FALLS CITY, NE

Bioeconomy Development Opportunity Zone

RATING GRADE: 'A'

Date of Issue: September 23, 2024

A
High Quality

Rating Parameters:

Category	Rated Quantity	Delivered Price	BDO Zone Size
Corn stover	**600,000 bdt/yr**	**$95-$115/bdt**	**75-mi drive distance from Falls City, NE**

BDO ZONE ASSETS

- Many farmers and agricultural companies in the BDO Zone are already familiar with the logistics of bale production, storage, and transport.
- High crop yields provide feedstock supply assurances.
- Existing and planned corn stover bio-projects are located outside of the Competition Zone.
- Prospective project development site (Mid-America Rail Campus) with rail access, open zoning, and support for utilities upgrades by multiple levels of government.

BDO ZONE LIABILITIES

- Large investments in baling equipment are necessary to meet supply chain standards likely to be preferred by project developers.
- Meeting quality standards of bio-projects will be challenging due to lack of experience with bale production at scale.
- Inclement weather can restrict time window for efficient bale production and collection.

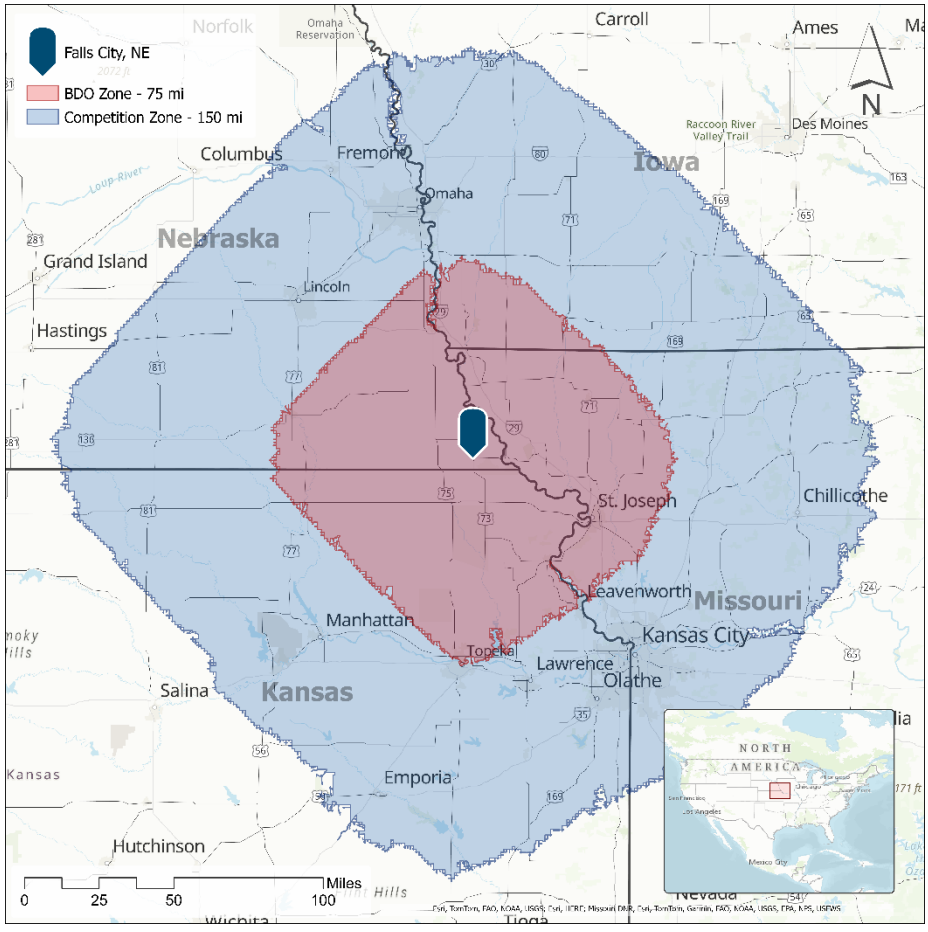
RATING GRADE

The Falls City, NE, Bioeconomy Development Opportunity 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 adverse weather, supply chain, economic, or infrastructure conditions than is the case for higher ratings.

FALLS CITY, NE BDO ZONE



BD|BIOECONOMY DEVELOPMENT
OZ|OPPORTUNITY ZONE INITIATIVE

ANALYST NOTES

A total of 600,000 bone dry tons (bdt) per year of corn stover is estimated to be available for new projects in the BDO Zone at low risk. This rated quantity accounts for current competition, supply chain constraints, and data/model uncertainty.

The average delivered price of corn stover is expected to range from $95-$115/bdt. This range accounts for operational costs, nutrient replacement costs, and supplier profit expectations.

The most significant risks to the rated quantity and pricing are associated with scale-up requirements, including the need for additional purchasing and/or leasing of large square baling units and 53-foot flatbed trailers. Medium risk indicators relate to supply chain logistics and the seasonality of corn stover collection (e.g., harvest and collection schedules, seasonal weather events). Competition-related risks are assessed as low due to methodology, which estimated stover availability for new projects after accounting for tillage practices and livestock industry demand. All other risk indicator categories present a low risk to the rated quantity and pricing.

BDO ZONE ASSETS

The only significant demand for corn stover in the BDO Zone comes from the corn industry. Approximately 58% of corn farmers utilize tillage management practices, incorporating stover into the soil for benefits related to erosion control and management of soil nutrients and organic matter content. It was assumed that corn stover would not be available from this market segment. The only other source of stover demand is the regional livestock industry, which is estimated to consume less than 5% of annually generated quantities. Although new markets for biofuels, chemicals, and other products have been growing recently in the American Midwest, all existing and planned facilities are located outside the Competition Zone.

Many Risk Indicators related to bale collection and transportation are associated with low risk. Although there is a significant equipment scale-up requirement, many experienced baling service providers, retailers, and operators are present in the BDO Zone. The presence of regional experience in baler operation and maintenance provides assurances that any logistical inefficiencies will be quickly resolved and delivered prices will remain within the estimated limits. Aspects of transportation conducive to bio-project development include low risk of public opposition to truck traffic, well-maintained road infrastructure, favorable transportation regulations, and local weight limits.

BDO ZONE LIABILITIES

Large bio-project developers will most likely prefer large square bales of the dimensions 3x4x8 feet and 4x4x8 feet. At present, no more than ten large square baling units are likely being operated in the BDO Zone. Although near-term supplies could be sourced using the existing capacity of round balers and medium-sized square balers, supply chain efficiencies can only be maximized in the long term with investment in hundreds of new equipment units.

Operational efficiency and feedstock quality are likely to be negatively affected during periods of heavy rainfall and in freezing conditions. Baling operations must occur during the window of time between corn grain combine harvesting and replanting. This window will vary from 40 to 150 days, depending on tillage practices. Inclement weather will inevitably shorten this window, potentially creating supply disturbances and reducing the quality of corn stover bales.

With respect to climate indicators, droughts, flooding events, and hail are all likely to impede corn stover production in many areas of the BDO Zone. The extent of this impact will most likely be limited. However, extended drought is common in the American Midwest over multidecadal time horizons and has led to prolonged downturns in crop yield.

INFRASTRUCTURE PROFILE

The Mid-America Rail Campus was evaluated as a potential project development site. The site is three miles south of Falls City, NE, and encompasses just over 1,000 acres. Rail transportation services are accessible through Union Pacific Railroad (UPRR) and Burlington Northern & Santa Fe (BNSF). Parcels from 5-300 acres with open zoning (no restrictions) are available for renewable energy projects. Utilities are in the area, with many being upgraded over the next two-to-three years for larger-scale projects to be located on the Campus.

The Falls City area provides housing and rental options that are both affordable and available. A qualified workforce is available locally and in the surrounding region to support new industries. See Section C for further details.

SCORING & RATING METHODOLOGY

In assessing the biomass supply chain risk for the Bioeconomy 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.

Feedstock quantities are expressed in bone dry tone per year (bdt/yr), while feedstock costs are expressed in United States dollars (USD). Maximum transport distance is based on a 75-mile driving distance from the center point (Falls City, Nebraska).

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 BDO Zone score for Falls City, NE, is ***21.29 out of 100, resulting in an 'A' designation.***

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

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BIOECONOMY DEVELOPMENT OPPORTUNITY ZONE PROGRAM
CERTIFIED 'A'

SECTION A: RISK INDICATOR SUMMARY

Figure A-1. All Risk Indicators

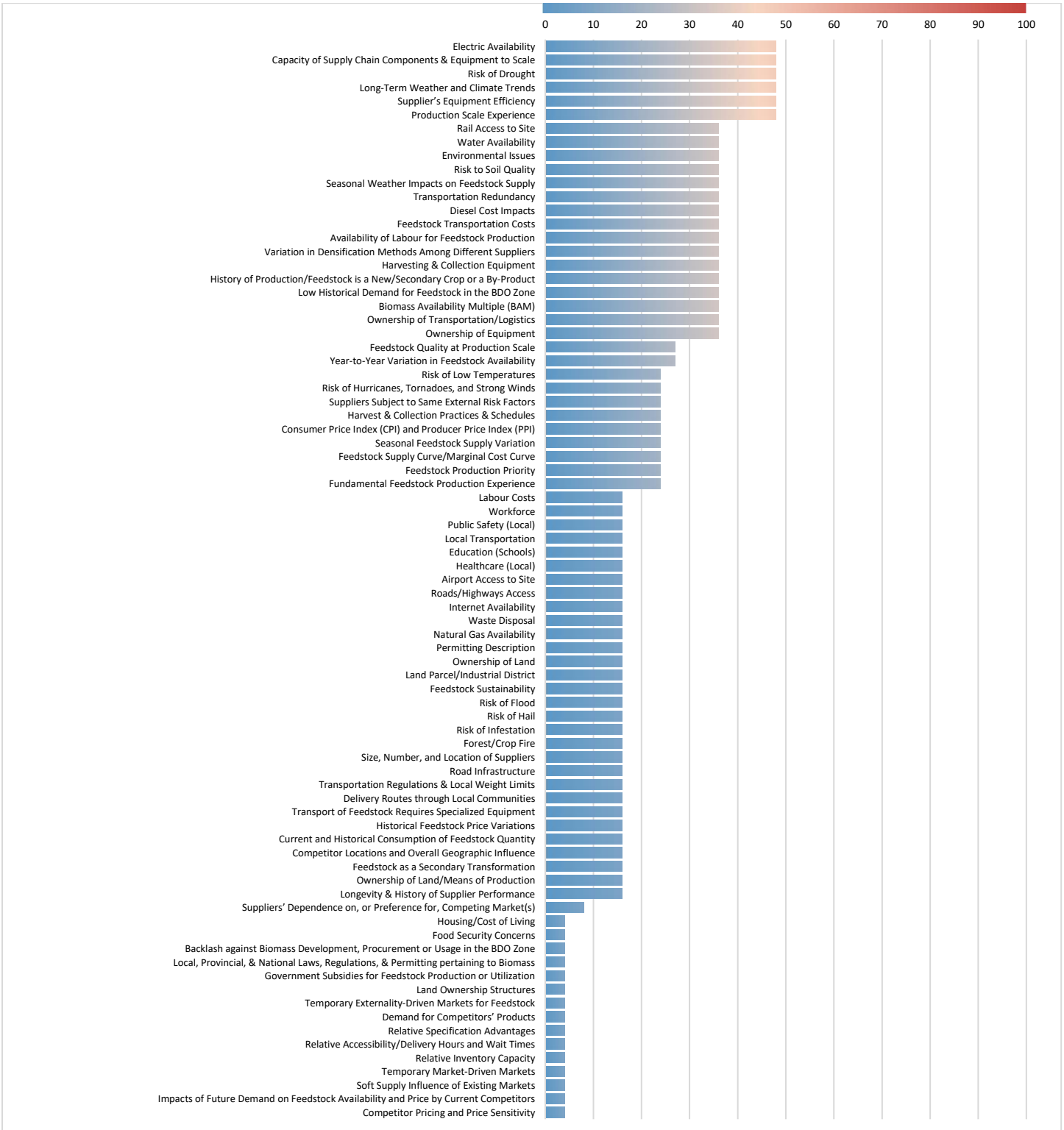


Table A-1. Risk Indicators and Associated Scores

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)	2	4	8	NN	8
1.3 Risk Factor: Supplier Control Over Production and Transportation					
1.3.1 Ownership of Land/Means of Production	4	4	16	NN	16
1.3.2 Ownership of Equipment	6	6	36	NN	36
1.3.3 Ownership of Transportation/Logistics	6	6	36	NN	36
1.3.4 Feedstock as a Secondary Transformation	4	4	16	NN	16
1.4 Risk Factor: Supplier Experience					
1.4.1 Fundamental Feedstock Production Experience	6	4	24	NN	24
1.4.2 Production Scale Experience	8	8	64	25%	48
1.5 Risk Factor: Supplier Harvesting/Collection/Processing Capacity					
1.5.1 Supplier's Equipment Efficiency	6	8	48	NN	48
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	2	2	4	NN	4
2.1.4 Impacts of Future Demand on Feedstock Availability and Price by Current Competitors	2	2	4	NN	4
2.1.5 Soft Supply Influence of Existing Markets	2	2	4	NN	4
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	2	2	4	NN	4
2.2.2 Relative Accessibility/Delivery Hours and Wait Times	2	2	4	NN	4
2.2.3 Relative Specification Advantages	2	2	4	NN	4
2.2.4 Demand for Competitors' Products	2	2	4	NN	4
Category 3.0: Supply Chain Risk					
3.1 Risk Factor: Feedstock Availability					
3.1.1 Biomass Availability Multiple (BAM)	6	6	36	NN	36
3.1.2 Feedstock Supply Curve/Marginal Cost Curve	4	6	24	NN	24
3.1.3 Seasonal Feedstock Supply Variation	4	6	24	NN	24
3.1.4 Year-to-Year Variation in Feedstock Availability	6	6	36	25%	27
3.2 Risk Factor: Historical Issues					
3.2.1 Historical Feedstock Price Variations	4	4	16	NN	16
3.2.2 Low Historical Demand for Feedstock in the BDO Zone	6	6	36	NN	36
3.2.3 History of Production/Feedstock is a New/Secondary Crop or a By-Product	6	6	36	NN	36
3.3 Risk Factor: Non-Weather Based Externalities					
3.3.1 Consumer Price Index (CPI) and Producer Price Index (PPI)	6	4	24	NN	24
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	2	2	4	NN	4
3.4 Risk Factor: Risks Related to Feedstock Production, Harvest, and Collection					
3.4.1 Harvest & Collection Practices & Schedules	4	6	24	NN	24
3.4.2 Harvesting & Collection Equipment	6	6	36	NN	36
3.4.3 Variation in Densification Methods Among Different Suppliers	6	6	36	NN	36
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	6	36	NN	36
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	4	4	16	NN	16
3.5.7 Transportation Redundancy	6	6	36	NN	36
3.6 Risk Factor: Supply Chain Resiliency					

