UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)
☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2023

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from to

Commission file number: 000-21467

ALTO INGREDIENTS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**41-2170618**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
1300 South Second Street, Pekin, Illinois	**61554**
(Address of principal executive offices)	**(Zip Code)**

Registrant’s telephone number, including area code: (916) 403-2123

Securities registered pursuant to Section 12(b) of the Act:

Title of each Class	Trading Symbol	Name of Exchange on Which Registered
Common Stock, $0.001 par value	ALTO	The Nasdaq Stock Market LLC (Nasdaq Capital Market)

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company,” and “emerging growth company” in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☒
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management’s assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant’s executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☒

The aggregate market value of the voting and non-voting common equity held by nonaffiliates of the registrant computed by reference to the closing sale price of such stock, was approximately $210.8 million as of June 30, 2023, the last business day of the registrant’s most recently completed second fiscal quarter.

As of March 12, 2024, there were 75,697,150 shares of the registrant’s common stock, $0.001 par value per share, and 896 shares of the registrant’s non-voting common stock, $0.001 par value per share, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE: Part III incorporates by reference certain information from the registrant's proxy statement (the "Proxy Statement") for the 2024 Annual Meeting of Stockholders to be filed on or before April 29, 2024.

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CAUTIONARY STATEMENT

All statements included or incorporated by reference in this Annual Report on Form 10-K, other than statements or characterizations of historical fact, are forward-looking statements. Examples of forward-looking statements include, but are not limited to, statements concerning projected net sales, costs and expenses, and margins; projected additional EBITDA or Adjusted EBITDA; the expected timing, cost and effects of our capital improvement projects, including our carbon capture and storage project and our corn oil and high protein system at our Magic Valley facility, and other strategic and business initiatives; expectations surrounding our repairs and maintenance activities and their timing, costs and effects; our business outlook and expected performance in future periods; the sufficiency of our liquidity and capital resources; our ability to continue as a going concern; our accounting estimates, assumptions and judgments; the demand for specialty alcohols and essential ingredients; the competitive nature of and anticipated growth in our industry; production capacity and goals; our ability to consummate acquisitions, if any, and integrate their operations successfully; and our prospective needs for additional capital. These forward-looking statements are based on our current expectations, estimates, approximations and projections about our industry and business, management's beliefs, and certain assumptions made by us, all of which are subject to change. Forward-looking statements can often be identified by words such as "anticipates," "expects," "intends," "plans," "predicts," "believes," "seeks," "estimates," "may," "will," "should," "would," "could," "potential," "continue," "ongoing," similar expressions and variations or negatives of these words. These statements are not guarantees of future performance and are subject to risks, uncertainties and assumptions that are difficult to predict. Therefore, our actual results could differ materially and adversely from those expressed in any forward-looking statements as a result of various factors, some of which are listed under "Risk Factors" in Item 1A of this report. These forward-looking statements speak only as of the date of this report. We undertake no obligation to revise or update publicly any forward-looking statement for any reason, except as otherwise required by law.

PART I

Item 1. Business.

Business Overview

We produce and distribute renewable fuel and essential ingredients. We are also the largest producer of specialty alcohols in the United States.

We operate five alcohol production facilities. Three of our production facilities are located in Illinois, one is located in Oregon and another is located in Idaho. We have an annual alcohol production capacity of 350 million gallons, including both fuel-grade ethanol and specialty alcohols ranging from industrial-, pharmaceutical-, and high-quality food- and beverage-grade alcohols. Of this amount, we can produce up to 110 million gallons annually of specialty alcohols, depending on our product mix among high-quality beverage-grade alcohol and alcohols of other quality specifications. We market and distribute all the alcohols produced at our facilities as well as alcohols produced by third parties. In 2023, we marketed and distributed approximately 383 million gallons combined of our own alcohols as well as fuel-grade ethanol produced by third parties, and over 1.5 million tons of essential ingredients on a dry matter basis.

We also specialize in break bulk distribution of specialty alcohols through our Eagle Alcohol subsidiary. We purchase bulk alcohol from suppliers and then store, denature, package, and resell alcohol products in smaller sizes, including tank trucks, totes and drums that typically garner a premium price to bulk alcohols. We deliver products to customers in the beverage, food, industrial and related-process industries via our own dedicated trucking fleet and common carrier.

We report our financial and operating performance in three segments: (1) Pekin production, which includes the production and sale of alcohols and essential ingredients produced at our three production facilities located in Pekin, Illinois, which we refer to as our Pekin Campus, (2) marketing and distribution, which includes marketing and merchant trading for company-produced alcohols and essential ingredients on an aggregated basis, and sales of fuel-grade ethanol sourced from third parties, and (3) Western production, which includes the production and sale of renewable fuel and essential ingredients produced at our two western production facilities on an aggregated basis, none of which are individually so significant as to be considered a separately reportable segment.

Our mission is to produce the highest quality, sustainable ingredients from renewable resources that make everyday products better. We intend to accomplish this goal in part by investing in our specialized and higher value specialty alcohol production and distribution infrastructure, expanding production in high-demand essential ingredients, expanding and extending the sale of our products into new regional and international markets, building efficiencies and economies of scale and by capturing a greater portion of the value stream.

Production Segments

We produce specialty alcohols, fuel-grade ethanol and essential ingredients, focusing on five key markets: *Health, Home & Beauty*; *Food & Beverage*; *Industry & Agriculture*; *Essential Ingredients*; and *Renewable Fuels*. Products for the *Health, Home & Beauty* markets include specialty alcohols used in mouthwash, cosmetics, pharmaceuticals, hand sanitizers, disinfectants and cleaners. Products for the *Food & Beverage* markets include grain neutral spirits used in alcoholic beverages and vinegar as well as corn germ used for corn oils. Products for *Industry & Agriculture* markets include alcohols and other products for paint applications and fertilizers. Products for *Essential Ingredients* markets include dried yeast, corn protein meal, corn protein feed, corn germ, and distillers grains and liquid feed used in commercial animal feed and pet foods. We also sell yeast for human consumption. Our products for the *Renewable Fuels* markets include fuel-grade ethanol and distillers corn oil used as a feedstock for renewable diesel and biodiesel fuels. Our specialty alcohols for the *Industry & Agriculture, Food & Beverage* and *Health, Home & Beauty* markets represented approximately 6%, 4% and 2%, respectively, of our sales in 2023 from these three product segments.

We produce our alcohols and essential ingredients at our production facilities described below. Our production facilities located in Illinois are in the heart of the Corn Belt, benefit from relatively low-cost and abundant feedstock and enjoy logistical advantages that enable us to provide our products to both domestic and international markets via truck, rail or barge. Our production facilities located in Oregon and Idaho are near their respective fuel and feed customers, offering significant timing, transportation cost and logistical advantages.

All of our production facilities, other than our Magic Valley plant, were operating for all of 2023, subject to scheduled and unscheduled downtimes to address facility repair and maintenance. On January 1, 2023, we temporarily hot-idled our Magic Valley production facility due to extreme natural gas prices, other unfavorable market conditions and to facilitate the installation of our new corn oil and high protein system. We brought the facility back online in April 2023. In January 2024, we again temporarily hot-idled our Magic Valley production facility to minimize losses from negative regional crush margins and to expedite the installation of additional equipment needed to achieve our intended production rate, quality and consistency from our corn oil and high protein system. We intend to restart Magic Valley production in the second quarter once the upgrades are complete and crush margins have improved. As market conditions change, we may increase, decrease or idle production at one or more operating facilities or resume operations at any idled facility.

Marketing and Distribution Segment

We market and distribute all the alcohols and essential ingredients we produce at our facilities. We also market and distribute alcohols produced by third parties.

We have extensive and long-standing customer relationships, both domestic and international, for our specialty alcohols and essential ingredients. These customers include producers and distributors of ingredients for cosmetics, sanitizers and related products, distilled spirits producers, food products manufacturers, producers of personal health/consumer health and personal care hygiene products, and global trading firms.

Our renewable fuel customers are located throughout the Western and Midwestern United States and consist of integrated oil companies and gasoline marketers who blend fuel-grade ethanol into gasoline. Our customers depend on us to provide a reliable supply of fuel-grade ethanol and manage the logistics and timing of delivery. Our customers collectively require fuel-grade ethanol volumes in excess of the supplies we produce at our facilities. We secure additional fuel-grade ethanol supplies from third-party ethanol producers. We arrange for transportation, storage and delivery of fuel-grade ethanol purchased by our customers through our agreements with third-party service providers in the Western United States as well as in the Midwest from a variety of sources.

We market our essential ingredient feed products to dairies and feedlots, in many cases located near our production facilities. These customers use our feed products for livestock as a substitute for corn and other sources of starch and protein. We sell our corn oil to poultry and biodiesel customers. We do not market essential ingredients from other producers.

See “Note 5 – Segments” to our Notes to Consolidated Financial Statements included elsewhere in this report for financial information about our business segments.

Company History

We are a Delaware corporation formed in 2005. Our common stock trades on The Nasdaq Capital Market under the symbol "ALTO." Our Internet website address is http://www.altoingredients.com. Information contained on our website is not part of this Annual Report on Form 10-K. Our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to such reports filed with or furnished to the Securities and Exchange Commission and other Securities and Exchange Commission filings are available free of charge through our website as soon as reasonably practicable after the reports are electronically filed with, or furnished to, the Securities and Exchange Commission.

Business Strategy

The key elements of our business and growth strategy include:

- *Focus on our customer relationships.* Although we continue to produce more fuel-grade ethanol than specialty alcohols, we have repositioned our business to focus on expanding the production and sale of specialty alcohols and essential ingredients. As a result, our business is now more service-oriented and focused on specialty products compared to a price-taking business focused on commodity products. We strive to make our business ever more customer-centric to enable our premium services to support premium prices and new differentiated and higher-margin products.

- *Implement carbon capture and storage at our Pekin Campus, lowering our carbon footprint*. The Inflation Reduction Act of 2022 raised the carbon capture tax credit to $85 per metric ton, reflecting the 45Q tax incentive benefits established under the Act. We produce over 600,000 metric tons of carbon dioxide, CO_2, per year at our Pekin Campus, which sits atop the Mount Simon formation, identified as one of the best and largest aquafers in the country for carbon storage. We are prioritizing our carbon capture and storage, or CCS, project over other long-term capital projects. We believe the financial benefits under the Inflation Reduction Act and the substantial additional economic benefits of the environmental attributes associated with low carbon ethanol will result in excellent returns on investment.

- *Expand product offerings*. We are pursuing initiatives to broaden our product offerings to appeal to a wider range of customers and uses in our key markets. For example, we have secured ISO 9001, ICH Q7 and EXCiPACT certifications at all of our Pekin Campus production facilities. These certifications appeal to customers with stringent quality demands and enable us to offer alcohol certified for use as an active pharmaceutical ingredient, or API, and as an excipient—an inactive component of a drug or medication, such as solvents, carriers or tinctures—in the pharmaceutical industry. All ingredients we produce for use in beverages, human and pet foods are third-party certified for ISO 9001 and hazard analysis and critical control points (HACCP). In addition, all of our alcohols with pharmaceutical end-uses are ICH Q7, EXCiPACT and ISO 9001 certified, and our animal feed production, including at our Oregon and Idaho facilities, has undergone third-party Food Safety Modernization Act (FSMA) auditing. We are reviewing additional certifications and product positioning within our key markets to expand the range of customers we serve and the uses our products support.

- *Implement new equipment and technologies.* We are evaluating and plan to implement new equipment and technologies to increase our production yields, improve our operating efficiencies and reliability, reduce our overall carbon footprint, diversify our products and revenues, and increase our profitability as financial resources and market conditions justify these investments.

- *Increase our break bulk capabilities.* With the addition of Eagle Alcohol, we have further diversified our business to include break bulk distribution of specialty alcohols. We can now store, denature, package and resell alcohol in smaller sizes, including tank trucks, totes and drums that typically garner a premium price to bulk specialty alcohols. We deliver these products to customers in the *Health, Home & Beauty*, *Food & Beverage* and related-process industries using our own trucking fleet and common carrier. We intend to leverage Eagle Alcohol's transportation expertise across our entire distribution platform, replacing a portion of our third-party trucking services, reducing our logistics costs and improving margins. We are also in the process of expanding our distribution territory into new geographies such as Southern California.

