

BDO Zone Rating: Phase 1 Opinion Letter

The Municipal District of Greenview and
County of Grande Prairie, AB

Prepared For:
**The Municipal District of Greenview
and County of Grande Prairie, AB**

Prepared By:
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BDO Zone Rating Opinion

Proponent: The MD of Greenview and County of Grande Prairie, AB

Rated Location: The MD of Greenview and County of Grande Prairie, AB

Biomass Category: Woody Biomass

1: INTRODUCTION

The Municipal District (MD) of Greenview and County of Grande Prairie, AB seek a BDO Zone Rating to leverage its access to woody biomass and other infrastructure-related supply chain advantages to help attract biobased projects and support new biobased economic development. Ecostrat Inc. has been retained to carry out BDO Zone rating activities within the framework of the [Standards for Biomass Supply Chain Risk](#). This Phase 1 Rating Opinion Letter (“Rating Opinion”) provides the assumptions behind a preliminary and high-level scoring and rating of woody biomass supply and feedstock supply chain resilience for the MD of Greenview and County of Grande Prairie, AB.

The BDO Zone Initiative is a regional risk-rating and certification program that enables regions to leverage local biomass assets to attract new bio-based manufacturing plants and create jobs. **A BDO Zone rating** is a qualified assessment of biomass feedstock and infrastructure attributes of a region with respect to the development potential of new biofuel, renewable chemical, biogas or bioproduct manufacturing plants.

- ✓ Use internationally recognized risk metrics to credibly quantify and signal key biomass feedstock and infrastructure “success” characteristics valued by biobased developers and investors around the world.
- ✓ Connect ‘A’ and ‘AA’ rated communities with bio-based project developers looking to build new plants in BDO Zones.
- ✓ Help get biomass-based manufacturing plants built in the places they are most likely to succeed.

With the current Allowable Annual Cut (AAC) volumes and the production capacity of sawmills in the BDO Zone region, it is estimated that around 300,000-350,000 oven dry tonnes per year of woody biomass-based feedstock functionally available (underutilized) to new bio-based markets within 120-km supply radii that cover the county of Grand Prairie, Greenview Industrial Gateway, and Grande Cache, AB. In addition, the BDO Zone assessment shows excellent initial scoring on key infrastructure and supply chain risk indicators.

There is already a strong demand for wood chips from the pulp and paper industry in the north and south west and central Alberta and it is expected that no sufficient quantities of this biomass resource will be available for future bioeconomy initiative.

THE MD OF GREENVIEW
AND COUNTY OF GRANDE
PRAIRIE, AB
RATING OPINION

Expected ‘A’ BDO
Zone rating

Minimum of 300,000-
350,000 oven dry
tonnes of woody
biomass per year

Underutilized forest
residuals

Excellent
infrastructure and
supply chain



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The primary source of available woody biomass which is currently underutilized is forest residues. It is estimated that over 300,000 oven dry tonnes of forest residues are produced from cutting timbers to meet the annual fibre demand of sawmills and pulp mills. The actual annual quantity depends on the volume of harvested timbers by these primary wood processing facilities.

The second source of available woody biomass is sawdust and wood shavings. It is estimated that about 50,000 oven dry tonnes could be available under long-term contracts. It is noted other potential sources of woody biomass that is expected to be available in the supply basin are woody biomass in communities with fire management and fibre utilization plans and wood wastes in the urban areas. The potential availability of these potential biomass resources will be evaluated in Phase 2.

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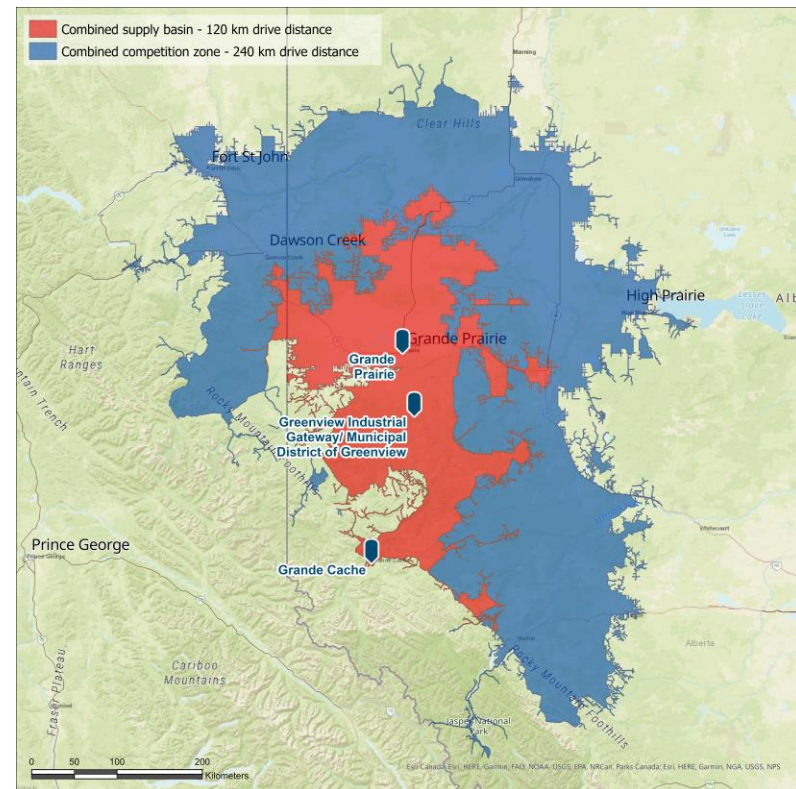
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The rating for The MD of Greenview and County of Grande Prairie, AB BDO Zone is expected to be at least 'A'.

