented to highlight the broadest range of potential land use policy implications.

### 4.2 Description of Growth Options

#### 4.2.1. Status Quo Option

This option assumes that future growth and development will occur within the context of the status quo as determined by existing zoning. The goal of this option is to encourage future growth to follow the same pattern as in the past.

The Land Use Bylaw has pre-zoned sufficient land allow for more than twice the 2005 population of the county in the Core, Future and Estate Country Residential Districts and, based on 2005 building permits for houses, meets the County's needs for 60 some years.

This option also assumes the status quo for the hamlets in regard to municipal services so that some limited growth can occur in the central and westerly portions of the County.

Similarly, industrial/commercial development will continue to concentrate in Acheson Industrial Park and potentially in Fifth Meridian Business Park as well as Entwistle Business Park assuming municipal services are extended by developers.

#### 4.2.2. Balanced Growth Option

Balanced growth assumes that future development is dispersed throughout the County such that development is not restricted to the areas currently zoned under the Land Use Bylaw, but rather, is permitted throughout the County based locational and development criteria. The goal of this option is to distribute new residential development in a manner that results in relatively low density in many parts of the County including the *west country*.

However, although the balanced growth approach may provide for some additional population in the west, the highest demand for new development can expected to continue to be proximate to Edmonton and related employment centres

This approach may meet the objectives of those farmers that are zoned agriculture but may be located in areas where a demand exists for alternate uses that are more profitable than agriculture. Owners of land adjacent to surrounding existing country residential subdivision south of Spruce Grove and Stony Plain and north of Highway 627 have expressed considerable interest in this approach. As well, interest has been expressed by some landowners located in the Agriculture Restricted District north of Spruce Grove and Highway 16.

Similarly, industrial development may locate throughout the County but locational demand will likely continue to be highest near Edmonton. The Municipal Development Plan currently directs industrial development to Acheson.

The balanced growth option would see the County encourage more development in the hamlets by upgrading service levels, both hard and soft services. Hamlet growth would result in more balanced growth throughout the County.

As is noted in Section 3.7.3, only Duffield requires no additional upgrades to accommodate an additional 70 persons. Entiwistle can accommodate about 200 additional persons assuming the water distribution system is upgraded. Tomahawk requires major upgrading to allow for new growth.

#### **4.2.3. Nodal Option**

This option assumes significant new growth will be directed to nodes that can be serviced by piped water and sewer along the regional trunk lines. The goal of this option is to apply smart growth principles to new development to encourage sustainability by accommodating the greatest number of people in a manner that makes the most efficient use of land and municipal resources. However, to encourage growth to occur in the linear nodal pattern, the County may potentially need to front end a segment of the municipal servicing extensions and recover the costs through an off-site levy.

Providing municipal services to smaller lots of  $\frac{1}{3}$  acres in size with a typical maximum density of 100 lots per quarter section is economically viable and are assumed for the nodes. Smaller lots with maximum densities as suggested will also allow for about  $\frac{1}{2}$  of a site to be retained as open space so that the rural feel and lifestyle that is very important to County residents is retained. By applying conservation approaches to subdivision design whereby lots are clustered, natural features and other green infrastructure elements can be preserved and incorporated into an overall open space system. Clustering lots also significantly reduces the length of required roads and service lines resulting in lower operating and maintenance costs.

The balance of the Big Lake Area Structure Plan lands north of Highway 16 is one node where additional growth maybe directed based on servicing potential. About five  $\frac{1}{4}$  sections may be available so that assuming 100 lots per  $\frac{1}{4}$  section resulting in 500 lots, and 3.0 persons per household, a population of 1,500 may be accommodated.

A second such node may be developed between Spruce Grove and Acheson, specifically south of the Wagner Natural Area and west of Osborne Acres. This node would serve to protect the south side of the Wagner Area from future development at urban densities. About four ¼ sections may be available. Again assuming 100 lots per ¼ section resulting in 400 lots, and 3.0 persons per household, a population of 1,200 may be accommodated.

Under this option, the County would also extend services into the Fifth Meridian and Entwistle Business Parks as a means of stimulating new industrial development outside Acheson. Extending services to the two ¼ sections located in the northwest quadrant of the Highways 16/43 interchange (Atim Creek Area Structure Plan) that are zoned Highway Commercial may stimulate development of these lands, perhaps as a future power centre.