- *Evaluate and pursue strategic opportunities*. We are examining opportunities to expand our business such as joint ventures, strategic partnerships, synergistic acquisitions and other opportunities. We intend to pursue these opportunities as financial resources and business prospects make these opportunities desirable.

Competitive Strengths

We believe that our competitive strengths include:

- *Customer and supplier relationships*. We have extensive and long-standing close customer and supplier relationships, both domestic and international, for our specialty alcohols and essential ingredients. We have an excellent reputation for developing specialty alcohols under stringent quality control standards, particularly at our Pekin Campus. Our quality management systems are supported by ISO 9001, ICH Q7, and EXCiPACT certifications which are viewed by our customers as important attestations of our quality control standards.

- *Diverse product mix*. We offer a wide range of specialty alcohol, essential ingredient and other products to meet customer demand. We offer multiple alcohol quality grades ranging from industrial-grade alcohol to the highest beverage grade low moisture 200 proof alcohol available. We also offer a wide variety of essential ingredients and other products for food, feed and other markets.

- *Barriers to entry*. Our production facilities use specialized equipment, technologies and processes to achieve stringent quality controls, higher yields and efficient production of alcohols and essential ingredients. Our specialized equipment, technologies and processes, together with our quality management certifications, strict regulatory requirements, and close customer and supplier relationships create significant barriers to entry to new market participants.

- *Our experienced management*. Our senior management team has a proven track record with significant operational and financial expertise and many years of experience in the alcohol production industry. Our senior executives have successfully navigated a wide variety of business and industry-specific challenges and deeply understand the business of successfully producing and marketing specialty alcohols and essential ingredients.

- *The strategic location of our Midwest production facilities*. We operate three distinct but integrated production facilities at our Pekin Campus in the Midwest. We are able to participate from that location in the largest regional specialty alcohol market in the United States as well as international markets.
  - We believe that our Midwest location enhances our overall hedging opportunities with a greater correlation to the highly liquid physical and paper markets in Chicago.
  - Our Midwest location provides excellent logistical access via rail, truck and barge. In particular, barge access via the Illinois River to the Mississippi River enables us to efficiently bring our products to international markets.
  - The relatively unique wet milling process at one of our production facilities at our Pekin Campus allows us to extract the highest use and value from each component of the corn kernel. As a result, the wet milling process generates a higher level of cost recovery from corn than that produced at a dry mill.
  - Our Midwest location allows us deep market insight and engagement in major specialty alcohol, fuel-grade ethanol, pet food and feed markets, thereby improving pricing opportunities.
  - Our Midwest location sits atop the Mount Simon formation, identified as one of the best and largest aquafers in the country for carbon storage, potentially allowing us to benefit from this close proximity to store CO_2.

Overview of Our Key Markets and Market Opportunity

We produce specialty alcohols, fuel-grade ethanol and essential ingredients, focusing on five key markets: *Health, Home & Beauty*; *Food & Beverage*; *Industry & Agriculture; Essential Ingredients*; and *Renewable Fuels*.

Health, Home & Beauty

Our products for the health, home and beauty markets include specialty alcohols used in mouthwash, cosmetics, pharmaceuticals, hand sanitizers, disinfectants and cleaners. We offer a variety of specialty alcohols for the health, home and beauty markets, depending on usage and regulatory requirements, including API-grade, United States Pharmacopeia, or USP, -grade ethyl alcohols, and industrial-grade ethyl alcohol.

We have ISO 9001, ICH Q7 and EXCiPACT certifications at each of our Pekin Campus production facilities, all of which are viewed as important attestations of quality control standards. In particular, our ICH Q7 certification qualifies our specialty alcohols for use as an API, and our EXCiPACT certification qualifies our specialty alcohols for use as an excipient in the pharmaceutical industry. These certifications enable us to offer products to a wider group of customers and generally at more profitable margins.

Food & Beverage

Our products for the food and beverage market include specialty alcohols used in alcoholic beverages, flavor extracts and vinegar as well as corn germ used for corn oils and CO_2 used for beverage carbonation and dry ice. The principal specialty alcohol we offer for beverage-grade product is our grain neutral spirits, or GNS, alcohol. In addition, we primarily sell FCC 190 and USP 190 Ultra into vinegar markets. We are also introducing new high-quality 192 proof and low-moisture 200-proof GNS products to our existing and target customers in the beverage, food, flavor, personal care and pharmaceutical industries.

We believe the key drivers in the food and beverage market include consumer preferences for the social currency of brand authenticity and heritage; consumers seeking unique and personalized experiences; improved consumer access to spirits products; the growth of craft distillers; and the ability to meet wide-ranging consumer preferences through a broad diversity of spirits categories and cocktails.

Industry & Agriculture

Our products for the industry and agriculture market include alcohols and other products for paint applications and fertilizers.

Essential Ingredients

Our essential ingredients include dried yeast, corn gluten meal, corn gluten feed, and distillers grains and liquid feed used in commercial animal feed and pet foods. We also sell yeast for human consumption. The raw materials for our essential ingredients are generated as co-products from our production of alcohols. These co-products are further manufactured, altered and refined into our essential ingredients, including for special customer applications.

Many of our essential ingredients are used in a variety of food products to affect their nutrition, including protein and fat content, as well as other product attributes such as taste, texture, palatability and stability. Our high quality and high purity manufacturing enable our customers to use some of our essential ingredients in human foods while others are used in pet foods and animal feed.

We expect the essential ingredients market to grow significantly due to global demand for higher-grade protein feed, such as feed used in fisheries and other applications.

Renewable Fuels

Our renewable fuels products include fuel-grade ethanol used as transportation fuel and distillers corn oil used as a biodiesel feedstock. Our renewable fuels business is supported by our own production of fuel-grade ethanol as well as fuel-grade ethanol produced by third parties.

Renewable fuels, primarily fuel-grade ethanol, are used for a variety of purposes, including as octane enhancers for premium gasoline and to enable refiners to produce greater quantities of lower octane blend stock; for fuel blending to extend fuel supplies and reduce reliance on crude oil and refined products; and to comply with a variety of governmental programs, in particular, the national Renewable Fuel Standard, or RFS, which was enacted to promote alternatives to fossil fuels. Under the RFS, the mandated use of all renewable fuels rose incrementally and peaked at 36.0 billion gallons in 2022, of which 15.0 billion gallons were required to be produced from conventional, or corn-based, ethanol. The RFS allows the Environmental Protection Agency, or EPA, to adjust the annual requirement based on certain facts and circumstances. The EPA has set its annual requirements for conventional ethanol to 15.0 billion gallons for each of 2023, 2024 and 2025. See “—Governmental Regulation”.

According to the Renewable Fuels Association, the domestic fuel-grade ethanol industry produced over 15.5 billion gallons of ethanol in 2023, up from 15.4 billion gallons in 2022. According to the United States Department of Energy, total annual gasoline consumption in the United States is approximately 137 billion gallons and total annual fuel-grade ethanol blended with gasoline represented approximately 10.4% of this amount in 2023. We anticipate that continued limited opportunities for gasoline refinery expansions and the growing importance of reducing CO_2 emissions using renewable fuels will generate additional growth in the demand for fuel-grade ethanol.

Overview of Alcohol Production Process

Alcohol production from starch- or sugar-based feedstock is a highly-efficient process. Modern alcohol production requires large amounts of corn, or other high-starch grains, and water as well as chemicals, enzymes and yeast, in addition to natural gas and electricity.

Dry Milling Process

In the dry milling process, corn or other high-starch grain is first ground into flour, then slurried with water to form a mash. Enzymes are added to the mash to convert the starch into dextrose, a simple sugar. The mash is processed through a high temperature cooking procedure, which reduces bacteria levels prior to fermentation. The mash is then cooled and transferred to fermenters, where yeast is added and the conversion of sugar to alcohol and CO2 begins.

After fermentation, the resulting "beer" is transferred to distillation where the alcohol is separated from the residual "stillage." The resulting alcohol is concentrated to 190 proof using conventional distillation methods and then is dehydrated to approximately 200 proof, representing 100% alcohol levels, in either a molecular sieve system or a grits system. For fuel-grade ethanol, the resulting anhydrous alcohol is then blended with approximately 2.5% denaturant, which is usually gasoline, and is then ready for shipment to renewable fuels markets. For specialty alcohols, the products can be sold pure or as one of the Tobacco Tax & Trade Bureau (TTB) approved specially denatured alcohol (SDA) formulations to meet customer specifications.

The residual stillage is separated into a coarse grain portion and a liquid portion through a screw press or centrifugation process. The soluble liquid portion is concentrated to about 40% dissolved solids by an evaporation process. This intermediate state is called condensed distillers solubles, or syrup. The coarse grain and syrup portions are then mixed to produce wet distillers grains, or WDG, or can be mixed and dried to produce dried distillers grains with solubles, or DDGS. Both WDG and DDGS are high-protein animal feed products.

Wet Milling Process

In the wet milling process, corn or other high-starch grain is first soaked or "steeped" in sulfurous acid for approximately 24 hours to soften the whole corn kernel ahead of milling. After steeping, the grain goes through coarse milling to gently open the kernels to separate the corn germ from which the corn oil can be further extracted in a separate process. The remaining fiber, gluten and starch components are further separated and sold.

The stillage from the fermentation process is concentrated in an evaporator and is co-dried with the fiber component to be sold as corn gluten feed. The gluten component is filtered and dried to produce a high protein corn gluten meal.

The starch is then processed into alcohol through fermentation. The fermentation process for alcohol at this stage is similar to the dry milling process. In addition, we separate and dry yeast to produce distillers yeast.

Overview of Distillers Grains Market

Distillers grains are produced as a co-product of alcohol production and are valuable components of feed rations primarily to dairies and beef cattle markets, both nationally and internationally. Our plants produce both WDG and DDGS. WDG is sold to customers proximate to the plants and DDGS is delivered by truck, rail and barge to customers in domestic and international markets. Producing WDG also allows us to use up to one-third less process energy, thus reducing production costs and lowering the carbon footprint of our production facilities.

Historically, the market price for distillers grains has generally tracked the price of corn. We believe that the market price of WDG and DDGS is determined by a number of factors, including the market prices of corn, soybean meal and other competitive ingredients, the performance or value of WDG and DDGS in a particular feed formulation and general market forces of supply and demand, including export markets for these co-products. The market price of distillers grains is also often influenced by nutritional models that calculate the feed value of distillers grains by nutritional content, as well as reliability of consistent supply.

Customers

We market and sell through our wholly-owned subsidiary, Kinergy Marketing LLC, or Kinergy, all of the alcohols we produce. Kinergy also markets fuel-grade ethanol produced by third parties. We market and sell through our wholly-owned subsidiary, Alto Nutrients, LLC, all of the essential ingredients we produce. We also sell break bulk quantities through Eagle Alcohol to customers in the beverage, food, industrial and related-process industries.

We have extensive and long-standing customer relationships, both domestic and international, for our specialty alcohols and essential ingredients, including yeast for pet food and human foods. These customers include producers and distributors of ingredients for cosmetics, sanitizers and related products, distilled spirits producers, food products manufacturers, producers of personal health/consumer health and personal care hygiene products, and global trading firms.

Our renewable fuel customers are located throughout the Western and Midwestern United States and consist of integrated oil companies and gasoline marketers who blend fuel-grade ethanol into gasoline. Our customers depend on us to provide a reliable supply of fuel-grade ethanol and manage the logistics and timing of delivery. We secure additional fuel-grade ethanol supplies from third-party fuel-grade ethanol plants.

We market our essential ingredient feed products to dairies and feedlots, in many cases located near our production facilities. These customers use our feed products for livestock as a substitute for corn and other sources of starch and protein. We sell our corn oil to poultry, renewable diesel and biodiesel customers. We do not market essential ingredients from other producers.

Our Pekin Campus production segment generated $502.2 million, $521.3 million and $498.2 million in net sales for the years ended December 31, 2023, 2022 and 2021, respectively, from the sale of alcohols. Our Pekin Campus production segment generated $217.7 million, $225.9 million and $189.5 million in net sales for the years ended December 31, 2023, 2022 and 2021, respectively, from the sale of essential ingredients.

