POINTE COUPÉE, LA

Biofuel Development Opportunity Zone

RATING GRADE: 'A'

Date of Issue: February 25, 2025

A
High Quality

Rating Parameters:

Category	Rated Quantity	Delivered Price	Supply Zone Size
Pulpwood	1,000,000 bdt/yr	$70-$80/bdt	75-mi drive distance
Forest residues	200,000 bdt/yr	$90-$100/bdt	from Livonia, LA
Sawmill residues	100,000 bdt/yr	$50-$70/bdt	

BDO ZONE ASSETS

- 1.3 million bone dry tons (bdt) of biomass available at low risk for a new project in the BDO Zone.
- Long term private forest ownership supportive of new biomass projects in Livonia.
- Strong endorsement from local logging companies to supply large quantities of hardwood pulpwood and forest residues to a new project.
- Greenfield location with all utilities available and room to expand.

BDO ZONE LIABILITIES

- Full scale-up may take longer than expected due to expensive equipment and long lead times.
- Increasing transportation costs due to high truck insurance rates and driver and equipment shortages.
- Increased frequency and impact of severe weather events could further reduce the harvest season and accessibility.

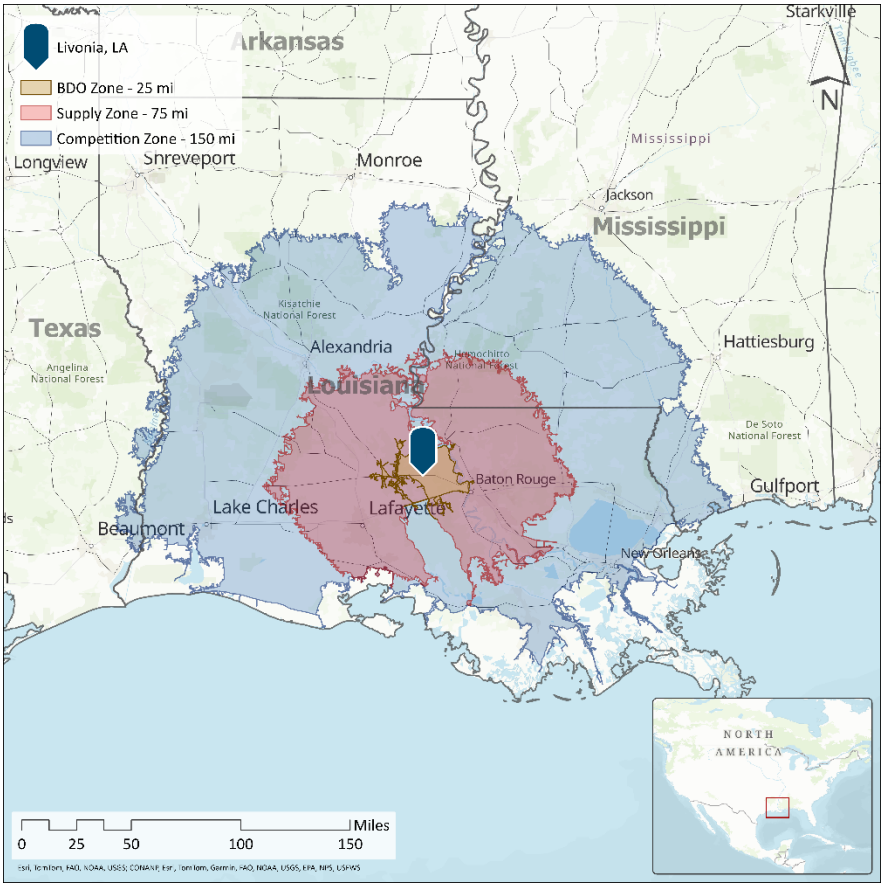
RATING GRADE

The Pointe Coupée, LA Biofuel Development Opportunity (BDO) Zone, is rated 'A', or 'low' risk.

Risk Rating Grades are defined as follows: AAA (extremely low), AA (very low), A (low), BBB (low-moderate), BB (moderate), B (moderate-high), and C (high).

'A' ratings denote high prospective viability of Feedstock Supply and Infrastructure and low expectations of default risk in the Zone. Capacity to support new biobased plant operations is considered strong. This capacity may, nevertheless, be more vulnerable to supply chain scale-up and adverse weather challenges than is the case for higher ratings.

POINTE COUPÉE, LA BDO ZONE



ANALYST NOTES

A biomass project located in the Pointe Coupée, LA BDO Zone has access to 1 million bdt/yr of pulpwood, 200,000 bdt/yr of forest residues, and 125,000 bdt/yr of sawmill residues. Delivered prices range between $50-$70/bdt for sawmill residues, $70-$80/bdt for pulpwood, and $90-$100/bdt for forest residues.

Nestled between the Atchafalaya and Mississippi rivers, the region is known for its abundance of bottomland hardwood and mixed species forests. Hardwood tree species, such as water oak, sweet gum, water tupelo, green ash, black willow, Chinese tallow, and American elm grow on approximately 3.8 million acres in the Supply Zone. In addition, 1.5 million acres of softwood forests, comprised mostly of Loblolly and slash pines grow here.

The highest risk scores assigned to the BDO Zone Risk Indicators were triggered by equipment and transportation scale-up challenges, high diesel costs, road infrastructure issues, and increased frequency of severe weather events.

BDO ZONE ASSETS

One of the biggest assets of the BDO Zone is the vast abundance of pulpwood biomass. Bottomland hardwood forests cover most of the Supply Zone and require immediate and significant restoration to return them to a natural state. Consequently, hardwood pulpwood generated through forest restoration activities constitutes the most plentiful feedstock in the Supply Zone. Likewise, pine plantations in need of thinning contribute significantly to the pulpwood availability.

Private forest ownership is another great asset of this BDO Zone as ninety percent of the forests are privately owned for generations. Their owners are strong supporters of a biomass project that could capitalize on current abundance of pulpwood and forest residues, currently underutilized.

Likewise, local forestry companies are eager to endorse any biomass project in the BDO Zone that could significantly increase their logging capacities, which were drastically reduced in the past five years.

A new project located in Livonia will also be presented with an opportunity of a greenfield industrial site with all utilities available at property line.

BDO ZONE LIABILITIES

The large volumes of available biomass will require significant investments in both equipment and labor training/retention.

Local foresters indicated that, in the short term, forest companies will be able to increase their capacities by up to 50%. However, a full scale-up will require investments in logging, grinding, and transportation equipment that can take up to one or even two years to complete due to high equipment prices and long lead times.

In addition, securing truck drivers to haul the rated quantities will be complicated by the shortage of drivers and high insurance rates.

Moreover, access to biomass has been increasingly restricted by severe seasonal and catastrophic events such as heavy rains, tornados, hurricanes, floods, droughts, and forest fires. Local forest companies have been trying to mitigate for these events through flexible harvest scheduling and strategically locating satellite log yards and chip plants close to biomass customers. However, the increased frequency and intensity of these events will require additional costs, special equipment, and increasingly more complex management practices.

INFRASTRUCTURE PROFILE

The Pointe Coupee Parish offers 341 acres of greenfield land adjacent to the Livonia Union Pacific Rail Yard. The site is ready to support various industrial operations as all base utilities, electricity, gas, and water are in place. For more infrastructure details and risk indicators see Sections C and D.

SCORING & RATING METHODOLOGY

In assessing the biomass supply chain risk for the Biofuel Development Opportunity (BDO) Zone, 88 Risk Indicators from the US Standards for Biomass Supply Chain Risk (BSCR) were applied. These BDO Zone Risk Indicators are the subset of BSCR Risk Indicators applicable to evaluating feedstock risk within a BDO Zone. The risk indicators include:

- The BDO Zone is a 25-mile drive distance from the center point, which represents the siting area for future biomass projects and is where the industrial site is located.
- The Supply Zone is a 75-mile drive distance from the center point, where biomass availability was assessed.
- The Competition Zone is a 150-mile drive from the center point, where consumers can compete for biomass generated in the Supply Zone.

Feedstock quantities are expressed in **bone dry tons per year (bdt/yr)**, while feedstock costs are expressed in **United States dollars ($)**. Maximum transport distance is based on a 75-mile driving distance from the center point (Livonia, LA).

The BDO Zone rating is based on an aggregation of the scores assigned to each BDO Zone Risk Indicator (RI) assessed in this report. First, each BDO Zone Risk Indicator is given a **Raw Risk Likelihood (RRL)** score, which denotes the likelihood of a risk to future BDO Zone projects due to the Risk Indicator. RRL Scores are scaled as either very low (2), low (4), medium (6), high (8), or very high (10).

Each BDO Zone Risk Indicator is given a **Raw Risk Impact (RRI)** score, which denotes the impact on a future BDO Zone project due to the Risk Indicator. RRI scores are scaled as either very low (2), low (4), medium (6), high (8), or very high (10). Impact level scores are based on the impact level of a risk on the successful development and deployment of a BDO Zone project with no mitigation measures.

The **Gross Risk Indicator (GRI)** score is then calculated as the product of the RRL and the RRI scores. For example, if the 'Competitor Price and Price Sensitivity' is scored at an RRL of 2 and an RRI of 8, then the GRI for this risk indicator is 2 X 8 = 16.

If the analyst deems that a typical bio-based project could implement economically reasonable measures or best practices that mitigate the likelihood (RRL), the impact (RRI), or both, then the GRI will be notched accordingly.

The **Loaded RI** score for each Risk Indicator is the product of the GRI score and any notched scores. Loaded RIs are the final score for a Risk Indicator.

Loaded RI scores of 4 or less are deemed very low risk; scores between 5 and 16 are deemed low risk; scores between 17 and 36 are deemed medium risk; scores between 37 and 64 are deemed high risk; and scores of 65 and greater are deemed very high risk.

The total risk rating for the BDO Zone is the average of all Loaded RI scores and Infrastructure Indicators. The score for Pointe Coupee, LA BDO Zone is ***19 out of 100, resulting in an 'A' designation.***

All scoring and rationale for each Risk Indicator are provided in Section D.

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SECTION A: RISK INDICATOR SUMMARY

Figure A-1. All Risk Indicators Sorted by Risk Level

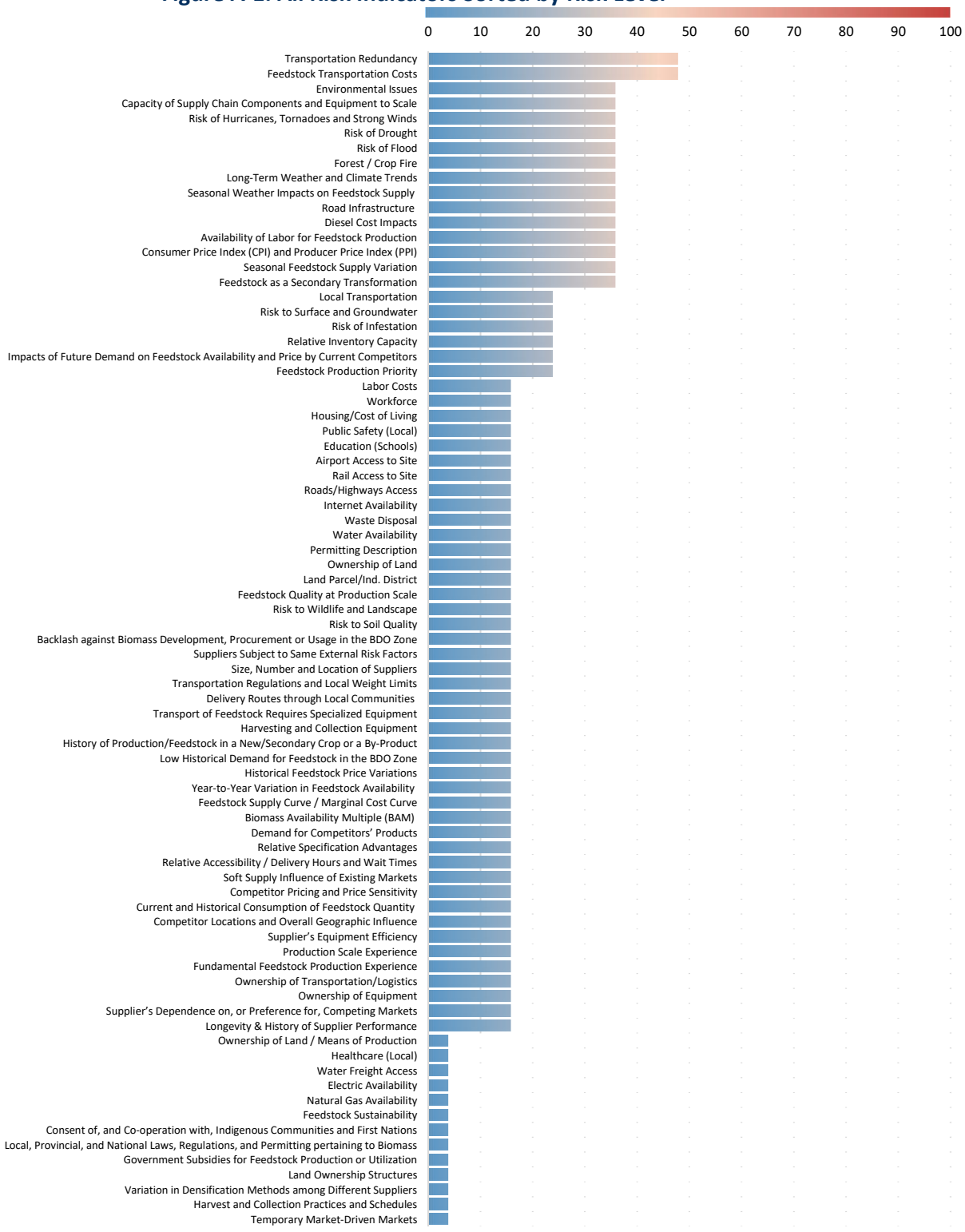


Table A-1. Risk Indicators and Associated Scores

Feedstock Supply Chain Risk Indicators	Raw Risk Likelihood	Raw Risk Impact	Gross Risk Indicator	Mitigation /Notching	Loaded RI Score
Category 1.0: Supplier Risk					
1.1 Risk Factor: Credit-Worthiness/Future Solvency of Suppliers					
1.1.1 Longevity & History of Supplier Performance	4	4	16	NN	16
1.2 Risk Factor: Conflicts of Interest/Vested Interest with Competing Market(s)					
1.2.1 Suppliers' Dependence on, or Preference for, Competing Market(s)	4	4	16	NN	16
1.3 Risk Factor: Supplier Control Over Production and Transportation					
1.3.1 Ownership of Land/Means of Production	2	2	4	NN	4
1.3.2 Ownership of Equipment	4	4	16	NN	16
1.3.3 Ownership of Transportation/Logistics	4	4	16	NN	16
1.3.4 Feedstock as a Secondary Transformation	6	6	36	NN	36
1.4 Risk Factor: Supplier Experience					
1.4.1 Fundamental Feedstock Production Experience	4	4	16	NN	16
1.4.2 Production Scale Experience	4	4	16	NN	16
1.5 Risk Factor: Supplier Harvesting/Collection/Processing Capacity					
1.5.1 Supplier's Equipment Efficiency	4	4	16	NN	16
1.6 Risk Factor: Supplier Motivation					
1.6.1 Feedstock Production Priority	4	6	24	NN	24
Category 2.0: Competitor Risk					
2.1 Risk Factor: Influence on Feedstock Supply of Existing Markets					
2.1.1 Competitor Locations and Overall Geographic Influence	4	4	16	NN	16
2.1.2 Current and Historical Consumption of Feedstock Quantity	4	4	16	NN	16
2.1.3 Competitor Pricing and Price Sensitivity	4	4	16	NN	16
2.1.4 Impacts of Future Demand on Feedstock Availability and Price by Current Competitors	6	4	24	NN	24
2.1.5 Soft Supply Influence of Existing Markets	4	4	16	NN	16
2.1.6 Temporary Market-Driven Markets	2	2	4	NN	4
2.2 Risk Factor: Specific Competitors' Competitive Advantage					
2.2.1 Relative Inventory Capacity	4	6	24	NN	24
2.2.2 Relative Accessibility/Delivery Hours and Wait Times	4	4	16	NN	16
2.2.3 Relative Specification Advantages	4	4	16	NN	16
2.2.4 Demand for Competitors' Products	4	4	16	NN	16
Category 3.0: Supply Chain Risk					
3.1 Risk Factor: Feedstock Availability					
3.1.1 Biomass Availability Multiple (BAM)	4	4	16	NN	16
3.1.2 Feedstock Supply Curve/Marginal Cost Curve	4	4	16	NN	16
3.1.3 Seasonal Feedstock Supply Variation	6	6	36	NN	36
3.1.4 Year-to-Year Variation in Feedstock Availability	4	4	16	NN	16
3.2 Risk Factor: Historical Issues					
3.2.1 Historical Feedstock Price Variations	4	4	16	NN	16
3.2.2 Historical Demand for Feedstock in the BDO Zone	4	4	16	NN	16
3.2.3 History of Production/Feedstock is a New/Secondary Crop or a By-Product	4	4	16	NN	16
3.3 Risk Factor: Non-Weather Based Externalities					
3.3.1 Consumer Price Index (CPI) and Producer Price Index (PPI)	6	6	36	NN	36
3.3.2 Currency Risk	NR	NR	NR	NR	NR
3.3.3 Border Risk	NR	NR	NR	NR	NR
3.3.4 Temporary Externality-Driven Markets for Feedstock	NR	NR	NR	NR	NR
3.4 Risk Factor: Risks Related to Feedstock Production, Harvest, and Collection					
3.4.1 Harvest & Collection Practices & Schedules	2	2	4	NN	4
3.4.2 Harvesting & Collection Equipment	4	4	16	NN	16
3.4.3 Variation in Densification Methods Among Different Suppliers	2	2	4	NN	4
3.4.4 Availability of Labor for Feedstock Production	6	6	36	NN	36
3.5 Risk Factor: Transportation					
3.5.1 Feedstock Transportation Costs	6	8	48	NN	48
3.5.2 Diesel Cost Impacts	6	6	36	NN	36
3.5.3 Transport of Feedstock Requires Specialized Equipment	4	4	16	NN	16
3.5.4 Delivery Routes through Local Communities	4	4	16	NN	16
3.5.5 Transportation Regulations & Local Weight Limits	4	4	16	NN	16
3.5.6 Road Infrastructure	6	6	36	NN	36
3.5.7 Transportation Redundancy	6	8	48	NN	48