Traditional multi-lot subdivisions would continue to be permitted in those areas zoned Country Residential Core District. However, areas zoned Country Residential Future should be reconsidered for that use. Similarly, the County would not front-end investment in any new infrastructure in the hamlets assuming that most new growth would be accommodated within existing systems capacity or be directed to the new nodes. Based on the current relatively low populations of the hamlets, even those with municipal services, the demand for residential development can be expected to continue to be near the large urban centres. No further rezoning to Country Residential Core would be permitted.

This option assumes that the County will aggressively target a larger share of regional growth, both population and economic. In recent years, Spruce Grove and particularly Stony Plain have been growing at higher rates than the County. An aggressive County growth strategy may alter this trend

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## 5. GROWTH OPTION EVALUATION

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The three options are evaluated in the table below based on the six growth management goals. These options will be ranked by the public on a scale of 1 to 3 with 1 indicating the best *fit* for each goal. The recommended growth option, or some combination of options, will be selected following the ranking process.

The growth options have the greatest impact on residential development with some implications for agricultural, industrial and hamlet development.

*Table 7 - Growth Option Matrix*

	Status Quo	Balanced Growth	Nodal
<b>Environmentally Sustainable</b>	<ul style="list-style-type: none"> <li>- For CR development, limits preservation of natural features and environmentally sensitive areas where ER does not apply because development leaves a large footprint.</li> <li>- Improperly installed or poorly maintained private sewage systems potentially may contaminate groundwater and aquifers as well as soils, particularly since CR is concentrated in designated locations that include extensive groundwater recharge areas.</li> <li>- Continued drilling of individual wells may cause depletion of water supply and add to the threat of groundwater contamination from above.</li> <li>- Concentrated growth in designed CR areas increases negative cumulative effects of traffic, noise and air-borne pollutants.</li> <li>- Industrial areas are serviced so impact is not as significant.</li> </ul>	<ul style="list-style-type: none"> <li>- For CR development, greater negative impact than status quo because of opportunity for more scattered CR so a greater portion of the County may be impacted.</li> <li>- Concentrated growth in designed CR areas can still occur so negative cumulative effect may also result.</li> <li>- Industrial development located outside the existing parks likely serviced on-site so may negatively impact groundwater and soils.</li> <li>- Greater potential for land use incompatibility</li> </ul>	<ul style="list-style-type: none"> <li>- Concentrates most new CR growth in small geographic area so footprint is reduced.</li> <li>- Greatest opportunity for preserving natural features and environmentally sensitive areas by applying rural by design principles that maintain such features and extensive open space.</li> <li>- Sewage is treated off-site so no impact on soils and groundwater.</li> <li>- Alternate water supply from a regional system means fewer individual wells so less impact on groundwater and/or aquifers.</li> <li>- Greater emphasis on attracting industry so more opportunity for local employment thereby reducing the home to work travel time and distance resulting in fuel efficiency and reduced air pollution.</li> </ul>

	Status Quo	Balanced Growth	Nodal
<b>Fiscally Sustainable</b>	<ul style="list-style-type: none"> <li>- For CR development, efficient design that maximizes yield while reducing road length is feasible in the Big Lake area only. The continued subdivision of traditional CR lots results in a greater population spread over a larger area so that the number and length of County roadways that need to be maintained increases over time.</li> <li>- Assuming developer front ends all services, the Big Lake and industrial areas are sustainable particularly since these areas tie into regional systems.</li> </ul>	<ul style="list-style-type: none"> <li>- Increases long term maintenance costs since development is scattered over a larger area.</li> <li>- If up front servicing costs are not recovered may be a burden to future generations.</li> </ul>	<ul style="list-style-type: none"> <li>- In the short term, significant municipal investment is required to front end services.</li> <li>- Municipal operating costs will be reduced because most new residential growth is compact and concentrated in small nodes and adjacent provincial highways.</li> <li>- If up front servicing costs are not recovered may be a burden to future generations.</li> <li>- For industrial, a larger supply of serviced land may stimulate more development that is needed to balance the residential assessment base.</li> </ul>
<b>Socially Sustainable</b>	<ul style="list-style-type: none"> <li>- Provides the current level of diversity and lifestyle options that meets the needs of many residents.</li> <li>- May not meet future needs as population ages and demand changes for new lifestyle options since diversity is limited.</li> <li>- Level of recreational opportunities at the local level limited by 10% MR requirement.</li> </ul>	<ul style="list-style-type: none"> <li>- More growth in hamlets may provide housing diversity and lifestyle choices but only for the <i>west country</i>.</li> <li>- Similar to status quo.</li> </ul>	<ul style="list-style-type: none"> <li>- Provides greatest opportunity for diversity in terms of both location and lifestyle options.</li> <li>- More opportunity for a variety of recreational opportunities such as local trails and trail networks as more open space is provided for a more concentrated population.</li> </ul>