During 2023, 2022 and 2021, our Pekin Campus production segment sold an aggregate of approximately 208.9 million, 204.6 million and 213.0 million gallons of alcohols and 878,400, 850,300 and 875,100 tons of essential ingredients, respectively, on a dry matter basis.

Our Western production segment generated $167.0 million, $253.6 million and $107.9 million in net sales for the years ended December 31, 2023, 2022 and 2021, respectively, from the sale of alcohols. Our Western production segment generated $57.3 million, $90.2 million and $31.1 million in net sales for the years ended December 31, 2023, 2022 and 2021, respectively, from the sale of essential ingredients.

During 2023, 2022 and 2021, our Western production segment sold an aggregate of approximately 67.0 million, 92.4 million and 37.6 million gallons of alcohols and 642,300, 787,100 and 361,000 tons of essential ingredients, respectively, on a dry matter basis.

Our marketing and distribution segment generated $263.0 million, $228.9 million and $381.2 million in net sales for the years ended December 31, 2023, 2022 and 2021, respectively, from the sale of all alcohols.

Our Corporate and other segment generated $15.8 million in net sales from Eagle Alcohol's business for each of the years ended December 31, 2023 and 2022, and sold 4.0 million gallons of alcohols for each of those years.

During 2023, 2022 and 2021, we produced or purchased from third parties and resold an aggregate of 382.5 million, 418.9 million and 479.6 million gallons of alcohols to approximately 88, 114 and 99 customers, respectively. For 2023, 2022 and 2021, sales to our two largest customers, Shell Trading US Company and Chevron Products USA represented an aggregate of approximately 16%, 20% and 22% of our net sales, respectively. For 2023, 2022 and 2021, sales to each of our other customers represented less than 10% of our net sales.

Suppliers

Pekin Campus and Western Production Segments

Our production operations depend upon various raw materials suppliers, including suppliers of corn, natural gas, electricity and water. The cost of corn is the most important variable cost associated with our alcohol production. We source corn for our plants using standard contracts, including spot purchase, forward purchase and basis contracts. When resources are available, we seek to limit the exposure of our production operations to raw material price fluctuations by purchasing forward a portion of our corn requirements on a fixed price basis and by purchasing corn and other raw materials futures contracts and options.

During 2023, 2022 and 2021, purchases of corn from our three largest suppliers represented an aggregate of approximately 26%, 38% and 28% of our total corn purchases, respectively, for those periods. Purchases from each of our other corn suppliers represented less than 10% of total corn purchases in each of 2023, 2022 and 2021.

Marketing and Distribution Segment

Our marketing and distribution operations include alcohols and essential ingredients we produce but also depend upon various third-party producers of fuel-grade ethanol. In addition, we provide transportation, storage and delivery services through third-party service providers with whom we have contracted to receive fuel-grade ethanol at agreed upon locations from our third-party suppliers and to store and/or deliver the ethanol to agreed-upon locations on behalf of our customers. These contracts generally run from year-to-year, subject to termination by either party upon advance written notice before the end of the then-current annual term.

During 2023, 2022 and 2021, we purchased and resold from third parties an aggregate of approximately 103 million, 118 million and 229 million gallons, respectively, of fuel-grade ethanol.

During 2023, 2022 and 2021, purchases of fuel-grade ethanol from our four largest third-party suppliers represented 86%, 69% and 76%, respectively, of our total third-party ethanol purchases for each of those periods. Purchases from each of our other third-party ethanol suppliers represented less than 10% of total third-party ethanol purchases in each of 2023, 2022 and 2021.

Production Facilities

We operate five alcohol production facilities. Three of our production facilities are located in Illinois, one is located in Oregon and another is located in Idaho. We have an annual alcohol production capacity of up to 350 million gallons, including both fuel-grade ethanol and specialty alcohols ranging from industrial-, pharmaceutical-, and high-quality food- and beverage-grade alcohols. Of this amount, we are able to produce up to 110 million gallons annually of specialty alcohols, depending on our product mix among high-quality beverage-grade alcohol and alcohols of other quality specifications. As market conditions change, we may increase, decrease or idle production at one or more operating facilities or resume operations at any idled facility. The tables below provide an overview of our five production facilities.

Pekin Campus Production Facilities

	Pekin Wet Facility	**Pekin Dry Facility**	**Pekin ICP Facility**
Location	Pekin, IL	Pekin, IL	Pekin, IL
Current operating status	Operating	Operating	Operating
Approximate maximum annual alcohol production capacity (in millions of gallons)	100	60	90
Approximate maximum annual specialty alcohol production capacity (in millions of gallons)	74	—	66
Production milling process	Wet	Dry	Dry
Primary energy source	Natural Gas	Natural Gas	Natural Gas

Western Production Facilities

	Magic Valley Facility	**Columbia Facility**
Location	Burley, ID	Boardman, OR
Current operating status	Hot-Idled	Operating
Approximate maximum annual fuel-grade ethanol production capacity (in millions of gallons)	60	40
Production milling process	Dry	Dry
Primary energy source	Natural Gas	Natural Gas

Commodity Risk Management

We employ various risk mitigation techniques. For example, we may seek to mitigate our exposure to commodity price fluctuations by purchasing forward a portion of our corn and natural gas requirements through fixed-price or variable-price contracts with our suppliers, as well as entering derivative contracts for fuel-grade ethanol, corn and natural gas. To mitigate fuel-grade ethanol inventory price risks, we may sell a portion of our production forward under fixed- or index-price contracts, or both. We may hedge a portion of the price risks by entering exchange-traded futures contracts and options. Proper execution of these risk mitigation strategies can reduce the volatility of our gross profit margins.

Specialty alcohols have relatively low price volatility and are usually priced at significant premiums to fuel-grade ethanol. The market price of fuel-grade ethanol is volatile, however, and subject to large fluctuations. Given the nature of our business, we cannot effectively hedge against extreme volatility or certain market conditions. For example, fuel-grade ethanol prices, as reported by the Chicago Mercantile Exchange, or CME, ranged from $1.58 to $2.67 per gallon during 2023, from $2.00 to $2.88 per gallon during 2022 and from $1.48 to $3.75 per gallon during 2021; and corn prices, as reported by the CME, ranged from $4.50 to $6.85 per bushel during 2023, from $5.64 to $8.18 per bushel during 2022 and from $4.84 to $7.73 per bushel during 2021.

Climate-Related and Other Risks

Short- to medium-term climate-related and other risks include high sensitivity to certain commodity prices such as corn and natural gas; regulatory changes and political volatility, both domestic and international; ethanol supply and demand imbalances; logistics and storage constraints from river access during inclement or volatile weather conditions; lack of automation of process optimization; high repair, maintenance and production costs resulting from older facilities; poor cooling capacity of our older facilities as water temperatures increase; and international market competition.

Long-term climate-related risks include water resource limitations; lower or volatile grain availability in local markets; market transition away from combustion fuels that include renewables; and the energy cost impact of technology such as wet milling and multiple distillation processes for high-quality alcohol. We also may be impacted by costs and regulatory burdens associated with carbon emissions from our production and distribution as well as truck transport and packaging associated with Eagle Alcohol's use of drums and totes. See "Risk Factors."

Marketing Arrangements

We market all the alcohols and essential ingredients produced at our facilities. We also market and distribute alcohols produced by third parties.

Competition

We are the largest producer of specialty alcohols in the United States.

Other significant producers of specialty alcohols in the United States are Archer-Daniels-Midland Company, Grain Processing Corporation, CIE and Greenfield Global Inc., which collectively make up a significant majority of the total installed specialty alcohol production capacity in the United States along with many smaller producers.

The largest producers of fuel-grade ethanol in the United States are POET, LLC, Valero Renewable Fuels Company, LLC, Archer-Daniels-Midland Company and Green Plains Inc., collectively with approximately 40% of the total installed fuel-grade ethanol production capacity in the United States. In addition, there are many mid-sized fuel-grade ethanol producers with several plants under ownership, smaller producers each with one or two plants, and several fuel-grade ethanol marketers that create significant competition. Overall, we believe there are over 200 fuel-grade ethanol production facilities in the United States with a total installed production capacity of approximately 17.8 billion gallons and many brokers and marketers with whom we compete for sales of fuel-grade ethanol and its co-products.

Our fuel-grade ethanol also competes on a global market against production from other countries, such as Brazil, which may have lower production costs than United States producers. Lower feedstock input costs such as sugarcane used in Brazil as compared to corn used in the Unites States may give foreign producers a competitive advantage. In addition, fuel-grade ethanol from sugarcane feedstock qualifies as an advanced biofuel, unlike corn ethanol, allowing certain producers to economically satisfy an advanced biofuel standard. Moreover, new products and production technologies are under continuous development, many of which, if adopted by competitors, could harm our ability to compete.

We believe that our competitive strengths include our customer and supplier relationships, our diverse product mix, the barriers to entry to our most profitable lines of business—including our modern technologies and certifications at our production facilities—our experienced management, and the strategic location of our Midwest production facilities. See "—Competitive Strengths."

Governmental Regulation

Our business is subject to a wide range of federal, state and local laws and regulations directed at protecting public health and the environment, including those promulgated by the Occupational Safety and Health Administration, or OSHA, the U.S. Food and Drug Administration, or FDA, the EPA, and numerous state, local and international authorities. These laws, their underlying regulatory requirements and their potential enforcement, some of which are described below, impact, or may impact, nearly every aspect of our operations, including our production of alcohols (including distillation), our production of essential ingredients, our storage facilities, and our water usage, wastewater discharge, disposal of hazardous wastes and emissions, and other matters pertaining to our existing and proposed business by imposing:

- restrictions on our existing and proposed operations and/or the need to install enhanced or additional controls;
- special requirements applicable to food and drug additives;
- the need to obtain and comply with permits and authorizations;
- liability for exceeding applicable permit limits or legal requirements, in some cases for the remediation of contaminated soil and groundwater at our production facilities, contiguous and adjacent properties and other properties owned and/or operated by third parties; and
- other specifications for the specialty alcohols and essential ingredients we produce and market.

In addition, some governmental regulations are helpful to our production and marketing business. The fuel-grade ethanol industry in particular is supported by federal and state mandates and environmental regulations that favor the use of fuel-grade ethanol in motor fuel blends in North America. Some of the governmental regulations applicable to our production and marketing business are briefly described below.

Food and Drug Regulation

Our products for the *Health, Home & Beauty*, *Food & Beverage* and *Essential Ingredients* markets are subject to regulation by the FDA as well as similar state agencies. Under the Federal Food, Drug, and Cosmetic Act, or FDCA, the FDA regulates the processing, formulation, safety, manufacture, packaging, labeling and distribution of food ingredients, vitamins, cosmetics and pharmaceuticals for active and inactive ingredients. Many of the FDA's and FDCA's rules and regulations apply directly to us as well as indirectly through their application in our customers' products. To be properly marketed and sold in the United States, a relevant product must be generally recognized as safe, approved and not adulterated or misbranded under the FDCA and relevant regulations issued under the FDCA. The FDA has broad authority to enforce the provisions of the FDCA. Failure to comply with the laws and regulations of the FDA or similar state agencies could prevent us from selling certain of our products or subject us to liability.

Renewable Fuels Energy Legislation

Under the RFS, the mandated use of all renewable fuels, including fuel-grade ethanol, rose incrementally and peaked at 36.0 billion gallons in 2022, of which 15.0 billion gallons are required from conventional, or corn-based, ethanol for each of 2023, 2024 and 2025. Under the provisions of the Energy Independence and Security Act of 2007, the EPA has the authority to waive the mandated RFS requirements in whole or in part. To grant a waiver, the EPA administrator must determine, in consultation with the Secretaries of Agriculture and Energy, that there is inadequate domestic renewable fuel supply or implementation of the requirement would severely harm the economy or environment of a state, region or the United States as a whole.

Various bills in Congress introduced from time to time are also directed at altering existing renewable fuels energy legislation, but none have passed in recent years. Some legislative bills are directed at halting or reversing expansion of, or even eliminating, the renewable fuel program, while other bills are directed at bolstering the program or enacting further mandates or grants that would support the renewable fuels industry.