2: BDO ZONE AREA AND DATASETS

- Sources of woody biomass supply were assessed within a 120-km drive distance from Country of Grande Prairie, Greenview Industrial Gateway, and Grande Cache, AB which serve as the BDO Zone center points.
- Potential competing markets within a 240-km drive distance will be included in the analysis and scoring (the “BDO Zone region”). Map 1 shows the supply and competition basins for the region.
- Primary ratings input used to assess the woody biomass availability in the region is mainly data from the Forest Management Agreements between Government of Alberta and the tenure holders (wood processing facilities), the production capacity of the wood processing facilities and recently published documents by Government of Alberta on the allocated AAC volumes and harvested timbers.



Map 1: Supply and Competition Basins for the MD of Greenview and County of Grande Prairie BDO Zone Designation

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2.1 The MD of Greenview and County of Grande Prairie BDO Zone

- The forest lands in the MD of Greenview and County of Grande Prairie BDO Zone are primarily under provincial ownership and is managed by the Forestry Division of Government of Alberta with some federal managed areas and private lands.
- In Alberta, Annual Allowable Cuts (AACs) are set for in the Forest Management Units (FMUs). A FMU is an area of forested public land designated by the Government of Alberta, under the authority of the Forests Act, as an administrative unit to manage timber. Figure 1 shows the FMUs in Alberta and the FMUs located in the Supply and Competition Basins (red box).
- Alberta has not experienced severe natural disturbances in recent years such as insect outbreaks and wildfires and thus AACs and the harvest levels in the majority of FMUs have not changed significantly. The region is not subject to significant annual wildfire risks. However, with changing climate conditions, motivation and desire for increased fuels treatment acres is relatively high.
- The forest region is dominated by a mix of coniferous and deciduous trees.
- Without significant biomass markets, the number of treated areas and utilization of forest residues has been limited.
- Road and logging infrastructure to support removal and transport of woody biomass are adequate to supply a proponent facility.
- Slope and terrain can restrict some harvesting equipment in the region. However, we discount biomass volumes from excessively sloped and otherwise poor terrain.

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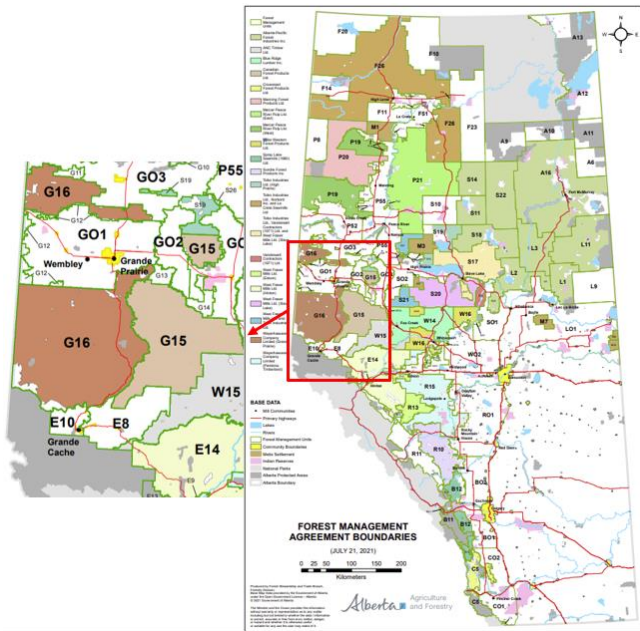


Figure 1. Map of current Forest Management Units (FMUs) and the FMUs located in the Supply Basin (red box)

2.2 Woody biomass sources in the MD of Greenview and County of Grande Prairie BDO Zone

Primary sources of woody biomass supply in the BDO Zone include:

- Sawmill Residues including woodchips, sawdust, wood shavings, and hog fuel,
- Forest Residues¹ from harvesting and fuel reduction operations (tops, limbs, and log waste),

Other potential sources of woody biomass that is expected to be available in the supply basin are woody biomass in communities with fire management and fibre utilization plans, pulp logs, and wood wastes in the urban areas. The potential availability of these potential biomass resources will be evaluated in Phase 2.

Additional validation in rating Phase 2 will provide higher levels of confidence in the estimated woody biomass supply and demand in the BDO Zone.

¹ Forest residues are often used synonymously with the term “slash”.