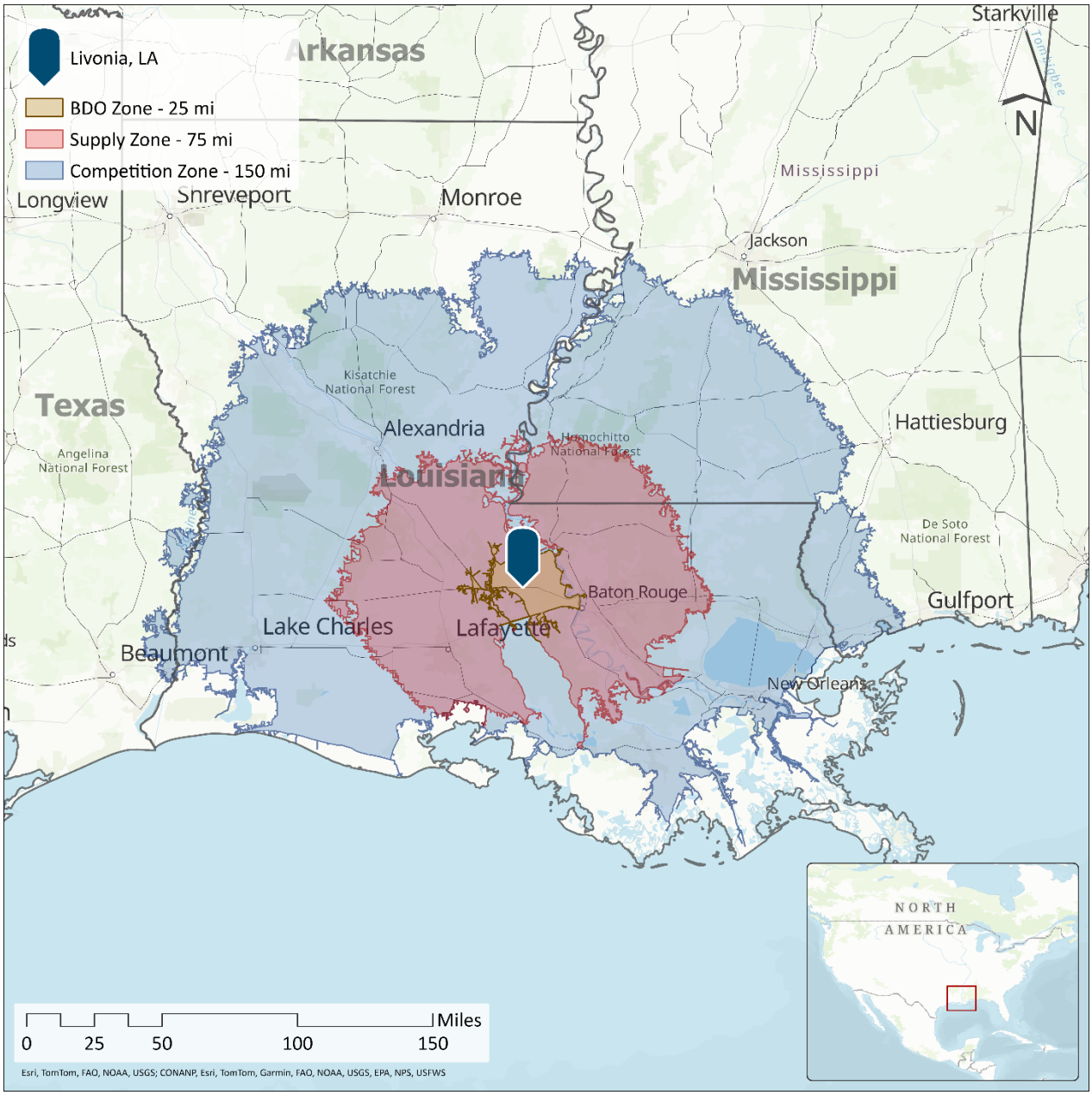
3.6 Risk Factor: Supply Chain Resiliency					
3.6.1 Size, Number, and Location of Suppliers	4	4	16	NN	16
3.6.2 Suppliers Subject to Same External Risk Factors	4	4	16	NN	16
3.6.3 Land Ownership Structures	2	2	4	NN	4
3.7 Risk Factor: Climate and Natural Risks					
3.7.1 Seasonal Weather Impacts on Feedstock Supply	6	6	36	NN	36
3.7.2 Long-Term Weather and Climate Trends	6	6	36	NN	36
3.7.3 Forest/Crop Fire	6	6	36	NN	36
3.7.4 Risk of Infestation	4	6	24	NN	24
3.7.5 Risk of Hail	NR	NR	NR	NR	NR
3.7.6 Risk of Flood	6	6	36	NN	36
3.7.7 Risk of Drought	6	6	36	NN	36
3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds	6	6	36	NN	36
3.7.9 Risk of Low Temperatures	NR	NR	NR	NR	NR
3.8 Risk Factor: Political and Social					
3.8.1 Government Subsidies for Feedstock Production or Utilization	2	2	4	NN	4
3.8.2 Local, Provincial, & National Laws, Regulations, & Permitting pertaining to Biomass	2	2	4	NN	4
3.8.3 Backlash against Biomass Development, Procurement or Usage in the BDO Zone	4	4	16	NN	16
3.8.4 Consent of, and Cooperation with, Indigenous Communities and First Nations	2	2	4	NN	4
3.8.5 Food Security Concerns	NR	NR	NR	NR	NR
3.9 Risk Factor: Sustainability and Environmental Concern					
3.9.1 Feedstock Sustainability	2	2	4	NN	4
3.9.2 Risk to Soil Quality	4	4	16	NN	16
3.9.3 Risk to Surface and Groundwater	4	6	24	NN	24
3.9.4 Risk to Hydrological Flux	NR	NR	NR	NR	NR
3.9.5 Pesticide Risk to Human and Ecosystem Health	NR	NR	NR	NR	NR
3.9.6 Risk to Wildlife and Landscape	4	4	16	NN	16
3.9.7 Biomass Classified as Genetically Modified Organism (GMO)	NR	NR	NR	NN	NR
Category 4.0: Feedstock Scale-up Risk					
4.1 Risk Factor: Feedstock Scale-Up					
4.1.1 Feedstock Quality at Production Scale	4	4	16	NN	16
4.1.2 Capacity of Supply Chain Components & Equipment to Scale	6	6	36	NN	36
Category 5.0: Infrastructure					
5.1 Risk Factor: Physical Infrastructure					
5.1.1 Land Parcel/Industrial District	4	4	16	NN	16
5.1.2 Ownership of Land	4	4	16	NN	16
5.1.3 Permitting Description	4	4	16	NN	16
5.1.4 Environmental Issues	6	6	36	NN	36
5.2 Risk Factor: Utilities					
5.2.1 Natural Gas Availability	2	2	4	NN	4
5.2.2 Electric Availability	2	2	4	NN	4
5.2.3 Water Availability	4	4	16	NN	16
5.2.4 Waste Disposal	4	4	16	NN	16
5.2.5 Internet Availability	4	4	16	NN	16
5.3 Risk Factor: Transportation/Logistics					
5.3.1 Roads/Highways Access	4	4	16	NN	16
5.3.2 Rail Access to Site	4	4	16	NN	16
5.3.3 Airport Access to Site	4	4	16	NN	16
5.3.4 Water Freight Access	2	2	4	NN	4
5.4 Risk Factor: Social Infrastructure					
5.4.1 Healthcare (Local)	2	2	4	NN	4
5.4.2 Education (Schools)	4	4	16	NN	16
5.4.3 Local Transportation	6	4	24	NN	24
5.4.4 Public Safety (Local)	4	4	16	NN	16
5.4.5 Housing/Cost of Living	4	4	16	NN	16
5.5 Risk Factor: Labor					
5.5.1 Workforce	4	4	16	NN	16
5.5.2 Labor Costs	4	4	16	NN	16
				Average	**19**

SECTION B: BIOMASS AVAILABILITY AND PRICING

OVERVIEW

To estimate the available biomass, three zones are delimited (Map B-1). The **BDO Zone** is the area delimited by a 25-mile drive distance from Livonia in which a new biomass project can be located to access rated quantities of biomass. The **Supply Zone** is defined by the driving distance of 75 miles from Livonia from where biomass will be sourced. The **Competition Zone** is defined by a driving distance of 150 miles from Livonia in which biomass users/competitors are located that impact the availability of biomass in the BDO Zone.

Map B-1. BDO, Supply, Competition Zones, and Center Point (Livonia, LA)



The Supply Zone spans over 26 parishes and includes an area of approximately 5.5 million acres of forest land. Approximately 1.5 million acres of forests in the Supply Zone are comprised of softwood tree species, mostly Loblolly and slash pines. Approximately 3.8 million acres of forests are comprised of bottomland hardwood species such as water oak, sweet gum, water tupelo, green ash, black willow, Chinese tallow, and American elm, and the remainder of forest area is comprised of mixed softwood/hardwood forests.[1] The Supply Zone contains extensive pine plantations located on its outskirts and bottomland hardwood forests located in the center, close to Livonia.

Forests constitute a major asset and contributor to the local economy in the Supply Zone. Between 2013 and 2021, a 20.5 million bdt increase in all live merchantable timber occurred in the Supply Zone, of which 3.2 million bdt was comprised of pulpwood size timber (Figures E-1 and E-2). The Supply Zone has a long history of private forest land ownership, logging, and wood processing. Approximately 83% of the merchantable timber and 95% of the harvest in the Supply Zone took place in privately owned forests (Figures E-3 and E-4).[2] Many private forests are American Tree Farm System (ATFS), Sustainable Forestry Initiative (SFI), and Forest Stewardship Council (FSC) certified. In addition, approximately 30 local logging contractors have at least eight operators each trained in Sustainable Forestry practices and are Master Logger certified.[3]

In the past few years, the Pointe Coupée BDO Zone and surrounding areas (i.e., the Baton Rouge area) have experienced increased interest in biomass, especially due to pulpwood and forest residues available in large quantities here. While several biomass proponents have been interested in the area, to date, no biomass project has started building a facility in the BDO Zone.[4]

EVALUATED FEEDSTOCKS

The three rated biomass feedstocks are defined as follows:

Pulpwood: Underutilized roundwood logs generated from harvesting trees with diameters at breast height (DBH) between 5.0 inches and 10.9 inches. Also, small-diameter roundwood logs produced during harvesting of sawlog-size trees (DBH > 11 inches) that fall into the pulpwood grade category.

Forest residues: Sections of tree stems that cannot be processed into merchantable logs (i.e., sawlogs or pulp logs); these include stem tops and large branches.

Sawmill residues: Byproducts of sawmill operations (wood chips, sawdust, shavings, and bark/hog fuel) generated from converting sawlogs into finished wood products, such as lumber and engineered wood.

The rated feedstock quantities presented in this report were determined by estimating the amount of each biomass type potentially available for harvest in the Supply Zone and considering the expected demand for biomass in the Competition Zone. A Biomass Availability Multiple (BAM) is applied to account for uncertainty in underlying data, models, assumptions, and future operating conditions. The resulting rated quantities are conservative estimates of biomass availability to new bio-projects.

Price ranges are determined through outreach and market analysis in the Competition Zone. They represent expected delivered prices that a new project will pay to secure the rated quantities.

[1] texasforestinfo.tamu.edu/tsa/ (Southern Timber Supply Analysis Report generated on September 24, 2024, available upon request)
[2] apps.fs.usda.gov/fiadb-api/evalidator
[3] Personal communication with local forester (Oct.3, 2024)
[4] Personal communication with local bioeconomy expert

SUPPLY ANALYSIS

Pulpwood

The forests in the Supply Zone are highly productive of both hardwood and softwood sawlogs and pulp logs. Clearcutting,[5] full stem harvesting, and transportation are the preferred logging practices in the region. The bulk of pulpwood logs are generated through thinning operations.[6] To reach maximum growth, pine plantations must be thinned at least two times before the highest value is obtained. Likewise, thinnings and selective cuts are required to restore currently overstocked bottomland forests and large volumes of pulpwood could be produced.

Until five years ago, large volumes of pulpwood logs, mostly hardwood, were harvested in the Supply Zone and hauled to a large pulp and paper mill located less than 50 miles from Livonia. This facility discontinued its pulpwood intake, and large quantities of pulpwood from the Supply Zone became underutilized. Moreover, this event triggered postponing thinning and forest management activities in the Supply Zone. Some forest owners still wanting to thin their forests do so at stumpage prices[7] lower than the average market price. Currently, pulpwood from the Supply Zone is being hauled to customers located over 100 miles away. Many of these customers impose a daily quota system that causes logistic and financial challenges for loggers and forest owners.

Figure B-1. Average Net Growth, Average Annual Removals, and GTD Ratio by Major Species Class for All and Pulpwood DBH Classes in the Supply Zone[8]

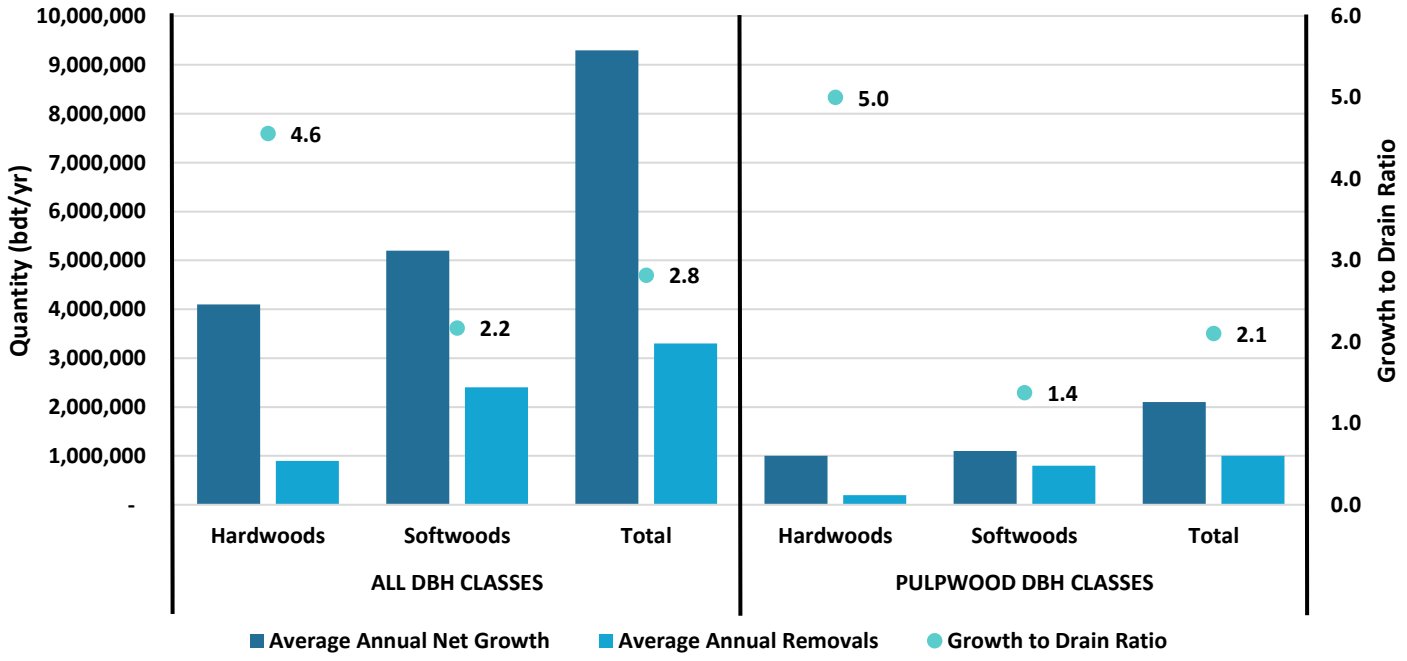


Figure B-1 shows the average annual net growth and removals per major species for all live merchantable trees (left) and pulpwood-size trees (right). Overall, the forest stands in the Supply Zone have a tremendous annual net growth (9.3 million

[5] Clearcutting: a timber harvesting practice where most of the trees in a given area are harvested at the same time.
[6] Thinning: removal of a portion of the trees in a young forest stand/plantation to reduce its density (trees/ac); thus, allowing the remaining trees to have access to more water, minerals, and sunlight and to achieve better growth rates.
[7] Timber prices paid by the timber customers to forest owners
[8] apps.fs.usda.gov/fiadb-api/evalidator. Variables 2636: Average annual net growth of aboveground biomass of trees (at least 5 inches d.b.h./d.r.c.), in dry short tons, on timberland; 574049: Average annual removals of merchantable bole bark and wood biomass of growing-stock trees (at least 5 inches d.b.h.), in dry short tons, on timberland. Values are rounded to the nearest 100,000 bdt.

bdt/yr), of which only a third (3.3 million bdt/yr) is harvested. This results in a growth-to-drain (GTD) ratio[9] of 2.8. Moreover, average net growth and removal values of hardwood timber results in a GTD ratio of 4.6, which indicates a significant utilization potential for hardwoods. Pulpwood values suggest a similar situation. While softwood pulp logs are currently in high demand (GTD ratio of 1.4), large quantities of hardwood pulp logs (GTD ratio of 5.0) are available for a new project.

Figure B-1 also indicates that from the average net growth of **2.1 million bdt/yr** of pulpwood size trees, only **1 million bdt/yr** is removed (GTD ratio of 2.1); thus, **1.1 million bdt/yr** of pulpwood, mostly hardwood, is available to a new project. In addition, the FIA data also indicates that approximately **300,000 bdt/yr** of pulpwood logs[10] are generated through harvesting operations in the Supply Zone. Thus, from the total 2.4 million bdt/yr pulpwood production, an average of **1.3 million bdt** of pulpwood could be available annually to a new project.

Table B-1. Annual Pulpwood Production, Harvest, and Availability Estimates

Source	Quantity (bdt/yr)
Pulpwood Net Growth	2,100,000
Pulpwood Logs	300,000
Total Production	**2,400,000**
Pulpwood Harvest	1,100,000
Total Available	**1,300,000**

Local loggers would welcome the additional amount of pulpwood harvest because it would extend their current work schedule from an average of 3-4 days per week to a full week, especially if medium- and long-term agreements were drafted with the new project proponent(s). They communicated that, despite the fact that some logging companies left the Supply Zone to find steady work in nearby states (e.g., Mississippi), they would most likely return home if a long-term demand existed from a biomass project located here.

Forest residues

FIA data indicates that, on average, approximately **800,000 bdt/yr** of forest residues[11] are generated in the Supply Zone from harvesting operations. Local forestry experts informed us that, when the pulpwood facility used to accept hardwood logs from the Supply Zone, it also provided incentives for grinding operations to produce hog fuel from forest residues for its biomass co-gen plant. Once that facility stopped purchasing pulp logs, no market was available in the Supply Zone for forest residues. Currently, forest residues are spread in the harvesting blocks and left to decompose.

Many in-woods grinding operations have moved outside the Supply Zone in regions where pellet mills and co-gen plants still demand this feedstock. In some locations (e.g., Mississippi), pulp mills accept a small quantity of stem tops in their pulpwood quota. This is very beneficial to loggers as stem tops can be produced, loaded, and transported with conventional logging and transportation equipment. Consequently, some forest residue recovery can take place without large investments in grinding and chip transportation equipment.

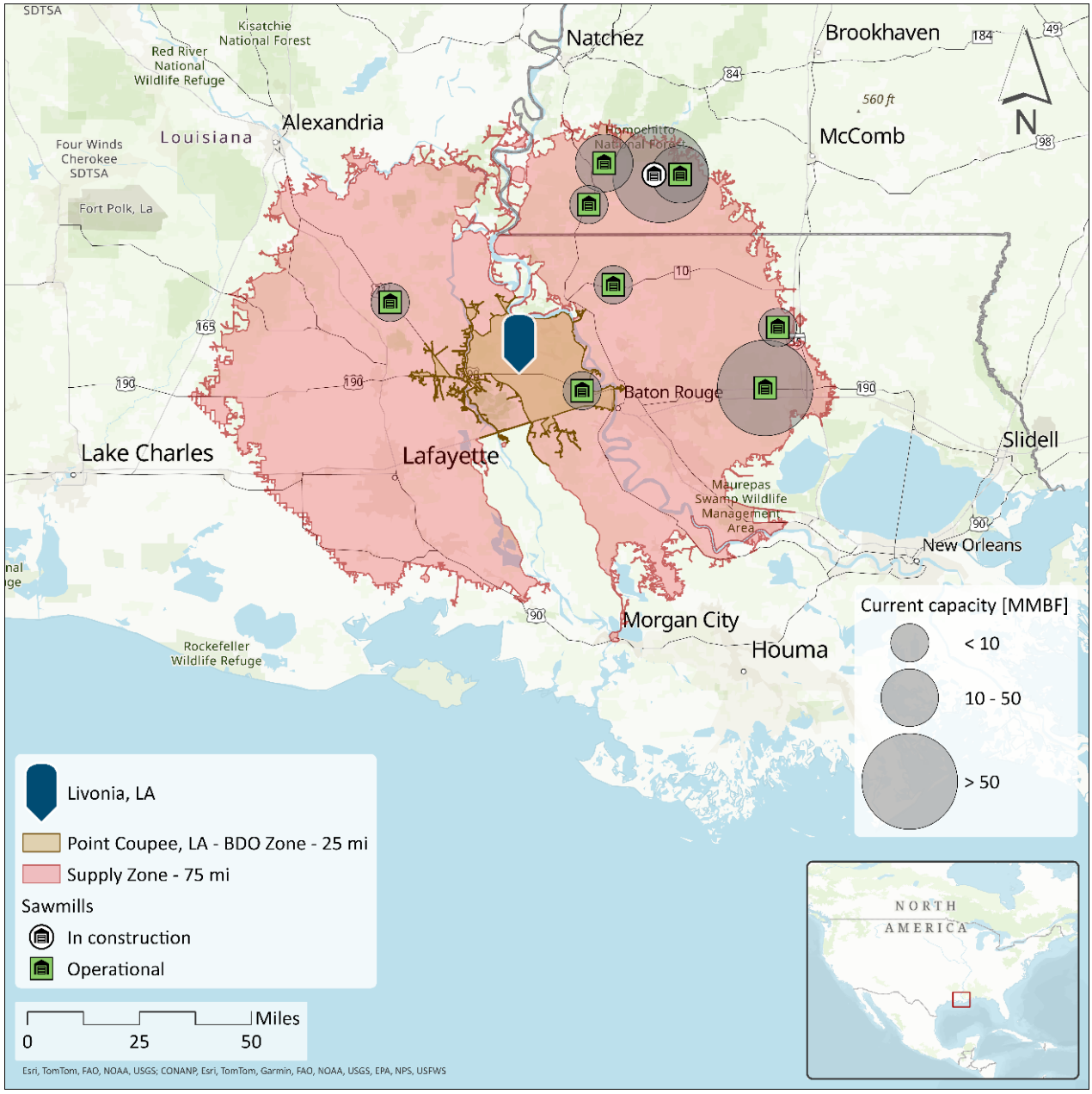
With the reduction in grinding operations, only a small portion (up to a quarter) of the existing forest residues generated in the Supply Zone may be initially available to a project in Livonia. As forest residue demand increases in the region, it is likely that in-woods grinding operations could start developing, and more forest residue quantities will be utilized.