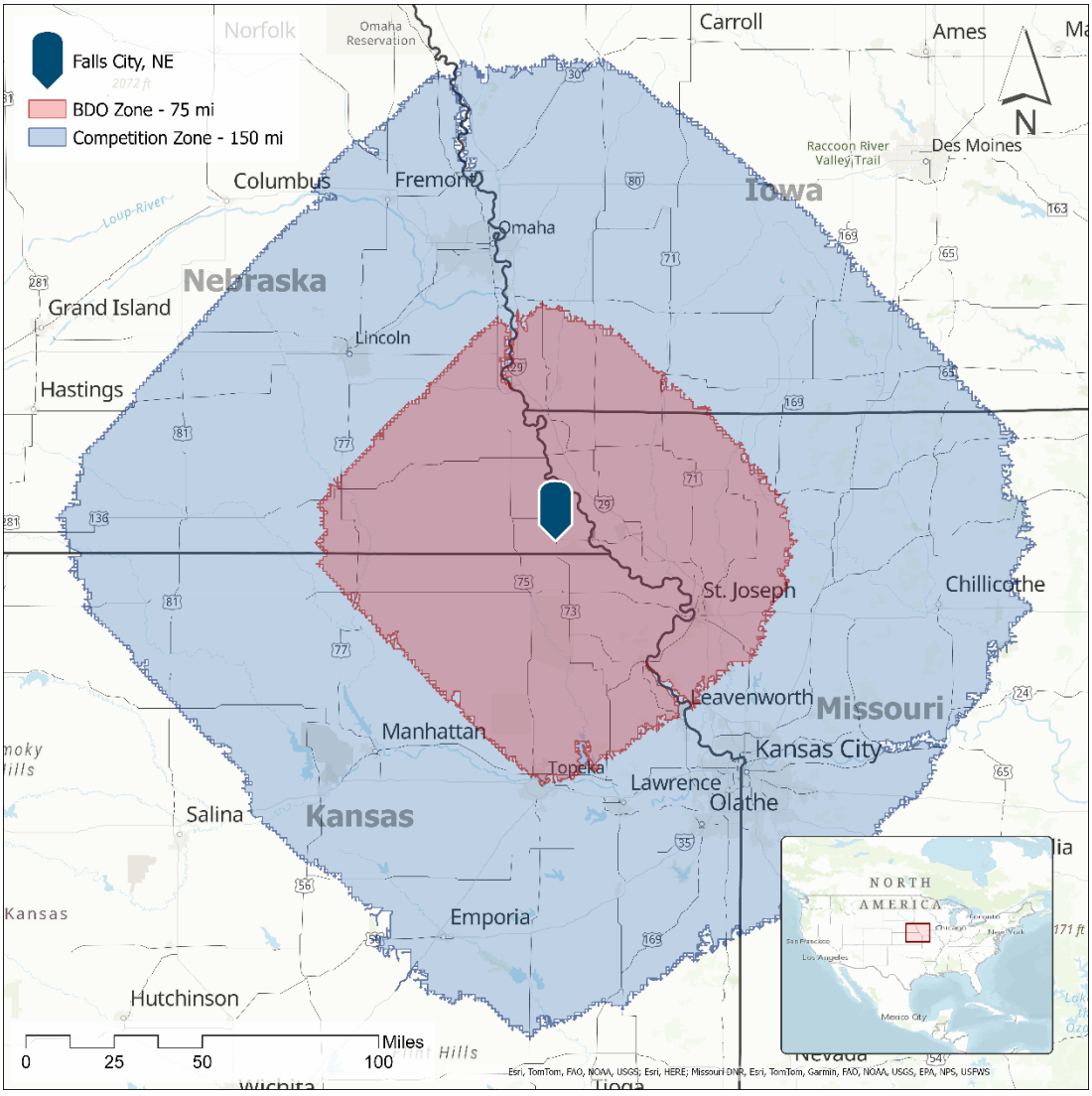
3.6.1 Size, Number, and Location of Suppliers	4	4	16	NN	16
3.6.2 Suppliers Subject to Same External Risk Factors	4	6	24	NN	24
3.6.3 Land Ownership Structures	2	2	4	NN	4
3.7 Risk Factor: Climate and Natural Risks					
3.7.1 Seasonal Weather Impacts on Feedstock Supply	6	6	36	NN	36
3.7.2 Long-Term Weather and Climate Trends	8	6	48	NN	48
3.7.3 Forest/Crop Fire	4	4	16	NN	16
3.7.4 Risk of Infestation	4	4	16	NN	16
3.7.5 Risk of Hail	4	4	16	NN	16
3.7.6 Risk of Flood	4	4	16	NN	16
3.7.7 Risk of Drought	8	6	48	NN	48
3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds	6	4	24	NN	24
3.7.9 Risk of Low Temperatures	4	6	24	NN	24
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	2	2	4	NN	4
3.8.4 Consent of, and Cooperation with, Indigenous Communities and First Nations	NR	NR	NR	NR	NR
3.8.5 Food Security Concerns	2	2	4	NN	4
3.9 Risk Factor: Sustainability and Environmental Concern					
3.9.1 Feedstock Sustainability	4	4	16	NN	16
3.9.2 Risk to Soil Quality	6	6	36	NN	36
3.9.3 Risk to Surface and Groundwater	NR	NR	NR	NR	NR
3.9.4 Water Use	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	NR	NR	NR	NR	NR
3.9.7 Biomass Classified as Genetically Modified Organism (GMO)	NR	NR	NR	NR	NR
Category 4.0: Feedstock Scale-up Risk					
4.1 Risk Factor: Feedstock Scale-Up					
4.1.1 Feedstock Quality at Production Scale	6	6	36	25%	27
4.1.2 Capacity of Supply Chain Components & Equipment to Scale	8	8	64	25%	48
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	4	4	16	NN	16
5.2.2 Electric Availability	6	8	48	NN	48
5.2.3 Water Availability	6	6	36	NN	36
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	6	6	36	NN	36
5.3.3 Airport Access to Site	4	4	16	NN	16
5.3.4 Water Freight Access	NR	NR	NR	NR	NR
5.4 Risk Factor: Social Infrastructure					
5.4.1 Healthcare (Local)	4	4	16	NN	16
5.4.2 Education (Schools)	4	4	16	NN	16
5.4.3 Local Transportation	4	4	16	NN	16
5.4.4 Public Safety (Local)	4	4	16	NN	16
5.4.5 Housing/Cost of Living	2	2	4	NN	4
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	**21.29**

SECTION B: BIOMASS AVAILABILITY AND PRICING

OVERVIEW

BDO Zone Risk Indicators are scored with reference to specific feedstock quantities and prices. The rated quantities are determined by estimating the potential amount of biomass feedstock that can be produced within the BDO Zone, defined by a 75-mile drive distance from Falls City, NE (Map B-1). This estimate of total potential is reduced based on the estimated demand for biomass in the Competition Zone (150-mile drive distance from Falls City, NE). A Biomass Availability Multiple (BAM) is then applied to further reduce the available amount given supply chain constraints (e.g., operational, accessibility, and market constraints). The resulting rated feedstock quantities are conservative estimates of availability for new projects. The price range associated with each rated quantity is determined through outreach and market analysis in the Competition Zone and reflects the anticipated price that a new bio-project would have to pay to secure the rated quantity of biomass.

Map B-1. Map of BDO Zone and Competition Zone



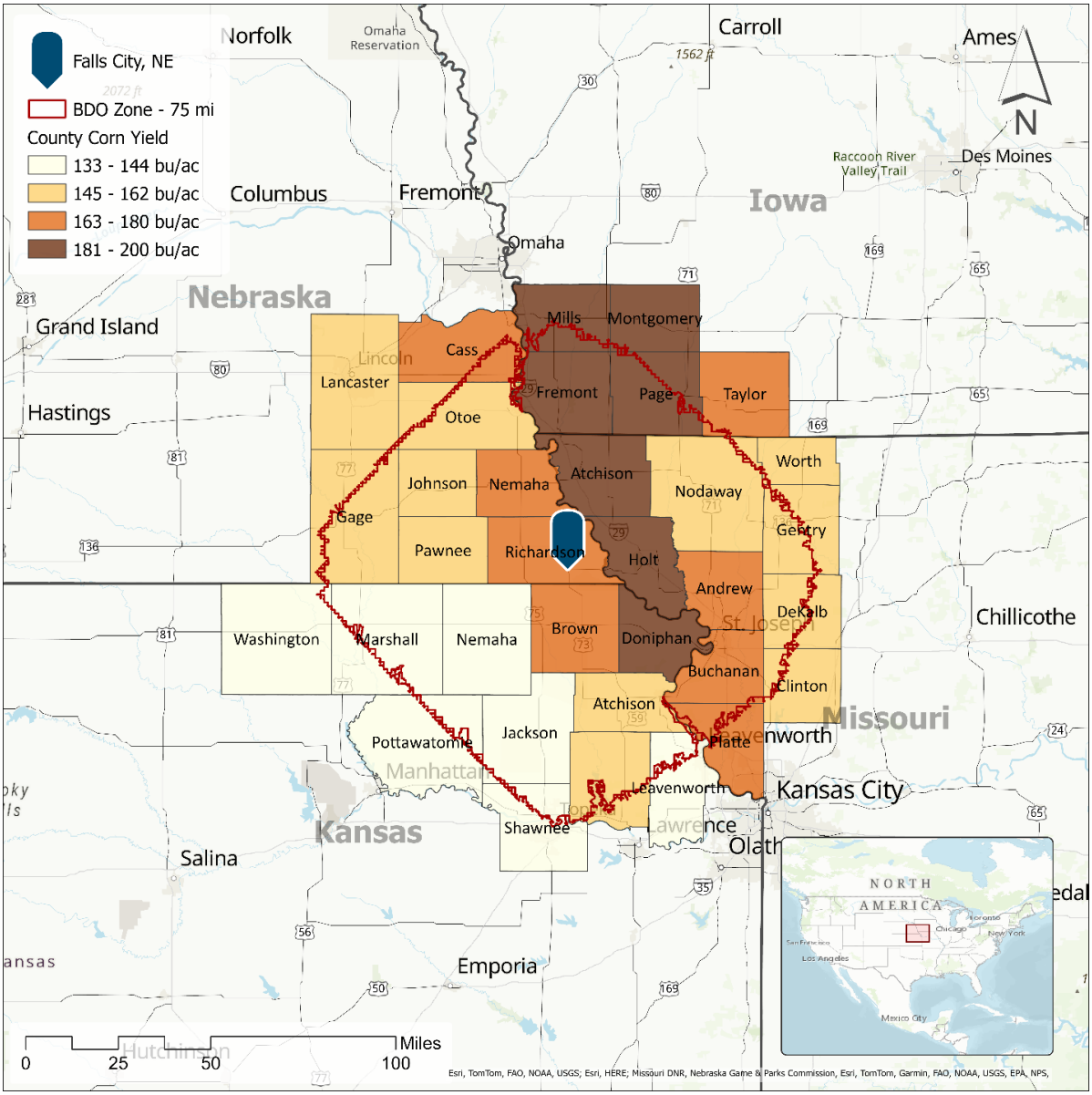
EVALUATED FEEDSTOCKS

Corn stover: The leaves and stalks of corn plants that remain in the field following combine harvesting of corn grain.

SUPPLY ANALYSIS

The Falls City, NE BDO Zone occupies a ~12,000 square mile area that includes southeast Nebraska, southwest Iowa, northeast Kansas, and northwest Missouri (Maps B-1, B-2). Ten-year average corn yields vary significantly among counties included in the BDO Zone, from 133 to 200 bushels per acre (Map B-2). High-yield counties (>163 bu/ac) are concentrated near the center point of the BDO Zone, extending to southwest Iowa and northwest Missouri. Corn is typically cropped in successive years with occasional cropping of soybeans.