	<b>Status Quo</b>	<b>Balanced Growth</b>	<b>Nodal</b>
<b>Emphasize Economic Development</b>	<ul style="list-style-type: none"> <li>- Rate of economic growth will not be impacted although Parkland can expect to benefit from any increased economic activity in the region. However, holding a stationary position while other are moving forward will result in a relative decrease in regional well being.</li> <li>- Assuming that residential development also will proceed as per recent years, the imbalance between residential and non-residential assessment also will remain.</li> <li>- Any increase in economic activity may be offset by an increase in the rate of residential development since increased regional economic activity is also resulting in regional population increases base on in-migration.</li> </ul>	<ul style="list-style-type: none"> <li>- Some opportunity for additional economic activity exists for those businesses that cannot afford to locate in Acheson but can locate in other areas where tie-ins to piped municipal services are not a requirement and land costs are lower.</li> </ul>	<ul style="list-style-type: none"> <li>- Economic development is emphasized with investment in infrastructure and the availability of more serviced industrial and commercial land.</li> <li>- Increased economic activity will better balance residential and non-residential assessment base providing for increased prosperity in the longer term.</li> <li>- Local employment opportunities may also increase.</li> </ul>
<b>Respect Community Character</b>	<ul style="list-style-type: none"> <li>- Maintaining the status quo is most likely to respect the community character both in the CR areas and in mainly farming areas.</li> </ul>	<ul style="list-style-type: none"> <li>- Less likely to respect community character since land use and social conflicts may result if CR subdivisions move into mainly farming areas.</li> </ul>	<ul style="list-style-type: none"> <li>- Existing traditional CR communities located adjacent future higher density subdivision may be impacted in terms of factors such as noise and privacy.</li> <li>- However, these communities may benefit from more public open space opportunities.</li> <li>- Mainly farming areas will not be impacted.</li> </ul>

	Status Quo	Balanced Growth	Nodal
Maintain Land Use Certainty	<ul style="list-style-type: none"> <li>– Most likely to maintain land use certainty since the status quo will be carried forward.</li> </ul>	<ul style="list-style-type: none"> <li>– Least likely to maintain certainty since development can occur across the County although some locational criteria may be applied.</li> </ul>	<ul style="list-style-type: none"> <li>– Certainty is maintained for most of the County since most of the County will not be impacted.</li> <li>– Lands located adjacent or near designated nodes will see a decrease in certainty as the density of new development increases.</li> <li>– Land values of undeveloped sites located adjacent designated nodes may increase so that although certainty is reduced, benefits may accrue.</li> </ul>

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## 6. POLICY IMPLICATIONS

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The Municipal Development Plan policy implications of each of the three growth options are listed in the table below by policy area including:

- Environmental Management
- Agriculture
- Residential Development
- Industrial/Commercial Development
- Future Growth

Only those policy implications that are unique to each growth option are listed. Many of the policy implications listed in the Issues and Policy Implications Discussion Paper will apply regardless of which of the three options, or some combination thereof, is selected as the basis for drafting a new Municipal Development Plan for Parkland County. Under these circumstances the term applied to the Status Quo option is misleading in terms of policies because some change will result with new policy initiatives.

*Table 8 – Policy Implications Matrix*

	<b>Status Quo</b>	<b>Balanced Growth</b>	<b>Nodal</b>
<b>Environmental Management</b>	<ul style="list-style-type: none"> <li>– For CR development, natural features and environmentally sensitive areas where ER does not apply will be located on private land. Policies requiring sensitive design that protect such features while allowing for a building site and yard need to be considered.</li> <li>– Require an environmental review/assessment as part of Outline Plan process to identify what features may be impacted and how design can assist in this regard.</li> <li>– Educating developers and landowners of the merits for conserving natural features may need to be a County priority.</li> <li>– Use of conservation easements needs to be further explored.</li> <li>– Encourage use of new innovative on-site sewage disposal systems that result in the disposal of <i>grey water</i>.</li> <li>– Consider cisterns as an option to wells.</li> </ul> <p>Limited policy implications for all other uses since existing policies support status quo.</p>	<ul style="list-style-type: none"> <li>– Environmental conservation criteria required for locating new subdivisions outside pre-zoned areas.</li> <li>– No new subdivision/development that may affect environmentally sensitive areas.</li> <li>– Policy implications that apply to status quo option would also apply to this option.</li> <li>– Environmental screening of industrial projects outside of currently designated parks will be important.</li> </ul>	<ul style="list-style-type: none"> <li>– Policy guidelines required to encourage and support nodal development and apply rural by design principles that maintain natural features environmentally sensitive areas as well as extensive open space.</li> <li>– Off-site levies need to be revisited.</li> <li>– Greater emphasis on eco-industrial parks may be considered.</li> </ul>