The EPA has allowed fuel and fuel-additive manufacturers to introduce into commercial gasoline up to 15% fuel-grade ethanol by volume, or E15, for vehicles from model year 2001 and after. According to the Renewable Fuels Association, E15 is explicitly approved by the manufacturer for use in approximately 95% of model year 2024 cars and light trucks based on its annual review of vehicle owner's manuals and warranty statements. Commercial sales of E15 have begun in a majority of states. E15 has historically been prohibited in most states during the summer driving season due to concerns over evaporative emissions and to meet federal clean air standards. For the 2022 and 2023 summer driving seasons, the EPA issued emergency fuel waivers to allow the sale of E15 to help alleviate high gasoline prices. E15 may, however, be sold year-round in states that have a reformulated gasoline program. In addition, the EPA proposed in late 2023 that E15 be permitted for sale year-round in various Midwestern states effective in April 2024. The U.S. Office of Management and Budget approved the proposal in February 2024 but deferred the effective date to April 2025.

Various states including California, Oregon and Washington, and other regions such as the Canadian province of British Columbia, have implemented low carbon fuel standards focused on reducing the carbon intensity of transportation fuels. Other states, including New York, Vermont, Massachusetts, Michigan, Illinois, Colorado and New Mexico, currently have proposed legislation or policies that would establish a low carbon fuel standard program. Blending fuel-grade ethanol into gasoline is one of the primary means of attaining these goals.

Additional Environmental Regulations

In addition to the governmental regulations applicable to the alcohol production and marketing industry described above, our business is subject to additional federal, state and local environmental regulations, including regulations established by the EPA and state regulatory agencies related to water quality and air pollution control. We cannot predict the manner by which, or extent to which, these regulations will harm or help our business or the alcohol production and marketing industry in general.

Human Capital Resources

As of March 12, 2024, we had approximately 460 full-time employees. Our human capital resources objectives include attracting and retaining well-qualified and highly skilled and motivated employees and executives. As of that same date, approximately 44% of our employees were represented by a labor union and covered by a collective bargaining agreement. We have never had a work stoppage or strike and we consider our relations with our employees to be good.

Our compensation program is designed to attract, retain and motivate our personnel. We use a mix of competitive salaries and other benefits to attract and retain employees and executives. Some of these benefits include matching 401K contributions of up to 6% of salary, health and wellness programs and a paid service day for employees to give back to their communities. At the direction and with the involvement of an environmental, social and governance, or ESG, committee established by our board of directors, we have established an ESG working committee that draws from our many administrative and operational departments to review key policies and procedures, conduct employee engagement surveys and training, champion volunteering and charitable drives, develop and implement recruiting efforts which promote diversity and inclusion and prioritize collecting and improving on key metrics from industry frameworks such as the Global Reporting Initiative and Sustainability Accounting Standards Board standards which are maintained by the International Sustainability Standards Board of the IFRS Foundation.

Item 1A. Risk Factors.

Before deciding to purchase, hold or sell our common stock, you should carefully consider the risks described below in addition to the other information contained in this Report and in our other filings with the Securities and Exchange Commission, including subsequent reports on Forms 10-Q and 8-K. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our business. If any of these known or unknown risks or uncertainties actually occurs with material adverse effects on Alto Ingredients, our business, financial condition, results of operations and/or liquidity could be seriously harmed. In that event, the market price for our common stock will likely decline, and you may lose all or part of your investment.

Risks Related to our Business

Our results of operations and our ability to operate at a profit are largely dependent on our ability to manage the costs of corn, natural gas and other production inputs, with the prices of our alcohols and essential ingredients, all of which are subject to volatility and uncertainty.

Our results of operations are highly impacted by commodity prices, including the cost of corn, natural gas and other production inputs that we must purchase, and the prices of alcohols and essential ingredients that we sell. Prices and supplies are subject to and determined by numerous market and other forces over which we have no control, such as inclement or favorable weather, domestic and global demand, supply excesses or shortages, export conditions, inflationary conditions, global geopolitical tensions and various governmental policies in the United States and throughout the world.

Price volatility of corn, natural gas and other production inputs, and alcohols and essential ingredients, may cause our results of operations to fluctuate significantly. We may fail to generate expected levels of net sales and profits even under fixed-price and other contracts for the sale of specialty alcohols used in consumer products. Our customers may not pay us timely or at all, even under longer-term, fixed-price contracts for our specialty alcohols, and may seek to renegotiate prices under those contracts during periods of falling prices or high price volatility.

Over the past several years, for example, the spread between corn and fuel-grade ethanol prices has fluctuated significantly. Fluctuations are likely to continue to occur. A sustained negative or narrow spread, whether as a result of sustained high or increased corn prices or sustained low or decreased alcohol or essential ingredient prices, would adversely affect our results of operations and financial condition. Revenues from sales of alcohols, particularly fuel-grade ethanol, and essential ingredients have in the past and could in the future decline below the marginal cost of production, which have in the past and may again in the future force us to suspend production, particularly fuel-grade ethanol production, at some or all of our facilities. For example, we hot-idled our Magic Valley facility in early 2023 due to unfavorable market conditions and again hot-idled our Magic Valley facility in early 2024 in part due to unfavorable market conditions.

In addition, some of our fuel-grade ethanol marketing and distribution activities will likely be unprofitable in a market of generally declining prices due to the nature of our business. For example, to satisfy customer demand, we maintain certain quantities of fuel-grade ethanol inventory for subsequent resale. Moreover, we procure much of our fuel-grade ethanol inventory outside of contracted third-party marketing and distribution arrangements and therefore must buy fuel-grade ethanol at a price established at the time of purchase and sell fuel-grade ethanol at an index price established later at the time of sale that is generally reflective of movements in the market price of fuel-grade ethanol. As a result, our margins for fuel-grade ethanol sold in these transactions generally decline and may turn negative as the market price of fuel-grade ethanol declines.

We can provide no assurances that corn, natural gas or other production inputs can be purchased at or near current or any specific prices, or that our alcohols or essential ingredients will sell at or near current or any particular prices. Consequently, our results of operations and financial condition may be adversely affected by increases in the prices of corn, natural gas and other production inputs or decreases in the prices of our alcohols and essential ingredients.

The prices of our products are volatile and subject to large fluctuations, which may cause our results of operations to fluctuate significantly.

The prices of our products are volatile and subject to large fluctuations. For example, the market price of fuel-grade ethanol is dependent upon many factors, including the supply of ethanol and the price of gasoline, which is in turn dependent upon the price of petroleum which itself is highly volatile, difficult to forecast and influenced by a wide variety of global economic and geopolitical conditions, including decisions concerning petroleum output by the Organization of Petroleum Exporting Countries (OPEC) and their allies, an intergovernmental organization that seeks to manage the price and supply of oil on the global energy market. Other important factors that impact the price of petroleum include war and threats of war, attacks on or threats to shipping vessels as has recently occurred in the Red Sea, the consequent rerouting of supply lines to less direct or more expensive paths, and other supply chain disruptions.

Our fuel-grade ethanol sales are tied to prevailing spot market prices rather than long-term, fixed-price contracts. Fuel-grade ethanol prices, as reported by the Chicago Mercantile Exchange, ranged from $1.58 to $2.67 per gallon in 2023, from $2.00 to $2.88 per gallon in 2022 and from $1.48 to $3.75 per gallon in 2021. In addition, even under longer-term, fixed-price contracts for our specialty alcohols, our customers may seek to renegotiate prices under those contracts during periods of falling prices or high price volatility. Fluctuations in the prices of our products may cause our results of operations to fluctuate significantly.

We may engage in hedging transactions and other risk mitigation strategies that could harm our results of operations and financial condition.

To partially offset the effects of production input and product price volatility, in particular, corn and natural gas costs and fuel-grade ethanol prices, we may enter into contracts to purchase a portion of our corn or natural gas requirements on a forward basis or fix the sale price of portions of our alcohol production. In addition, we may engage in other hedging transactions involving exchange-traded futures contracts for corn, natural gas and unleaded gasoline from time to time. The financial statement impact of these activities is dependent upon, among other things, the prices involved and our ability to sell sufficient products to use all of the corn and natural gas for which forward commitments have been made. We have recognized losses in the past, and may suffer losses in the future, from our hedging arrangements. For example, for the year ended December 31, 2023, we recognized net losses of $8.0 million related to the change in the fair values of hedging contracts.

Hedging arrangements also expose us to the risk of financial loss in situations where our counterparty to the hedging contract defaults on its contract or, in the case of exchange-traded contracts, where there is a change in the expected differential between the underlying price in the hedging agreement and the actual prices paid or received by us. In addition, our open contract positions may require cash deposits to cover margin calls, negatively impacting our liquidity. As a result, our hedging activities and fluctuations in the price of corn, natural gas, fuel-grade ethanol and unleaded gasoline may adversely affect our results of operations, financial condition and liquidity.

Disruptions in our production or distribution, including from climate change and other weather effects, may adversely affect our business, results of operations and financial condition.

Our business depends on the continuing availability of rail, road, port, storage and distribution infrastructure. In particular, due to limited storage capacity at some of our production facilities and other considerations related to production efficiencies, certain facilities depend on timely delivery of corn. Alcohol production also requires a significant and uninterrupted supply of other raw materials and energy, primarily water, electricity and natural gas. Local water, electricity and gas utilities may fail to reliably supply the water, electricity and natural gas that our production facilities need or may fail to supply those resources on acceptable terms. In the past, poor weather has caused disruptions in rail transportation, which slowed the delivery of fuel-grade ethanol by rail, a key method by which fuel-grade ethanol from our Pekin Campus is transported to market.

For example, in the third quarter of 2023 we experienced unusually high unscheduled production downtime for repairs and maintenance which reduced sales volumes and profits. In 2022, a lightning strike at the utility servicing our Pekin Campus disrupted our operations, cutting power to our facilities and materially affecting our production, resulting in unexpected repair and maintenance costs, lost production and degradation in the quality of work-in-progress inventories. In addition, in 2020, we experienced closure of the Illinois River for lock repairs which required greater use of less cost-effective modes of product transport such as via rail and truck, which resulted in higher costs and negatively affected our results of operations.

Disruptions in production or distribution, whether caused by labor difficulties, unscheduled downtimes and other operational hazards inherent in the alcohol production industry, including equipment failures, fires, explosions, abnormal pressures, blowouts, pipeline ruptures, transportation accidents, climate change and natural disasters such as earthquakes, floods and storms, or other weather effects, or human error or malfeasance or other reasons, could prevent timely deliveries of corn or other raw materials and energy, and could delay transport of our products to market, and may require us to halt production at one or more production facilities, any of which could have a material adverse effect on our business, results of operations and financial condition.

Some of these operational hazards may also cause personal injury or loss of life, severe damage to or destruction of property and equipment or environmental damage, and may result in suspension of operations and the imposition of civil or criminal penalties. Our insurance may not fully cover the potential hazards described above or we may be unable to renew our insurance on commercially reasonable terms or at all.

Increased alcohol or essential ingredient production or higher inventory levels may cause a decline in prices for those products, and may have other negative effects, materially and adversely impacting our results of operations, cash flows and financial condition.

The prices of our alcohols and essential ingredients are highly impacted by competing third-party supplies of those products. In addition, if fuel-grade ethanol production margins improve, we anticipate that owners of production facilities operating at below capacity, or owners of idled production facilities, will increase production levels, thereby resulting in more abundant fuel-grade ethanol supplies and inventories. Increases in the supply of alcohols and essential ingredients may not be commensurate with increases in demand for alcohols and essential ingredients, thus leading to lower prices. Any of these outcomes could have a material adverse effect on our results of operations, cash flows and financial condition.

We may suffer impairments in the value of our long-lived assets which may materially and adversely affect our results of operations.

We evaluate our long-lived assets annually for impairment or when circumstances indicate that the full carrying value of an asset may be unrecoverable. These evaluations rely on financial and other assumptions concerning the assets, any of which may not materialize in the future. For example, we recognized asset impairments of $6.5 million and $3.1 million for the years ended December 31, 2023 and 2021, respectively. We may recognize additional impairments of the values of our long-lived assets in the future based on then-prevailing financial and other circumstances. Impairments of our long-lived assets may materially and adversely affect our results of operations.