Map B-2. Map of BDO Zone – Location and Corn Yield Values, by County



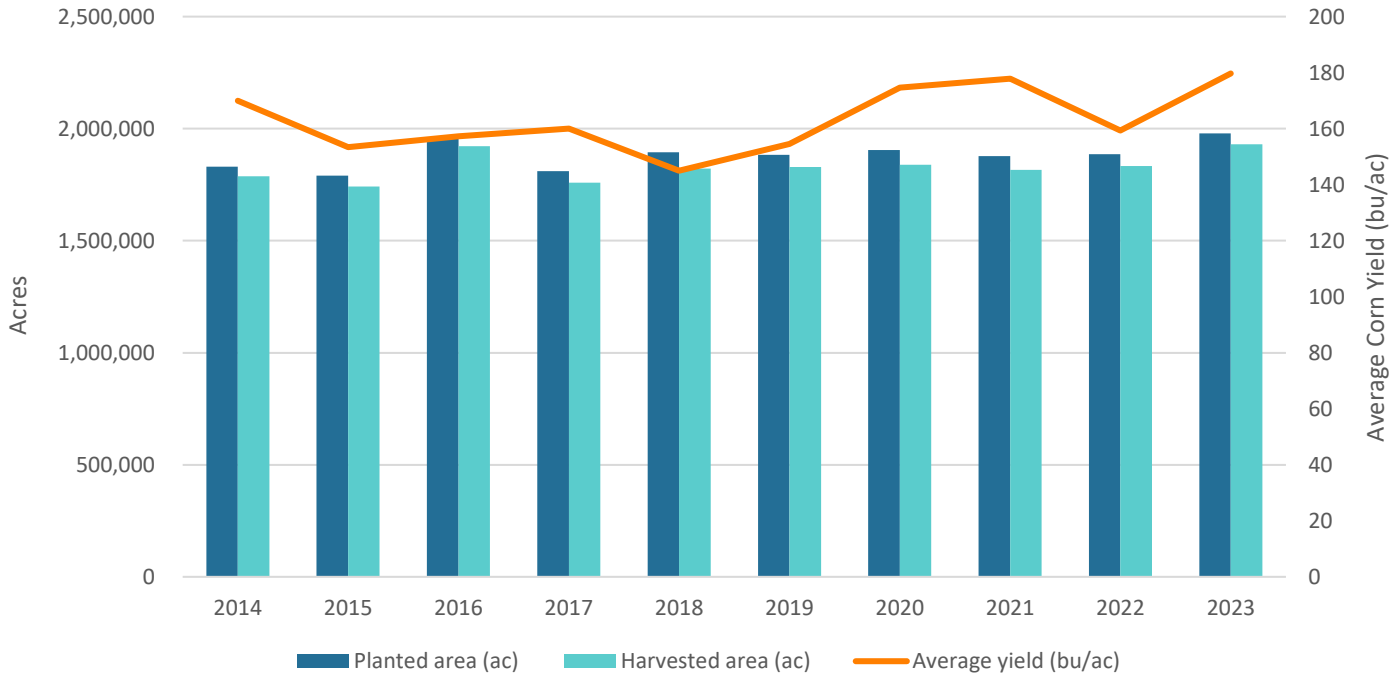
Average annual corn stover production in the BDO Zone is estimated to be approximately 6.5 million bdt/yr (Table B-1). Figure B-1 shows that the corn grain industry in the BDO Zone has maintained relatively constant productivity over the past decade. Average yield reached 180 bu/ac in 2023 after dropping to 145 bu/ac in 2018. Year-to-year variation in planted area and harvested area over the 2014-2023 period did not exceed 9%. Interannual fluctuations in planted and harvested areas can be attributed to precipitation patterns and extreme weather events such as droughts, floods, and hailstorms.

Table B-1. Generation of Corn Stover*

Parameter or Output	Value
Average annual harvested area (ac)	1,828,000
Average annual grain yield (bu/ac)	164
Average annual grain production (green tons)[1]	8,394,000
Stover/grain ratio	1:1
Average corn stover moisture content (wet basis)	22%
Average annual corn stover production (bdt)	6,547,000

***Numbers may not add due to rounding**

Figure B-1. Historical Planted and Harvested Area and Average Corn Yield



COMPETITION ANALYSIS

The primary use of corn stover in the BDO Zone is for soil management purposes. Approximately 58% of corn farmers in the BDO Zone till soils before planting, incorporating stover into the soil for benefits related to erosion control and

[1] 1 bushel = 0.028 short tons (green)

retention of moisture, nutrients, and organic matter.[2] It is assumed the corn stover will not be available from farmers that utilize tillage management practices. Corn stover is also used in relatively small quantities as an animal bedding material and feed when forage grasses, hay (e.g., alfalfa), corn grain, and other sources are not available in sufficient quantities.[3] Advanced biofuel and RNG facilities in the American Midwest that are currently utilizing corn stover are located outside of the Competition Zone and, therefore, are not expected to affect availability and pricing for new projects. A new corn stover-to-liquid fuel project in Phelps County, NE (230 miles from Falls City) was announced in August of 2024. Operations are expected to begin in 2030.[4]

After accounting for current demand for stover, we estimate that approximately 63% of the total amount of corn stover generated annually in the BDO Zone is currently utilized and unlikely to be available for future bio-projects (Table B-2). Note that a new developer would likely secure some portion of this quantity once the supply chain is demonstrated and further details regarding farmers' contract and price expectations are resolved.

Table B-2. Current Demand for Corn Stover*

Parameter or Output	Value
Average annual corn stover production (bdt)	6,547,000
Current demand for corn stover based on tillage practices	58%
Current demand for corn stover by livestock industry	5%
Total current demand for corn stover (bdt)	4,125,000

***Numbers may not add due to rounding**

RATED QUANTITIES AND PRICING

Given the results of the supply and competition analyses, we estimate that 37% of the corn stover that is generated annually (2.4 million bdt/yr) could be available to new projects at low-to-moderate risk for the rated price range. The fraction of this available quantity that is recovered during field operations (e.g., cutting, windrowing, and baling) will depend on the collection efficiency of equipment and methods used. We assume a collection efficiency of 75%.[5] Therefore, after accounting for collection efficiency, the final estimated amount of corn stover that could be available to new project is 1,800,000 bdt/yr.

To determine the rated quantity of corn stover, we apply a Biomass Availability Multiple (BAM) of 3.0x to the estimate of potential availability. The BAM was selected to account for uncertainty in underlying data, models, participation rate, supply chain efficiency, and fluctuations in corn stover production and demand. The resulting rated quantity of 600,000 bdt/yr represents 9% of the total estimated corn stover production in the BDO Zone, given production trends over the past decade. The quantity of corn stover that can be brought to market is expected to increase following the construction of a project and the establishment of proof-of-concept supply chains. Calculations are summarized in Table B-3.

[2] https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/
[3] Annual consumption has likely never exceeded 5% of total corn stover production in the region.
[4] https://dgfuels.com/2024/08/07/phelps-county-selected-for-dg-fuels-first-midwest-sustainable-aviation-fuel-plant/
[5] Actual collection efficiencies for large square bales will depend on the methods and equipment used to windrow stover before baling (e.g., Prewitt et al. 2007. Corn stover availability and collection efficiency using typical hay equipment. Transactions of the ASABE 50(3): 705-711).

Table B-3. Annual Corn Stover Availability and Rated Quantity*

Parameter or Output	Value
Average annual corn stover production (bdt)	6,547,000
Total current demand for corn stover (bdt)	4,125,000
Stover collection efficiency	75%
Potential annual availability of corn stover (bdt)	1,800,000
BAM	3.0
Rated Quantity (bdt)	600,000
Removal % from total	9%

***Numbers may not add due to rounding**

The delivered price is estimated to range from $95.30/bdt to $116.40/bdt, or $47.60/bale to $58.20/bale. The final rated delivered price range was rounded to $95-$115/bdt. Table B-4 indicates how the delivered price range for the rated quantity of corn stover is estimated using various cost components. Each bale is assumed to weigh about 0.5 bdt. Estimated delivered prices inferred from the cost analysis in Table B-4 were validated through outreach and literature review.[6]

Table B-4. Farm Gate and Delivered Price Ranges[7]

Price Component	$/bdt	$/bale
Chopping/Windrowing[8]	$7.2-$8.8	$3.6-$4.4
Baling[9]	$27.0-$33.0	$13.5-$16.5
Moving/Stockpiling[10]	$3.6-$4.4	$1.8-$2.2
Nutrient Replacement Value[11]	$17.6-$21.5	$8.8-$10.7
Producer Markup[12]	$11.1-$13.5	$5.5-$6.8
Calculated price at farm gate	$66.5-$81.2	$33.2-$40.6
Loading/unloading cost[13]	$6.3-$7.7	$3.2-$3.9
Average Transportation Cost (50-mi)[14]	$22.5-$27.5	$11.3-$13.8
Delivered Price	$95.3-$116.4	$47.6-$58.2

[6] Expected delivered price was $25-$60/bale ($50-$120/bdt). See also https://www.ams.usda.gov/mnreports/ams_2935.pdf.
[7] To obtain ranges, published ranges were used. For parameters with no published range available, ranges were obtained by assuming variance of +/- 10%.
[8] https://extensionpubs.unl.edu/publication/ec823/2024/pdf/view/ec823-2024.pdf
[9] Ibid.
[10] Ibid.
[11] See Table E-1, Section E.
[12] Assumes 20% producer markup.
[13] Equivalent to loading/unloading costs in Minnesota and Iowa.
[14] Assumes $5/mile (one way) (e.g., $5/mi x 100 miles / 20 bdt = $25/bdt).

OPERATIONAL CONSIDERATIONS

Reliable recovery of the rated quantity of corn stover (600,000 bdt/yr) would require approximately 120 balers (round or square), 120 bale collectors, and 240 tractors,[15] and approximately 40 trucks with 53-ft flatbed trailers.[16] There is a sufficient number of round baling equipment, tractors, and 53-ft flatbed trailers to meet this demand. 2022 Census data indicates that approximately 19,000 tractors and 2,800 balers are present in the BDO Zone.[17] With regards to transportation equipment, a large company with up to 200 53-ft flatbed trailers is located within the BDO Zone, and there are a number of farmers who own at least one 53-ft flatbed trailer.

Square balers are less common in the BDO Zone. We identified fewer than 10 square baling units through direct outreach to farmers in the region. Most of these balers are medium-sized, producing bales of the dimensions 3x3x8 ft. Biorefineries and other projects that utilize large quantities of baled corn stover are expected to prefer large square bales of the dimensions 3x4x8 ft and 4x4x8 ft, as this maximizes payload, facilitates ease of storage and processing (when covered storage sites are available), and improves worker safety.

Therefore, if a new project does, in fact, prefer large square bales, up to 120 new large square balers will have to be purchased or leased. While a portion of the equipment could be sourced directly by farmers, baling service providers, and other small- to medium-sized businesses in the area, a new project proponent will likely have to make investments in large square baling equipment and associated workers. Overall, these considerations present a significant scale-up risk that is assessed in the Risk Indicators below.

[15] Assumes that one baling unit and two tractors are required for each operation. One tractor is used to pull the baler and the other tractor pulls the bale collector. Both tractors are assumed to have a productivity of 25 bales/hour and are assumed to operate 10 hours/day for 40 days/year. This is a conservative estimate of equipment requirements.

[16] Assumes a payload of 18 bdt per truck for round bales (36 bales per truck) and 20 bdt per truck for square bales (40 bales per truck), 240 days/year, and 3 trips/day. See Figure E-1.

[17] Values adjusted for county overlap with BDO Zone (quickstate.nass.usda.gov).

SECTION C: INFRASTRUCTURE

PROPERTY OVERVIEW

Address:	70326 652 Avenue
City:	Falls City, Nebraska
County:	Richardson
Acres:	1017
Pricing Note:	$25K/acre
Lease Available:	No
Topography:	Flat on southern Plots, rolling hills in northwest, flood area west of rail line
Zoning:	Industrial-Light, Commercial

SITE CONTACTS

Lucas Froeschl
Falls City Economic Development and Growth Enterprise, Inc (EDGE)
1705 Stone Street
Falls City, NE 68355
P: 402-245-2105
director@fallscityedge.com

ADDITIONAL NON-RATED SITES

Infrastructure Site Contact
Bob Buckingham
BDO Zone Infrastructure
bob@ecostrat.com

PROPERTY PROFILE

The Mid-America Rail Campus is a 1000-acre complex located 3 miles south of Falls City, Nebraska. The Rail Campus' location provides access to a major commercial railroad carrier (Union Pacific). Parcels between 5 and 300 acres with open zoning (no restrictions) for renewable energy projects are available. Utilities are being upgraded to accommodate larger scale projects.

Transportation

Nearest Highway: U.S. Highway 73 & U.S. Hwy 159 (0.1 Miles)
Nearest Interstate: I-29 (25.00 Miles)
Nearest Airport: Kansas City International (MCI) 90 miles
Rail Served: Yes, Union Pacific
Rail Accessible: Yes
Rail Infrastructure in Place: Yes

Electric Service

Supplier: Falls City Utilities
Website: www.fallscitynebraska.org/falls-city/utilities
Ownership: Municipal
Phone: 402-245-2722
All Utilities Extend to Site: Yes
Nearest Substation: 3 miles
Capability: Currently, there is a 3-Phase overhead, distribution lines (12.5kv), and minimal available capacity. System to be upgraded to full industrial capacity with state grant of $15 million.