[9] The ratio between the annual net growth and removals. A GTD > 1 indicates sustainable removals below the net growth measured in a forest area
[10] apps.fs.usda.gov/fiadb-api/evalidator, Variable 574054: Average annual removals of merchantable bole bark and wood biomass above the sawlog of sawtimber trees, in dry short tons, on timberland
[11] Ibid. Variable: 574065 - Average annual removals of top and limb bark and wood biomass of growing-stock trees (at least 5 inches d.b.h.), in dry short tons, on timberland. Value rounded to the nearest 100,000 bdt

Sawmill residues

The Supply Zone includes eight sawmills (Map B-2), seven of which are hardwood mills with maximum capacities below 30 MMBF of lumber production per year and one softwood mill of 260 MMBF per year. Another large softwood sawmill with an announced capacity of 250 MMBF is under construction and will come online in 2025. This large sawmill is located on the northeast side of the Supply Zone, beside a large pellet manufacturing facility. When operational, it is very likely that this sawmill will furnish all sawmill residues to the pellet mill.

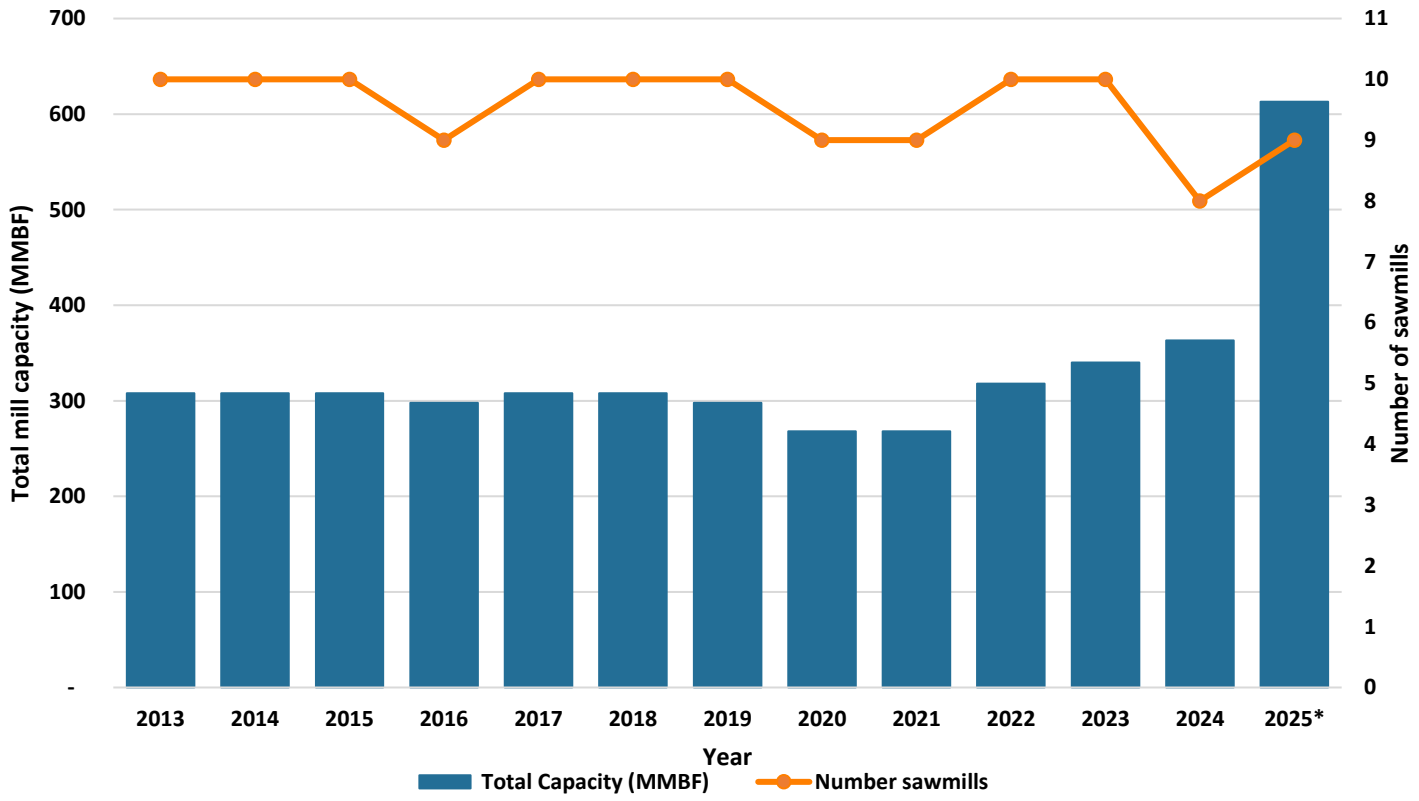
Map B-2. Sawmilling Facilities in the Supply Zone[12]



[12] forisk.com/product/north-american-forest-industry-capacity-database

Historically, the Supply Zone used to be home to ten sawmills (Figure B-2), but in 2024 two sawmills closed down. While sawmill capacity exists in the Supply Zone, the location of larger sawmills in the vicinity of large biomass customers, such as pulp and paper and pellet mills, challenges the availability of sawmill residues to a new project in Livonia.

Figure B-2. Historical Sawmilling Capacity (MMBF) and Number of Sawmills in the Supply Zone[13]



* Forecasted (new 250 MMBF sawmill coming online in 2025)

The sawmill residue supply analysis, combined with and confirmed by outreach, estimated that approximately **500,000 bdt/year** of sawmill residues could be generated in the Supply Zone (Table B-2).[14] Outreach indicated that the largest sawmill (260 MMBF/year), located 65-mile distance from Livonia, generates approximately **300,000 bdt/year** of sawmill residues. Sawmill management communicated that the sawmill will not be able to provide any residues to a new project in Livonia due to its long-term agreements. The smaller sawmills, however, will be able to supply residues to a new entrant under mutually beneficial off-take agreements. Thus, an average of **200,000 bdt/yr** of sawmill residues could be available to a new project.

Table B-2. Sawmill Residue Production and Availability Estimates in the Supply Zone

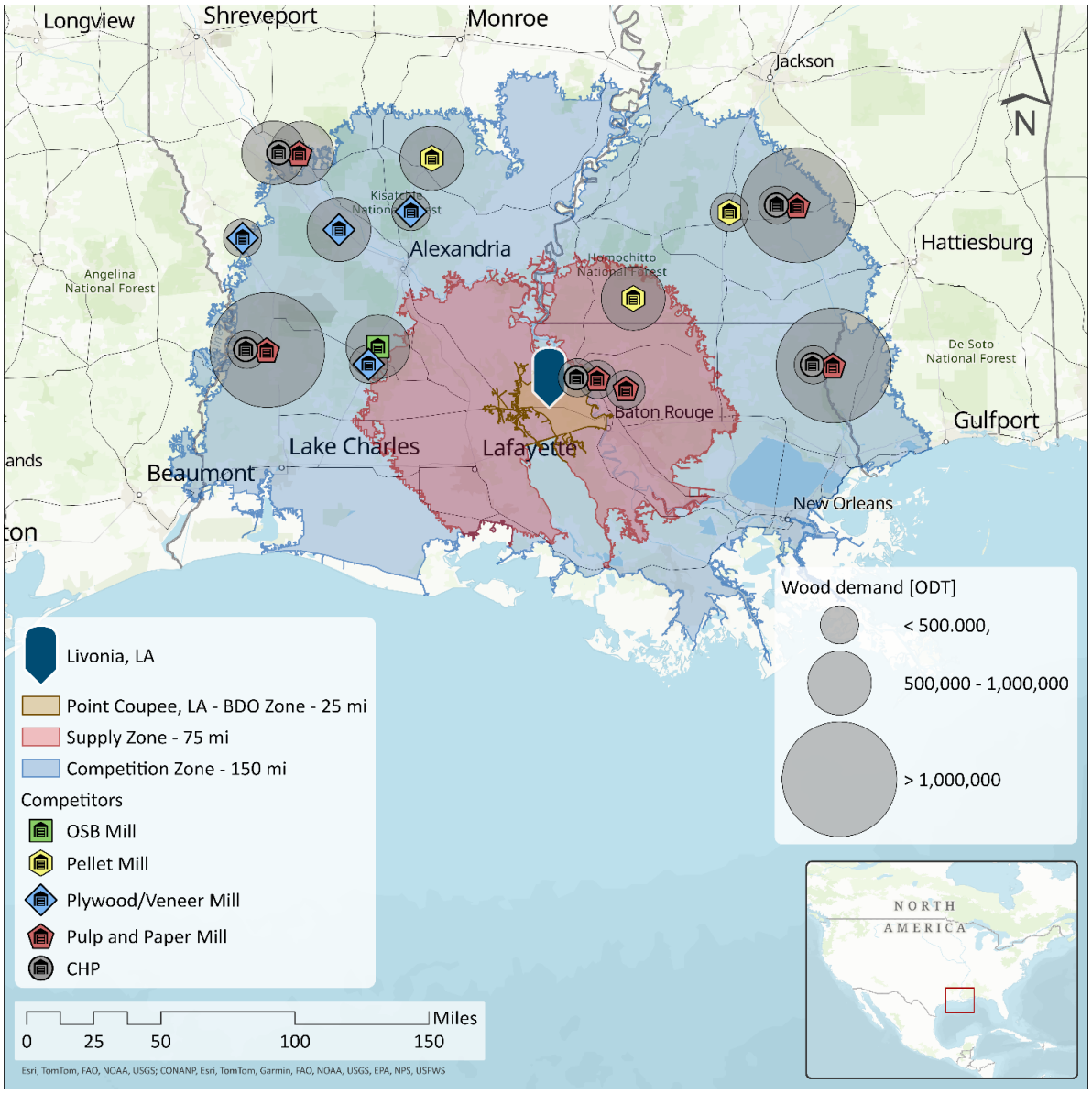
Sawmill residue	Chips	Sawdust	Shavings	Bark	TOTAL
Estimated Quantity (bdt/yr)	300,000	40,000	60,000	100,000	**500,000**
Committed Quantity (bdt/yr)	170,000	30,000	40,000	60,000	**300,000**
Available Quantity (bdt/yr)	**130,000**	**10,000**	**20,000**	**40,000**	**200,000**

[13] Q2 2024 Forisk Database
[14] Ibid. Ecostrat sawmill residue calculator was used to estimate sawmill residue production based on sawmill capacity. Values are rounded.

COMPETITION ANALYSIS

There are currently eighteen consumers of sawmill residues and pulpwood in the Competition Zone (Map B-3): one OSB mill, six pulp and paper mills, three pellet mills, four plywood/veneer mills, and five biomass cogeneration plants. The nineteenth facility is a paper mill located in the Supply Zone, which ceased producing its own pulp from pulpwood logs harvested in the Supply Zone. There are three competitors located in the Supply Zone, one pulp and paper mill, its cogeneration plant, and a pellet mill. However, they have a small demand compared to the pulp and paper mills located on the outskirts of the Competition Zone (Map B-3).

Map B-3. Biomass Competitors in the Competition Zone[15]



[15] Q2 2024 Forisk Database

In 2024, competitors located in the Competition Zone utilized approximately **10.9 million bdt/yr** of biomass (Figure B-3, Table B-3). The largest competitors are pulp and paper facilities, which account for half of this demand. However, these large pulp and paper mills are located significantly above 100-mile drive distance from Livonia and pose a limited risk to a new project located here. Historically, the Competition Zone experienced a significant increase in biomass demand from two large pellet mills that came online in 2015 (Figure B-3). Since then, the total biomass consumption remained relatively stable with some fluctuations. The most notable ones were the ceasing of log intake of a pulp and paper mill in 2019 (as described above) and the closing of a pulp and paper mill in 2024. Thus, the demand gap created by these events opened the opportunity for a new entrant to acquire the underutilized pulpwood feedstock.

Figure B-3. Historical Total Wood Intake and Number of Facilities in the Competition Zone[16]

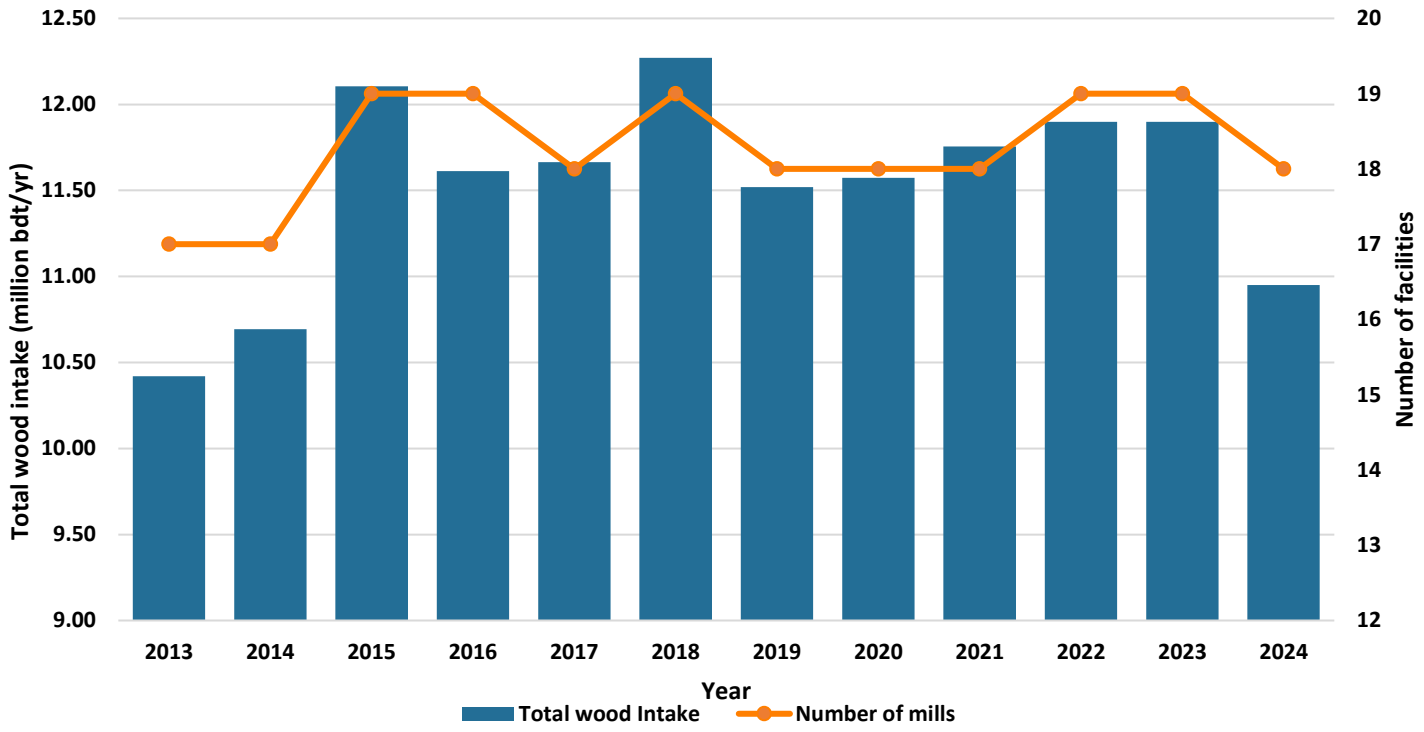


Table B-3. Biomass Demand by Competitor Category[17]

Competitor Category	Biomass Demand (bdt/yr)	% Total Demand	Biomass Types
Pulp and Paper	5,400,000	50%	Sawmill residue, pulpwood
Biomass Power	1,700,000	15%	Sawmill residue, pulpwood
Pellets	1,400,000	13%	Sawmill residue, pulpwood
Plywood/Veneer	1,600,000	15%	Pulpwood
OSB	800,000	7%	Pulpwood
Total	10,900,000		

[16] Ibid.
[17] Ibid. Values were rounded to the nearest 10,000 bdt.

RATED QUANTITIES AND PRICES

Table B-4 presents technical and rated quantities of pulpwood, forest residues, and sawmill residues. Biomass Availability Multiple (BAM) factors with values between 1.5 and 4.0 were applied to the available quantities of each feedstock type to account for uncertainty in the accuracy of existing inventory, scale-up readiness, historical harvesting practices and volumes, and sudden changes in supply and demand, as follows:

- The **BAM of 1.5 for pulpwood** was selected to provide a realistic pulpwood quantity to a large project, while maintaining a sustainable growth-to-drain ratio above 1.2. The resulting rated pulpwood quantity of 1 million bdt/year is similar to the quantity that the pulp and paper facility in the Supply Zone consumed and to which current logging companies used to supply.
- The **BAM of 4 for forest residues** was justified by the current practice of spreading the residues in the woods. This BAM factor allows for sufficient room to expand, especially if long-term agreements result in investments in grinding and chipping equipment.
- The **BAM of 2 for sawmill residues** was the result of outreach interviews, which indicated that strong competition and agreements exist for sawmill residues currently.

Table B-4 also presents price ranges for pulpwood, forest residues, and sawmill residues delivered to an average 50-mile drive distance from Livonia, LA. These price ranges were estimated based on outreach to local sawmill operators and forestry professionals and validated by the most current regional Timber Mart South market prices (Figures E-8 and E-9). Pulpwood prices include stumpage, harvesting, and hauling costs. In addition to these costs, forest residue prices include the chipping cost. The delivered sawmill residue price ranges between the lowest average price of sawdust and bark to the highest average price for wood chips and shavings.

Table B-4: Rated Quantities and Delivered Price Ranges of Biomass in the Supply Zone

Biomass type	Available Quantity (bdt/yr)	Biomass Availability Multiple (BAM)	Rated Quantity (bdt/yr)	Delivered Price Range ($/bdt)
Pulpwood	1,400,000	1.5	1,000,000	70 - 80
Forest residues	800,000	4.0	200,000	90 - 100
Sawmill residues	200,000	2.0	100,000	50 - 70
TOTAL	**2,400,000**		**1,300,000**	

OPERATIONAL CONSIDERATIONS

Pulpwood

Currently, due to low demand for hardwood pulpwood and a system of daily quotas in the Competition Zone, pulpwood suppliers must deliver to distances in excess of 100 miles for similar delivered prices to those presented in Table B-4. A new facility located in the BDO Zone would have a location advantage. To supply the rated quantity to Livonia, LA, approximately 34 logging crews[18] and 128 logging trucks[19] would be necessary. Local foresters communicated that local forestry companies are currently operating at approximately 70% capacity, and an increase of logging capacity by one-third to one-half of current capacity was possible in the short-term, with existing crews. However, they also indicated that a full scale-up to supply the entire rated quantity, in addition to the current supply, will require between six months to a year to accomplish. Trucking fleets seem sufficient to address spot increases in demand, but a full scale-up would require a similar period of between six months to a year.

Forest Residues

In addition to the above considerations, which also apply to forest residue recovery, approximately nine grinders[20] and 36 chip vans[21] would be necessary to grind and transport the rated quantity of forest residues to Livonia, LA. Considering the high investment costs of grinding and transportation equipment, the scale-up period will very likely be significantly longer than for pulpwood. Unfortunately, with the ceasing of pulpwood intake of the local pulp and paper mill, many in-woods grinding operations have moved outside the Supply Zone. Local foresters communicated that it was possible that some grinding operations would return to the Supply Zone if a large-scale biomass project was developed here. One solution to assist the scale-up efforts may be to initially transport stem tops to the project location, which would not affect the current logging operation practices and costs. Moreover, if the tops were decked neatly and seasoned at the roadside after logging, significant quality improvements and cost savings would be possible. The income generated by stem top recovery and increased demand for forest residues may lead to investment in grinding and chip transportation equipment.

Sawmill Residues

To utilize the rated quantity of sawmill residues, mutually agreeable off-take agreements will be necessary. However, outreach indicated that the local sawmills are strongly committed to their existing agreements. No challenges were identified in terms of transportation capacity to the project location.