Our alcohol production relies on traditional corn-based feedstock and process technologies. New technologies could make corn-based alcohol production and traditional process technologies less competitive or even obsolete, materially and adversely harming our business.

We produce our alcohols from corn. Moreover, our plants are constructed and operate exclusively as corn-based alcohol production facilities. Competitors and other third parties have undertaken research to develop competing products to corn-based alcohols, and ethanol in particular, as well as new process technologies. These research efforts seek alternatives to corn-based ethanol and traditional process technologies aimed at improving real or perceived problems with the fuel, such as the carbon and energy intensity of its production, its lower energy content compared to gasoline and its hydrophobic nature resulting in water separation in transit or at other times. Competitors and other third parties may develop new alcohols and processes that improve on any of these or other real or perceived problems with corn-based alcohols, including ethanol. If viable competing products or new process technologies are developed and attract widespread or even modest adoption, we may be forced to modify our production facilities, including our process technologies, if possible, to transition in full or in part to these other products or process technologies to remain competitive. Modifying our production facilities may require expertise that our personnel may not possess and would likely require significant capital expenditures the funding for which we may not have. An inability to remain competitive due to the introduction and adoption of competing products or new process technologies, or significant costs associated with the adoption of new products and process technologies, would materially and adversely affect our business, financial condition and results of operations.

Inflation and sustained higher prices may adversely impact our results of operations and financial condition.

We have experienced adverse inflationary impacts on key production inputs, wages and other costs of labor, equipment, services, and other business expenses. In addition, we have experienced adverse inflationary impacts on our budgets and expenses for many of our in-process and planned capital projects. Inflation and its negative impacts could escalate in future periods. Even if inflation stabilizes or abates, the prices of key production inputs, wages and other costs of labor, equipment, services, and other business expenses, and for our capital projects, may remain at elevated levels. We may not be able to include these additional costs in the prices of the products we sell. As a result, inflation and sustained higher prices may have a material adverse effect on our results of operations and financial condition.

Climate change, and governmental regulations aimed at addressing climate-related issues, may affect conditions to which our business is highly sensitive, many of which could materially and adversely harm our business, results of operations and financial condition.

Our business is highly sensitive to commodity prices, in particular, the prices of corn and natural gas. Inclement weather from climate change, including extreme temperatures or drought, may adversely affect growing conditions, which may reduce available corn supplies, our primary production input, and other grain substitutes, driving up prices and thereby increasing our production input costs. In addition, governmental regulators may disfavor carbon-based energy sources, such as natural gas, leading to regulations that disincentivize their use or otherwise make their production more difficult and costly, driving up their prices. Higher natural gas prices would likewise increase our production input costs.

Other factors that may result from climate change, or that may result from governmental regulations aimed at addressing climate-related issues, may also adversely affect our business, including the following:

- water is one of our key production inputs; water resource limitations may result from drought and other inclement weather; water resource limitations may also result from rationing and other governmental regulations limiting water use;

- higher water temperatures due to increased global or regional temperatures may negatively affect production efficiencies due to water temperature production requirements given the poor cooling capacities of our older facilities;

- flooding and other inclement weather may negatively affect our river access, other transportation logistics and costs, and storage requirements;

- an overall increase in energy costs will negatively impact our production costs generally and may critically impact certain high energy-intensive production technologies, such as our wet milling and multiple distillation processes for high-quality alcohol;

- regulatory and market transition away from combustion fuels and fuel-grade ethanol blending may threaten the viability of our renewable fuels business; and

- costs and regulatory burdens associated with governmental regulations that limit or tax greenhouse gas emissions, such as CO_2, from alcohol production and distribution, or from truck transport and packaging associated with Eagle Alcohol's business and use of drums and totes, will negatively impact us.

New legislation in the United States to address climate change issues, including at the federal, state and local levels, likely will continue. This includes new or expanded cap-and-trade programs that may layer additional costs on any business that emits greenhouse gases. New legislation, including new or expanded cap-and-trade programs, could materially and adversely impact our production cost structure and the market viability of our products.

Any of these factors could materially and adversely harm our business, results of operations and financial condition.

Risks Related to our Finances

We have incurred significant losses and negative operating cash flow in the past and we may incur losses and negative operating cash flow in the future, which may hamper our operations and impede us from expanding our business.

We have incurred significant losses and negative operating cash flow in the past. For example, for the three months ended December 31, 2023 and the years ended December 31, 2023 and 2022, we incurred consolidated net losses of approximately $19.0 million, $28.0 million and $41.6 million, respectively. We may incur losses and negative operating cash flow in the future. We expect to rely on cash on hand, cash, if any, generated from our operations, borrowing availability under our lines of credit and proceeds from our future financing activities, if any, to fund all of the cash requirements of our business. Additional losses and negative operating cash flow may hamper our operations and impede us from expanding our business.

We are engaged in a wide variety of capital improvement projects. These projects, and their financing, costs, timing and effects, are based on our plans, expectations and various assumptions that may not eventuate. We may therefore be unable to timely achieve, or achieve at all, the results we expect, including as to projected additional EBITDA and Adjusted EBITDA.

We are engaged in a wide variety of capital improvement projects to diversify and enhance our revenue streams and to expand margins and profitability by reducing costs. These projects have different timelines, returns on investment and risk profiles. In addition, we must raise significant additional capital to complete some of our projects, including our carbon capture and storage project. Our expected financial and other results from these projects are based on assumptions around many factors, including their costs, timing, operation and market prices prevailing at project completion and thereafter, as well as tax and other favorable environmental attributes associated with low carbon ethanol that may accrue to our benefit. For example, our assumptions around the anticipated results of our CCS project rely heavily on the tax benefits that may accrue to us under the Inflation Reduction Act of 2022 as well as other favorable environmental attributes associated with carbon capture and storage and low carbon alcohol production. These tax and other benefits may change, including as a result of new or repealed laws, new administrations and the implementation or interpretation of existing laws. We can provide no assurances that any particular benefit will be available to us upon completion of our CCS project, or thereafter, or any other capital improvement project.

Capital improvement projects require significant outlays of capital and are often subject to material execution risks. We may have insufficient financial resources, and we may be unable to raise sufficient capital, to complete our projects timely or at all. Although we intend to use reputable third-party contractors with expertise in their fields to implement our projects, adverse conditions and events as well as delays in capital projects are not uncommon. Moreover, the projects' interaction with existing processes may result in the degradation of other plant operations. For example, operation of our corn oil and high protein system at our Magic Valley facility has resulted in inconsistent product quality and degraded other operations at the plant, including production rates. We continue to work to resolve the system's issues but can provide no assurance that the system will perform as anticipated or perform sufficiently well to justify continued operation or expansion to our three other dry mills. In the past, we have extended our expected completion dates for various projects and, as circumstances require, may have to do so again.

We can provide no assurances that our projects will be completed, or if completed, will be completed timely. We also can provide no assurances that our project assumptions will reflect prevailing future conditions or that our projects will achieve the results we expect, including as to projected additional EBITDA and Adjusted EBITDA. Failure to achieve our expected results may have a material adverse effect on our business, financial condition and results of operations.

We regularly incur significant expenses to repair, maintain and upgrade our production facilities and operating equipment, and any interruption in our operations would harm our operating performance.

We regularly incur significant expenses to repair, maintain and upgrade our production facilities and operating equipment, estimated at an average of $30.0 million per year. The machines and equipment we use to produce our alcohols and essential ingredients are complex, have many parts, and some operate on a continuous basis. We must perform routine equipment maintenance and must periodically replace a variety of parts such as motors, pumps, pipes and electrical parts, and engage in other repairs. In addition, our production facilities require periodic shutdowns to perform major maintenance and upgrades. Our production facilities also occasionally require unscheduled shutdowns to perform repairs. For example, in the third quarter of 2023 we experienced unusually high unscheduled production downtime for repairs and maintenance at our Pekin Campus which reduced sales volumes and increased losses. These scheduled and unscheduled shutdowns result in lower sales and increased costs in the periods during which a shutdown occurs and could result in unexpected operational issues in future periods resulting from changes to equipment and operational and mechanical processes made during shutdown.

Our indebtedness may expose us to risks that could negatively impact our business, prospects, liquidity, cash flows and results of operations.

We have incurred, and anticipate incurring additional, substantial indebtedness for our capital improvement projects. We expect that these projects, when completed, will generate financial returns sufficient to service and ultimately repay or refinance our indebtedness. However, the costs, timing, and effects of our capital improvement projects may not meet our projections. In addition, our indebtedness could:

- make it more difficult to repay or refinance our indebtedness if it becomes due during adverse economic and industry conditions;
- result in adverse consequences due to a breach of our financial or other covenants and obligations in favor of our lenders;
- limit our flexibility to pursue strategic opportunities or react to changes in our business and the industries in which we operate and, consequently, place us at a competitive disadvantage to our competitors who have less debt;
- require a substantial portion of our cash flows from operations for debt service payments, thereby reducing the availability of our cash flows to fund working capital, additional capital expenditures, acquisitions, dividend payments and for other general corporate purposes; or
- limit our ability to procure additional financing for working capital or other purposes.

Our ability to generate operating results and sufficient cash to make all required principal and interest payments when due, and to satisfy our financial covenants and other obligations, depends on our performance, which is subject to a variety of factors beyond our control, including the cost of key production inputs, the supply of and demand for alcohols and essential ingredients, and many other factors related to the industries in which we operate. We cannot provide any assurance that we will be able to timely service or satisfy our debt obligations, including our financial covenants. Our failure to timely service or satisfy our debt obligations, including to meet our financial covenants, could result in our indebtedness being immediately due and payable, and would have a material adverse effect on our business, business prospects, liquidity, financial condition, cash flows and results of operations.

Our ability to utilize net operating loss carryforwards and certain other tax attributes may be limited.

Federal and state income tax laws impose restrictions on our use of net operating loss, or NOL, and tax credit carryforwards in the event that an "ownership change" occurs for tax purposes, as defined by Section 382 of the Internal Revenue Code, or Code. In general, an ownership change occurs when stockholders owning 5% or more of a corporation entitled to use NOL or other loss carryforwards have increased their ownership by more than 50 percentage points during any three-year period. The annual base limitation under Section 382 of the Code is calculated by multiplying the corporation's value at the time of the ownership change by the greater of the long-term tax-exempt rate determined by the Internal Revenue Service in the month of the ownership change or the two preceding months. Our ability to utilize our NOL and other loss carryforwards may be substantially limited. These limitations could result in increased future tax obligations, which could have a material adverse effect on our financial condition and results of operations.

Risks Related to Legal and Regulatory Matters

We may be adversely affected by environmental, health and safety laws and regulations, as well as related liabilities that may not be adequately covered by insurance.

We are subject to various federal, state and local environmental laws and regulations, including those relating to the discharge of materials into the air, water and ground; the generation, storage, handling, use, transportation and disposal of hazardous materials and wastes; and the health and safety of our employees. In addition, some of these laws and regulations require us to operate under permits that are subject to renewal or modification. These laws, regulations and permits often require expensive pollution control equipment or operational changes to limit actual or potential impacts to the environment. Any violation of these laws and regulations or permit conditions may result in substantial fines, natural resource damages, criminal sanctions, permit revocations and/or production facility shutdowns. In addition, we have made, and expect to make, significant capital expenditures on an ongoing basis to comply with increasingly stringent environmental laws, regulations and permits.

We may be liable for the investigation and cleanup of environmental contamination at each of our production facilities and at off-site locations where we arrange for the disposal of hazardous substances or wastes. If these substances or wastes have been or are disposed of or released at sites that undergo investigation and/or remediation by regulatory agencies, we may be responsible under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, or other environmental laws for all or part of the costs of investigation and/or remediation, and for damages to natural resources. We may also be subject to related claims by private parties alleging property damage and personal injury due to exposure to hazardous or other materials at or from those properties. Some of these matters may require us to expend significant amounts for investigation, cleanup or other costs not covered by insurance.

In addition, new laws, new interpretations of existing laws, increased governmental enforcement of environmental laws or other developments could require us to make significant additional expenditures. Continued government and public emphasis on environmental issues will likely result in increased future investments for environmental controls at our production facilities. Present and future environmental laws and regulations, and interpretations of those laws and regulations, applicable to our operations, more vigorous enforcement policies and discovery of currently unknown conditions may require substantial expenditures that could have a material adverse effect on our results of operations and financial condition.