Natural Gas

Supplier: Falls City Utilities
Website: www.fallscitynebraska.org/falls-city/utilities
Ownership: Municipal
Phone: 402-245-2722
Size of Main: 6"-12"
Pressure: 50 psi
Capability: Gas is in the vicinity but not to the site.

Water

Supplier: Rural Water Dist. #2
Website: www.fallscitynebraska.org/falls-city/utilities
Ownership: Municipal
Phone: 402-245-3128
Size of Main: 4"
Peak Capacity: N/A
Capability: Water system to be upgraded when the park is annexed by City – 2025-2026.

Wastewater

Supplier: Rural Water Dist. #2
Website: www.fallscitynebraska.org/falls-city/utilities
Ownership: Municipal
Phone: 402-245-3128
Size of Main: 8"
Capability: Water system to be upgraded when the park is annexed by City – 2025-2026.

Telecommunications

Supplier: Southeast Nebraska Comms.
Website: http://sentco.net/
Ownership: Investor Owned
Phone: 402-245-4451
Platforms: Fiber, wireless
Capability: Primary wireless and fiber optics are available.

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: Farms are generally family owned and have been managed over multiple generations. The longevity of businesses in the region is bolstered by corn market growth: between 2017 and 2022, the value of corn sales in Nebraska increased from $5.6 billion to $9.3 billion.[18]

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**

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: Corn stover purchasers are restricted to cattle ranchers, dairy farmers, and other owners and managers of livestock. The quantity of stover bought and sold within the BDO Zone is less than 65,000 bdt/yr. The main buyers of corn stover (e.g., the Nebraska livestock industry) are concentrated in the western and northeastern parts of the state.[19]

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 low, therefore the RRI is 4 out of 10.	**4**
Gross Risk Indicator (GRI)	**Score**

[18] https://agecon.unl.edu/2022-census-agriculture-nebraska-highlights
[19] https://www.nefb.org/02/27/2023/counting-counties-cows/

The Gross Risk Indicator (RRL X RRI) is 8 out of 100.	**8**
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 8 out of 100.	**Score** **8**

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: All farmland in the BDO Zone is owned by, or leased from, private landowners (farmers). Leasing arrangements are legally binding and have been common to American Midwest agriculture for decades.

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**

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 farmer and 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. For example, when harvesting agricultural residues such as corn stover, using a third-party company with standard equipment specializing in harvesting, collection, and transportation may decrease quality variations (e.g., ash content) of the final feedstock.

Risk Information: Many round balers currently in use in the BDO Zone are suited only to the processing of lighter feedstocks such as winter wheat, alfalfa, and other thin grasses. Efficient collection of corn stalks at scale will require heavy-duty square balers. There are at least two large suppliers of heavy-duty balers in the region, providing direct baling, baler leasing, and baler maintenance services. Square balers are uncommon within the BDO Zone, and they are

used mainly to meet the bedding and feedstock needs of the livestock industry. For the rated quantity (600,000 bdt/yr), it is expected that suppliers and project proponents would be able to manage bale production, delivery, and storage in initial years using existing round bale infrastructure. Scale-up to the rated quantity would occur over a period of three to five years and would likely involve mass investment in square balers.

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**

1.3.3 Ownership of Transportation/Logistics

Rationale: In most cases, suppliers that own or lease transportation equipment necessary to transport biomass from forests or fields 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: Trucks and flatbed trailers present in the BDO Zone are owned by a large number of small- and medium-sized enterprises, including farmers and trucking companies. There is one large transportation company in the region with a fleet of 200 trucks and flatbed trailers. There are also at least five transportation service companies in the region with fleets of 3-10 trucks that have experience hauling bales. The rated quantity (600,000 bdt/yr) would require up to 65 trucks equipped with 53-ft flatbed trailers. Transportation service companies in the region are expected to make additional investments in trucks and trailers to meet market demand for the rated prices, if required.

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**

1.3.4 Feedstock as a Secondary Transformation

Rationale: Secondary transformation is dependent upon the production of primary products. Forest residues, corn stover, 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.

In the case of agricultural feedstocks, such as corn stover, the feedstock is a by-product of a primary crop. Since the primary crop is significantly more lucrative than the residue, it will be a priority for the producer. If the production of the primary crop requires resources to be taken away from the production of the secondary crop (e.g., shorter harvesting windows due to weather), the secondary feedstock supply will suffer. In times of stretched resources, suppliers may also perceive the harvest and collection of the feedstock as a nuisance, potentially decreasing production levels.

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

Risk Information: Corn stover production is dependent on the production of corn grain, which is in turn dependent on planted and harvested area, corn grain yield, weather, corn grain markets, and other factors. Planted and harvested area and yield in the BDO Zone have been stable over the past ten years (Figure B-1). The rated quantity of corn stover is equivalent to approximately 9% of average stover production over the 2014-2023 period, providing assurances that any significant reductions in future planted or harvested area and yield will have limited impacts on corn stover supply.

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**

1.4 Risk Factor: Supplier Experience

1.4.1 Fundamental Feedstock Production Experience

Rationale: Risk is higher when suppliers have limited experience with planting, growing, harvesting, processing, and/or collecting biomass. Limited experience may be common for stover or forest residue supply chains where farmers or forestry producers may have no previous experience.

Risk Information: Corn stover is generally not compatible with the light-weight balers that are used by farmers for hay production. However, heavy-duty round balers are already present in the region and farmers/baling service providers have operational experience. At least two companies in the area provide specialized heavy-duty baler services, including sales, maintenance, and baling. Although only a small fraction of the stover produced annually is baled and brought to market, local knowledge and experience with light-weight hay baling, the presence of specialized heavy-duty balers, and the simplicity of baler operation and maintenance provides assurances of supply efficiency.

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**

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: Less than 32,500 bales of corn stover are currently produced in the BDO Zone annually. There have been no previous examples of large-scale stover supply chains. Producing the rated quantity of feedstock (600,000 bdt/yr) would require that bale production, storage, and transportation activity increase by a factor of 40x relative to historical levels. Baling, bale storage, and transportation at this scale is unproven.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed high, therefore the RRL is 8 out of 10.	**8**
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 64 out of 100.	**64**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)*	**25%**

There are large companies in North America that specialize in agricultural residue harvesting, with fleets of over 100 tractors and required equipment. A project proponent could leverage this resource, thereby reducing the impact of limited production scale experience within the BDO Zone.

The Total Notch (RRL Notch) X (RRI Notch) is 25%.

Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 64 out of 100.	**48**

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: The efficiency of bale production and collection can range from 25-50 bales per working hour. Balers (round and square) are of relatively simple design, enabling ease of operation and maintenance. However, the efficiency of corn stover bale supply chains at scale is unproven. There are a number of factors that are likely to impede supply chain and equipment efficiency in initial years, including timing of operations to ensure that grain harvesting and replanting operations are not affected and operator consistency.

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) 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**

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 corn stover (e.g., corn) or forest residues (e.g., pulpwood), supply may not be a top priority for a supplier.

Risk Information: The prevalence of no-till management of corn crops in the BDO Zone expands the window of time when baling operations can occur relative to other areas in the Midwest. In years with relatively low precipitation, corn

stover baling can occur during the winter months. On farms where tilling occurs after combine harvesting, the expectation is that baling operations will have a window of approximately 40 days.[20]

With regards to trucking, larger transportation companies contacted during outreach indicated a hesitancy to allocate trucks and trailers to a new corn stover supply chain due to the expectation of low rates relative to other cargo (e.g., forest products, vehicles). The rated price range was adjusted upwards to account for this concern. It is expected that a proponent willing to pay a delivered price of $95-$115/bdt ($48-$58/bale) would ensure the participation of larger trucking companies in the region.

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: Approximately 42% of farmers in the BDO Zone do not utilize tilling management practices and, therefore, are most likely to supply corn stover to a new developer. Markets for corn stover are restricted to the livestock industry and do not exceed 5% of total generation (~300,000 bdt/yr). Livestock producers are concentrated at a distance from Falls City, NE, in northern Nebraska and northwestern Iowa.[21] All advanced biorefineries in the region are located outside of the Competition Zone.

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**

[20] Confirmed during outreach. See Mason City, IA BDO Zone.
[21] https://www.nass.usda.gov/Statistics_by_State/Nebraska/Publications/County_Estimates/23NEcattle.pdf; https://www.iowafarmbureau.com/Article/Livestock-and-Poultry-In-Iowa

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 The Loaded RI Score ((1-Total Notch) X GRI Score) is 16 out of 100.	**Score** **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: As described in Risk Indicator 2.1.1, current demand for corn stover produced from no-till operations is very low. There has been no point in history when corn stover markets were significant in the region.

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**

2.1.3 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: There is no significant competitor in the Competition Zone that could control pricing given low current demand and the large quantity of corn stover that is potentially available.

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 *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 4 out of 100.	**4**

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: Tillage practices are slow to change and livestock industry demand for corn stover is weak. There is very low risk that use of corn stover by farmers and the livestock industry will increase over time.

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 *RRL Mitigation (Notch)* No adjustment. *RRI Mitigation (Notch)*	**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 4 out of 100. **4**

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: Existing markets for corn stover are weak and, therefore, unable to exert high degrees of pressure over local suppliers.
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)* **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 4 out of 100. **4**

2.1.6 Temporary Market-Driven Markets

Rationale: Alternative, non-traditional, market-driven competitors for feedstock can drive feedstock demand in unusual circumstances. A BDO Zone Rating Issuer based on corn stover as a feedstock, for example, would not typically compete with higher-end animal feed markets due to quality issues. However, in times of significant hay shortage (e.g., during drought), farmers use corn stover in place of hay, driving the price of feedstock and decreasing availability for bio-projects.[22]
Risk Information: There are no non-traditional markets for corn stover.
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)* **NN**

[22] Bergtold, 2018.

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 4 out of 100.	**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. 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: There are no significant competitors in the Competition Zone.

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**

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: Local competing markets are weak, and therefore, there is no risk associated with the Risk Indicator.

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)	**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 4 out of 100.	**4**

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: Current buyers of corn stover require baled products (round or square) with low moisture content (<22%). These demands are currently met by bale producers in the region. The low current demand for corn stover negates any potential competitor feedstock specification advantage.

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.	**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 4 out of 100.	**4**

2.2.4 Demand for Competitors' Products

Rationale: Increased demand for the competitor's final product can cause an 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: Traditional markets for corn stover (on-farm soil management, livestock bedding, and fodder) are not expected to increase significantly in future years. New markets, including for biofuels, chemicals, and other products, have been expanding recently in the American Midwest, but all facilities (planned and operational) are located outside of the Competition Zone.

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 *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**

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 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: As presented in Section B – Rated Quantity and Pricing, a BAM value of 3.0x was selected to account for uncertainty in producer participation, scale-up readiness, data and model accuracy, and other factors. The resulting rated quantity of corn stover (600,000 bdt/yr) is equivalent to approximately 9% of the total amount of corn stover that is available after applying a 75% collection efficiency.

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**

3.1.2 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, and 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 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: The supply curve shown in Figure E-6 shows that approximately half of total corn stover production (3,200,000 bdt/yr) is located within a 50-mile drive distance of Falls City, NE. It is possible that a new project could restrict transportation of the rated quantity (600,000 bdt/yr) to within a 50-mile transport distance, thereby ensuring that delivered costs remain within the rated price range ($95-$115/bdt). However, the location and size distribution of corn farmers willing to participate in a future corn stover supply chain is presently unknown.

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**

3.1.3 Seasonal Feedstock Supply Variation

Rationale: Biomass supply can present significant seasonal supply variations. Seasonal supply variations combined with limitations associated with longer-distance transportation and storage can lead to BDO Zone biomass supply imbalances[23] and can manifest in shortages and higher costs for Issuers.

Risk Information: Corn stover baling occurs following corn harvesting during the months of September, October, and November. Baling operations on croplands that are not tilled can occur anytime between September and February (a stover collection window of up to approximately 150 days). For croplands that are tilled, baling operations are restricted to the window of time between corn harvesting and tilling operations (approximately 40 days). In both situations, baling operations are vulnerable to seasonal weather changes, including extended periods of rainfall or freezing conditions. The prevalence of no-till management practices in the BDO Zone reduces risk.

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**

[23] Golecha & Gan, 2016.

The Gross Risk Indicator (RRL X RRI) is 24 out of 100.	**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**

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, particularly with agricultural biomass.

Risk Information: Corn production in the BDO Zone has been steady over the past decade (Figure B-1). Production was supported by a long-term increase in corn prices and subsequent revenue gains (Figure E-2).[24] However, interannual corn prices in the Midwest are known to vary by as much as +/- 30%. Prolonged multi-year droughts are also common in the American Midwest and will have significant impacts on future corn grain and stover production. For example, prolonged droughts were experienced in Nebraska from 1884-1895, 1906-1913, 1931-1940, and 1952-1957.[25] Significant year-to-year variations in feedstock availability are therefore expected to occur in future years.

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)* Declines in stover availability during periods of prolonged drought can be managed to some extent through stockpiling of square bales in covered storage areas. The Total Notch (RRL Notch) X (RRI Notch) is 25%.	**Notch** **25%**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is 27 out of 100.	**Score** **27**

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.

[24] The value of corn sales in Nebraska increased from $5.6 billion to $9.3 billion between 2017 and 2022 (https://agecon.unl.edu/2022-census-agriculture-nebraska-highlights)
[25] https://extensionpubs.unl.edu/publication/g1551/2005/pdf/view/g1551-2005.pdf

Risk Information: Hay bale prices in Nebraska and elsewhere in the American Midwest are known to increase significantly during periods of high demand for fodder in the livestock industry. In recent years, prices in some parts of Nebraska have fluctuated from a low of $25/bale to a high of $60/bale.[26] However, given the low demand for corn stover relative to supply potential, historical price variation is likely related to inadequate bale production. Risk of continued feedstock price variation is expected to be low for new projects supporting the production of corn stover bales at scale.