	<b>Status Quo</b>	<b>Balanced Growth</b>	<b>Nodal</b>
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>- .No significant policy implications.</li> <li>- Existing policies support the status quo apply.</li> </ul>	<ul style="list-style-type: none"> <li>- Greater subdivision flexibility require policies that include locational and other criteria that will allow a parcel zoned Agriculture to be used for other more intensive uses.</li> <li>- Policies that encourage compatibility will be required particularly in regard to CFO's.</li> </ul>	<ul style="list-style-type: none"> <li>- Agriculture not impacted by this option so policies implications are similar to those listed for Status Quo option.</li> </ul>
<b>Residential Development</b>	<ul style="list-style-type: none"> <li>- Implication on new policies limited and most current policies will continue to be relevant.</li> <li>- Existing policies that allow for second dwelling units or suites may be revisited to allow for greater housing diversity to meet needs of an aging population and smaller households</li> <li>- Older Area Structure Plans may be revisited to provide guidelines for increasing long term sustainability of new multi-lot subdivisions.</li> </ul>	<ul style="list-style-type: none"> <li>- Policies that support infill and direct new growth to hamlets required.</li> <li>- Locational criteria for locating new CR multi-lot subdivision in the Agricultural area required.</li> <li>- CR multi lot subdivision will not be restricted to the Country Residential Core District.</li> <li>- Country Residential Future District may be redundant.</li> <li>- Boundaries of existing CR Area Structure Plans may be revisited.</li> <li>- Similar to status quo.</li> </ul>	<ul style="list-style-type: none"> <li>- Policies that direct growth to nodes required.</li> <li>- Policy guidelines dealing with density and size of lot required.</li> <li>- Policy design guidelines required to promote smart growth and conservation principles that maintains natural areas and sufficient open space to retain rural flavour.</li> <li>- Reduced emphasis on traditional CR subdivisions.</li> </ul>
<b>Recreation and Open Space</b>	<ul style="list-style-type: none"> <li>- Not impacted by status quo option.</li> <li>- May consider emphasis on Municipal Reserve as land in the form of linear corridors instead of cash-in-lieu to increase trail opportunities.</li> </ul>	<ul style="list-style-type: none"> <li>- Same as status quo.</li> <li>- Greater emphasis on County providing recreational opportunities as a means of attracting growth to hamlets.</li> </ul>	<ul style="list-style-type: none"> <li>- Municipal Reserve will be taken as land.</li> <li>- Policy design guidelines required that determine type, location and amount of open space to be conserved in nodes.</li> <li>- Policies required that encourage integrating open space areas with adjacent subdivisions.</li> </ul>
<b>Industrial and</b>	<ul style="list-style-type: none"> <li>- No major policy implications. Policies</li> </ul>	<ul style="list-style-type: none"> <li>- Policies required that encourage</li> </ul>	<ul style="list-style-type: none"> <li>- Proactive policies required to attract a</li> </ul>

	<b>Status Quo</b>	<b>Balanced Growth</b>	<b>Nodal</b>
<b>Commercial</b>	not impacted by status quo option.	<p>industrial/commercial clusters or <i>scatterization</i> throughout the County outside Acheson and Fifth Meridian.</p> <ul style="list-style-type: none"> <li>- Locational policy criteria required for locating outside existing parks so that compatibility between uses may result.</li> <li>- Greater emphasis on extending services to Entwistle Business Park and other hamlets.</li> </ul>	<p>greater share of regional industrial growth.</p> <ul style="list-style-type: none"> <li>- Requires more emphasis on economic development than in the past.</li> </ul>
<b>Future Growth</b>	- No major policy implications. Policies not impacted by status quo option	- Policies that direct future growth to the hamlets and encourage dispersed growth in the Agricultural District required.	<ul style="list-style-type: none"> <li>- Policies required that County will undertake a municipal servicing study to determine type, location and cost of infrastructure improvements</li> <li>- Proactive policies required that see the County attracting a larger share of all regional growth – both economic and population.</li> </ul>