The hazards and risks associated with producing and transporting our products (including fires, natural disasters, explosions and abnormal pressures and blowouts) may also result in personal injury claims or damage to property and third parties. As protection against operating hazards, we maintain insurance coverage against some, but not all, potential losses. However, we could sustain losses for uninsurable or uninsured risks, or in amounts in excess of existing insurance coverages. Events that result in significant personal injury or damage to our property or third parties or other losses that are not fully covered by insurance could have a material adverse effect on our results of operations and financial condition.

We may be adversely affected by food and drug laws and regulations, as well as related liabilities that may not be adequately covered by insurance.

Some of our products are subject to regulation by the U.S. Food and Drug Administration, or FDA, as well as similar state agencies. The FDA regulates, under the Federal Food, Drug, and Cosmetic Act, or FDCA, the processing, formulation, safety, manufacture, packaging, labeling and distribution of food ingredients, vitamins, cosmetics and pharmaceuticals for active and inactive ingredients. Many of the FDA’s and FDCA’s rules and regulations apply directly to us as well as indirectly through their application in our customers’ products. To be properly marketed and sold in the United States, a relevant product must be generally recognized as safe, approved and not adulterated or misbranded under the FDCA and relevant regulations issued under the FDCA.

If we fail to comply with laws and FDA regulations or those of similar state agencies, we may be prevented from selling certain of our products and may also be subject to government agency enforcement liability. In addition, we may be subject to product liability and other claims by our customers or by individuals alleging personal injury from our products as food and drug additives.

We maintain insurance coverage against some, but not all, potential losses. Some of these matters, if they arise, may require us to expend significant amounts for investigation and defense or other costs not covered by insurance. We could sustain losses for uninsurable or uninsured risks, or in amounts in excess of existing insurance coverages. Events that result in significant personal injury or other losses that are not fully covered by insurance could have a material adverse effect on our results of operations and financial condition.

The United States fuel-grade ethanol industry is highly dependent upon various federal and state laws and regulations and any changes in those laws or regulations could have a material adverse effect on our results of operations, cash flows and financial condition.

The domestic market for fuel-grade ethanol is significantly impacted by federal mandates for volumes of renewable fuels (such as ethanol) required to be blended with gasoline. Future demand for fuel-grade ethanol will largely depend on incentives to blend ethanol into motor fuels, including the price of ethanol relative to the price of gasoline, the relative octane value of ethanol, constraints on the ability of vehicles to use higher ethanol blends, and the Environmental Protection Agency’s, or EPA’s, established volumes from time to time, small refinery waivers, and other applicable environmental requirements.

The EPA has implemented the Renewable Fuel Standard under the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007. The EPA, in coordination with the Secretary of Energy and the Secretary of Agriculture, determines annual quotas for the quantity of renewable fuels (such as fuel-grade ethanol) that must be blended into motor fuels consumed in the United States. The EPA finalized mandatory volumes of 15.0 billion gallons for each of 2023, 2024, and 2025 of conventional renewable fuel, or corn-based fuel-grade ethanol, which could decline in future years.

The EPA may issue small refinery waivers, in full or in part, to reduce or eliminate annual renewable fuel volume requirements for small refineries that process fewer than 75,000 barrels of petroleum daily. In the past, the EPA has issued small refinery waivers that have materially and adversely affected overall demand for and the price of fuel-grade ethanol. The U.S. Court of Appeals for the Fifth Circuit, in the fourth quarter of 2023, struck down the EPA’s decision to deny numerous small refinery waivers, finding that the EPA’s denials were impermissibly retroactive, contrary to law and counter to evidence in the litigation record. Accordingly, small refinery waivers from the EPA may be more likely in the future and could again materially and adversely affect overall demand for and the price of fuel-grade ethanol.

Various bills in Congress introduced from time to time are also directed at altering existing renewable fuels energy legislation, but none have passed in recent years. Some legislative bills are directed at halting or reversing expansion of, or even eliminating in its entirety, the renewable fuel program.

Our results of operations, cash flows and financial condition could be adversely impacted if the EPA reduces mandatory volumes or issues significant small refinery waivers, or if any legislation is enacted that reduces volume requirements.

Future demand for fuel-grade ethanol is uncertain and may be affected by changes to federal mandates, public perception, consumer acceptance and overall consumer demand for transportation fuel, any of which could negatively affect demand for fuel-grade ethanol and our results of operations.

Although many trade groups, academics and governmental agencies support ethanol as a fuel additive that promotes a cleaner environment, others criticize fuel-grade ethanol production and use as consuming considerably more energy and emitting more greenhouse gases than other biofuels and potentially depleting water resources. Some studies suggest that corn-based ethanol is less efficient than ethanol produced from other feedstock and that it negatively impacts consumers by causing increased prices for dairy, meat and other food generated from livestock that consume corn. Additionally, critics of fuel-grade ethanol contend that corn supplies are redirected from international food markets to domestic fuel markets. If negative views of corn-based ethanol production gain broader acceptance, support for existing measures promoting use and domestic production of corn-based ethanol as a fuel additive could decline, leading to a reduction or repeal of federal ethanol usage mandates, which would materially and adversely affect the demand for fuel-grade ethanol. These views could also negatively impact public perception of the fuel-grade ethanol industry and acceptance of ethanol as an alternative fuel.

There are limited markets for fuel-grade ethanol beyond those established by federal mandates. Discretionary blending and E85 blending (i.e., gasoline blended with up to 85% fuel-grade ethanol by volume) are important secondary markets. Discretionary blending is often determined by the price of fuel-grade ethanol relative to the price of gasoline. In periods when discretionary blending is financially unattractive, the demand for fuel-grade ethanol may decline. Also, the demand for fuel-grade ethanol is affected by the overall demand for transportation fuel. Demand for transportation fuel is affected by the number of miles traveled by consumers and vehicle fuel economy. Lower demand for fuel-grade ethanol and essential ingredients, including through the transition by consumers to alternative fuel vehicles such as electric vehicles and hybrid vehicles, would reduce the value of our ethanol and related products, erode our overall margins and diminish our ability to generate revenue or to operate profitably. In addition, we believe that additional consumer acceptance of E15 and E85 fuels is necessary before fuel-grade ethanol can achieve any significant growth in market share relative to other transportation fuels.

Risks Related to Ownership of our Common Stock

Our stock price is highly volatile, which could result in substantial losses for investors purchasing shares of our common stock and in litigation against us.

The market price of our common stock has fluctuated significantly in the past and may continue to fluctuate significantly in the future. The market price of our common stock may continue to fluctuate in response to one or more of the following factors, or any of the other risks or uncertainties discussed in this report, many of which are beyond our control:

- fluctuations in our quarterly or annual operating results;
- fluctuations in the market prices of our products;
- fluctuations in the costs of key production input commodities such as corn and natural gas;
- the timing, cost and effects of our capital improvement projects, including with respect to our CCS project and our corn oil and high protein system at our Magic Valley facility;
- anticipated trends in our financial condition and results of operations;
- our ability to obtain any necessary financing;
- the volume and timing of the receipt of orders for our products from major customers, including annual contracted sales volumes for our specialty alcohols;
- competitive pricing pressures;
- changes in market valuations of companies similar to us;

- stock market price and volume fluctuations generally;
- regulatory developments or increased enforcement;
- additions or departures of key personnel;
- environmental, product or other liabilities we may incur;
- our financing activities and future sales of our common stock or other securities; and
- our ability to maintain contracts that are critical to our operations.

The price at which you purchase shares of our common stock may not be indicative of the price that will prevail in the trading market. You may be unable to sell your shares of common stock at or above your purchase price, which may result in substantial losses to you and which may include the complete loss of your investment. In the past, securities class action litigation has often been brought against a company following periods of high stock price volatility. We may be the target of similar litigation in the future. Securities litigation could result in substantial costs and divert management's attention and our resources away from our business.

Any of the risks described above could have a material adverse effect on our results of operations, the price of our common stock, or both.

Because we do not plan to pay any cash dividends on our shares of common stock, our stockholders will not be able to receive a return on their shares unless and until they sell them.

We intend to retain a significant portion of any future earnings to finance the development, operation and expansion of our business. We do not anticipate paying any cash dividends on our common stock in the near future. The declaration, payment, and amount of any future dividends will be made at the discretion of our board of directors, and will depend upon, among other things, our results of operations, cash flows, and financial condition, operating and capital requirements, compliance with any applicable debt covenants, and other factors our board of directors considers relevant. There is no assurance that future dividends will be paid, and, if dividends are paid, there is no assurance of the amount of any such dividend. Unless our board of directors determines to pay dividends, our stockholders will be required to look solely to appreciation in the value of our common stock to realize any gain on their investment. There can be no assurance that any such appreciation will occur.

Our bylaws contain exclusive forum provisions that could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or agents.

Our bylaws provide that, unless we consent in writing to the selection of an alternative forum, the Delaware Court of Chancery shall be the sole and exclusive forum for (a) any derivative action or proceeding brought on our behalf, (b) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of us to us or our stockholders, (c) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, or (d) any action asserting a claim governed by the internal affairs doctrine.

Our bylaws also provide that, unless we consent in writing to the selection of an alternative forum, to the fullest extent permitted by applicable law, the federal district courts of the United States of America shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act of 1933, as amended, or the Securities Act, including all causes of action asserted against any defendant named in such complaint, including our officers and directors, underwriters for any offering giving rise to such complaint, and any other professional entity whose profession gives authority to a statement made by that person or entity and who has prepared or certified any part of the documents underlying the offering.

For the avoidance of doubt, the exclusive forum provisions described above do not apply to any claims arising under the Securities Act or the Securities Exchange Act of 1934, as amended, or the Exchange Act, to the extent federal law requires otherwise. Section 27 of the Exchange Act creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder, and Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder.

The choice of forum provisions in our bylaws may limit our stockholders' ability to bring a claim in a judicial forum that they find favorable for disputes with us or our directors, officers, employees, agents or other third parties, which may discourage such lawsuits against us and our directors, officers, employees, agents and other third parties even though an action, if successful, might benefit our stockholders. The applicable courts may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments or results may be more favorable to us than to our stockholders. With respect to the provision making the Delaware Court of Chancery the sole and exclusive forum for certain types of actions, stockholders who do bring a claim in the Delaware Court of Chancery could face additional litigation costs in pursuing any such claim, particularly if they do not reside in or near Delaware. Finally, if a court were to find these provisions of our bylaws inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could have a material adverse effect on us.

General Risk Factors

Cyberattacks through security vulnerabilities could lead to disruption of our business, reduced revenue, increased costs, liability claims, or harm to our reputation or competitive position.

Security vulnerabilities may arise from our hardware, software, employees, contractors or policies we have deployed, which may result in external parties gaining access to our networks, data centers, cloud data centers, corporate computers, manufacturing systems, and/or access to accounts we have at our suppliers, vendors or customers. External parties may gain access to our data or our customers' data, or attack the networks causing denial of service or attempt to hold our data or systems in ransom. The vulnerability could be caused by inadequate account security practices such as the failure to timely remove employee access when terminated. To mitigate these security issues, we have implemented measures throughout our organization, including firewalls, backups, encryption, employee information technology policies and user account policies. However, there can be no assurance that these measures will be sufficient to avoid cyberattacks. If any of these types of security breaches were to occur and we were unable to protect sensitive data, our relationships with our business partners and customers could be materially damaged, our reputation could be materially harmed, and we could be exposed to a risk of litigation and possible significant liability.

Further, if we fail to adequately maintain our information technology infrastructure, we may have outages and data loss. Excessive outages may affect our ability to timely and efficiently deliver products to customers or develop new products. Such disruptions and data loss may adversely impact our ability to fulfill orders and interrupt other processes. Delayed sales or lost customers resulting from these disruptions could adversely affect our financial results, stock price and reputation.