[18] Estimates assume 15 truckloads/day/crew (2-3 people per crew), 14 bdt/truckload, 7 work months/year (due to heavy rain season)
[19] Estimates assume an average of 4 roundtrips per day
[20] Estimates assume 20 bdt/hr grinder productivity, 7 work months/year (due to heavy rain season)
[21] Estimates assume 4 chip vans per grinder

SECTION C: INFRASTRUCTURE



PROPERTY OVERVIEW

Address:	2284 Maringouin Road W
City:	Livonia
State:	LA
County:	Pointe Coupée Parish
Acres:	341
Pricing Note:	$17,500/acre
Topography:	Leveled farmland
Zoning:	Industrial-Light, Commercial
Lease available:	No

SITE CONTACT

Jayson W. Newell
Regional Director, Business Development
Baton Rouge Area Chamber
564 Laurel Street
Baton Rouge, LA 70801
225-381-7158
jayson@brac.org

ADDITIONAL NON-RATED SITES

Infrastructure Sites Contact
Bob Buckingham
Infrastructure Specialist
bob@ecostrat.com

PROPERTY PROFILE

The Woodley Site consists of 341 acres of greenfield land, a prime opportunity for industrial and commercial development, especially due to its strategic location adjacent to the Livonia Union Pacific Rail Yard. The site has access to all base utilities such as electric, gas, and water already in place. Its commercial/industrial zoning allows flexibility of uses, accommodating a wide range of sectors. The potential for dividing the parcel into smaller acreages means that it can easily be tailored to suit the specific needs of multiple tenants, making it attractive for both large and small-scale developments. This site would be particularly appealing to industries that require robust logistical infrastructure, such as manufacturing, warehousing, or bio-economy sectors. A short promotional video is available here: Woodley Site - Livonia, LA Video

Transportation

Nearest Highway: Route 77
Nearest Interstate: I-10
Nearest Airport: False River Regional
Nearest Commercial Airport: Baton Rouge Metro (BTR)
Rail Served: Union Pacific
Rail Accessible: Yes
Air Infrastructure in place : Yes
Water Port: Bayou Grosse Tete and Greater Baton Rouge

Electric Service

Supplier: Entergy Gulf States
Ownership: Private
Phone: 800-368-3749
Website: www.entergy.com
All Utilities Extend to Site: Yes
Nearest Substation: less than 1 mi
Capability: Currently, 3-phase overhead distribution lines (12.5kv) with 25kV service in the area and along the site border. Available capacity - unknown

Natural Gas

Supplier: Consumers Energy
Ownership: Private
Phone: 800-477-5050
Capability: Property line
Website: www.consumersenergy.com
Size of Main: 6"-12" (less than 1 mi)
Pressure: 50 psi

Water

Supplier: Town of Livonia
Ownership: Municipal
Phone: 225-637-2981
Capability: Service to Maringouin Road
Website: www.livoniala.net
Size of Main: 4 in
Peak Capacity: not available

Wastewater

Supplier: Town of Livonia
Ownership: Municipal
Phone: 225-637-2981
Capability: Service to Maringouin Road
Website: www.livoniala.net
Size of Main: 8 in

Telecommunications

Supplier: Star Communications
Ownership: Private
Phone: 225-625-2333
Capability: High speed fiber optic
Website: www.starinternet.net
Platforms: Fiber optic

SECTION D: RISK INDICATOR SCORING METRICS

CATEGORY 1.0: SUPPLIER RISK

1.1 Risk Factor: Credit-Worthiness/Future Solvency of Suppliers

1.1.1 Longevity & History of Supplier Performance

Rationale: Number of years in business is a positive indicator of future solvency. Historical performance is an indicator of future performance.

Risk Information: The Supply Zone has a long history of forest land ownership, logging, and forest biomass utilization. Despite the challenges associated with mill closures or curtailments, the forest industry has been resilient. Risk is deemed low due to the long history of forest operations in the region and capability to adapt quickly to various challenges.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

1.2 Risk Factor: Conflicts of Interest/Vested Interest with Competing Market(s)

1.2.1 Suppliers' Dependence on, or Preference for, Competing Markets

Rationale: Suppliers may have a vested interest or preference in supplying specific competitors with biomass feedstock. Preferences may be due to historical, long-term, or personal relationships, less stringent feedstock quality requirements, more flexible operating hours by competing markets, or suppliers' dependence on competing markets to accept or purchase other products/by-products. During periods of feedstock shortage, such suppliers may be more likely to allocate the scarce supply to competitors, resulting in supply disruptions for the Issuer.

Risk Information: As presented in Section B, there is strong preference for sawmills to supply residues to large competitors such as pulp and paper and pellet mills in the Competition Zone. However, there is currently an oversupply of pulpwood and forest residues produced in the Supply Zone. Competition for these two feedstocks is relatively small, as the largest competitors are located on the outskirts of the Competition Zone. Thus, the risk to supply the bulk of the rated quantity to a new project is low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**

Mitigation/Notching	Notch
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

1.3 Risk Factor: Supplier Control Over Production and Transportation

1.3.1 Ownership of Land/Means of Production

Rationale: Suppliers that own land or a production facility where feedstock is produced tend to have better control of supply chains and present lower degrees of supply risk.

Risk Information: Approximately 90% of the forests are privately owned.

Raw Risk Likelihood (RRL)	Score
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**2**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**2**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**4**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**4**

1.3.2 Ownership of Equipment

Rationale: In most cases, suppliers that own or lease equipment for harvest, collection, and processing feedstock are at lower risk than those that are not. For example, third-party harvesting equipment may not be available when required. Short harvest windows may be missed if a contractor cannot schedule convenient harvest times, and quantity shortages can result. However, in some circumstances, reliance on third-party equipment to harvest or produce feedstock can decrease supply chain risk.

Risk Information: Harvesting and transportation equipment is entirely owned by logging companies and sawmills (chip vans) with long-term experience.

Raw Risk Likelihood (RRL)	Score
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**

Mitigation/Notching	Notch
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

1.3.3 Ownership of Transportation/Logistics

Rationale: In most cases, suppliers that own or lease transportation equipment necessary to transport biomass from forests are at lower risk than those that do not. However, in some circumstances, reliance on third parties to transport biomass is common practice and does not contribute to risk.

Risk Information: Several logging companies in the Supply Zone own their own fleet of logging trucks (on average, 2-3 trucks per crew), but many also use transportation companies. Sawmills also own or hire chip vans to supply sawmill residues to various customers. Thus, the risk is deemed low.

Raw Risk Likelihood (RRL)	Score
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

1.3.4 Feedstock as a Secondary Transformation

Rationale: Secondary transformation is dependent upon the production of primary products. Forest residues, bark, and sawmill chips (unless from a dedicated chip mill) are all secondary transformations of a primary product.

Risks are higher if the feedstock is a secondary transformation of a primary, more valuable product. In the absence of markets for the primary product, it may not be economical for suppliers to produce biomass on their own. For example, a supplier may produce dimensional lumber as its primary product and wood chips as a by-product, therefore relying on the health of the housing market for production levels. If the demand for dimensional lumber drops, so can the availability of sawmill residues.

Understanding the economic drivers for suppliers' primary products can help gauge risk levels for secondary transformation biomass products.

Risk Information: Sawmill and forest residues are by-products of a secondary transformation, lumber manufacturing and logging, respectively, and are subject to this risk. The bulk of the pulpwood rated quantity is not dependent on a secondary transformation as it is generated by commercial thinning and forest restoration activities. Consequently, the risk is deemed medium.
Raw Risk Likelihood (RRL) **Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6**
Raw Risk Impact (RRI) **Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10. **6**
Gross Risk Indicator (GRI) **Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100. **36**
Mitigation/Notching **Notch**
RRL Mitigation (Notch) **NN**
No adjustment.
RRI Mitigation (Notch)
No adjustment.
The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

1.4 Risk Factor: Supplier Experience

1.4.1 Fundamental Feedstock Production Experience

Rationale: Risk is higher when suppliers have limited experience with harvesting, processing, and/or collecting biomass.
Risk Information: Logging companies in the Supply Zone have a long-term history in the region and are capable of sustaining significant growth if an opportunity arose. The sawmilling industry in the Supply Zone has been historically stable with the exception of a couple of closures and capacity reductions. However, a new large sawmill will increase the total sawmilling capacity in the Supply Zone significantly. The only activity that does not have a more recent development is the removal and utilization of forest residues. However, that expertise can be revived if biomass off-take agreements were developed with a new project. The risk is deemed low as expertise in all these three activities has existed and a new project would most likely incentivize their development.
Raw Risk Likelihood (RRL) **Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4**
Raw Risk Impact (RRI) **Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10. **4**
Gross Risk Indicator (GRI) **Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16**
Mitigation/Notching **Notch**
RRL Mitigation (Notch) **NN**
No adjustment.
RRI Mitigation (Notch)
No adjustment.
The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16**

1.4.2 Production Scale Experience

Rationale: Scale-up entails risk. Risk is higher when suppliers have limited experience producing the required quantity of feedstock.

Risk Information: Logging companies in the Supply Zone used to supply similar quantities of pulp logs and forest residues to a pulp and paper facility (Section B). While scale-up may require some investments in new equipment, especially for single-crew logging operations and chipping/grinding, there is general support for large-scale projects, especially if off-take agreements for the rated quantities were implemented.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

1.5 Risk Factor: Supplier Harvesting/Collection/Processing Capacity

1.5.1 Supplier's Equipment Efficiency

Rationale: Equipment efficiency significantly influences the supplier's feedstock production capacity. Understanding the supplier's equipment capability enables understanding of their ability to produce feedstock of suitable quality.

Risk Information: Logging operations in the Supply Zone have high harvest productivities, especially in thinning operations, which require less maintenance. However, annual productivity is constrained during winter months by heavy rains that restrict access to logging sites, especially in the southern part of the Supply Zone. However, with proper planning, these shortcomings can be alleviated by strategically locating satellite log yards close to the project site and harvesting in drier areas during the wet season. Outreach indicated that logging companies employ high efficiency equipment. Investment in grinding and transportation equipment for the recovery of forest residues is however constrained by off-take agreements with the new entrant. The risk related to equipment efficiency is thus deemed low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)*	**NN**

No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score — **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. — **16**

1.6 Risk Factor: Supplier Motivation

1.6.1 Feedstock Production Priority

Rationale: When biomass feedstock is a secondary or non-core line of business, a by-product, or a residual from a more valuable product, suppliers may not put in sufficient effort for consistent production. The risk of breach increases when feedstock production and/or delivery compromise a supplier's ability to make a primary product. When biomass feedstock is a by-product of another main higher margin or main product such as forest residues (e.g., pulpwood), supply may not be a top priority for a supplier.

Risk Information: Pulpwood production from commercial thinnings and forest restoration operations has a high priority in the Supply Zone due to high demands from forest owners and economic hurdles associated with supplying pulpwood to distant customers. Sawmilling and forest residues, however, have a lower priority because they are by-products of much higher value products (i.e., lumber and sawlog, respectively). Thus, the risk is set to medium-low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**24**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100.	**24**

CATEGORY 2.0: COMPETITOR RISK

2.1 Risk Factor: Influence on Feedstock Supply of Existing Markets

2.1.1 Competitors' Locations and Overall Geographical Influence

Rationale: Competitors' locations relative to siting locations within a BDO Zone can affect the viability of procuring feedstock and the cost of that feedstock. Accurate and detailed competitor mapping provides an understanding of a competitor's geographical influence on new plants within a BDO Zone, including competitive advantages such as short hauling.

Risk Information: There are currently three major competitors, one pulp and paper mill, its cogeneration plant, and a pellet mill in the Supply Zone (Map B-3) that have a small competitive impact on the biomass supply. A large oversupply of pulpwood and forest residues exists in the Supply Zone. The majority of the largest competitors are located on the outskirts of the Competition Zone, which could acquire fiber from outside the Supply Zone. The risk is deemed low.

Raw Risk Likelihood (RRL) — **Score**

The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

2.1.2 Current and Historical Consumption of Feedstock Quantity

Rationale: Clear understanding of feedstock consumption by key competitors for each rated feedstock type in the BDO Zone is essential to quantifying competitor risk.
Understanding current consumption and historical trends of feedstock utilization can provide valuable information about feedstock price elasticity during shortages and insight into events that may impact future supply conditions. It can enable more accurate estimates of the sensitivity of feedstock availability to potential future consumption levels or the impact of external events (e.g., weather events, structural economic changes, seasonality, or policy change).

Risk Information: Map B-3 shows that only four out of eighteen competitors in the Competition Zone are located in the Supply Zone and have a small impact on the biomass supply. Moreover, in the past five years, one large pulp and paper mill in the Supply Zone ceased intaking a large quantity of hardwood pulpwood, which provides a great opportunity for a new project. The risk is deemed low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

2.1.3 Competitor Pricing and Price Sensitivity

Rationale: Understanding how much competitors pay (or receive) for different feedstock types is essential in determining the Issuer's competitiveness and accurately assessing the delivered cost range in the BDO Zone rating.

Current and historical prices paid/received by competitors provide insight into their procurement behaviors and exert pressure on suppliers in the BDO Zone, such as the ability/willingness to pay premiums for feedstock during times of feedstock shortage or reduce prices (or cut-off deliveries) during gluts. Competitors that have the ability to offer higher prices for feedstock during feedstock shortages can pose a significant risk to the Issuer.

Knowledge of competitor pricing and price sensitivity is also an essential prerequisite to formulating a feedstock cost curve, which can enable predictions of feedstock redundancy, i.e., how much feedstock could become available at different pricing levels (see Category 3–Supply Chain Risk 3.1.3).

Risk Information: The historical price trends (Figures E-7 and E-8) indicate that prices for pulpwood are in decline while those of sawmill residues maintain a stable trend. Moreover, the quota strategy that competitors employ for pulpwood favors a new entrant to have access to the rated quantities at the rated price ranges. Under the current conditions, a low risk was deemed reasonable.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

2.1.4 Impacts of Future Demand on Feedstock Availability and Price by Current Competitors

Rationale: Feedstock utilization in a BDO Zone can change over time. Expansion of feedstock demand by current competitors can put additional pressure on feedstock and lead to higher prices, feedstock disruptions, shortages, supplier breaches, or other types of supply chain disruption.

If current markets for feedstock have been publicly signaling the potential for increased demand for feedstock (in the case of a sawmill adding a shift or pulp mill potentially expanding into the production of renewable chemicals, for example), high interest in a supply zone can make suppliers overconfident, leading to a supplier-controlled market where short-term contracting becomes the norm and supply chain reliability is compromised for the Issuer. If and when it occurs, increased demand on feedstock may decrease availability and increase cost for new plants within the BDO Zone.

Risk Information: The Competition Analysis indicated that in the past year the number of competitors and their total capacity has been declining (Figure B-3). While some advanced biofuel projects have been actively scouting the Supply Zone, no new facilities have started construction. To account for this increased interest, a low to medium risk was assigned.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**

Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**Score** **24**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100.	**Score** **24**

2.1.5 Soft Supply Influence of Existing Markets

Rationale: In some cases, existing markets for feedstock may be able to exert high degrees of pressure over local suppliers, effectively enabling control of feedstock, especially during times of shortage. This control can derive from qualitative or "soft" factors, such as long previous relationships between local suppliers and existing markets for feedstock.

Risk Information: Currently, biomass users in the Competition Zone have engaged in off-take agreements and quotas with their loggers. Also, sawmills are engaged in long-term agreements with large pulp and paper and pellet mills. Despite this situation, significant underutilized quantities of pulpwood and forest residues exist in the Supply Zone, as described in Section B. To stay in business, many suppliers haul biomass to locations exceeding 100-mile radius, thus cutting deep into their revenues. Outreach indicated that local forest companies have been waiting for an opportunity to deliver their supply to a new entrant within a 50 to 75-mile drive distance. The risk was thus deemed low.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

2.1.6 Temporary Market-Driven Markets

Rationale: Alternative, non-traditional, market-driven competitors for feedstock can drive feedstock demand in unusual circumstances.

Risk Information: No temporary markets were found for the rated biomass in the Supply Zone.

Raw Risk Likelihood (RRL) The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**Score** **2**
Raw Risk Impact (RRI) The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**Score** **2**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**Score** **4**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**Score** **4**

2.2 Risk Factor: Specific Competitors' Competitive Advantage

2.2.1 Relative Inventory Capacity

Rationale: The more inventory a competing biomass facility is able to store, the more competitive pressure it can exert on supply. The ability to store large inventories allows competitors to purchase inventory when the prices are low, potentially giving it an economic advantage. Additionally, the ability to store inventory during feedstock supply surpluses can enable competitors to continue to intake feedstock when the Issuer's plant (with lesser inventory capacity) may be forced to put suppliers on quota. Larger inventory capacity on the part of competing markets creates supplier loyalty and can make it more difficult for new projects to secure supply without paying a significant premium.

Risk Information: Competitors have storing capacity and also are connected with nearby chip plants that can also store large quantities of pulpwood. However, most of the larger competitors and chip plants are located outside the Supply Zone and on the outskirts of the Competition Zone. The risk is set to low/medium.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**Score** **6**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**Score** **24**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100.	**Score** **24**

2.2.2 Relative Accessibility/Delivery Hours and Wait Times

Rationale: The value attributed by suppliers to local competing markets for biomass is often directly related to the degree of flexibility the market provides in terms of delivery hours and the more efficient discharge can occur.

Risk Information: As presented in Section B, some competitors have imposed delivery time windows and/or quotas to suppliers. This situation creates an opportunity to new projects to develop competitive advantage, through more flexible procurement strategies.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

2.2.3 Relative Specification Advantages

Rationale: When choosing a market for biomass feedstock, suppliers not only look at price but also at relative quality requirements or specifications. It is important to understand feedstock quality specifications for competing markets within the BDO Zone in order to accurately quantify the risk that competitors can exert on the Issuer's supply chain.

Risk Information: Existing competitors (see Section B - Competition Analysis) are capable of utilizing all three biomass types presented in this report without major quality concerns. However, high moisture content and soil/rock contamination of biomass furnishes can cause problems during energy and bio-fuel conversions. It is anticipated that a new project will address them in their quality control systems. Under this assumption, the risk is deemed low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

2.2.4 Demand for Competitors' Products

Rationale: Increased demand for the competitor's final product can cause increased demand for feedstock by the competitor. For example, an increased demand for wood pellets due to high energy prices in Europe or for biofuels due to a favorable clean fuels policy can cause increased pellet/biofuel production by competing markets. Thereby driving demand for feedstock within a BDO Zone.

Risk Information: The current increased wood pellet demand from EU countries and recent announcements of bio-projects in the region indicate that this trend will continue into the foreseeable future. Thus, the demand for sawmill residue will continue or even increase. However, the demand from pulp and paper companies is decreasing as described in the Competition Analysis. Many pulp and paper mills are forced to close or to adjust their production strategy toward higher value products. Consequently, large volumes of pulpwood are currently available to new projects. Moreover, forest residues are also available in large quantities. Due to the large and diverse fiber basket that is generated in the Supply Zone and the low likelihood of significantly increasing demand, a low risk was assigned to this indicator.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

CATEGORY 3.0: SUPPLY CHAIN RISK

3.1 Risk Factor: Feedstock Availability

3.1.1 Biomass Availability Multiple (BAM)

Rationale: Biomass Availability Multiple (BAM) indicates the degree of redundancy in an Issuer's supply chain in relation to the rated quantity in the BDO Zone. BAM is the mean ratio of biomass feedstock available to a project in relation to delivered cost, divided by the Issuer's mean rated quantity. BAM is a strong indicator of supply chain resilience when stressed by a supply shortage and/or supplier breach. BAMs of 1.5 or higher are generally signals of lower feedstock risk for new projects in BDO Zones.

Risk Information: The Biomass Availability Multiple (BAM) allows for a conservative quantity redundancy that ensures investors a higher degree of confidence that the project-ready estimates are achievable. Section B and more specifically Table B-3 presents how applying BAM factors to pulpwood (1.5), forest residue (4.0), and sawmill residue (2.0) technical available quantities is justified by the number of variables that affect availability, such as: accuracy of existing inventory (FIA data), scale-up readiness, historical harvesting practices and volumes, and sudden changes in supply and demand.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**

Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

3.1.2 Feedstock Supply Curve/Marginal Cost Curve

Rationale: The greater the feasible transport distance, the more feedstock is accessible to the Issuer, but at a higher delivered cost. The feedstock supply curve, sometimes referred to as the marginal cost curve, is a function of feedstock availability over its cost, which is primarily, but not exclusively, a function of distance. The feedstock supply curve is used to determine the availability of redundant feedstock at various price points, as well as the cost of replacing feedstock with substitutes located at different distances.

Feedstock cost curves are useful in determining supply chain resilience; they provide information about the cost of feedstock availability in times of supply disturbance. Biomass supply chains are prone to supply disturbances over time; suppliers can become insolvent, or weather events can temporarily disrupt feedstock availability. When a disturbance occurs, the Issuer may need to source replacement feedstock from different suppliers at different locations and at different costs. A biomass supply curve indicates quantities of feedstock available at various price levels from suppliers generally located further away than the core supplier.

Risk Information: To better understand the availability of pulpwood, forest residue, and sawmill residue at 10-mile distance increments from Livonia, LA, supply curves were constructed (Figure E-5). The graph indicates that the total rated quantity of 1.3 million bdt would be sourced from up to 55 miles drive distance from Livonia. However, when each feedstock type is analyzed separately, the graph suggests that, to access the rated quantity of 100,000 bdt/yr of sawmill residues, one would have to travel distances above 65 miles. By contrast, the rated quantity of 200,000 bdt/yr of forest residues is more accessible, at a drive distance of up to 45 miles from Livonia. While the drive distance to secure sawmill residues implies an increased delivered price, considering that currently pulpwood travels distances in excess of 100 miles to reach customers and forest residues are located closer than the other feedstocks, a low risk was assigned.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment.	**Notch** **NN**

The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score — **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. — **16**

3.1.3 Seasonal Feedstock Supply Variation

Rationale: Biomass supply can present significant seasonal variations. Seasonal supply variations, combined with limitations associated with longer-distance transportation and storage, can lead to BDO Zone biomass supply imbalances,[22] which can manifest in shortages and higher costs for Issuers.