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## APPENDIX A – MUNICIPAL INFRASTRUCTURE

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### ACHESON

#### LAGOON

n/a - connection to ACRWC (see separate discussion)

#### COLLECTION SYSTEM

large mains for industrial areas

4 connections to regional trunk

significant capacity in existing mains for residential servicing

more connections to regional trunk available

#### WATER TREATMENT

n/a - connection to Parkland water commission (see separate discussion)

#### WATER DISTRIBUTION

one existing reservoir and pumphouse

future connection and reservoir planned for food processing

existing pipes sized for industrial fire flows, so can also support

substantial residential supply requirements

additional connections to regional system available

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## DUFFIELD

### LAGOON

Lagoon capacity 56,700 m<sup>3</sup> evaporative

Assume 3 years storage, therefore 18,900 m<sup>3</sup>/yr

Assume 0.45 m<sup>3</sup> per day per person, therefore suitable for 115 people

Original design was for 130 people, therefore 0.40m<sup>3</sup>/yr

Existing population 70, therefore capacity for 45 to 60 people available

### COLLECTION SYSTEM

Designed for same capacity as lagoon, therefore capacity for 45 to 60 people available

Originally 43 service connections (3 people per connection = 130)

If all service connections are put into service, then no spare capacity

### WATER TREATMENT

n/a

### WATER DISTRIBUTION

Individual wells

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## ENTWISTLE

Populations : 1991 - 460; 1996 - 453; 2000 - 453; 2005 - 545 (county)

### LAGOON

New(circa 2002) lagoon - 4 anaerobic, 1 facultative, 2 storage - capacity 130,000 m<sup>3</sup>/yr

2005 population - 545, at 0.45 m<sup>3</sup>/day = 90,000 m<sup>3</sup>/yr, therefore room for about 200 more people

2005 population - 545, at 0.52 m<sup>3</sup>/day = 103,441 m<sup>3</sup>/yr, therefore room for about 140 more people

### COLLECTION SYSTEM

AssE 2000 report - outfall surcharging from MH4 to lagoon - no upgrade recommended.

New (circa 2002) - outfall - capacity assumed for peak flow to match lagoon

### LIFT STATIONS

2000 report said replace existing with same capacity because it is 25 years old

Existing capacity is 9.3 L/s and peak flow is 8.2 L/s, therefore 13% spare capacity

Assuming 0.45 m<sup>3</sup>/day per person, spare capacity for about 50 people

Assuming 0.52 m<sup>3</sup>/day per person, spare capacity for about 43 people

Other lift station is near new lagoon presumably with capacity for peak flow to match lagoon

### WATER TREATMENT

Upgrade grant \$27,100 - 2002

License allows 120,000 m<sup>3</sup>/yr (730 people @ 0.45 m<sup>3</sup>/day)

Usage about 89,516 m<sup>3</sup>/yr (545 people @ 0.45 m<sup>3</sup>/day), therefore capacity for 185 more people

### WATER DISTRIBUTION

AssE 2000 report - distribution pumps should be 12.2 L/s, were upgraded actual capacity unknown

For 12.2 L/s peak flow, average flow is 2.7 L/s (AssE 2000 report)

At 450 L/day per person 2.7 L/s is for 518 people, therefore no room for more people

Reservoir 681 m<sup>3</sup> (150,000 impgal) - circa 2001 (alberta first)

Reservoir 2000 m<sup>3</sup> (440,000 impgal) now (county)

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## TOMAHAWK

### LAGOON

Lagoon capacity 6,762 m<sup>3</sup> (from license)

Drain twice per year (from license), therefore 13,524 m<sup>3</sup> per year

Assume 0.45 m<sup>3</sup> per day per person, therefore suitable for 82 people

Existing population 127, therefore no capacity available

### COLLECTION SYSTEM

Peak factor for 82 population = 4.3

Peak factor for 127 population = 4.2

Peak flow from 127 people (127 x 4.2) is 10 m<sup>3</sup>/hr

Capacity of 200 mm (min) at 0.4% (min) is 75 m<sup>3</sup>/hr, therefore system has capacity for roughly 950 people

### WATER TREATMENT

n/a

### WATER DISTRIBUTION

Individual wells

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