Our and our business partners' or contractors' failure to fully comply with applicable data privacy or similar laws could lead to significant fines and require onerous corrective action. In addition, data security breaches experienced by us or our business partners or contractors could result in the loss of trade secrets or other intellectual property, public disclosure of sensitive commercial data, and the exposure of personally identifiable information (including sensitive personal information) of our employees, customers, suppliers, contractors and others.

Unauthorized use or disclosure of, or access to, any personal information maintained by us or on our behalf, whether through breach of our systems, breach of the systems of our suppliers or vendors by an unauthorized party, or through employee or contractor error, theft or misuse, or otherwise, could harm our business. If any such unauthorized use or disclosure of, or access to, such personal information was to occur, our operations could be seriously disrupted, and we could be subject to demands, claims and litigation by private parties, and investigations, related actions, and penalties by regulatory authorities. In addition, we could incur significant costs in notifying affected persons and entities and otherwise complying with the multitude of foreign, federal, state and local laws and regulations relating to the unauthorized access to, or use or disclosure of, personal information. Finally, any perceived or actual unauthorized access to, or use or disclosure of, such information could harm our reputation, substantially impair our ability to attract and retain customers and have an adverse impact on our business, financial condition and results of operations.

Item 1B. Unresolved Staff Comments.

We have received no written comments regarding our periodic or current reports from the staff of the Securities and Exchange Commission that were issued 180 days or more preceding the end of our 2023 fiscal year and that remain unresolved.

Item 1C. Cybersecurity.

We recognize the critical importance of maintaining the trust and confidence of our customers, business partners, employees and other stakeholders. We engage in active oversight of cybersecurity, a cornerstone of our comprehensive enterprise risk management (ERM) program. Our cybersecurity framework is rooted in the National Institute of Standards and Technology, or NIST, Cybersecurity Framework, or CSF, as well as the International Organization for Standardization (ISO/IEC 27001), reflecting our commitment to uphold the highest cybersecurity standards. We align our policies, standards and practices with these benchmarks and dynamically refine them to address evolving cybersecurity threats.

Risk Management and Strategy

We maintain a cybersecurity program aligned with NIST CSF standards designed to identify critical assets and vulnerabilities, protect them with appropriate safeguards, promptly detect cybersecurity events, respond effectively to mitigate their impact and recover from incidents to restore services. Our cybersecurity program is designed to safeguard the confidentiality, integrity and availability of information. Our cybersecurity risk management strategy includes:

- **Governance:** The Audit Committee of our Board of Directors oversees our cybersecurity risk management. Our Chief Financial Officer and Director of Information Technology, along with key executives, have roles in governance and facilitating alignment across our organization.

- **Compliance and Standards:** We design our cybersecurity program for compliance with industry-specific and other regulations (e.g., the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA)) demonstrating our commitment to both domestic and international information security standards.

Technical Safeguards

We deploy technical defenses against cybersecurity risks of attack and other incidents, including firewalls, intrusion detection and prevention systems and access controls. We refine these measures based on our ongoing assessments, including cybersecurity threat intelligence updates.

- **Incident Response and Recovery Planning:** We maintain incident response and recovery frameworks, tested twice yearly through simulations and tabletop exercises, to improve our preparedness to effectively manage and mitigate cybersecurity incidents.

- **Education and Awareness:** Our personnel undergo mandatory periodic training on cybersecurity threats, with updated insights into effective defense mechanisms and our evolving cybersecurity policies and practices.

- **Use of Third Parties:** We collaborate with external cybersecurity service providers, including auditors and consultants, to refine our cybersecurity measures. These service providers carry out cybersecurity risk evaluations such as periodic assessments and vulnerability scans to pinpoint potential security flaws and suggest enhancements. In addition, we employ third-party technology and other solutions to enhance our protection against cybersecurity risks. These solutions include our use of a managed security service provider to support our in-house technology team, an endpoint detection and response, or EDR, system for ongoing surveillance, detection, and action against threats, as well as a security information and event management, or SIEM, system designed to automate the real time identification, investigation and prioritization of critical alerts.

- **Third-Party Risk Management:** We use a comprehensive due diligence process to manage third-party risks, emphasizing continuous monitoring and to ensure our business partners' cybersecurity practices meet our stringent standards.

As of the filing of this report, we do not believe that any risks from cybersecurity threats, including as a result of any previous cybersecurity incidents, have materially affected or are reasonably likely to materially affect, Alto Ingredients, Inc.

Governance

- We take a comprehensive and forward-looking approach to cybersecurity risk management under the oversight of our Audit Committee. Management, including our Chief Financial Officer and our Director of Information Technology, provide regular updates to ensure a strategic, unified response to cybersecurity challenges. Management is notified of, and monitors, cybersecurity incidents through our EDR and SIEM systems.

- Our Director of Information Technology has over 20 years of experience in information technology and five years of experience serving directly as a Chief Information Security Officer for other organizations.

- Our networks and systems are continuously monitored by a combination of third-party service providers and an internal cybersecurity team. Management is promptly notified of cybersecurity incidents.

- Our Audit Committee is promptly notified by our management of any material cybersecurity breach.

- Our Board of Directors is briefed at least annually on the state of our cybersecurity program.

- Our internal cybersecurity team collaborates with external cybersecurity service providers, including auditors and consultants, to refine our cybersecurity measures. These service providers carry out cybersecurity risk evaluations such as periodic assessments and vulnerability scans to pinpoint potential security flaws and suggest enhancements.

Engagement and Continuous Improvement

We periodically evaluate our cybersecurity measures through internal and external audits and assessments to ensure our cybersecurity program is at the forefront of industry best practices. The results of these audits and assessments inform adjustments to our cybersecurity program to improve our resilience against emerging cybersecurity threats.

Item 2. Properties.

Our corporate headquarters, located in Pekin, Illinois, consists of plants and facilities comprising our Pekin Campus production segment and totaling 145 acres on land we own. In Sacramento, California, we lease office space totaling approximately 3,400 square feet under a lease expiring in 2026. In St. Louis, Missouri, we lease warehouse space totaling approximately 84,000 square feet under a lease expiring in 2030. We have plants located in Boardman, Oregon, at a 25-acre facility, and Burley, Idaho, at a 25-acre facility. The land in Boardman, Oregon is leased under a lease expiring in 2076. We own the land in Burley, Idaho. The plants and facilities in Oregon and Idaho comprise our Western production segment. See "Business—Production Facilities." Our properties are subject to deeds of trust and other encumbrances in favor of our lenders.

Item 3. Legal Proceedings.

We are subject to legal proceedings, claims and litigation arising in the ordinary course of business. While the amounts claimed may be substantial, the ultimate liability cannot presently be determined because of considerable uncertainties that exist. Therefore, it is possible that the outcome of those legal proceedings, claims and litigation could adversely affect our quarterly or annual operating results or cash flows when resolved in a future period. However, based on facts currently available, management believes such matters will not adversely affect in any material respect our financial position, results of operations or cash flows.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market For Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

Our common stock trades on The Nasdaq Capital Market under the symbol "ALTO." We also have non-voting common stock outstanding, which is convertible into our voting common stock, and which is not listed on an exchange.

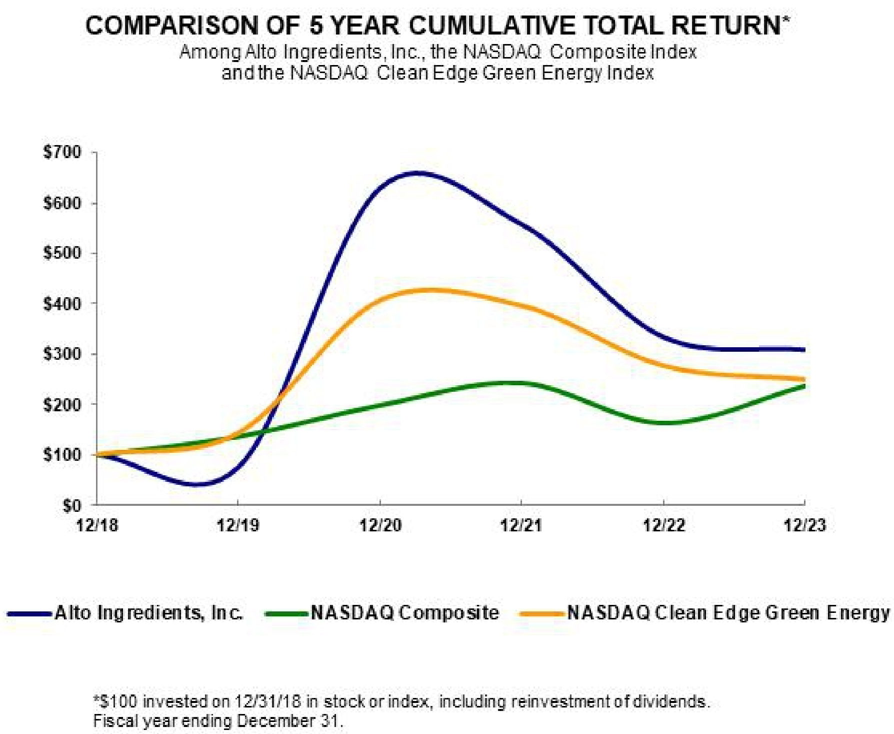
Security Holders

As of March 12, 2024, we had 75,697,150 shares of common stock outstanding held of record by approximately 320 stockholders and 896 shares of non-voting common stock outstanding held of record by one stockholder. These holders of record include depositories that hold shares of stock for brokerage firms which, in turn, hold shares of stock for numerous beneficial owners. On March 12, 2024, the closing sales price of our common stock on The Nasdaq Capital Market was $2.01 per share.

Performance Graph

The graph below shows a comparison of the cumulative total stockholder return on our common stock with the cumulative total return on The Nasdaq Composite Index and The Nasdaq Clean Edge Green Energy Index, or Peer Group, in each case over the five-year period ended December 31, 2023.

The graph assumes $100 invested at the indicated starting date in our common stock and in each of The Nasdaq Composite Index and the Peer Group, with the reinvestment of all dividends. We have not paid or declared any cash dividends on our common stock and do not anticipate paying any cash dividends on our common stock in the foreseeable future. Stockholder returns over the indicated periods should not be considered indicative of future stock prices or stockholder returns. This graph assumes that the value of the investment in our common stock and each of the comparison groups was $100 on December 31, 2018.



	Years Ended					
	12/2018	12/2019	12/2020	12/2021	12/2022	12/2023
Alto Ingredients, Inc.	100.00	75.49	630.66	558.65	334.49	308.94
Nasdaq Composite	100.00	136.69	198.10	242.03	163.28	236.17
Nasdaq Clean Edge Green Energy	100.00	142.67	406.35	395.62	276.35	248.97

Dividend Policy

We have never paid cash dividends on our common stock and do not intend to pay cash dividends on our common stock in the foreseeable future. We anticipate that we will retain any earnings for use in the continued development of our business.

Our current and future debt financing arrangements may limit or prevent cash distributions from our subsidiaries to us, depending upon the achievement of specified financial and other operating conditions and our ability to properly service our debt, thereby limiting or preventing us from paying cash dividends. Further, the holders of our outstanding Series B Preferred Stock are entitled to dividends of 7% per annum, payable quarterly in arrears. Accrued and unpaid dividends in respect of our Series B Preferred Stock must be paid prior to the payment of any dividends in respect of shares of our common stock.

For 2023, 2022 and 2021, we declared and paid cash dividends on our outstanding shares of Series B Preferred Stock as they became due.

Recent Sales of Unregistered Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

The following table sets forth information about repurchases of our common stock for the three months ended December 31, 2023:

Period	Total number of shares purchased (1)	Average price paid per share	Total number of shares purchased as part of publicly-announced plans or programs (2)	Approximate dollar value of shares that may yet be purchased under plans or programs (2)(3)
October 1 to October 31, 2023	—	$ —	—	$ —
November 1 to November 30, 2023	436,000	$ 2.27	436,000	$ 45,001,000
December 1 to December 31, 2023	—	$ —	—	$ —
Three months ended December 31, 2023	436,000	$ 2.27	436,000	$ 45,001,000

(1) We repurchased 436,000 shares as part of our publicly announced share repurchase program during the three months ended December 31, 2023 and received no shares transferred from employees in satisfaction of minimum statutory tax withholding obligations upon the vesting of restricted stock during the period.