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**

3.2.2 Low 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: Corn stover bale production in the BDO Zone has never occurred at scale. Livestock industry demand is estimated to equate to less than 5% of the available resource (65,000 bdt/yr). Risks associated with lack of regional demand and experience are moderated by the relative simplicity of bale supply chains, including the ease of use of baling technology and conventional storage, loading, and transport requirements.

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**

[26] Based on outreach and the Direct Hay Report (https://www.ams.usda.gov/mnreports/ams_2935.pdf)

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**

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

Rationale: If 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 crop or by-product producers may be less likely to prioritize production.

For new crop types, inexperience in planting, harvest, collection, and yield data may pose higher levels of risk.

If feedstock is a secondary transformation (i.e., wheat straw, corn stover, or forest residue), then production can be subject to variables beyond suppliers' control (e.g., changing demand for sawtimber, or primary crop prices).

Risk Information: Corn stover bale supply chains involve relatively simple equipment and routine procedures. However, corn stover collection and transport have never occurred at scale in the BDO Zone. Farmers may be hesitant to accommodate baling operations if there is risk that such operations will interfere with tilling, nutrient management, or planting.

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**

3.3 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: The Midwest CPI and national PPI spiked considerably during 2021-2022 period as a result of the COVID-19 pandemic, lockdowns, and related global supply chain disruptions. These inflation trends have begun to

stabilize since 2023, due in part to Federal Reserve interest rate hikes. The current Federal Reserve monetary policy strategy is to gradually reduce interest rates as inflation levels decline, with the goal of facilitating a long-term interest rate of 2%.[27] Despite recent improvements in CPI and PPI numbers (Figures E-4 and E-5), the future state of the economy remains more uncertain than the period preceding the hyperinflation of 2021-2022.

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**

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.

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**
Click or tap here to enter text.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.

Raw Risk Likelihood (RRL)	**Score**

[27] https://www.federalreserve.gov/monetarypolicy.htm

The risk likelihood is deemed not relevant, therefore the RRL is not rated (NR).	**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** **NR**
Loaded RI Score The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**Score** **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. For example, an Issuer using corn stover as a feedstock would not typically compete with the higher-end animal feed market. However, in times of significant hay shortage (e.g., during drought), farmers may use corn stover as hay replacement, driving the price of stover feedstock and decreasing its availability for bio-projects.[28]

Risk Information: No non-traditional or externality-driven sources of feedstock demand were identified.

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**

3.4 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, agricultural feedstocks and energy crops have optimal harvesting windows to ensure minimal moisture content. In certain BDO Zones, these harvesting windows may coincide with heightened weather risks, such as frost or rain.

[28] Bergtold, 2018.

For forestry biomass, 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: Corn stover bale supply chain practices are relatively simple, involving the use of low-tech mechanical balers and routinized storage and transportation practices. However, the time window available for stover baling and collection can be constrained as a result of agricultural practices (e.g., timing of combine harvesting, types of equipment used) and weather. Baling operations on croplands that are tilled are typically restricted to a 40-day period. No-till croplands can accommodate a time window of up to 150 days for bale production and retrieval. Under both management types, inclement weather, such as extended periods of rainfall, snowfall, or freezing conditions, serves to further reduce available time.

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**

3.4.2 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 cultivation, harvesting, and collection can increase feedstock quality risks.

Relevant equipment should be specified for the sake of product consistency and risk reduction.

Risk Information: The majority of baling units in the BDO Zone produce round bales. Many of these units are of lighter design and, therefore, are not suited to corn stover collection. Square baling units are uncommon and generally in the small-to-medium size range, producing bales of the dimensions 3x3x8 feet. It is expected that biomass-based projects utilizing large quantities of corn stover annually (e.g., >500,000 bdt/yr) will prefer large square bales of the dimensions 3x4x8 feet and 4x4x8 feet. Acquisition of the required fleet of large square balers would likely occur over a period of 3-5 years. Therefore, in the initial years, it is likely that a large diversity of corn stover baling equipment will be used. This could lead to reductions in productivity and bale quality.

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 *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**

3.4.3 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 round or square bales, pellets, cubes, chips, or grindings. The size of wood fiber processed in a grinder is less homogenous than if a chipper is used.

Bales of different densities can absorb moisture at different rates. In certain cases, round bales have been viewed as problematic due to their uneven moisture content distribution.[29]

Risk Information: As described in Risk Indicator 3.4.2, there is considerable variation in baling unit type and size in the BDO Zone that is likely to persist in the initial years of a corn stover supply chain. This is likely to lead to variation in bale productivity and quality. The eventual acquisition of fleets of large square baling units will lead to standardization of bale quality, but there is uncertainty as to which parties will bear the cost of equipment purchase/lease (e.g., individual farmers, baling service providers, or project proponents).

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**

3.4.4 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

[29] Huhnke, 2018.

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: Most corn farmers own tractors with an average purchase price of approximately $400,000. Producing corn stover bales would enable farmers to maximize utilization of their capital investments in equipment while also generating an additional revenue stream. Additional labor demands for baling and bale collection operations at scale are, therefore, modest. Uncertainties remain regarding the availability of truck drivers at the scale required, and therefore, risk impact is assessed as 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 80-120 km 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: Approximately half of the total quantity of corn stover that is potentially available in the BDO Zone is located within a 50-mile drive distance from Falls City, NE (Figure E-6). At this transport distance, transportation cost is expected to account for 25% of the total delivered price. It is possible that a new bio-project could restrict procurement to distances less than 50 miles but the locations of corn farms willing to participate in future corn stover supply chains are unknown.

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 *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**

3.5.2 Diesel Cost Impacts

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

Risk Information: Diesel prices in the Midwest doubled during the period of high inflation in 2021-2022 (Figure E-3). Prices have since stabilized but there is uncertainty as to the future effects of diesel price drivers, in particular climate policies.

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: Transportation of corn stover bales (round and square) is achieved using standard flatbed trailers. No specialized equipment is required.

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	**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 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: Heavy truck traffic has been common in the Midwest for over 50 years. Increased trafficking of corn stover bales on flatbed trailers is unlikely to result in opposition from local communities and authorities.

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**

3.5.5 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: All states that overlap with the BDO Zone (IA, NE, MO, and KS) have a standard gross vehicle weight (GVW) limit of 80,000 lbs. Special permits for oversized or overweight (up to 25%) loads are available in each of the four states. Special permitting is unlikely to be required when hauling corn stover bales.

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	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**

3.5.6 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: Kansas and Nebraska have top-ranking road infrastructure, whereas Iowa and Missouri rank #33 and #39 in the country.[30] We determined through outreach that there are no major road infrastructure issues in the BDO Zone. Highways are frequently traveled by overweight trucks (hauling corn grain in hopper trailers) and 20-foot-wide combines.

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**

3.5.7 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: As described in Section B, the rated quantity would require a dedicated fleet of about 40 trucks with 53-ft flatbed trailers, operating 240 days per year and making three trips per day.[31] A large transportation company with access to over 200 53-ft flatbed trailers is located within the BDO Zone. Representatives of the company indicated that they would allocate trailers or purchase additional trailers if demand and prices were favorable. There are also a number of farmers in the BDO Zone that own at least one flatbed trailer, and that could make investments in additional trailers. The transportation investment requirement is significant and, therefore, risk is assessed as medium.

[30] https://www.usnews.com/news/best-states/rankings/infrastructure/transportation

[31] Assumes a payload of 18 bdt per truck for round bales (36 bales per truck) and 20 bdt per truck for square bales (40 bales per truck).

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**

3.6 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: There are over 5,000 corn grain producers in the BDO Zone, with an average size of approximately 425 acres. The large number of potential suppliers significantly reduces the risk of supplier breach.

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**

3.6.2 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: All areas of the BDO Zone are vulnerable to multi-year droughts, which will affect corn stover supply. Risks can be mitigated through the maintenance of large bale inventories, but supplies could become scarce over prolonged periods (e.g., 8-10 years).

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**

3.6.3 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: Croplands in the BDO Zone are privately owned and managed for profit. Corn stover baling operations are expected to be supported for the rated price range.

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.	**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 4 out of 100. **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 (i.e., spring thaws, rainy seasons, or dry seasons – as opposed to from 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 major 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 important in assessing feedstock risk and enable accurate assessment of the efficacy of Issuer's mitigation methods.

Risk Information: Corn grain yield variations over the past decade can be attributed mainly to variations in precipitation. Precipitation-/drought-induced variation in corn yield and associated corn stover supply will continue indefinitely in the region. While stover supply variation can be managed through stockpiling and sourcing from alternative suppliers, there is the risk that these management approaches will fail to maintain a constant throughput of corn stover bales during periods of extended drought or uncommon weather events (e.g., derechos).

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**

3.7.2 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: Prolonged droughts are common in the American Midwest and will have significant impacts on future corn grain and stover production. Droughts lasting longer than six years were experienced in Nebraska from 1884-1895, 1906-1913, 1931-1940, and 1952-1957.[32] While the impacts of climate change on drought trends in the American

[32] https://extensionpubs.unl.edu/publication/g1551/2005/pdf/view/g1551-2005.pdf

Midwest is unclear, precipitation is projected to become more volatile and flooding events may become more common.[33]
Raw Risk Likelihood (RRL) **Score**
The risk likelihood is deemed high, therefore the RRL is 8 out of 10. **8**
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 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**

3.7.3 Forest/Crop Fire

Rationale: Forest/crop 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: Major wildfire events in croplands are uncommon in the American Midwest.
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)

[33] https://nca2023.globalchange.gov/

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**

3.7.4 Risk of Infestation

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

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 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: Corn production in the region is not significantly affected by pest outbreaks. Infestation risk likelihood and impact are mitigated by routinized insecticide applications, crop rotations, and crop insurance.

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**

3.7.5 Risk of Hail

Rationale: Hail has negligible impact on forestry biomass but is one of the principal destroyers of agricultural crops in North America.

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: Severe hailstorms can result in significant damage to corn grain, knocking corn ears off stalks. However, hailstorms are unlikely to have a significant impact on corn stover availability. While a proportion of corn leaves are affected by hail, corn stalks are generally resistant to hailstorm damage. Therefore, it is expected that farmers willing to participate in a future corn stover supply chain will bale stover following a hailstorm.

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**

3.7.6 Risk of Flood

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

Risk Information: Significant flooding events are rare in the BDO Zone. Some climate models project that flooding will become more common in the Midwest over the long term.

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**

3.7.7 Risk of Drought

Rationale: Droughts can cause significant disruptions to feedstock supplies across entire BDO Zones for extended periods of time, especially in case of agricultural residues and energy crops. 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: Drought has not significantly impacted corn production in the BDO Zone over the past ten years (yield has ranged from 145 to 180 bushels per acre). However, extended drought is common in the Midwest over multidecadal time horizons. Only 3% of cropland acreage in the BDO Zone is irrigated.[34]

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed high, therefore the RRL is 8 out of 10.	**8**
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 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**

3.7.8 Risk of Hurricanes, Tornadoes, and Strong Winds

Rationale: Hurricanes, tornadoes, and strong winds can destroy timber stands, crops, and feedstock piles. They can also delay forestry and agricultural 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 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: Major windstorms, including derechos and tornados, occur annually in the Midwest and can affect crop production. However, the total cropland area affected by major windstorms is relatively small.

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)	**NN**

[34] https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/index.php

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 24 out of 100.	**24**

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: Freezing temperatures can interfere with baling operations in the months of October-November (tilled croplands) and the months of October-February (untilled croplands). The window of time for baling operations will be restricted in colder-than-average years.

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**

3.8 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: There are currently no subsidies supporting corn stover production in the BDO Zone.

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**

3.8.2 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 that 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 or corn stover, allowable 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: Croplands in the BDO Zone are privately owned and are not subject to regulations specific to biomass. Peak associations for corn growers in Nebraska and Iowa, for example, encourage profitable farming practices that minimize inputs and thereby improve sustainability.[35]

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 Issuer's ability to procure, transport, trans-load, store, or utilize feedstock by affecting local policies, regulations, and Issuer's ability to obtain necessary permitting.

Risk Information: The public generally supports the corn industry and is therefore expected to support the future development of sustainable corn stover supply chains.

[35] https://necga.org/mission-purpose/; https://www.iowacorn.org/membership/policy-development/

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**

3.8.4 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: Not relevant.

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

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: Corn stover is a by-product of corn grain production. Stover is not used as a human food source and therefore does not pose food security risk.

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	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

3.9 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.

Canada leads all countries with 166 million hectares of certified forests, a figure that is nearly four times more than second-place United States at 47 million hectares.

Risk Information: The rated quantity of corn stover was estimated by assuming that stover would only be available from no till systems and that 75% of the aboveground mass of available stover is recovered. Rated price estimates account for the additional cost of fertilizer that would be needed to offset nutrient losses resulting from stover removal.

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

3.9.2 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: The impacts of corn stover removal on soil quality will vary depending on soil type, ambient temperature, precipitation levels, soil moisture, and other site-specific factors. Therefore, the optimal level of corn stover removal will vary from farm to farm depending on local site conditions.

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**

3.9.3 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: Not relevant to corn stover production.