Risk Information: Logging operations are kept on hold during the rainy season (November to May), especially in the bottomland hardwood forests. In order to minimize this negative effect, logging operations must move to drier harvesting sites. Chipping plants located closer to biomass users are capable of storing large quantities of pulpwood, thus, supplying the necessary furnish during wet periods. These activities are expected to continue, especially if a new project develops an optimal system of satellite yards and chip plants. Under these conditions/assumptions the risk is deemed medium.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment.	**NN**
RRI Mitigation (Notch) No adjustment.	
The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	**36**

3.1.4 Year-to-Year Variation in Feedstock Availability

Rationale: Biomass can have significant year-to-year supply variations due to variability in yield from biomass harvesting operations.

Risk Information: Historically, in the past 12 years there were no significant variations in total sawmilling capacity (Figure B-2). With the coming online of a new large sawmill in 2025, the sawmilling capacity in the Supply Zone will almost double. A stable sawmilling and wood pellet capacity in the region indicates a stable supply of biomass for new entrants. While the curtailment of the pulp and paper mill resulted in a significant drop in demand for pulpwood in the Supply Zone, this event is an opportunity for a new entrant to secure this underutilized supply. Thus, the risk was set to low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**

[22] Golecha & Gan, 2016.

Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

3.2 Risk Factor: Historical Issues

3.2.1 Historical Feedstock Price Variations

Rationale: If the historical feedstock price shows volatility, then the risk of future price fluctuation is elevated. If feedstock prices have historically exceeded the price at which the Issuer would have to cease operations or breach a financial covenant (i.e., the "red line" feedstock cost), then mitigation measures should be put in place.

Risk Information: Figures E-7 and E-8 indicate a declining price trend for pulpwood and a slightly increasing trend for sawmill residues. Some price increases were noted in 2022 as a result of supply chain disruptions due to the pandemic but overall, no significant historical volatility existed. The Supply Zone also experiences a pulpwood supply significantly larger than the demand. Likewise, forest residues are not being utilized and are available in large quantities for a new project. Thus, a low risk was assigned for this indicator.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

3.2.2 Historical Demand for Feedstock in the BDO Zone

Rationale: If Issuer BDO Zone does not have a history of developed large-scale feedstock procurement, suppliers may not have sufficient expertise in feedstock production to ensure reliable supply, especially in the early years. This can be particularly true for forest residues, where, typically, the infrastructure for collection, processing, and delivery is immature.

Where supply chains are not well-established, risk can be mitigated when new bio-based plants control a higher degree of feedstock processing. For example, if a BDO Zone rating is issued for clean wood chips and the historical demand in the Zone has been exclusively for pulpwood, then supply chain risk will be decreased for new bio-based plants that intake pulpwood and manage log debarking and chipping internally, rather than requiring inexperienced suppliers to deliver debarked wood chips.

Risk Information: Suppliers have extensive long-term expertise in supplying large quantities of forest biomass to large users (pulp and paper mills, pellet mills, etc.). Historically, the Competition Zone experienced a significant increase in biomass demand from two large pellet mills that came online in 2015 (Figure B-3). Since then, the total biomass consumption remained relatively stable with some fluctuations, the most notable ones being the ceasing of pulpwood intake of a pulp and paper mill in 2019 (as described above) and the closing of a pulp and paper mill in 2024. As mentioned in Section B, logging companies are looking forward to returning to the days when they were supplying large quantities of pulpwood and forest residues to a pulp and paper mill in the Supply Zone. Risk is deemed low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

3.2.3 History of Production/Feedstock is a New/Secondary Crop or By-Product

Rationale: If the feedstock is a new/secondary crop or a by-product, suppliers may either lack sufficient experience to mitigate risk or be unable to react to such risk. Secondary crops or by-product producers may be less likely to prioritize production.

Risk Information: Suppliers have extensive and long-term experience supplying the three rated feedstocks. Moreover, historical data indicates that total sawmilling capacity increased dramatically, while total demand decreased (Section B). This situation creates an opportunity for a new entrant to take advantage of large pulpwood and forest residue volumes available locally. The risk was deemed low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment.	**NN**

RRI Mitigation (Notch) No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16**

3.3 Risk Factor: Non-Weather Based Externalities

3.3.1 Consumer Price Index (CPI) and Producer Price Index (PPI)

Rationale: CPI and PPI can impact feedstock cost of harvest and collection over time. Sensitivities to worst-case scenarios should be run.

Risk Information: Significant increases and volatility of CPI and PPI values were recorded during the period 2020-2022 (Figures E-11 and E-12), due to the pandemic and global supply chain disruptions. However, since then the values seemed to reach a steady status as the economic situation is gradually improving in the country and the region. A medium risk was assigned due to the fluctuations in both CPI and PPI in the past 5 years.

Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6**
Raw Risk Impact (RRI) **Score** The risk impact is deemed medium, therefore the RRI is 6 out of 10. **6**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is 36 out of 100. **36**
Mitigation/Notching **Notch** *RRL Mitigation (Notch)* **NN** No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

3.3.2 Currency Risk

Rationale: Where feedstock is purchased in a currency different than that which a new bio-based plant will locate in a BDO Zone, currency exchange rates and volatility can constitute risk exposure. BDO Zones that cross the US-Canada border, for example, which intake feedstock from both countries, are exposed to such currency risk.

Risk Information: Not relevant to this BDO Zone.

Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). **NR**
Raw Risk Impact (RRI) **Score** The risk impact is deemed not relevant, therefore the RRI is not rated (NR). **NR**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is not rated. **NR**
Mitigation/Notching **Notch** The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). **NR**
Loaded RI Score **Score**

The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**NR**

3.3.3 Border Risk

Rationale: Where feedstock is transported cross-border to another country, risk exposure to border closures and crossing delays becomes present. The availability of trucks willing to do cross-border runs is limited, which can decrease supply chain flexibility and resilience. Plants near the US-Canada border, which intake feedstock from both countries, are exposed to these risks.

Risk Information: Not relevant to this BDO Zone.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**NR**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**NR**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is not rated.	**NR**
Mitigation/Notching	**Notch**
The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).	**NR**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**NR**

3.3.4 Temporary Externality-Driven Markets for Feedstock

Rationale: Alternative, non-traditional, externality-driven competitors for feedstock can drive feedstock demand (and cost) in unusual circumstances.

Risk Information: Not relevant to this BDO Zone.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**NR**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**NR**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is not rated.	**NR**
Mitigation/Notching	**Notch**
The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).	**NR**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**NR**

3.4 Risk Factor: Risks Related to Feedstock Production, Harvest, and Collection

3.4.1 Harvest & Collection Practices & Schedules

Rationale: Differences in harvest timing and practices used can create risk to both the quantity and quality of feedstock. For example, feedstock harvested by different suppliers in different windows can undergo varying levels of exposure to sun, wind, and moisture, leading to variations in delivered feedstock quality. For example, unsightly clear-cuts and slash piles (even on plantation forests and especially when located near communities) can provoke unwanted public backlash even when suitable and sustainable replanting regimes are followed.

Risk Information: Suppliers have long-term experience delivering feedstocks to customers requiring different quality standards, such as species, moisture content, particle size, and bark content. Sustained support exists from both public and government organizations for current and new forestry-related activities.

Raw Risk Likelihood (RRL)	**Score**

The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**2**
Raw Risk Impact (RRI) The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**Score** **2**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**Score** **4**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**Score** **4**

3.4.2 Harvesting & Collection Equipment

Rationale: Different types of harvesting and collection equipment used by suppliers in a BDO Zone can have a significant impact on the quality and availability of feedstock. Using different types and combinations of harvesting, collection, and processing equipment among suppliers can lead to non-homogeneous feedstock. Equipment that is not designed specifically for biomass harvesting and collection can increase feedstock quality risks. Relevant equipment should be specified for the sake of product consistency and risk reduction.

Risk Information: Forest operations in the Supply Zone have employed modern mechanized forestry equipment, including harvesters, skidders, processors, and loaders. Pulpwood harvesting through commercial thinning and forest restoration operations is common in the Supply Zone and is expected to become more prevalent if a new pulpwood customer/project operated in the BDO Zone. Grinding and transportation operations/contractors of comminuted forest residues are currently scarce in the region, but they could be enhanced if a serious demand existed that incentivized investments in equipment. Meanwhile, harvesting of stem tops can be accommodated by conventional logging practices/equipment. The risk of existing equipment to not meet the quality demands of potential projects is thus low.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

3.4.3 Variation in Densification Methods Among Different Suppliers

Rationale: The shape and density of the unit in which feedstock is supplied can impact feedstock cost and quality. Standard feedstock densification modes for biomass consist of bales, pellets, cubes, chips, or grindings. The size of wood fiber processed in a grinder is less homogenous than if a chipper is used.

Risk Information: Forest biomass harvested in the Supply Zone is produced in formats acceptable by all biomass processing and conversion companies. No densification methods are currently required or demanded. Risk is very low.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**2**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**2**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**4**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**4**

3.4.4 Availability of Labor for Feedstock Production

Rationale: Skilled labor shortages can be difficult to remedy in the short term. The availability of suitable labor in an area can impact the ability to procure sufficient feedstock quantities on required schedules. Labor risks are higher where supply chains are not yet active or for Issuers for whom large feedstock requirements or the development of new (or expanded) supply chains demand significant additions to the local labor force.

Risk Information: See Section B – Operational Considerations. Full scale-up to secure the rated quantities will require approximately 34 logging crews that employ 2-3 operators each. While some regional capacity exists to meet up to one half of this labor need, significant labor attraction, retention, and training will be required. Thus, the risk was set to medium.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**

The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	**36**

3.5 Risk Factor: Transportation

3.5.1 Feedstock Transportation Costs

Rationale: Transportation can be one of the most significant cost components of biomass supply chains. The average transport cost and percentage of total feedstock cost attributable to transport should be known.

Transport distances of 50-75 miles for biomass feedstocks are typical, but larger distances can be common. Where the average transport distance from suppliers to Issuers is high, the supply chain is subject to greater sensitivities to risks, such as increases in diesel cost, weather impacts, mechanical breakdown, and the demand for scarce feedstock from competitors closer to the source.

Understanding average transport distance can help flag higher-risk BDO Zones where transport distance materially exceeds the average.

Risk Information: Transportation costs account for 20-50% of the total biomass delivered price depending on the type of biomass, the distribution of the biomass in the BDO Zone, and the supply and demand dynamics in the region. Supply curves presented in Figure E-5 indicate that the total rated quantity is available at 55-mile drive distance from Livonia, but the sawmill residues are available at distances above 65 miles, at higher prices. As described in Section B – Operational Considerations, transportation scale-up may require a capital investment that could result in even higher transportation costs. The large volume of biomass that needs to be transported, the shortage of drivers, and the high insurance rates grant a medium-high risk to this indicator.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**8**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 48 out of 100.	**48**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 48 out of 100.	**48**

3.5.2 Diesel Cost Impacts

Rationale: Changes in diesel costs impact transport costs over time. Sensitivities to worst-case scenarios should be run.

Risk Information: Although average diesel prices dropped considerably from $4.60/gal to $3.60/gal since 2022 (Figure E-10) the historical price trend is upward. Fuel price volatility and steep increases are major concerns for biomass projects given the relatively low bulk density of some biomass types (i.e., shavings and chips) and long transportation distances, which could negatively affect the supply chain reliability and price stability. For this BDO Zone, however, a medium risk was considered acceptable as diesel prices stabilize and significant volumes of hardwood pulpwood and forest residues are located within 55-mile drive distance from Livonia.

Raw Risk Likelihood (RRL) The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**Score** **6**
Raw Risk Impact (RRI) The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**Score** **6**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**Score** **36**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	**Score** **36**

3.5.3 Transportation of Feedstock Requires Specialized Equipment

Rationale: Requirements for specialized transport equipment (e.g., walking-floor trailers) can increase supply chain risk. Where there is low availability of required transportation equipment, equipment owners have increased leverage over transportation prices, and supply chain resiliency can be lower.

Risk Information: Availability of chip vans seem to pose limited challenges to the sawmills located in the Supply Zone as they deliver occasionally to facilities located outside the 75-mile area. Likewise, pulpwood and forest residues will not require specialized trucking equipment.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

3.5.4 Delivery Routes through Local Communities

Rationale: Transportation of biomass can become a nuisance to local communities, especially if a large number of trucks pass through residential and school areas. Local communities often have the power to force regulations regarding truck transport, impeding the ability of BDO Zone suppliers to transport feedstock.

Risk Information: There is a long history of forestry and wood processing in the Supply Zone, and the local population is familiar with seeing logging trucks driving through their communities, which is also the case with Livonia. Moreover, the vast majority of trucking occurs on tertiary/logging roads and major highways.
Raw Risk Likelihood (RRL) — **Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10. — **4**
Raw Risk Impact (RRI) — **Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10. — **4**
Gross Risk Indicator (GRI) — **Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100. — **16**
Mitigation/Notching — **Notch**
RRL Mitigation (Notch) — **NN**
No adjustment.
RRI Mitigation (Notch)
No adjustment.
The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score — **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. — **16**

3.5.5 Transportation Regulations & Local Weight Limits

Rationale: In many BDO Zones, transportation is regulated based on seasonal road conditions. These regulations (e.g., "frost laws") often take the form of weight restrictions or limits on the number of trucks allowed on roads. Such regulations can impede the project's ability to source sufficient feedstock or increase the cost of doing so at certain times of the year.
Risk Information: While road weight limits exist in Louisiana, forest and transportation companies are well equipped to manage them so no risks associated with this indicator have been identified.
Raw Risk Likelihood (RRL) — **Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10. — **4**
Raw Risk Impact (RRI) — **Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10. — **4**
Gross Risk Indicator (GRI) — **Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100. — **16**
Mitigation/Notching — **Notch**
RRL Mitigation (Notch) — **NN**
No adjustment.
RRI Mitigation (Notch)
No adjustment.
The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score — **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. — **16**

3.5.6 Road Infrastructure

Rationale: Feedstock cost and availability can be a function of road infrastructure, in particular the accessibility the infrastructure provides to feedstock. Issues with road networks will translate directly to risks to feedstock supply.

Risk Information: Outreach indicated some difficulties to access certain bottomland hardwoods stands due to improper road infrastructure. A medium risk was assigned due to special equipment required for these types of situations.
Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6**
Raw Risk Impact (RRI) **Score** The risk impact is deemed medium, therefore the RRI is 6 out of 10. **6**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is 36 out of 100. **36**
Mitigation/Notching **Notch** *RRL Mitigation (Notch)* **NN** No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

3.5.7 Transportation Redundancy

Rationale: Transport equipment redundancy is important for dealing with seasonally variable feedstock supplies as well as the risk of equipment breakdowns.
Risk Information: Approximately 34 logging crews and 125 trucks would be needed to supply the rated quantities of pulpwood and forest residues (see Section B). Some redundancy exists in the area for spot increases in demand, but, as presented in Section B – Operational Considerations, scale-up will most likely require one to two years to complete. Due to the large volume of biomass that needs to be transported, the shortage of drivers, and high insurance rates, a medium-high risk was assigned to this indicator.
Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6**
Raw Risk Impact (RRI) **Score** The risk impact is deemed high, therefore the RRI is 8 out of 10. **8**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is 48 out of 100. **48**
Mitigation/Notching **Notch** *RRL Mitigation (Notch)* **NN** No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 48 out of 100. **48**

3.6 Risk Factor: Supply Chain Resiliency

3.6.1 Size, Number, and Location of Suppliers

Rationale: In general, a supply portfolio involving multiple suppliers of various sizes (and from multiple BDO Zones) is important for ensuring steady and uninterrupted feedstock supply with minimal price fluctuations. If a small number of large suppliers provides a high proportion of total feedstock, a disruption or supplier breach will have greater impact on the supply chain. In such cases the risk of disruption is lower, but the impact of those disruptions is higher. Conversely, many small suppliers are less likely to have the capacity to withstand internal disruptions and thus may be more likely to breach. Here, risk of disruption is higher, but their likely impact is lower. The number of suppliers as well as the ratio of small to large suppliers should be optimized.

There is no pre-determined number or optimal ratio of suppliers, although having too many or too few can both pose higher degrees of risk.

Risk Information: Eight sawmills are located in the Supply Zone (Map B-2), seven of which are hardwood mills with maximum capacities below 30 MMBF of lumber production per year and one softwood mill of 260 MMBF per year. Another large softwood sawmill with an announced capacity of 250 MMBF is under construction and will come online in 2025 (Section B – Sawmill Residues). Outreach indicated that an appropriate number of logging operators with single and multiple crews exists in the Supply Zone to deliver up to one-half of the rated quantity of pulpwood.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

3.6.2 Suppliers Subject to Same External Risk Factors

Rationale: When a single risk event can impact the feedstock production ability of all (or most) suppliers, then feedstock risk is higher and supply chain resiliency is lower. Resilience is maximized when biomass supply chains exhibit diversity in spatial location (i.e., geography), production practices, and other elements of supply chain structures such that the impact of single high-risk events have varying impacts on suppliers.

Risk Information: The Supply Zone has experienced a well-balanced supply and demand. Sawmills are mostly affected by housing market fluctuations and lumber prices. However, the rated quantity of sawmill residues constitutes only a small portion of the total rated quantity. The largest portion is comprised of pulpwood generated by thinning and forest restoration activities, which is less prone to the risk of a one-time event than sawmilling. Also, there are currently several sawmills, pulp and paper mills, pellet mills, plywood mills, chip plants, and co-gen facilities in the region that ensure a stable bio-economy for current and new players.

Raw Risk Likelihood (RRL)	**Score**

The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

3.6.3 Land Ownership Structures

Rationale: The ownership (or control) of the land base on which feedstock is produced can have a significant impact on the Issuer's feedstock risks. Risk of long-term variation in stumpage cost for wood fiber (i.e., the cost that one pays to a landowner for the right to cut and purchase their wood fiber), for example, is much higher in the US, where >90% of the land is private, and thus stumpage cost is determined on a competitive auction basis. Conversely, in Canada, >90% of the land is owned by the Crown, and stumpage is allocated by the government.

Risk Information: Land is in vast majority owned privately (see Section B), thus posing a very small risk to investments.

Raw Risk Likelihood (RRL) The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**Score** **2**
Raw Risk Impact (RRI) The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**Score** **2**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**Score** **4**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**Score** **4**

3.7 Risk Factor: Climate and Natural Risks

3.7.1 Seasonal Weather Impacts on Feedstock Supply

Rationale: Seasonal weather impacts are defined as those deriving from natural weather variations (e.g., spring thaws, rainy seasons, or dry seasons—as opposed to singular weather events like fires, droughts, or hurricanes). Seasonal weather changes can be a significant risk factor affecting feedstock availability, quality, and price.

Given the significant influence that weather has on multiple aspects of growing, harvesting, and transporting biomass, it is difficult to predict the availability of biomass at a specific location at different points in the future with a high degree of certainty. However, it is still possible, using past data and statistical models, to generate reasonable upper/lower bound estimates of biomass production in any given year in a wider supply zone. Such estimates are essential in assessing feedstock risk and enable accurate assessment of the efficacy of the Issuer's mitigation methods.

Risk Information: Outreach indicated that a heavy rain season between November and May significantly impacts harvesting and transportation of timber, especially from bottomland forests. Local suppliers indicated that solutions exist to alleviate this situation through harvesting in drier areas, satellite log yards, locating chip plants closer to users, etc. However, due to the fact that a large quantity of pulpwood is produced in hardwood bottomland forests, the risk is deemed medium.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	**36**

3.7.2 Long-Term Weather and Climate Trends

Rationale: In certain BDO Zones, climatic trends and significant potential changes to future weather patterns can create feedstock risk.

Risk Information: Outreach suggested that increased extreme weather events are occurring in the Supply Zone, such as tornados and hurricanes, heavy rains followed by severe droughts, forest fires, etc. Considering that the local forestry sector has extensive experience mitigating these events, a medium risk was assigned.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**

Loaded RI Score	Score
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	36

3.7.3 Forest/Crop Fire

Rationale: Forest fires, especially when occurring on a large scale, destroy feedstock and create shortages.

Fire-prone conditions are predicted to increase across Canada. This could potentially result in a doubling of the amount of area burned by the end of this century compared with amounts burned in recent decades. Boreal forests, which have been historically greatly influenced by fire, will likely be especially affected by this change.