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2.2.1 Sawmill Residues:

Sawmill Residues are produced during the primary breakdown of logs into lumber at sawmills, making them candidate sources of feedstock for biomass processing facilities such as wood pellet plants and Co-generation facilities. There are 4 sawmills in the BDO Zone (Table 1). Given the capacity of the sawmills, we estimate that about 670,000 dry tonnes of sawmill residuals are produced in the BDO Zone including 485,000 dry tonnes of wood chips and 186,000 dry tonnes of sawdust, wood shavings and hog fuels.

There is already a strong demand for wood chips from the pulp and paper industry in the region and it is expected that no sufficient quantities of this woody biomass will be available for future bioeconomy initiative. There is a large pulp mill in the region with an annual wood chip consumption of over 510,000 dry tonnes (Table 2).

There are two cogeneration facilities in the BDO Zone (Table 2) with an annual consumption of 136,000 dry tonnes of sawdust, wood shavings and hog fuels. About 50,000 oven dry tonnes of sawdust and wood shavings should be available after meeting the feedstock demand of the two Cogen facilities in the region. This volume has been used for other applications such as livestock bedding and landscaping (under short-term contracts). This volume should be available for bioeconomy initiatives under long-term contracts.

Table 1: Operational Sawmills in the BDO Zone

Name	Estimated Annual Capacity	Estimated sawmill residues
Weyerhaeuser lumber sawmill	340 million board feet	164,000 oven dry tonnes of wood chips 84,000 oven dry tonnes of sawdust and wood shaving
Canfor lumber sawmill	294 million board feet	142,000 oven dry tonnes of wood chips 72,000 oven dry tonnes of sawdust and wood shaving
Foothills Forest Products lumber sawmill	120 million board feet	58,000 oven dry tonnes of wood chips 30,000 oven dry tonnes of sawdust and wood shaving
Norbord Inc OSB sawmill (now owned by West Fraser)	730 million square feet 3/8" thick	121,000 oven dry tonnes of wood chips

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Table 2: Primary users of woody biomass in the BDO Zone

Name	Estimated Annual Capacity	Estimated woody biomass use
International Paper’s pulp mill	250,000 air-dried metric ton	510,000 oven dry tonnes of wood chips
TC Energy cogeneration facility	32 MW	76,000 oven dry tonnes of sawdust and wood shavings
Canfor cogeneration facility	25 MW	60,000 oven dry tonnes of sawdust and wood shavings

2.2.2 Forest Residues:

- Forest Residues are non-merchantable woody biomass and wood waste from logging practices -- which consists of tops, branches, stumps, D-grade, log waste, and needles/leaves². In the BDO Zone they are either scattered and left in the forest cut blocks for silvicultural and ecological considerations or collected, piled, and burned the following year.
- Due to the lack of large-scale biomass power/Cogen plants and pellet plants within the competition zone, currently there is no established demand for forest residues and they are usually piled and burned to prevent forest fires.
- About 20% of harvested timbers ends up in the forest as forest residues. Given the capacity of current sawmills and the pulp mill in the supply area, it is expected that over 300,000 oven dry tonnes of forest residues are produced from harvesting of coniferous and deciduous timbers.
- Terrain variability, interference with logging operations, and lack of proper road access to logging residues at some of the cut blocks can make accessing this material problematic in in some cases but most of it can be accessed with proper planning and placement of piles.

² Forest residues are often used synonymously with the term “slash”.

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3: RATING OPINION DRIVERS

<p>RATING DRIVER 1</p>	<p>Underutilized forest residues and price constraints of current markets</p> <ul style="list-style-type: none"> ➤ Large underutilized commercial quantities of forest residues ➤ Anticipated a consistent supply of forest residuals given a healthy forest industry in the BDO Zone region ➤ Current markets constrained at prices significantly above \$80/dry tonne. ➤ A majority of underutilized forest residues in the MD of Greenview and County of Grande Prairie BDO Zone can be delivered to the the BDO Zone center points at a high-level delivered cost range of \$80-90 per dry tonnes. More granular verification in rating Phase 2. ➤ It is estimated that about 50,000 dry tonnes of sawdust and wood shavings could be available under long-term contracts at a high-level delivered cost range of \$40-50 per dry tonnes
<p>RATING DRIVER 2</p>	<p>Robust fiber harvest infrastructure</p> <ul style="list-style-type: none"> ➤ Commercial quantities of woody biomass currently produced and underutilized in the MD of Greenview and County of Grande Prairie BDO Zone. ➤ Harvest infrastructure appears to be adequate to access and manage feedstock delivery.
<p>RATING DRIVER 2</p>	<p>Key supply chain infrastructure</p> <ul style="list-style-type: none"> ➤ Physical infrastructure is excellent with Grande Prairie having two major industrial hubs: 1. Tradesman, an industrial area with 192 hectares of land for future expansion and 2. NW Clairmont a 1651 hectares of land with on-site rail lines. ➤ The MD of Greenview also has two major industrial parks 1. Greenview Industrial Gateway at 2000 acres and 2. Big Mountain Industrial Park with 108 acres. All sites have access to natural gas and electricity. ➤ Good transportation links, including rail to Port of Prince Rupert in BC. ➤ Social infrastructure is also attractive, with cost of living lower than other areas in Alberta, good education, including post secondary, natural beauty, and lower than averaging housing pricing and availability.