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 NN (No Notch).	**NR**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	**NR**

3.9.4 Water Use

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 corn stover production as the majority of croplands are not irrigated.

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 NN (No Notch).	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 agricultural and 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: Corn stover production does not lead to increases in pesticide application. Therefore, not relevant.

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 NN (No Notch).	NR
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	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: Corn stover production does not increase cropland area and does not change landscape-level wildlife conservation strategies (e.g., prairie strips).[36] Therefore, not relevant.

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 NN (No Notch).	NR
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is not rated.	NR

[36] www.nrem.iastate.edu/research/STRIPS/content/what-are-prairie-strips

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 corn stover.

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 NN (No Notch).	**Notch** **NR**
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: The annual production of corn stover bales in the BDO Zone is low relative to the rated quantity and primarily involves the use of round balers. To scale up, major investments in square balers will be required. Due to the simplicity of balers and related supply chain operations (collection, stacking, transport), inexperience is unlikely to reduce feedstock quality (e.g., moisture content, soil contamination) during baling operations. However, there is some uncertainty as to how the moisture content of stored square bales will be managed, given that covered storage areas are uncommon.

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)* Project proponents willing to invest in storage depots and quality control programs would reduce the risk of feedstock quality at the production scale. *RRI Mitigation (Notch)* No adjustment. The Total Notch (RRL Notch) X (RRI Notch) is 25%.	**Notch** **25%**
Loaded RI Score	**Score**

The Loaded RI Score ((1-Total Notch) X GRI Score) is 27	**27**

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: To date, developers of large-scale corn stover projects have indicated a preference for large square bales, which improve storage and transportation efficiency relative to round bales. There are only a few medium-sized square balers in the BDO Zone that are used to meet the bedding and feedstock needs of the livestock industry. Therefore, securing the rated quantity will require significant purchasing and/or leasing of equipment (up to 120 units). Transportation service companies in the region are expected to make additional investments in trucks and trailers to meet market demand for the rated prices.

Raw Risk Likelihood (RRL)	**Score**
The risk likelihood is deemed high, therefore the RRL is 8 out of 10.	**8**
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 64 out of 100.	**64**
Mitigation/Notching	**Notch**
RRL Mitigation (Notch) No adjustment. *RRI Mitigation (Notch)* In the initial years of corn stover supply, round bales could be provided to a project proponent using existing equipment. Many local agricultural professionals contacted during outreach were of the opinion that mass investment in square balers and associated infrastructure (e.g., covered storage areas) was unnecessary. With proper receiving infrastructure and quality control protocols, it is possible that a proponent could utilize both round and square bales. The scale-up risk posed by mass investment in square baling units is therefore reduced but remains medium-to-high. The Total Notch (RRL Notch) X (RRI Notch) is 25%.	**25%**
Loaded RI Score	**Score**
The Loaded RI Score ((1-Total Notch) X GRI Score) is 48 out of 100.	**48**

CATEGORY 5.0: INFRASTRUCTURE RISKS

5.1 Risk Factor: Physical Infrastructure

5.1.1 Land Parcel/Industrial District

Risk Information: The 1000-acre Mid-America Rail Campus is a low-risk option for new industrial projects. Located 3 miles south of Falls City, this greenfield site features extensive utility infrastructure, prime transportation access, and efficient permitting processes. The area is highly supportive of business, especially in bio-energy and carbon-reducing projects, with 700+ acres reserved for bio-industries and an additional 200 acres for wind and solar development. The lack of zoning restrictions in Richardson County for renewable energy projects further enhances its suitability for new industrial ventures.

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**

5.1.2 Ownership of Land

Risk Information: The land ownership situation for Falls City is low risk for new industries. Falls City Economic Development and Growth Enterprise, Inc. (EDGE) holds options on 1,017 acres at $25k/acre with two private landowners, ensuring expedient acquisition of properties as EDGE can act as sellers. Currently, there are no lease options for industrial sites, but the ownership arrangement facilitates a smooth and reliable land acquisition process.

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**

5.1.3 Permitting Description

Risk Information: The permitting process in Falls City is low risk for new developments. The city manages building, operational, and environmental permits, with a typical turnaround time of 60-90 days for non-hazard permits. Although floodplains are identified on the property and may require a floodplain development permit depending on grading operations, this represents a low risk for the permitting situation.

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

5.1.4 Environmental Issues

Risk Information: Agricultural runoff can strain potable water supplies during periods of heavy rainfall and flooding. Ambient particulate concentrations are also above normal during dry periods compared to less arid regions of the United States.

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**

5.2 Risk Factor: Utilities

5.2.1 Natural Gas Availability

Risk Information: The risk associated with natural gas provision for the Rail Campus is nominal. The city offers competitively priced natural gas at $9.71/mcf, which is the 7th lowest nationally. Expansion of gas line infrastructure to the site is underway, with completion expected within 18 months. Additionally, Southern Star's ongoing Renewable Natural Gas (RNG) projects could potentially provide 300 to 400 MMSCF per day starting around 2026 to 2027, offering benefits such as reduced infrastructure costs and potential federal tax credits. Given these factors, the risk to new development is minimal.

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	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**

5.2.2 Electric Availability

Risk Information: The risk associated with Falls City's electrical infrastructure for new developments is medium-high. Falls City Utilities offers industrial electricity at a rate 20.95% below the national average, and 65% of Nebraska's power comes from natural gas. The Nebraska Legislature's allocation of $15,000,000 through LB977 for redundancy and resilience presents an opportunity to enhance electrical capacity, specifically for the Rail site. However, the construction timeline of four to five years introduces uncertainty. With only 2-3 MWs of excess capacity available and the potential for solar-to-power operations, the risk to new development is significant if the necessary infrastructure is not completed on schedule.

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) 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**

5.2.3 Water Availability

Risk Information: The city's ability to meet the additional 500,000 GPD demand for the Mid-America Rail Campus is moderate risk**.** While the existing wells and production facility can handle the increased output, extending production hours by 4 to 8 hours per day, along with adjustments to operational schedules and the hiring of additional staff, will be required. The city's plan to implement the necessary infrastructure within 18 months is feasible, but the need for operational adjustments and staffing changes introduces a moderate level of complexity and 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 *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**

5.2.4 Waste Disposal

Risk Information: The Mid-America Rail Campus's projected need for 400,000 gallons per day (GPD) of wastewater processing is low risk. The existing facility is capable of handling this load with minimal modifications, primarily requiring routine monitoring and operational adjustments. While a lift station installation may be necessary for wastewater flow from the south side of the property, and future upgrades may be required as the site reaches buildout, these factors are manageable and do not pose significant risk.

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**

5.2.5 Internet Availability

Risk Information: Telecommunications is provided by Southeast Nebraska Communications (SNC), which has served the eastern half of Richardson County since 2012. In August of 2010, Southeast Nebraska Communications was awarded USDA funding to extend Fiber-to-the-Home technology beyond the city limits of Falls City to rural areas of Richardson County. SNC's entire service territory is 100 percent fiber optics. This is a low risk for new industries to obtain good internet communications at the Rail Campus.

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	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**

5.3 Risk Factor: Transportation/Logistics

5.3.1 Road/Highway Access

Risk Information: Falls City is less than a 20-minute drive from Interstate 29. A major NAFTA transportation corridor, I-29 runs from the Canadian border to Kansas City, where it connects to I-35, which continues on to the Mexico border. I-29 connections provide access to east and west coast transcontinental transportation corridors, including I-80 (approximately 95 miles to the north) and I-70 (approximately 90 miles to the south). This accessibility is attractive to new industries.

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**

5.3.2 Rail Access

Risk Information: Given the current infrastructure, the City of Falls City's Rail Campus offers medium risk for new bio-economy industries requiring rail transport. While the presence of both Burlington Northern Santa Fe (BNSF) and Union Pacific Railroad (UPRR) main lines is a strong positive factor, the lack of existing spurs on the campus and the potential need for new loading areas for intermodal transport present a cost challenge. These factors could impact the economic feasibility of utilizing rail transport, but the availability of rail service remains a significant asset.

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**

5.3.3 Airport Access

Risk Information: Brenner Field in Falls City is a municipal airport with a 4000' paved runway and GPS approaches. This is adequate for most private aircraft, including business jets. Kansas City International Airport (MCI) is located 90 miles to the southwest. This commercial airport manages full passenger and freight needs to all domestic and international destinations. This is a low risk for new industries wanting to move personnel around and provide staffing from outside the Falls City area.

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**

5.3.4 Water Freight Access

Risk Information: Fourteen miles to the east of Falls City, the Missouri River has loading facilities, primarily for barge traffic. There are no dams or locks on the river to maintain the minimum 9' clearance depth, so during several dry months of the year (November-February) the flow is not sufficient for traffic. This type of transport is not highly desirable for many of the new bio-industries. This is not deemed as a risk item for this report and is therefore not rated.

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 NN (No Notch).	**NR**

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

5.4 Risk Factor: Social Infrastructure

5.4.1 Healthcare (Local)

Risk Information: Falls City's Community Medical Center, since reopening in 2009, has become a vital healthcare hub in the region. As a 25-bed critical access hospital, it offers an impressive range of services, including regular clinics from a diverse group of specialists. The inclusion of three family practice clinics and two senior living facilities further enhances its community reach.

The volunteer-based emergency and ambulance services are commendable, with two three-person crews on duty around the clock, supported by 28 EMTs and three ambulances. This level of coverage ensures a dependable healthcare safety net, making Falls City an attractive option for developers and new personnel. The hospital's comprehensive care and strong emergency services earn high marks for reliability and community health support.

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

5.4.2 Education (Schools)

Risk Information: Falls City upholds Nebraska's strong reputation for quality education, offering a well-rounded educational environment for its residents. The public school system features two elementary schools with a favorable teacher-to-student ratio of 16 to 1, alongside a public middle school and a senior high school serving 480 students.

The proximity to nine colleges within a 75-mile radius—including four private institutions, three public universities, and one community college—provides ample higher education opportunities. For a town of 4,000, this range of educational options is impressive and sufficient to meet the needs of students at various stages of their academic journey. Overall, Falls City offers a solid educational foundation and accessibility to higher learning, making it an excellent community for families and educators alike.

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

5.4.3 Local Transportation

Risk Information: Richardson County Transit has been a staple for Falls City residents since 1994, offering a unique and reliable transit service that stands out from typical municipal bus services. While rides are by appointment, the convenience of regularly scheduled service within the city and to surrounding communities makes this an invaluable resource for both local residents and newcomers alike. Whether a commuter or exploring new job opportunities in the area, Richardson County Transit ensures dependable transportation options. Highly recommended for its reliability and community focus.

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**

5.4.4 Public Safety (Local)

Risk Information: Based on the information provided, the area served by the Falls City Police Department and the Richardson County Sheriff's Posse can be rated as low risk for both violent crime and property-related infractions. The fact that these crime rates are well below national averages adds to the appeal for new residents, making it a favorable option for those seeking a safer community.

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	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**

5.4.5 Housing/Cost of Living

Risk Information: Falls City offers an exceptional cost of living that is hard to beat, making it a highly attractive option for individuals, families, and businesses alike. With a median home cost of $82,300—well below the national median of $231,200—and average rent prices around $600 per month, housing is incredibly affordable.

Utilities and food costs are also lower than the national average, with groceries costing about 8% less. Additionally, the availability of housing and rentals at just over 7%—compared to the national average of 4%—further enhances the appeal for potential new residents and industries considering relocation. Falls City's affordability and housing availability make it a standout choice for those seeking a low-cost, high-quality living environment.

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**

5.5 Risk Factor: Labor

5.5.1 Workforce

Risk Information: Businesses located at the Mid-America Rail Campus will have access to a workforce of over 62,000 people. The mega site is on the Nebraska/Kansas border and ten miles from the Missouri state border making it easy to recruit talent from three states. The population of the Richardson County Labor Basin is estimated to be 62,305. The Civilian Labor Force (CLF) is estimated to be 34,126. The Institute estimates that 13,331 individuals are considered to be part of the Available Labor Pool.