Other climate change impacts that could add damaged or dead wood to the forest fuel load (e.g., as a result of insect outbreaks, ice storms, or high winds) may increase the risk of fire activity. New research is aimed at refining these climate change estimates of fire activity and investigating adaptation strategies and options to deal with future fire occurrences. There is growing consensus that as wildfire activity increases, fire agency suppression efforts will be increasingly strained. However, analyses of fire history suggest that the effect of climate variability on precipitation regimes is the primary reason for the decreasing fire activity in the southern BDO Zone of Canada.

Risk Information: The risk level presented by wildfires in Louisiana is expected to significantly increase by 2050, affecting almost half of the overall population. Anthropogenic (human-induced) climate change makes the environment increasingly vulnerable to the threat of wildfires. There is a significant increase in severe heat and dryness, which are considered adequate wildfire conditions. The peak of the fire season in Louisiana usually begins in early September and lasts up to 30 weeks. As such, wildfires now approach the point where they may be regarded as less of a "season" and more of a year-round phenomenon.[23] Consequently, likelihood of occurrence is increasing, but also the impact due to higher fire intensity. The risk level is set to medium to reflect the beginning of this year-round trend. In the future this risk level may have to be further elevated.

Raw Risk Likelihood (RRL)	Score
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	6
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	6
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	36
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	NN
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	36

3.7.4 Risk of Infestation

Rationale: Risk of future infestation, including its estimated consequences on feedstock supply, should be calculated into the overall risk profile.

[23] louisiana.emergencyresponseguide.org/wildfire

Since forest insect populations are influenced by environmental conditions, future changes in climate can be expected to significantly alter the outbreak dynamics of certain forest insect species. In some cases, larger and more frequent insect outbreaks may occur, but in other cases, recurring outbreaks may be disrupted or diminished. As the climate continues to change, we can expect more situations, particularly at the margins of tree ranges, where sub-optimal conditions for tree growth and reduced tree vigor can lead to outbreaks of forest insects.

Risk Information: Southern pine beetle (SPB) is the most significant forest insect pest in the Southern States and Louisiana.[24] Overall, in Louisiana, SPB activity has been insignificant since the late 1990s. However, recent trapping results consisted of five parishes with the heaviest concentration, of which West Feliciana, bordering Point Coupee Parish, had the higher concentration. While insect infestations can affect the quality of high-value timber, they can generate, through salvage operations, significant amounts of biomass. Thus, the risk is set to low/medium.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**24**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100.	**24**

3.7.5 Risk of Hail

Rationale: Hail has negligible impact on forestry biomass. However, there is much uncertainty about the effects of anthropogenic climate change on the frequency and severity of extreme weather events like hailstorms and their subsequent economic losses. Some studies indicate a strong positive relationship between hailstorm activity and hailstorm damage, as predicted by minimum temperatures using simple correlations. This relationship suggests that hailstorm damage may increase in the future if global warming leads to further temperature increases.

Risk Information: Not relevant to this BDO Zone.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**NR**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**NR**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is not rated.	**NR**
Mitigation/Notching	**Notch**
The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).	**NR**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**NR**

[24] www.fs.usda.gov/foresthealth/docs/fhh/LA_FHH_2022.pdf

3.7.6 Risk of Flood

Rationale: Floods can cause catastrophic disruption and delay in feedstock supply. Where there is a high risk of flood and thus a negative impact on feedstock supply, the BDO Zone rating should account for this risk.

Risk Information: A vast area of the Supply Zone, especially the southern part, is covered by hardwood bottomland forests (Section B). During the heavy rain season (November to May), floods are a common occurrence and logging operations move to higher and drier areas on the outskirts of the Supply Zone where pine plantations are located. While these contingency plans have optimized well logging schedules and utilization, increased frequency and duration of these floods associated with other severe weather events (hurricanes, tornados, heavy storms) elevate the risk to medium.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	**36**

3.7.7 Risk of Drought

Rationale: Droughts can cause significant disruptions to feedstock supplies across entire BDO Zones for extended periods of time. Parts of Western Canada are experiencing more frequent and severe droughts, and scientists expect drought to affect new areas across Canada going forward.

Tree species are adapted to specific moisture conditions. Having less water available through drought has a range of negative impacts on the health of forest ecosystems. Direct impacts include reduced growth, increased tree mortality, and failure to regenerate. Indirect impacts include reduced ability to defend against insects and disease and increased fire risk. These impacts can affect the availability of wood fiber for an Issuer.

Risk Information: As indicated in RI 3.7.3, there is a significant increase in severe heat and dryness, which are considered adequate wildfire conditions. During drought periods the risk of starting a wildfire triggered by mechanical logging operations increases. Due to increased frequency and impact of drought in the Supply Zone, the risk is set to medium.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch)	**NN**

No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds

Rationale: Hurricanes, tornadoes, and strong winds can destroy timber stands and feedstock piles. They can also delay forestry operations. Hurricanes and tornadoes can indirectly cause temporary shortages of available transportation as available trucking moves to handle higher-value disaster-related contracts. For example, Katrina cleanup limited the availability of live-bottom trailers in the North and South East of the US for several months as truckers shifted operations to handle more lucrative government contracts. Although scientists are uncertain whether climate change will lead to an increase in the number of hurricanes, warmer ocean temperatures and higher sea levels are expected to intensify their impacts. Recent analyses conclude that the strongest hurricanes occurring in some BDO Zones, including the North Atlantic, have increased in intensity over the past two to three decades.
Risk Information: The risk of hurricanes, tornadoes, and heavy storms has increased dramatically in the past few years, especially in 2024, when Louisiana experienced the largest number of disaster events (with damages over 1 billion dollars) in a decade.[25] While the forest industry has extensive experience managing for extreme weather events, due to their increase frequency and impact, this risk is set to medium.
Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed medium, therefore the RRL is 6 out of 10. **6**
Raw Risk Impact (RRI) **Score** The risk impact is deemed medium, therefore the RRI is 6 out of 10. **6**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is 36 out of 100. **36**
Mitigation/Notching **Notch** *RRL Mitigation (Notch)* **NN** No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

3.7.9 Risk of Low Temperatures

Rationale: Low temperatures can cause crop failure, leading to shortages of biomass. Additionally, low temperatures can have adverse impacts on the operations of feedstock processing equipment in Northern BDO Zones.
Risk Information: Not relevant to this BDO Zone.
Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). **NR**

[25] www.ncei.noaa.gov/access/billions/state-summary/LA

Raw Risk Impact (RRI) The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**Score** **NR**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is not rated.	**Score** **NR**
Mitigation/Notching The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).	**Notch** **NR**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**Score** **NR**

3.8 Risk Factor: Political and Social

3.8.1 Government Subsidies for Feedstock Production or Utilization

Rationale: Feedstock that is directly subsidized through government programs can pose greater long-term risk than feedstock that is not. Subsidies may be subject to amendment or repeal, sometimes with minimal notice.

NOTE: This risk indicator refers to direct feedstock subsidies only; it does not apply to government subsidies that pertain indirectly to the Issuer's operations, such as Loan Guarantees, or to the markets for products produced by the Issuer.

Risk Information: No subsidies for biomass harvesting, transportation, and utilization were found or reported.

Raw Risk Likelihood (RRL) The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**Score** **2**
Raw Risk Impact (RRI) The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**Score** **2**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**Score** **4**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**Score** **4**

3.8.2 Local, Provincial, & National Laws, Regulations, & Permitting Pertaining to Biomass

Rationale: Feedstock whose production is directly dependent on local, provincial, or national laws or government regulations can pose greater long-term risk than feedstock which is not, since laws and regulations may be subject to amendment or repeal.

If biomass utilization requires specific permits (e.g., percentage removal of forest residues, allowable annual cut limits, air emission, storage permits, rights-of-way, overweight permits for trucks, cross-border permitting for shipment of biomass, chain of custody, or certification of sustainability), the likelihood of obtaining such permits and/or complying with permitting requirements should be examined.

Risk Information: No permitting is required for biomass supply.

Raw Risk Likelihood (RRL) The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**Score** **2**

Raw Risk Impact (RRI) The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**Score** **2**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**Score** **4**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**Score** **4**

3.8.3 Backlash Against Biomass Development, Procurement, or Usage in the Region

Rationale: Public backlash against biomass development in the Issuer BDO Zone can directly impact the Issuer's ability to procure, transport, trans-load, store, or utilize feedstock by affecting local policies, regulations, and the Issuer's ability to obtain necessary permitting.

Risk Information: While criticism at the national and international level exists from NGOs against the use of pulpwood for wood pellets, outreach indicated a strong support for thinning and forest restoration activities and for increased utilization of pulpwood and forest residues to develop a bio-economy in the BDO Zone.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

3.8.4 Consent of, and Cooperation with, Indigenous Communities and First Nations

Rationale: Where new project development on or near Indigenous or First Nation land, or where near Indigenous or First Nations exert influence over feedstock producing areas, consent of, and cooperation with, Indigenous communities and First Nations decreases Issuer risk.

Risk Information: There are currently four recognized tribes in the Region 6 of Louisiana: Clifton Choctaw, Louisiana Band of Choctaw, Jena Band of Choctaw, and Tunica-Biloxi Tribe.[26] Only the latter tribe is present in just the Avoyelles

[26] gov.louisiana.gov/page/indian-affairs

Parish, which is one of the 26 parishes within the Supply Zone. The risk of interference with a biomass project in the BDO Zone is very low.
Raw Risk Likelihood (RRL) **Score**
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. **2**
Raw Risk Impact (RRI) **Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10. **2**
Gross Risk Indicator (GRI) **Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100. **4**
Mitigation/Notching **Notch**
The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch). **NN**
Loaded RI Score **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100. **4**

3.8.5 Food Security Concerns

Rationale: Despite the fact that any significant correlation between food prices and biofuel production is unclear, claims that biofuel production has driven up food prices, taken food from communities or had a negative impact on land use can fuel public backlash. For example, the removal of biomass may raise public concerns relating to food security if Issuer feedstock requires the use of land that would otherwise be used for growing food.
Risk Information: Not relevant to this BDO Zone.
Raw Risk Likelihood (RRL) **Score**
The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR). **NR**
Raw Risk Impact (RRI) **Score**
The risk impact is deemed not relevant, therefore the RRI is not rated (NR). **NR**
Gross Risk Indicator (GRI) **Score**
The Gross Risk Indicator (RRL X RRI) is not rated. **NR**
Mitigation/Notching **Notch**
The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated). **NR**
Loaded RI Score **Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated. **NR**

3.9 Risk Factor: Sustainability and Environmental Concern

3.9.1 Feedstock Sustainability

Rationale: Public concerns about the sustainability of feedstock production can jeopardize biomass feedstock operations. Sustainability certification schemes should be utilized where applicable to ensure that feedstock comes from sustainable sources.
Risk Information: Several forestlands are SFI, FSC, and American Tree Farm System (ATFS) certified (see Section B). Also, the rated quantity of pulpwood guarantees a sustainable growth-to-removal ratio above 1.5. Moreover, thinning and forest restoration operations increase forest health and timber value.
Raw Risk Likelihood (RRL) **Score**
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10. **2**
Raw Risk Impact (RRI) **Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10. **2**
Gross Risk Indicator (GRI) **Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100. **4**
Mitigation/Notching **Notch**

RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**Score** **4**

3.9.2 Risk to Soil Quality

Rationale: Soil sustainability can be defined as the management of soil in a way that does not exert any negative or irreparable effects either on the soil itself or any other systems. There is a diversity of approaches to soil sustainability in jurisdictional guidelines for forest biomass harvesting and production. For different feedstock types, there are also different thresholds at which feedstock removal causes significant negative consequences on the soil.

Poor soil quality that negatively impacts the long-term sustainability of the feedstock can entail long-term feedstock risk. Sub-optimal soil management can leave exposed soil post residue-harvest, which can lead to soil wash-off and soil carbon loss from precipitation and wind. Over-harvesting of biomass also depletes the carbon stock in the soil and creates a negative feedback loop that can degrade the soil and its nutrients.

Risk Information: Thinning and forest restoration operations are generally performed with care for the remaining forest. Forest residuals, when removed, have a recovery rate of below 60%. The unrecovered quantity of forest residues is spread back in the harvesting site to prevent nutrient depletion, for soil protection and carbon storage.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

3.9.3 Risk to Surface and Groundwater

Rationale: Excessive nutrient runoff from biomass feedstock production can accumulate in surface waters and result in algal blooms and hypoxia, which can lead to habitat loss for aquatic species higher up the food chain and alter aquatic ecosystem food webs. Damage to aquatic ecosystems can cause social and regulatory backlash. Water intake issues can also increase risk.

Risk Information: Vast areas of the Supply Zone belong to bottomland ecosystems. Local forestry companies are fully aware of these sensitive ecosystems and manage them in a sustainable manner. The risk of damage to aquatic

ecosystems, however, was set to low/medium to account for those rare cases in which forest operations may accidentally impact these ecosystems.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**24**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100.	**24**

3.9.4 Risk to Hydrological Flux

Rationale: Biomass feedstock operations can have significant impacts on the hydrological flux (infiltration, groundwater recharge, interception, and transpiration) of ecosystems. This can lead to water shortages, lower yields, and backlash from regulatory bodies if management plans are not properly instituted.

Risk Information: Not relevant to this BDO Zone.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**NR**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**NR**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is not rated.	**NR**
Mitigation/Notching	**Notch**
The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).	**NR**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**NR**

3.9.5 Pesticide Risk to Human and Ecosystem Health

Rationale: Application of pesticides (i.e., herbicides, fungicides, and insecticides) on forest landscapes can result in adverse health effects for humans and ecosystems. If pesticide application is required in feedstock production, the impact must be considered in the BDO Zone rating.

Risk Information: Not relevant to this BDO Zone.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**NR**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**NR**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is not rated.	**NR**

Mitigation/Notching The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).	**Notch** **NR**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**Score** **NR**

3.9.6 Risk to Wildlife and Landscape

Rationale: Biomass production and supply chain operations with negative impacts on wildlife and landscape are at a greater long-term risk of encountering project setbacks and disruptions.

Risk Information: While disruptions occur during thinning, forest restoration operations, and forest residue removals, they do not affect long-term viability of wildlife habitats. Forest certification and chain of custody exists in the Supply Zone and should continue to be encouraged by project proponents; thus, ensuring that sustainable practices are followed.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

3.9.7 Biomass Classified as Genetically Modified Organism (GMO)

Rationale: There are various risks associated with GMOs, such as migration or dispersion across the landscape, which can generate community backlash and create supply chain risk. GMOs can also be heavily regulated. If planning to grow or procure GMO feedstocks, especially purpose-grown energy crops, it is important to understand the risks.

Risk Information: Not relevant to this BDO Zone.

Raw Risk Likelihood (RRL) The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**Score** **NR**
Raw Risk Impact (RRI) The risk impact is deemed not relevant, therefore the RRI is not rated (NR).	**Score** **NR**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is not rated.	**Score** **NR**
Mitigation/Notching The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**Score** **NR**

CATEGORY 4.0: FEEDSTOCK SCALE-UP RISK

4.1 Risk Factor: Feedstock Scale-Up

4.1.1 Feedstock Quality at Production Scale

Rationale: The physical and chemical properties of feedstock used in lab, pilot, and field testing can fail to be representative of feedstock generated by large-scale operations.
It is important to conduct tests on feedstock representative of that which will be produced by large-scale operations. Failure to adequately test the full range of parameter values can result in severe problems during scale-up.

Risk Information: No significant risks associated with feedstock quality were foreseen for sawmill and forest residues if proper feedstock management practices were followed. These include: allowing forest residue to dry before comminution, reducing soil and rock contamination through proper handling, and careful piling/decking of residue. A quality control plan that incentivizes maintaining and improving feedstock quality is recommended. Current suppliers have already abided by strict quality control specifications imposed by pulp and paper and pellet mills producers.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

4.1.2 Capacity of Supply Chain Components & Equipment to Scale

Rationale: Scale-up risk increases if supply chain components or underlying feedstock infrastructure necessary for these components cannot scale to handle Issuer feedstock requirements and throughput capacity. Capacity to scale should be demonstrated.

Risk Information: As described in Section B – Operational Considerations, full scale-up will require a period of between six months to one year for logging equipment and even longer for grinding and transportation equipment. Moreover, training and retention of operators further increases the scale-up risk.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment.	**NN**

RRI Mitigation (Notch) No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NR (Not Rated).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100. **36**

CATEGORY 5.0: INFRASTRUCTURE RISKS

5.1 Risk Factor: Physical Infrastructure

5.1.1 Land Parcel/Industrial District

Risk Information: The 341-acre Woodley site in Livonia, LA (Map E-1) is a greenfield site zoned light industrial and commercial, currently used as farmland.

Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4**
Raw Risk Impact (RRI) **Score** The risk impact is deemed low, therefore the RRI is 4 out of 10. **4**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16**
Mitigation/Notching **Notch** *RRL Mitigation (Notch)* **NN** No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).
Loaded RI Score **Score** The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100. **16**

5.1.2 Ownership of Land

Risk Information: The Woodley site is privately owned and managed by the Baton Rouge Area Chamber (BRAC) under Regional Director Jayson Newell. BRAC provides professional management and support throughout the acquisition and development process.

Raw Risk Likelihood (RRL) **Score** The risk likelihood is deemed low, therefore the RRL is 4 out of 10. **4**
Raw Risk Impact (RRI) **Score** The risk impact is deemed low, therefore the RRI is 4 out of 10. **4**
Gross Risk Indicator (GRI) **Score** The Gross Risk Indicator (RRL X RRI) is 16 out of 100. **16**
Mitigation/Notching **Notch** *RRL Mitigation (Notch)* **NN** No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).

Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

5.1.3 Permitting Description

Risk Information: The Pointe Coupée Parish mandates a Flood Zone Determination Certificate for all residential and commercial construction projects as part of its permitting process. Given the high flood risk, this certificate establishes the required foundation elevation to ensure compliance with floodplain regulations. New businesses typically face a 3 to 4-month period to complete the permitting process, which includes both construction and environmental clearances.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

5.1.4 Environmental Issues

Risk Information: The Phase I Environmental Site Assessment (ESA) for the Woodley Site identified environmentally sensitive areas along the southeastern edge, potentially comprising wetlands or protected habitats. The assessment also noted a potential archaeological site, which may necessitate further investigation or preservation under state and federal regulations. Additionally, a former sugar mill site and potential pesticide contamination may affect soil and water quality. A Phase II ESA is recommended to assess contamination levels and define necessary remediations. However, significant land areas located at the northern end mitigate these environmental risks.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed medium, therefore the RRI is 6 out of 10.	**6**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 36 out of 100.	**36**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**

The Loaded RI Score ((1-Total Notch) X GRI Score) is 36 out of 100.	**36**

5.2 Risk Factor: Utilities

5.2.1 Natural Gas Availability

Risk Information: Industrial natural gas prices in Livonia, LA averaged $2.83/Mcf,[27] approximately 8.7% lower than the U.S. average of $3.10/Mcf. Entergy serves as the general natural gas supplier across Louisiana. Consumers Energy manages local distribution, providing pipeline infrastructure, metering, and billing services. Two pipelines (6-inch and 12-inch) are located adjacent to the site.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**2**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**2**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**4**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**4**

5.2.2 Electricity Availability

Risk Information: The industrial site is serviced by Entergy at an average industrial bundled electricity rate of 6.32 cents per kWh, which is 21% lower than the national average.[28] The site is served by two 15kV lines running along its northern edge and a 115kV substation located just a quarter mile away.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**2**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**2**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**4**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**

[27] naturalgaslocal.com/states/louisiana/livonia/ (August 2024)
[28] findenergy.com/la/pointe-coupee-parish-electricity/#recent-news (December 2024)

The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**4**

5.2.3 Water Availability

Risk Information: The City of Livonia operates a reliable potable water system, with no reported shortages in the Parish. The Woodly industrial site has access to several available water pipelines, primarily six inches in diameter, which can be expanded, if needed. Thus, the water supply poses a low risk to new projects.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

5.2.4 Waste Disposal

Risk Information: Wastewater disposal is managed by the City of Livonia, with infrastructure supporting a daily capacity of 1,000,000 gallons. However, the capability to support larger industrial operations or significant growth remains uncertain due to limited data availability.

Solid waste disposal in Livonia is managed through local/regional waste services, with capacity adequate for residential and small business needs. Waste Management operates the largest landfill in Pointe Coupee Parish, located 30 miles east of the Woodley industrial site.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

5.2.5 Internet Availability

Risk Information: Several high-speed fiber optics internet providers exist in Livonia. Prices range between $30 to $120 per month depending on speed and connectivity.[29]

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

5.3 Risk Factor: Transportation/Logistics

5.3.1 Road/Highway Access

Risk Information: The Ronald Reagan Highway (U.S. 190), a key east-west corridor through Louisiana, passes directly through Livonia, allowing easy access to major state and interstate markets. Interstate 10, located just 10 miles south of Livonia, spanning from California to Florida, provides efficient access to regional, national, and international markets, including Gulf ports.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

[29] https://broadbandnow.com/Louisiana/Livonia

5.3.2 Rail Access

Risk Information: The Woodley Industrial Site is located adjacent to the Union Pacific rail yard in Livonia, LA, which is a major classification yard.[30]

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

5.3.3 Airport Access

Risk Information: The Woodley site is located 13 miles from the False River Regional Airport and 25 miles from the Baton Rouge Metropolitan Airport. The False River Regional Airport features a 5,000-foot asphalt runway, capable of accommodating general aviation and most corporate aircraft. The Baton Rouge Metropolitan Airport provides access to commercial flights and air freight services to both national and international destinations.