Of the Available Labor Pool, an estimated 1,099 (8.2%) non-working and 2,117 (15.9%) working individuals are looking for new full-time employment, while 1,945 (14.6%) non-working and 8,170 (61.3%) working individuals would consider

new and/or different full-time employment for the right opportunities. Almost 70% of the Available Labor Pool has at least some college experience and 97.2% has at least a high school diploma. This is low risk for new employers.
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**

5.5.2 Labor Costs

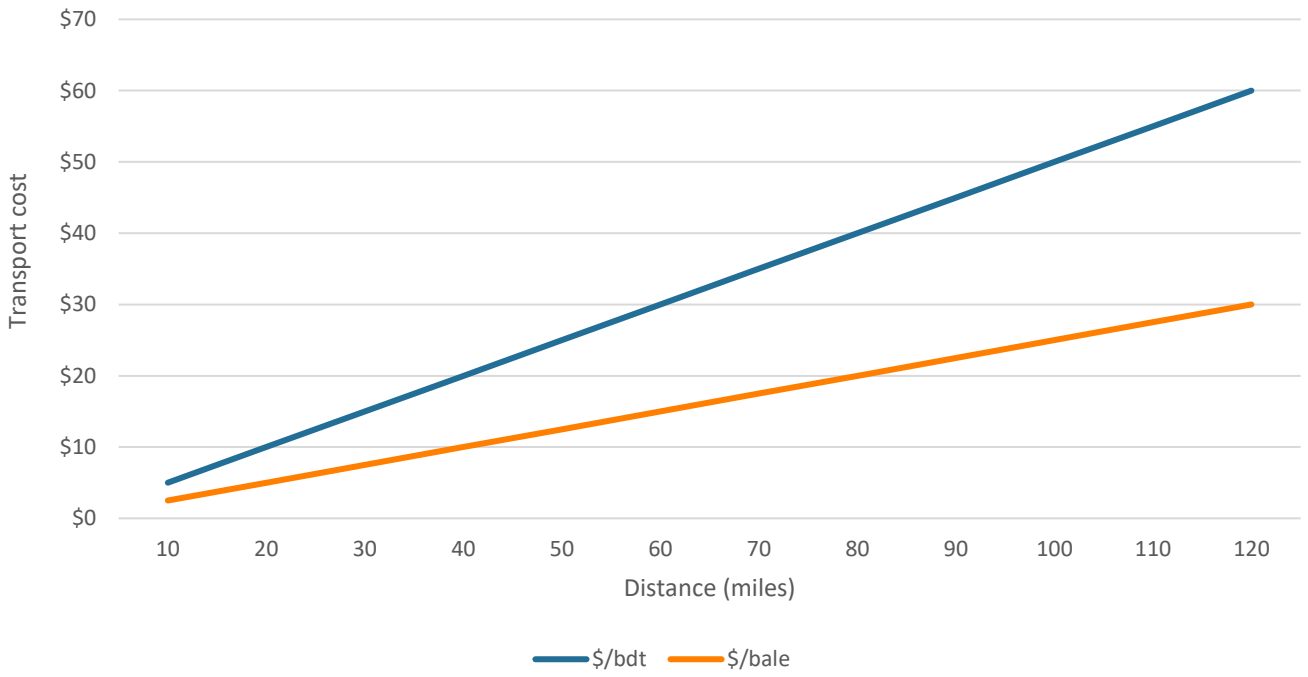
Risk Information: Nebraska's minimum wage increased to $12 per hour effective January 1, 2024. In accordance with an initiative passed by voters in November of 2022, the minimum wage will increase $1.50 each year through 2026, followed by an annual cost of living increase beginning in 2027. The average salary in the Falls City area is $48,100 ($23/hour). This is an attractive pay scale for new industries seeking to attract staff.
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**

SECTION E: TABLES, FIGURES, AND MAPS

Table E-1. Nutrient Replacement Value Estimation

Nutrient	Nutrient loss resulting from corn stover removal (lbs nutrient/ton stover)[37]	Fertilizer nutrient price ($/lbs)[38]	Nutrient replacement value ($/ton)	Nutrient replacement value ($/bdt)
Phosphorous (P_2O_5)	4	0.96	3.83	4.91
Potassium (K_2O)	34	0.34	11.40	14.62
Total	--	--	**15.24**	**19.54**

Figure E-1. Corn Stover Transportation Cost by Distance from Falls City, NE[39]

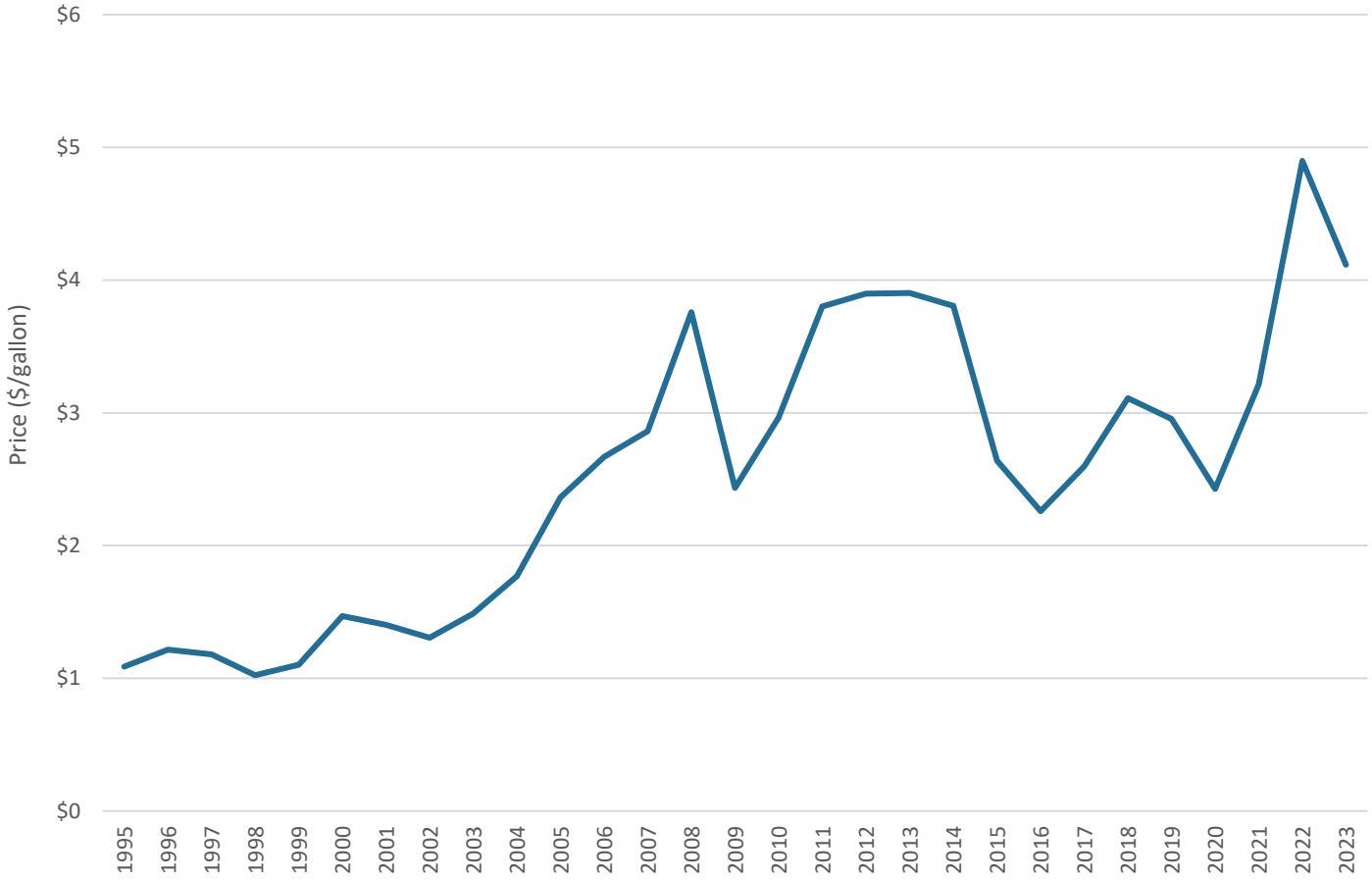


[37] Table I in https://extensionpubs.unl.edu/publication/g1846/na/html/view#target2.
[38] Estimated by multiplying fertilizer prices by nutrient content in fertilizer. Fertilizer price data taken from Iowa Production Cost Report (Bi-Weekly), Fri Aug 9, 2024 (https://www.ams.usda.gov/market-news/production-cost). Nutrient content data estimated using internal model.
[39] Assumes $5/mile, one way, and 20 bdt/40 bales per load.

Figure E-2. Historical Corn Prices[40]

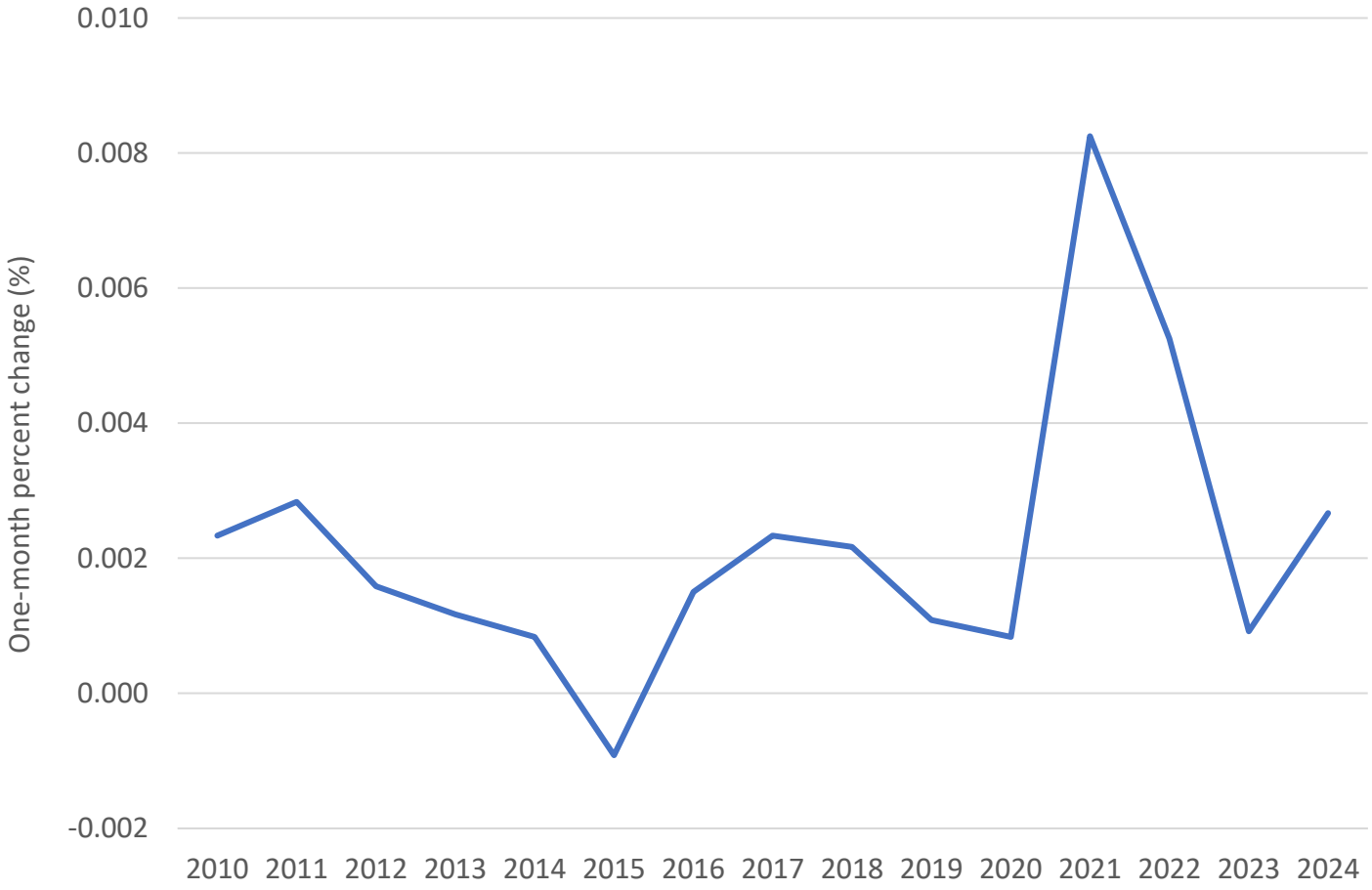
[40] quickstats.nass.usda.gov

Figure E-3. Average Annual Midwest Diesel Prices[41]



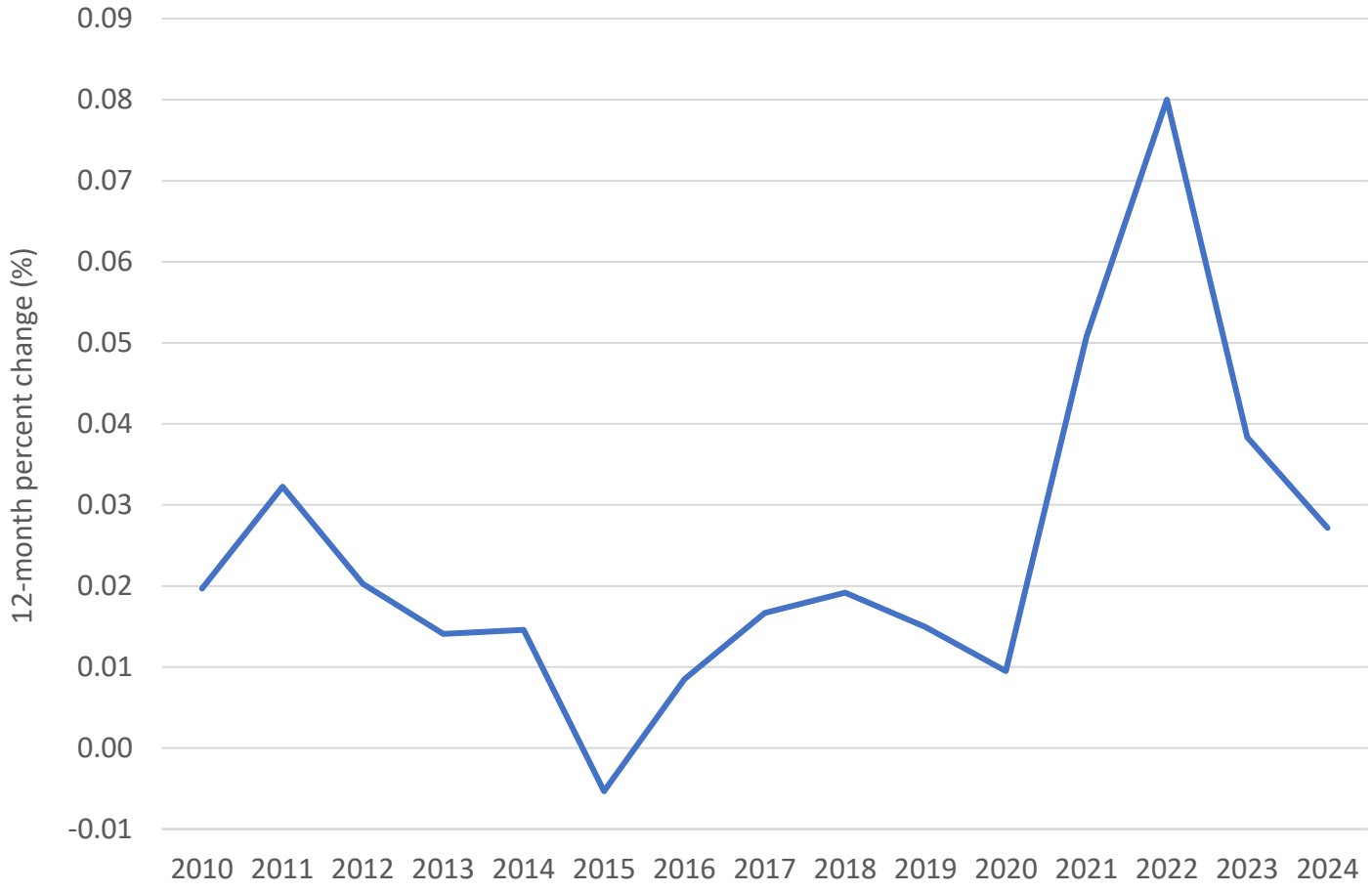
[41] https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2D_PTE_R20_DPG&f=A