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

5.3.4 Water Freight Access

Risk Information: The site benefits from water freight access via the Atchafalaya River, located 9 miles west of the site and maintained by the U.S. Army Corps of Engineers for over a century. This river provides a 75-mile navigable route to

[30] A railway yard where railway cars accumulate on several tracks

the Gulf of Mexico and access to international shipping channels. Additionally, the Port of Baton Rouge, one of the largest ports in the US South, situated 22 miles southeast of Livonia, offers extensive international freight services, including containerized goods, bulk cargo, and other commodities.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**2**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**2**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**4**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**4**

5.4 Risk Factor: Social Infrastructure

5.4.1 Healthcare (Local)

Risk Information: The site is serviced by the Pointe Coupée General Hospital, a critical access hospital in New Roads, LA, located 13 miles from Livonia. The hospital delivers key services, including emergency care, laboratory testing, radiology, and physical therapy. The Pointe Coupée Parish is further supported by over a dozen urgent care and specialty clinics. Additionally, Baton Rouge, situated 30 miles away, offers comprehensive healthcare options, including university-affiliated medical facilities and specialized services.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed very low, therefore the RRL is 2 out of 10.	**2**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed very low, therefore the RRI is 2 out of 10.	**2**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 4 out of 100.	**4**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 4 out of 100.	**4**

5.4.2 Education (Schools)

Risk Information: The educational system is served by the Pointe Coupée Parish Public Schools, comprising six schools: two high schools, one of which is a STEM school, and four elementary schools. There are also two private schools in the

parish.[31] The public school system has a "B-" rating.[32] Baton Rouge is the home of Louisiana State University, a top education and research institution, located only a 30-minute drive from Livonia.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**16**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**16**

5.4.3 Local Transportation

Risk Information: There is no public transportation in Livonia except what is provided by the Council on Aging.[33]

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed medium, therefore the RRL is 6 out of 10.	**6**
Raw Risk Impact (RRI)	**Score**
The risk impact is deemed low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**
The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**24**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**NN**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 24 out of 100.	**24**

5.4.4 Public Safety (Local)

Risk Information: The violent crime rate in Livonia is 18.1, below the U.S. average of 22.7, and the property crime rate is 20.0, also below the national average of 35.4.[34] The Livonia Police Department actively manages local safety, offering residential, civil, and emergency services through a well-trained and equipped team.

Raw Risk Likelihood (RRL)	**Score**

[31] Personal communications Pointe Coupee Parish
[32] www.niche.com/k12/d/pointe-coupee-parish-public-schools-la/
[33] Personal communications Pointe Coupee Parish
[34] www.bestplaces.net/crime/zip-code/louisiana/livonia/70755

The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

5.4.5 Housing/Cost of Living

Risk Information: In 2023, there were 11,169 housing units in Livonia, and 77.5% were owner-occupied. The median home price was $174,500.[35] Living expenses are 93% of the national average.[36] The rental is on average $830/month for a two-bedroom unit.[37]

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

5.5 Risk Factor: Labor

5.5.1 Workforce

Risk Information: The average unemployment rate in October 2024 in the Baton Rouge Metropolitan Statistical Area was 4.0, similar to the national average of 4.1, but higher than the previous year's unemployment rate of 3.4.[38] The Pointe Coupee Parish has 81.5% of its population with high school and higher education.[39]

[35] www.census.gov/quickfacts/fact/table/pointecoupeeparishlouisiana,LA/POP060210
[36] www.bestplaces.net/cost_of_living/city/louisiana/livonia
[37] Ibid.
[38] U.S Bureau of Labor Statistics 2024
[39] www.census.gov/quickfacts/fact/table/pointecoupeeparishlouisiana,LA/POP060210

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

5.5.2 Labor Costs

Risk Information: The average weekly wage in the first quarter of 2024 in the Pointe Coupée Parish was $1,053, lower than the statewide average of $1,195 and nationwide average of $1,527.[40] The average median household income (in 2023 dollars) in the parish was $59,351, similar to the state average of $60,000.[41]

Raw Risk Likelihood (RRL) The risk likelihood is deemed low, therefore the RRL is 4 out of 10.	**Score** **4**
Raw Risk Impact (RRI) The risk impact is deemed low, therefore the RRI is 4 out of 10.	**Score** **4**
Gross Risk Indicator (GRI) The Gross Risk Indicator (RRL X RRI) is 16 out of 100.	**Score** **16**
Mitigation/Notching *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is NN (No Notch).	**Notch** **NN**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **16**

[40] www.bls.gov/regions/southwest/news-release/countyemploymentandwages_louisiana.htm
[41] www.census.gov/quickfacts/fact/table/pointecoupeeparishlouisiana,LA/POP060210

SECTION E: TABLES AND FIGURES

Figure E-1. Merchantable Biomass of All Live Trees in the Supply Zone (2013-2021)[42]

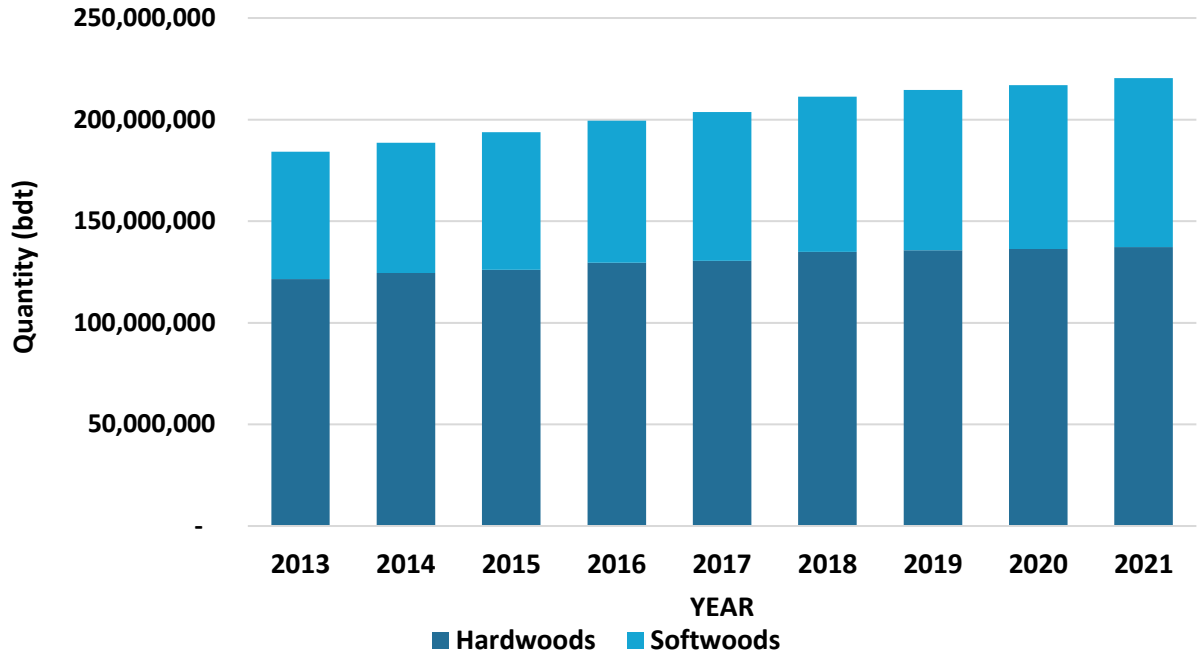
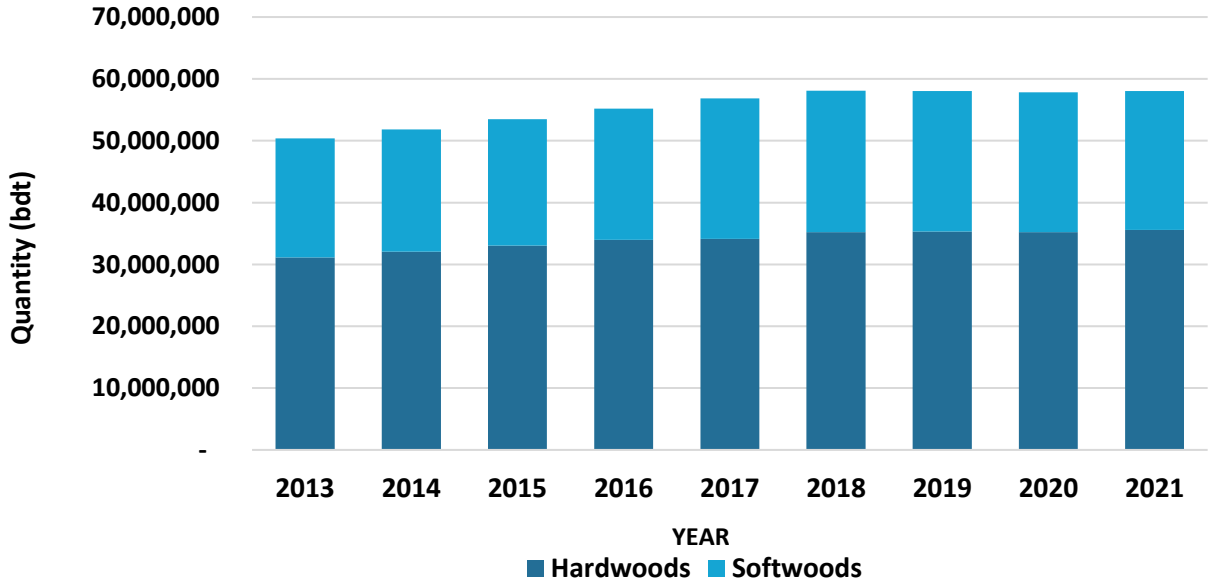


Figure E-2: Merchantable Biomass of Live Pulpwood Size Trees in the Supply Zone (2013-2021)[43]



[42] apps.fs.usda.gov/fiadb-api/evalidator. Variable 12000: Merchantable bole bark and wood biomass of live trees (timber species at least 5 inches d.b.h.), in dry short tons, on timberland
[43] Ibid.

Figure E-3. Percent Merchantable Biomass of Live Trees by Ownership[44]

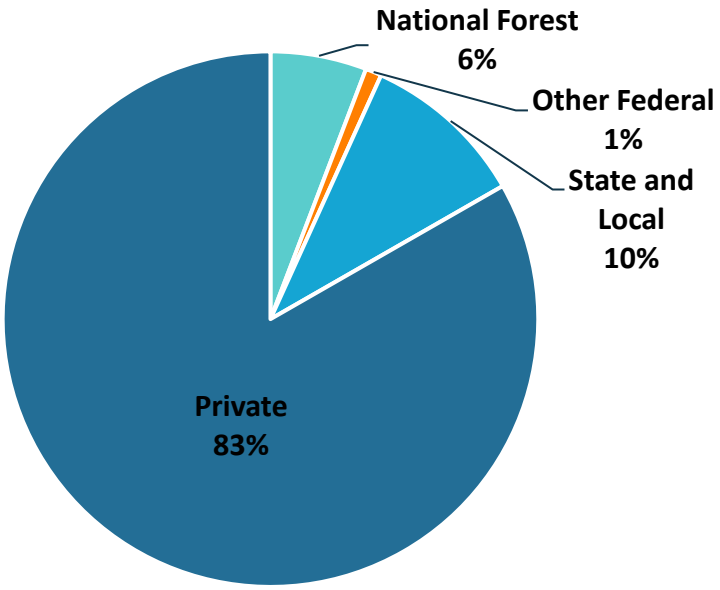
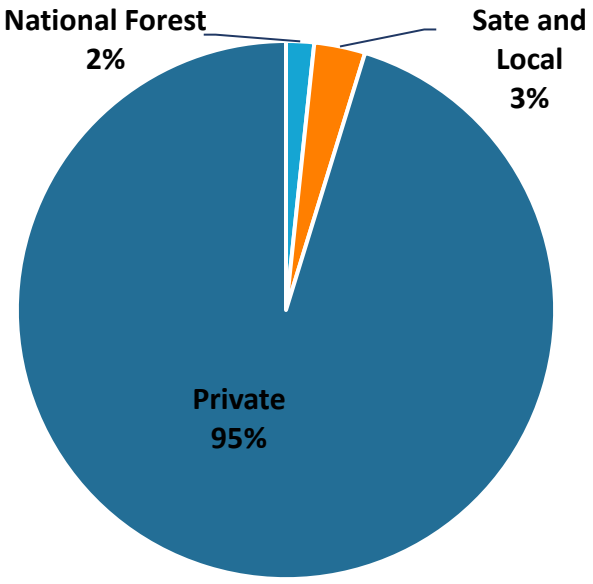


Figure E-4. Percent Timber Removal by Ownership[45]



[44] Ibid.
[45] Ibid. Variable: 574049 - Average annual removals of merchantable bole bark and wood biomass of growing-stock trees (at least 5 inches d.b.h.), in dry short tons, on timberland

Figure E-5. Distance-based Supply Curves of Sawmill Residues, Pulpwood, and Forest Residues Generated in the Supply Zone[46]

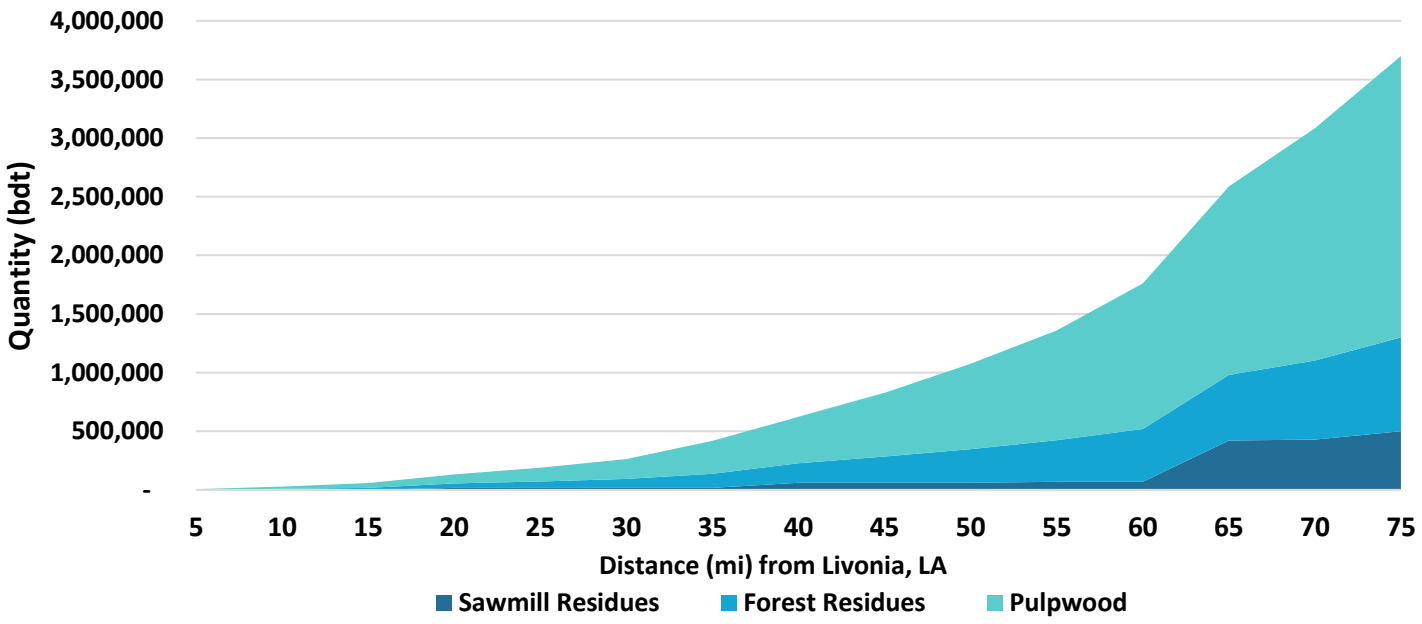
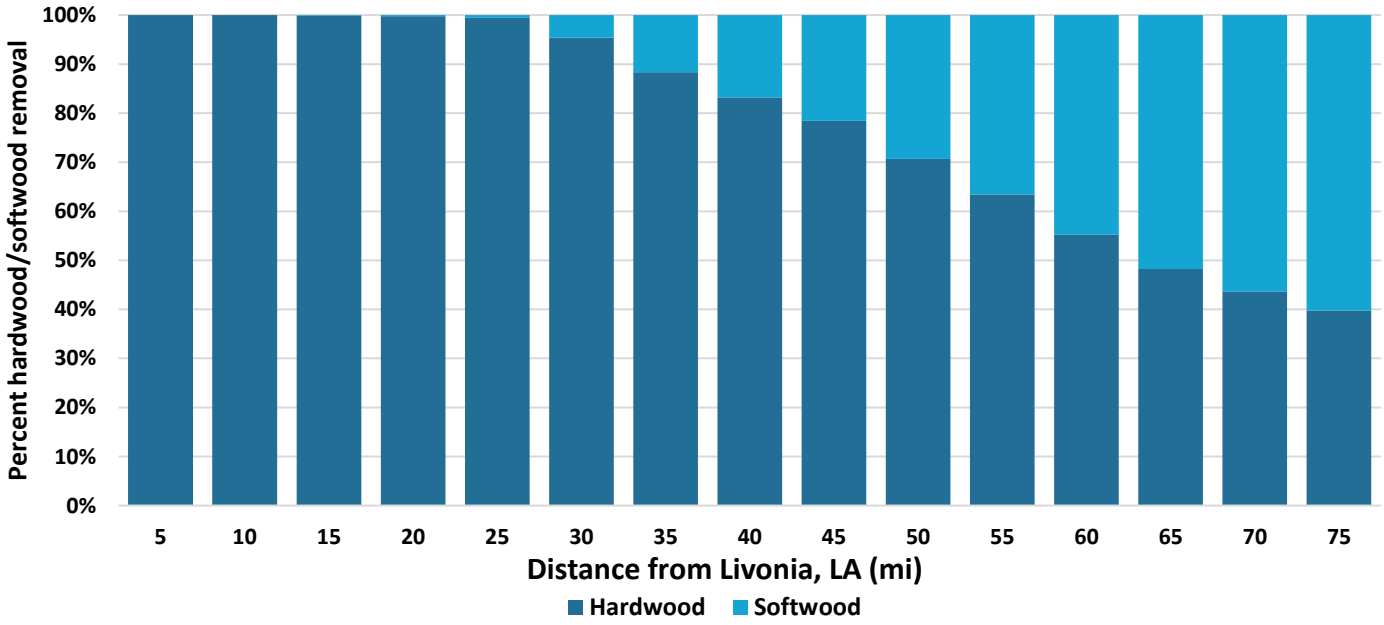


Figure E-6. Percent Average Annual Removals of Merchantable Wood (> 5 in DBH) by Distance from Livonia, LA and Major Species Group in the Supply Zone[47]



[46] apps.fs.usda.gov/fiadb-api/evalidator
[47] Ibid.