Figure E-4. Producer Price Index – National[42]



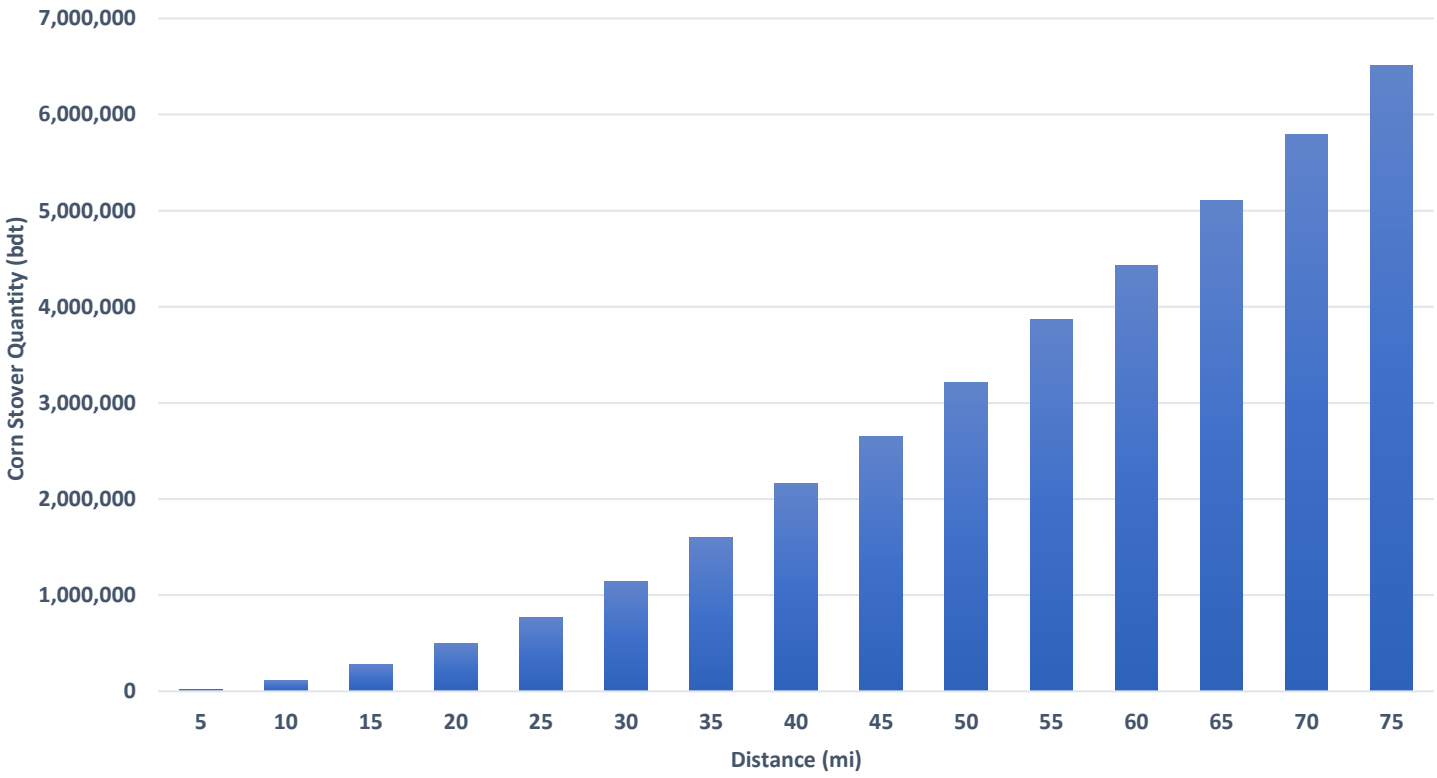
[42] https://www.bls.gov/charts/producer-price-index/final-demand-1-month-percent-change.htm#

Figure E-5. Consumer Price Index – Midwest[43]

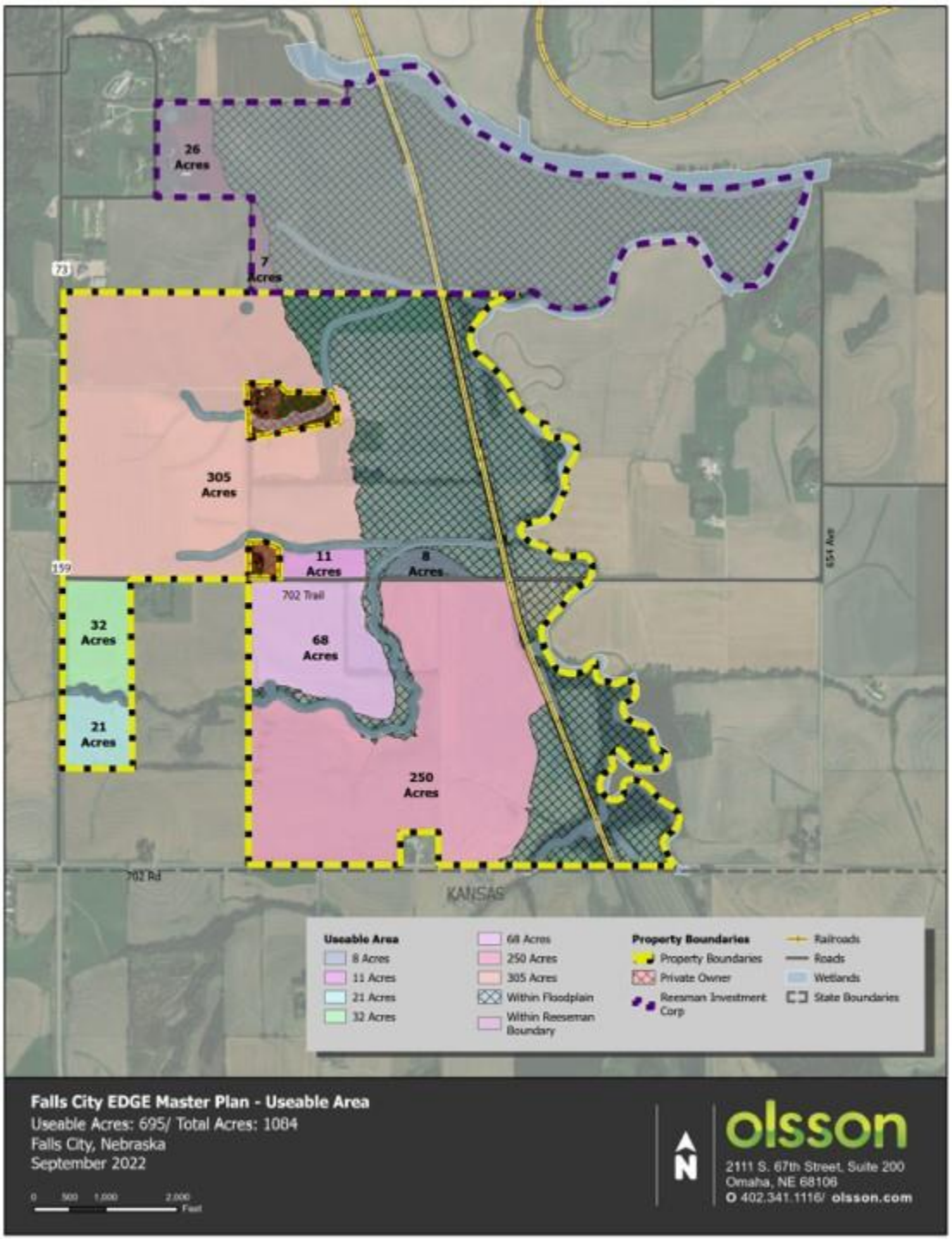


[43] https://www.bls.gov/charts/consumer-price-index/consumer-price-index-by-region.htm

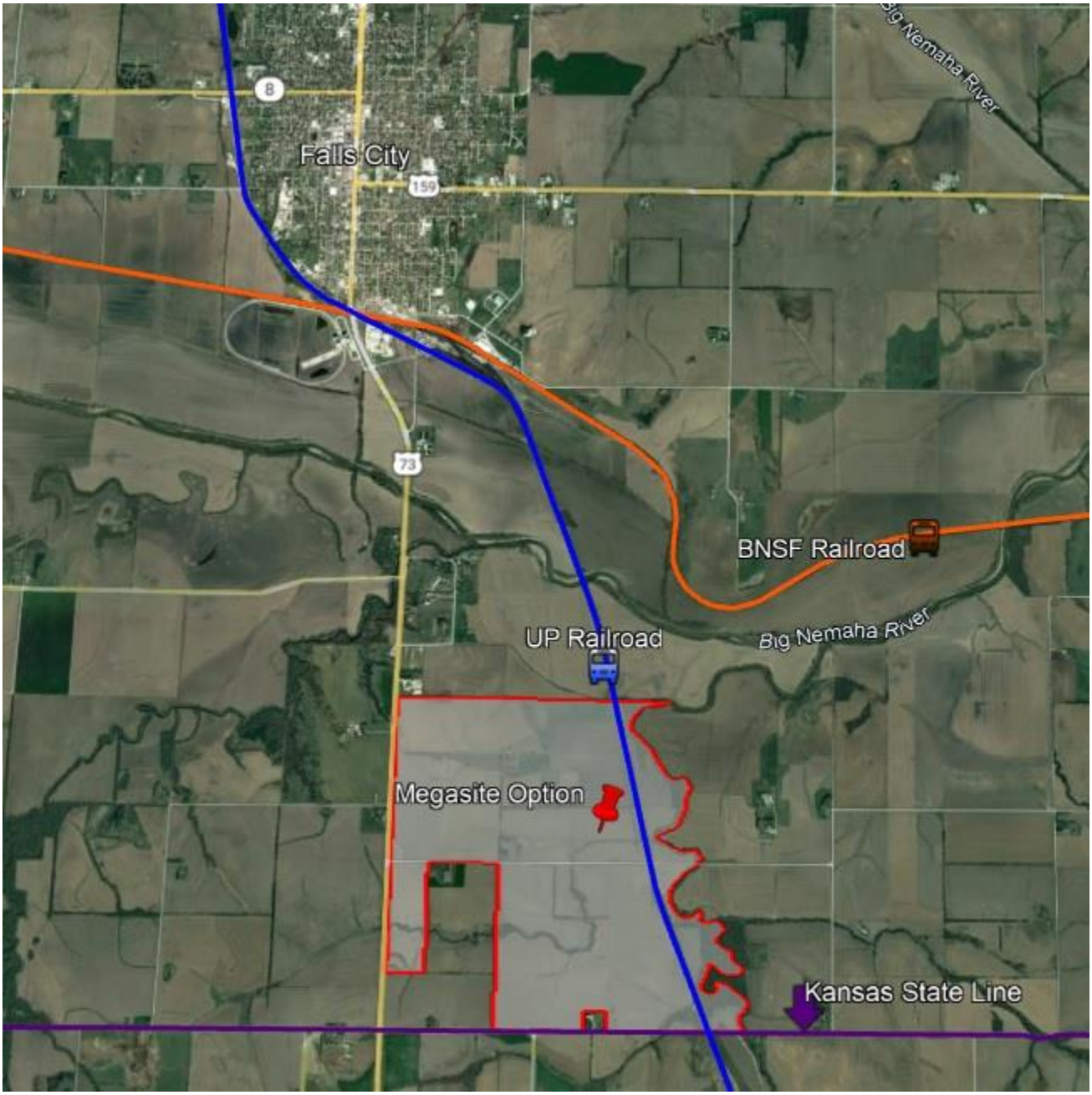
Figure E-6. Estimated Corn Stover Production by Distance from Falls City, NE



Map E-1. Parcels available at Mid-America Rail Campus – Falls City, NE



Map E-2. Location of Mid-America Rail Campus – Falls City, NE



Map E-3. Image of Landscape at Mid-America Rail Campus – Falls City, NE

SECTION F: LEGAL DISCLAIMER

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