Figure E-7. Historical Real-term Delivered Price of Pulpwood (2024 $/bdt)[48]

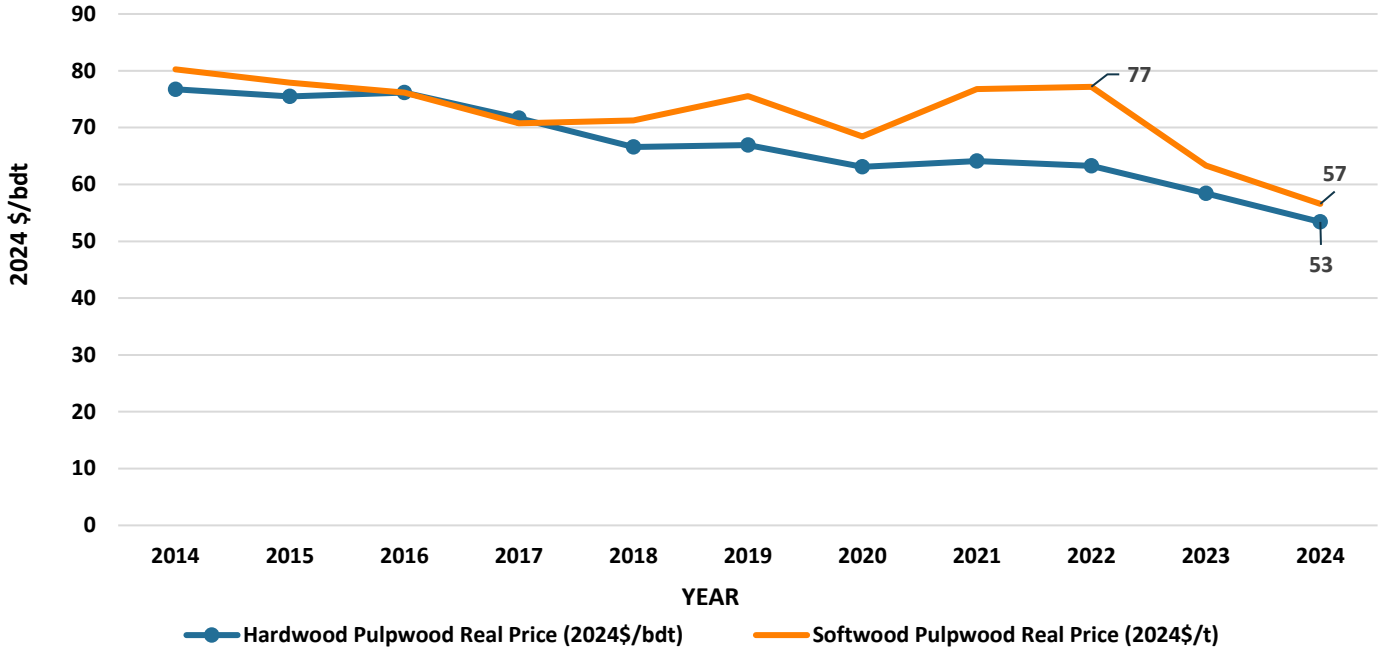
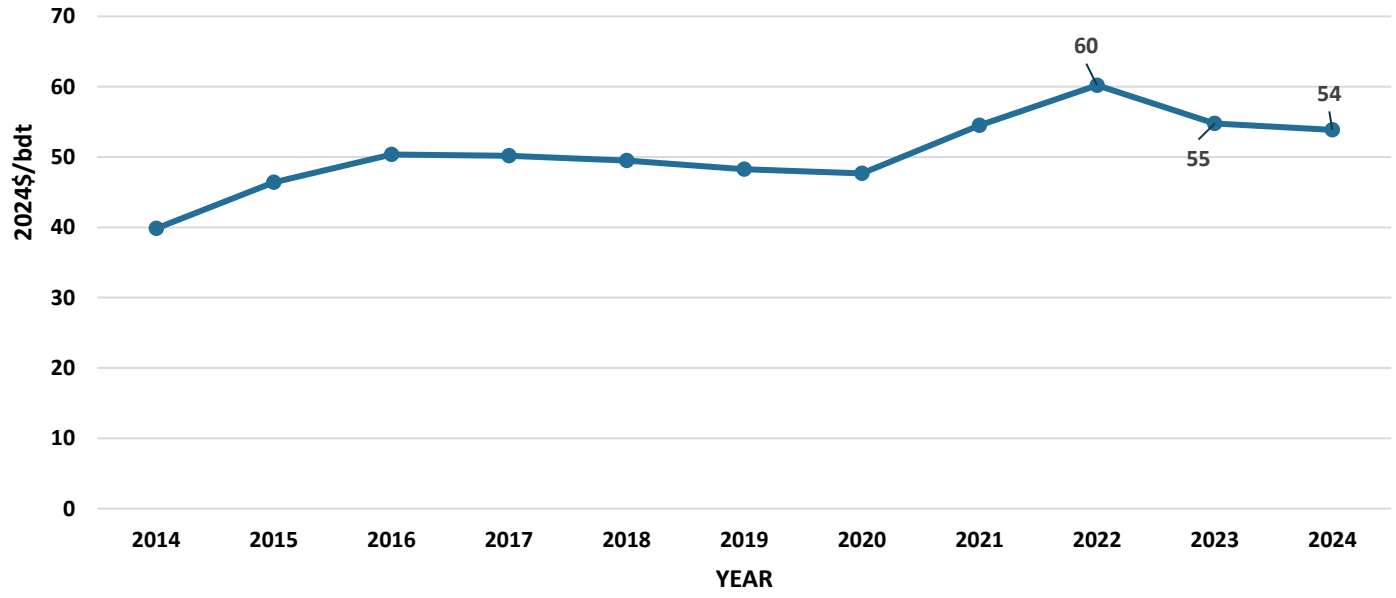


Figure E-8. Historical Real-term FOB Price of Sawmill Residues (2024 $/bdt)[49]



[48] Timber Mart South Q2 2024 report
[49] Ibid.

Figure E-9. Transportation Costs ($/bdt) by Distance from Livonia LA[50]

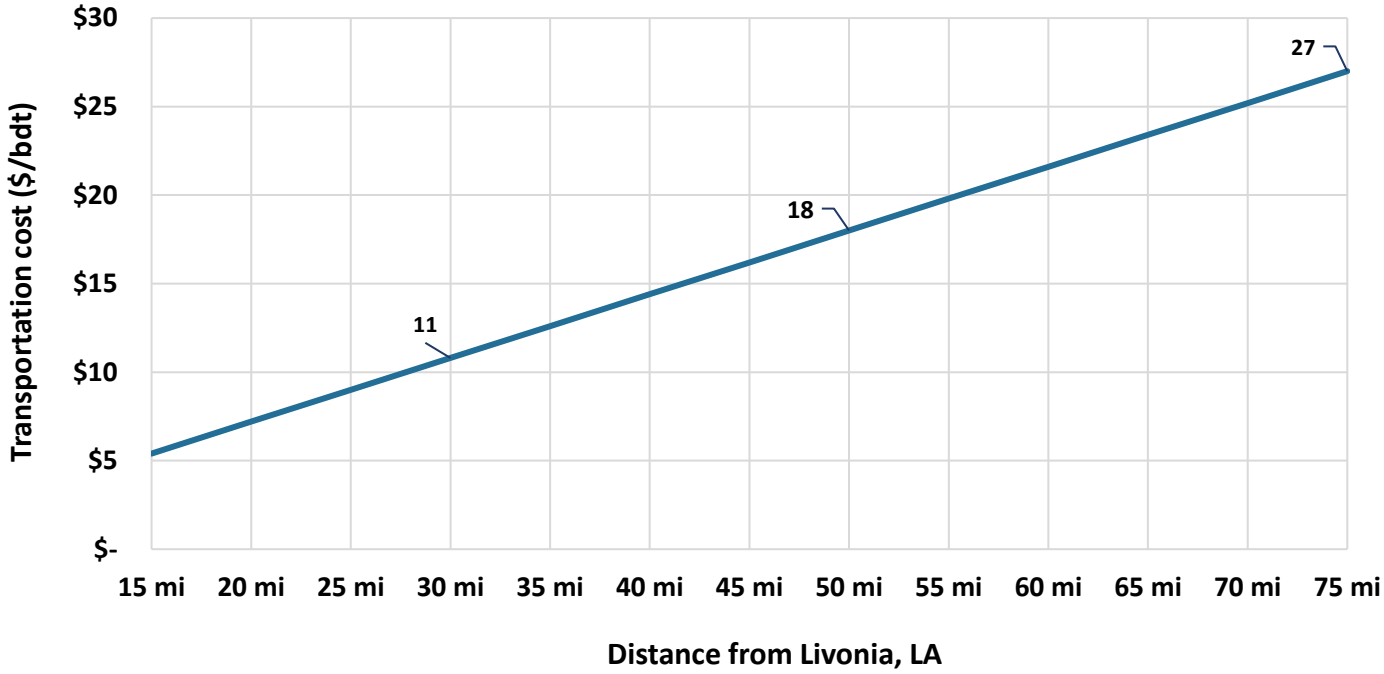
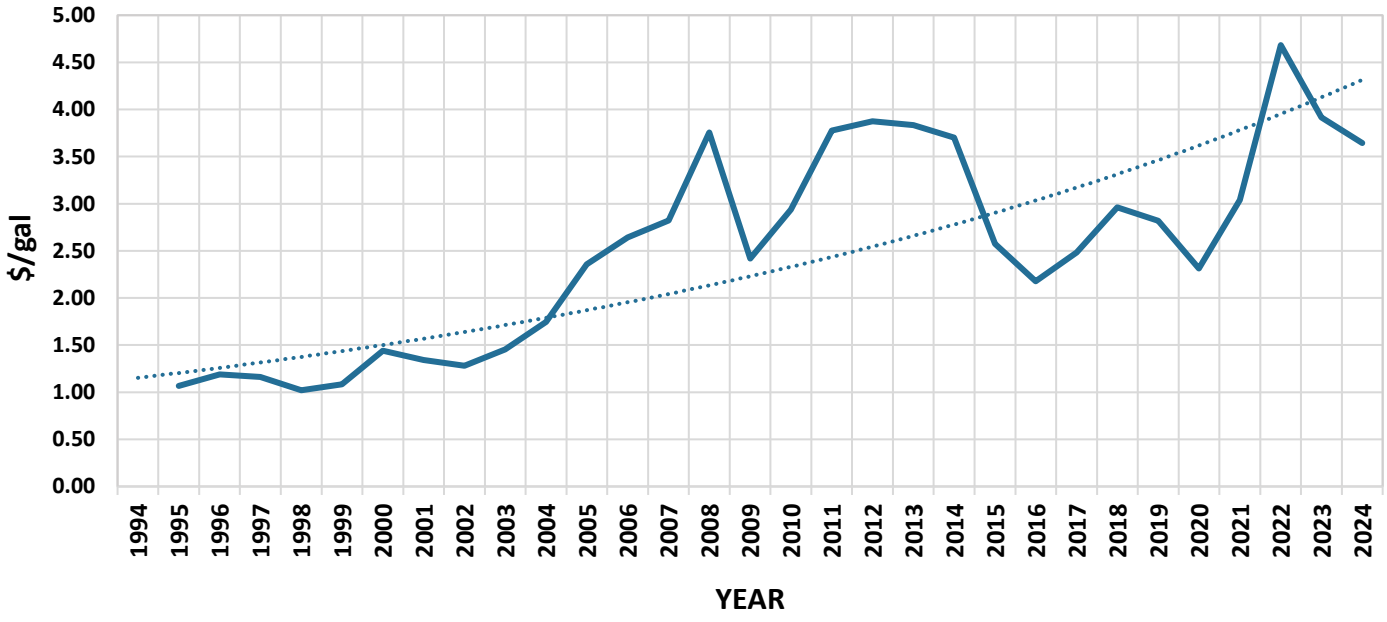


Figure E-10. Historical Diesel Prices ($/gal) and Trendline in the Gulf Coast Region (1994-2024)[51]



[50] Based on a rate of $0.18/t/loaded mile (Timber Mart South Supplement Q2 2024)
[51] www.eia.gov

Figure E-11. Producer Price Index (2010-2024)[52]

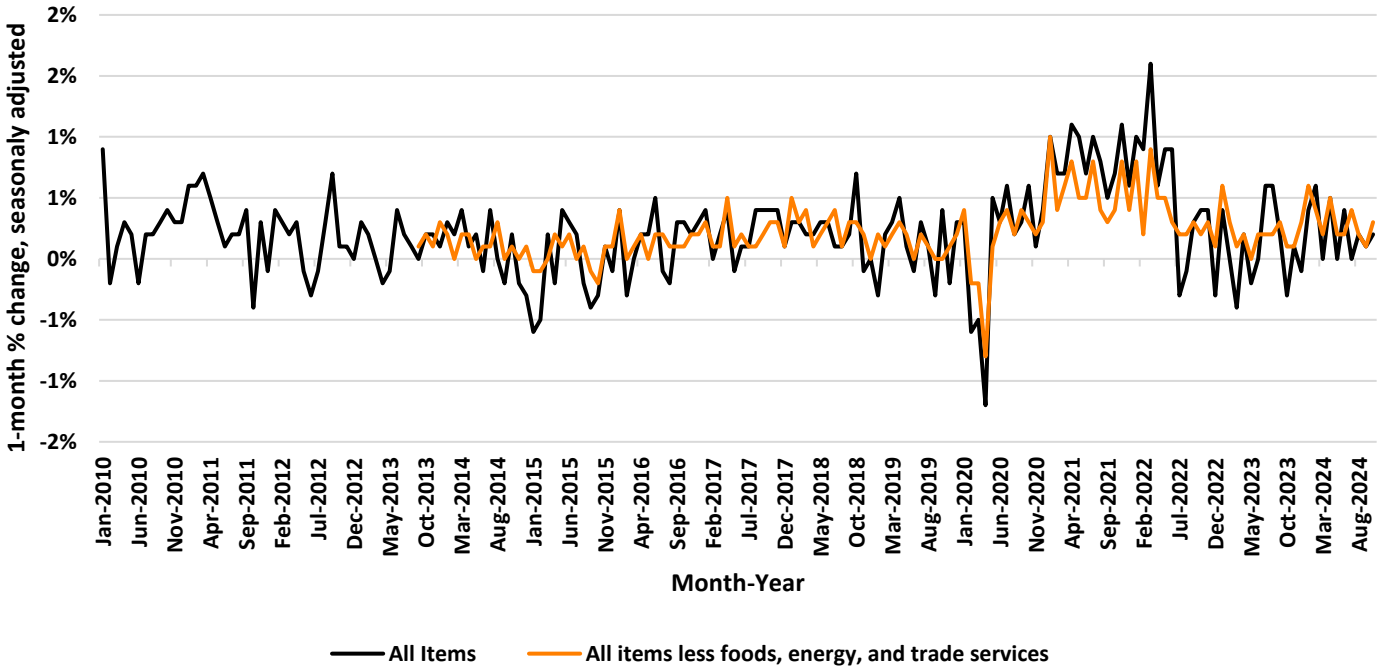
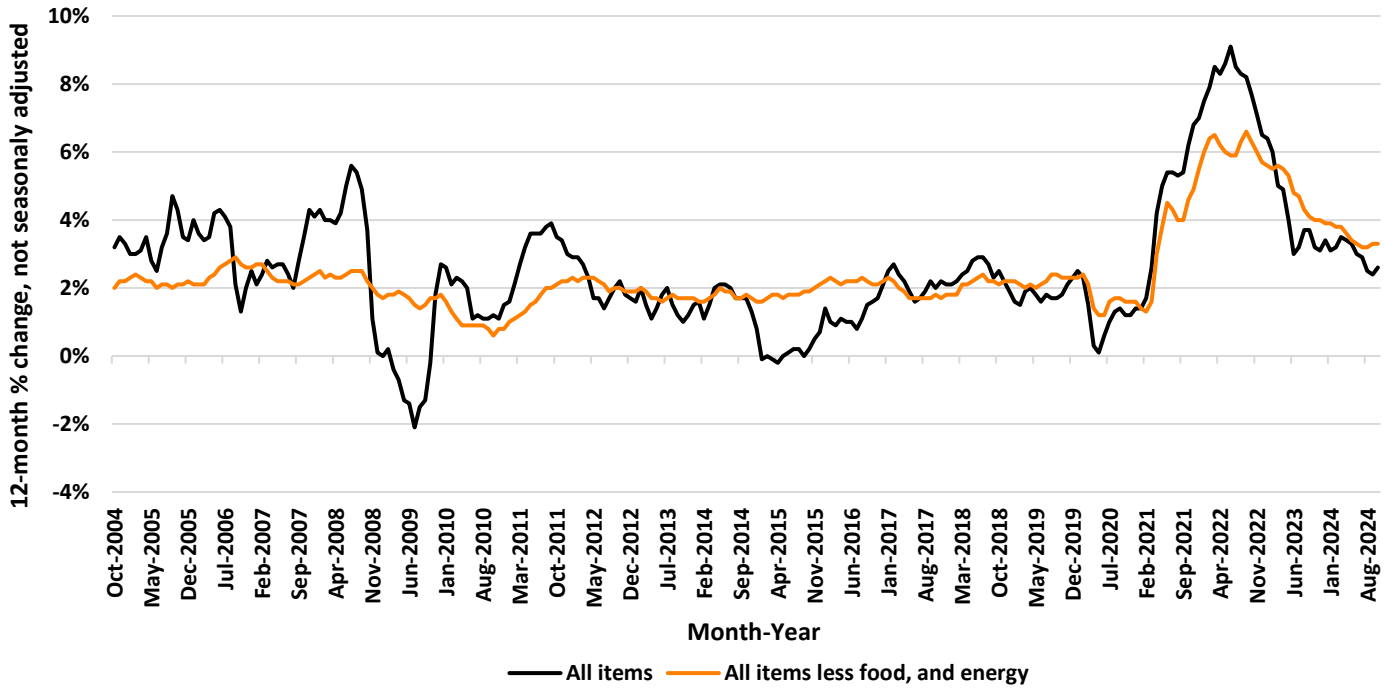
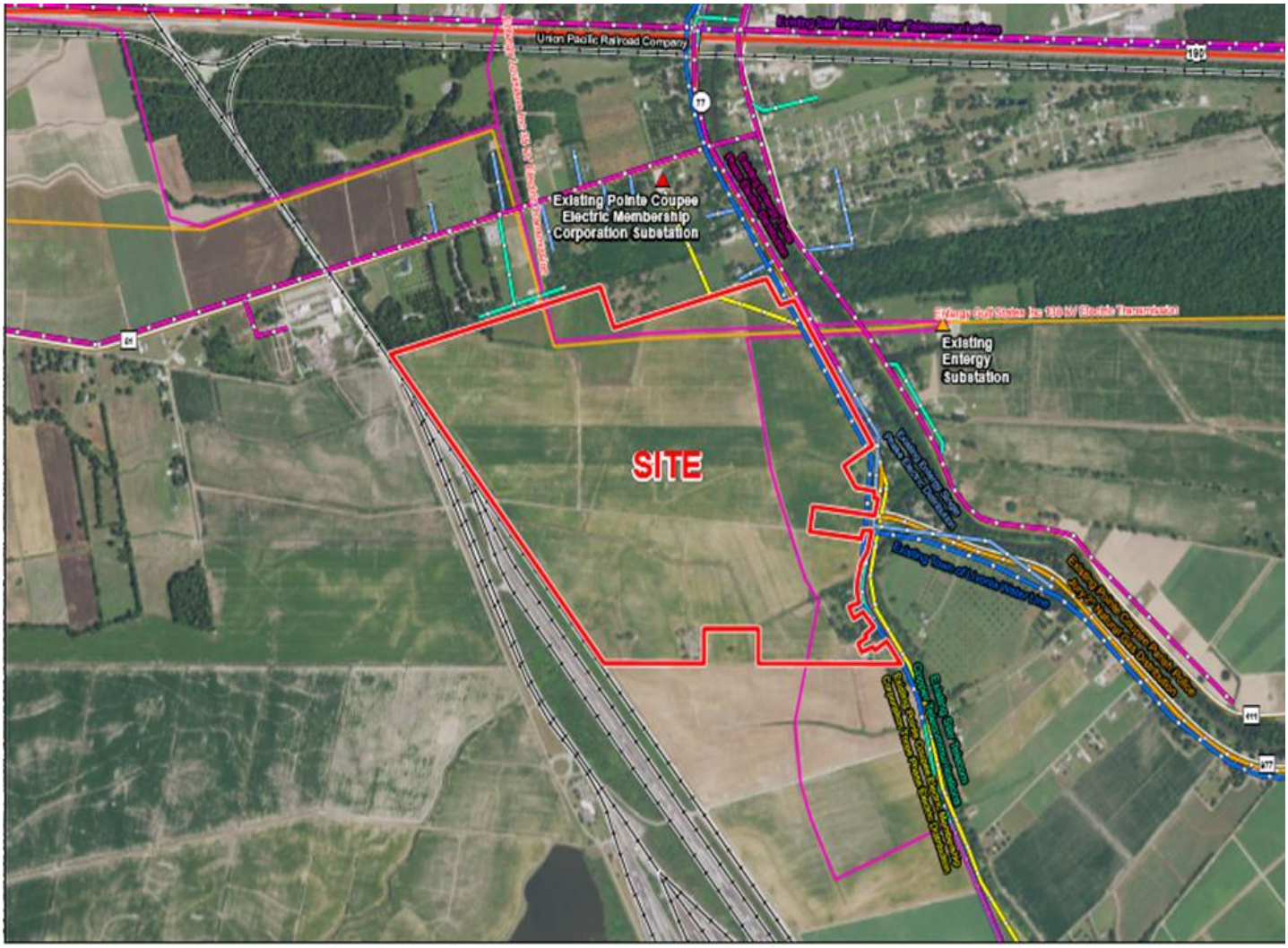


Figure E-12. Consumer Price Index (2004-2024)[53]



[52] www.bls.gov/charts/producer-price-index/final-demand-1-month-percent-change.htm
[53] www.bls.gov/charts/consumer-price-index/consumer-price-index-by-category-line-chart.htm

Map E-1. Woodley Site - Utilities



SECTION F: LEGAL DISCLAIMER

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