(2) On September 12, 2022, we announced a share repurchase program under which we may repurchase up to $50 million of our common stock with an initial purchase authorization of $10 million. Our lenders have further limited our purchase authorization to $5 million. Amounts in excess of our lenders' initial purchase authorization of $5 million will require additional lender consent and amounts in excess of the initial purchase authorization of $10 million will require additional board and preferred stockholder authorization. The share repurchase program does not have an expiration date, does not require the repurchase of any particular amount of shares, and may be implemented, modified, suspended or discontinued in whole or in part at any time and without further notice.

(3) Amount represents the share repurchase program size of $50 million less approximately $5 million in aggregate share repurchases, but is subject to authorizations for purchases in excess of our lenders' purchase authorization of $5 million and our board and preferred stockholders' initial purchase authorization of $10 million.

Item 6. [Reserved]

Not Applicable.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and notes to consolidated financial statements included elsewhere in this report. This discussion contains forward-looking statements, reflecting our plans and objectives that involve risks and uncertainties. Actual results and the timing of events may differ materially from those contained in these forward-looking statements due to a number of factors, including those discussed in the section entitled "Risk Factors" and elsewhere in this report.

Overview

We produce and distribute renewable fuel and essential ingredients. We are also the largest producer of specialty alcohols in the United States.

We operate five alcohol production facilities. Three of our production facilities are located in Illinois, one is located in Oregon and another is located in Idaho. We have an annual alcohol production capacity of up to 350 million gallons, including both fuel-grade ethanol and specialty alcohols ranging from industrial-, pharmaceutical-, and high-quality food- and beverage-grade alcohols. Of this amount, we are able to produce up to 110 million gallons annually of specialty alcohols, depending on our product mix among high-quality beverage-grade alcohol and alcohols of other quality specifications. We market and distribute all of the alcohols produced at our facilities as well as alcohols produced by third parties. In 2023, we marketed and distributed approximately 383 million gallons combined of our own alcohols as well as fuel-grade ethanol produced by third parties, and over 1.5 million tons of essential ingredients on a dry matter basis.

We also specialize in break bulk distribution of specialty alcohols through our Eagle Alcohol subsidiary. We purchase bulk alcohol from suppliers and then store, denature, package, and resell alcohol products in smaller sizes, including tank trucks, totes and drums that typically garner a premium price to bulk alcohols. We deliver products to customers in the beverage, food, industrial and related-process industries via our own dedicated trucking fleet and common carrier.

We report our financial and operating performance in three segments: (1) Pekin production, which includes the production and sale of alcohols and essential ingredients produced at our three production facilities located in Pekin, Illinois, which we refer to as our Pekin Campus, (2) marketing and distribution, which includes marketing and merchant trading for company-produced alcohols and essential ingredients on an aggregated basis, and sales of fuel-grade ethanol sourced from third parties, and (3) Western production, which includes the production and sale of renewable fuel and essential ingredients produced at our two western production facilities on an aggregated basis, none of which are individually so significant as to be considered a separately reportable segment.

Our mission is to produce the highest quality, sustainable ingredients from renewable resources that make everyday products better. We intend to accomplish this goal in part by investing in our specialized and higher value specialty alcohol production and distribution infrastructure, expanding production in high-demand essential ingredients, expanding and extending the sale of our products into new regional and international markets, building efficiencies and economies of scale and by capturing a greater portion of the value stream.

Production Segments

We produce specialty alcohols, fuel-grade ethanol and essential ingredients, focusing on five key markets: *Health, Home & Beauty*; *Food & Beverage*; *Industry & Agriculture; Essential Ingredients*; and *Renewable Fuels*. Products for the *Health, Home & Beauty* markets include specialty alcohols used in mouthwash, cosmetics, pharmaceuticals, hand sanitizers, disinfectants and cleaners. Products for the *Food & Beverage* markets include grain neutral spirits used in alcoholic beverages and vinegar as well as corn germ used for corn oils. Products for *Industry & Agriculture* markets include alcohols and other products for paint applications and fertilizers. Products for *Essential Ingredients* markets include dried yeast, corn protein meal, corn protein feed, corn germ, and distillers grains and liquid feed used in commercial animal feed and pet foods. We also sell yeast for human consumption. Our products for the *Renewable Fuels* markets include fuel-grade ethanol and distillers corn oil used as a feedstock for renewable diesel and biodiesel fuels.

We produce our alcohols and essential ingredients at our production facilities. Our production facilities located in Illinois are in the heart of the Corn Belt, benefit from relatively low-cost and abundant feedstock and enjoy logistical advantages that enable us to provide our products to both domestic and international markets via truck, rail or barge. Our production facilities located in Oregon and Idaho are near their respective fuel and feed customers, offering significant timing, transportation cost and logistical advantages.

All of our production facilities are currently operating except our Magic Valley plant, which we temporarily hot-idled in January 2024 to minimize losses from negative regional crush margins and to expedite the installation of additional equipment needed to achieve our intended production rate, quality and consistency from our corn oil and high protein system. We intend to restart Magic Valley production in the second quarter once the upgrades are complete and crush margins have improved. As market conditions change, we may increase, decrease or idle production at one or more operating facilities or resume operations at any idled facility.

Marketing and Distribution Segment

We market and distribute all of the alcohols and essential ingredients we produce at our facilities. We also market and distribute alcohols produced by third parties.

We have extensive and long-standing customer relationships, both domestic and international, for our specialty alcohols and essential ingredients. These customers include producers and distributors of ingredients for cosmetics, sanitizers and related products, distilled spirits producers, food products manufacturers, producers of personal health/consumer health and personal care hygiene products, and global trading firms.

Our renewable fuel customers are located throughout the Western and Midwestern United States and consist of integrated oil companies and gasoline marketers who blend fuel-grade ethanol into gasoline. Our customers depend on us to provide a reliable supply of fuel-grade ethanol and manage the logistics and timing of delivery. Our customers collectively require fuel-grade ethanol volumes in excess of the supplies we produce at our facilities. We secure additional fuel-grade ethanol supplies from third-party ethanol producers. We arrange for transportation, storage and delivery of fuel-grade ethanol purchased by our customers through our agreements with third-party service providers in the Western United States as well as in the Midwest from a variety of sources.

We market our essential ingredient feed products to dairies and feedlots, in many cases located near our production facilities. These customers use our feed products for livestock as a substitute for corn and other sources of starch and protein. We sell our corn oil to poultry and biodiesel customers. We do not market essential ingredients from other producers.

See “Note 5 – Segments” to our Notes to Consolidated Financial Statements included elsewhere in this report for financial information about our business segments.

Financial Review, Current Initiatives and Outlook

In 2023, we continued our transformation to produce a variety of essential ingredients and the highest-grade beverage alcohol in the industry. We invested significant capital in our facilities to improve efficiency and capacity utilization rates and to expand margins long term. These strategies have begun to mitigate the impact of negative commodity price fluctuations. Although ethanol crush margins exhibited greater volatility in the second half of 2023, both our fourth quarter and full year 2023 results significantly outperformed those same periods in 2022 despite lower overall plant utilization rates.

Gross loss declined by $18.8 million in the fourth quarter of 2023 compared to the same period in 2022. We generated $16 million in gross profit for the full year 2023, an improvement of $43 million over 2022.

We reported positive Adjusted EBITDA of $3 million for the fourth quarter of 2023, an improvement of $19 million compared the same period in 2022. We also reported positive Adjusted EBITDA of approximately $21 million for all of 2023, an increase of $27 million over the prior year, representing a significant year-over-year improvement, particularly in light of $20 million less in USDA cash grants in 2023 as compared to 2022.

We define EBITDA as unaudited consolidated net income (loss) before interest expense, interest income, provision for income taxes and depreciation and amortization expense. We define Adjusted EBITDA as unaudited consolidated net income (loss) before interest expense, interest income, unrealized derivative gains and losses, acquisition-related expense, asset impairments, provision for income taxes and depreciation and amortization expense.

Renewable fuel margins were strong for the second and third quarters of 2023. As a result, we shifted part of our production to renewable fuel to take advantage of the higher margin environment. Ethanol crush margins exhibited extreme volatility in the second half of 2023, peaking in the mid-60 cents per gallon in September and declining thereafter to slightly negative in December. Margin volatility impacted the production volumes we were willing to sell, the prices at which we sold and the volume of third-party production we contracted for sale. Overall sales volume declined for 2023 due to these factors as well as the hot-idling of our Magic Valley facility in the first quarter of the year, ongoing challenges with the corn oil and high protein system at the facility, and longer than expected unscheduled downtime in the third quarter at our Pekin Campus.

Thus far in 2024, although crush margins have been break-even or slightly negative, they have begun to improve compared to the end of 2023. In addition, margins were approximately 20 cents per gallon higher for January and February 2024 compared to the same period in 2023. In January 2024, however, a polar vortex in the Midwest negatively impacted both operations and logistics at our Pekin Campus. Despite significant preparations ahead of the freeze and timely recovery response efforts, we experienced a shift to lower margin feed products and reduced alcohol production by approximately one million gallons due to frozen river conditions. In addition, the hot-idle of our Magic Valley facility in January 2024 will lower renewable fuel production, shifting sales volumes to higher third-party production compared to the fourth quarter of 2023.

We have contracted approximately 93 million gallons of fixed-price, high-quality alcohol at an average premium to renewable fuel of 31 cents per gallon, with additional capacity to take advantage of spot sales.

Our overall outlook for 2024 is favorable in light of good corn inventories, low corn and natural gas prices, higher sugar prices, domestic regulatory support for summer blending and expected global demand growth for U.S.-sourced ethanol. These factors should result in an improved crush margin environment in the coming months and yield positive crush spreads through most of 2024. Markets are dynamic but we remain agile and financially prudent while we seek to capitalize on the best opportunities. We remain enthusiastic about our prospects and confident in our long-term growth strategy.

During the fourth quarter, repairs and maintenance expense across our plants was $7.7 million compared to $7.1 million for the same period in 2022, bringing total repairs and maintenance expense to $29.5 million for 2023 as compared to $30.0 million for 2022.

Our wet mill, yeast facility and distillery capabilities at our Pekin Campus provide significant differentiation and greater production capabilities than the typical dry mill. However, given the nature and age of these facilities, they require consistent, ongoing repairs and maintenance, and capital upgrades integral to the longevity, sustainable performance and modernization of these assets. To maintain reliable and efficient operations, we normally address smaller concerns as needed and conduct larger scheduled outages approximately every two years.

We originally scheduled our biennial Pekin Campus wet mill repair and maintenance outage for August 2023 but due to favorable crush margins and sufficient corn supply at the time, we postponed the outage to this coming April. We expect the repairs and maintenance activities will take approximately ten days, lowering production in the second quarter. The repairs and maintenance are projected to cost approximately $4.0 million. For the full year 2024, we expect to track to our typical repairs and maintenance run rate of around $30.0 million, bringing the total, including the upcoming outage expense, to $34.0 million for 2024.

We invested $5.0 million in capital expenditures in the fourth quarter of 2023, bringing our year-end total to $30.0 million for all of 2023, compared to $13.0 million in the fourth quarter of 2022 and $38.0 million for all of 2022. We plan for capital expenditures of approximately $25.0 million in 2024 for equipment upgrades, process improvements and projects with short-term paybacks. We believe that these ongoing repairs and maintenance efforts and our capital improvement projects position us for a much stronger future. Our biennial outages have historically increased reliability and production run rates. We expect these positive effects will benefit 2024, in particular as we head into the typically more favorable summer months.

We continue to pursue a number of strategic capital investment initiatives. In the fourth quarter of 2023 and into 2024, we continued our ongoing evaluation of these initiatives. Based on current market dynamics, recent findings from our updated front-end engineering and design (FEED) studies, interest from potential strategic partners and expected project return profiles, we decided to designate our carbon capture and storage, or CCS, project as our top priority.

Under the Inflation Reduction Act, we have a compelling opportunity to capture and store biogenic CO_2 we generate at our Pekin Campus. Together with associated energy upgrades, we believe that our CCS project provides excellent economics. Given the significant time, personnel and financial resources necessary to complete our CCS project, we decided to pause further development of our primary yeast and biogas conversion projects. These projects continue as opportunities for potential future development as resources permit.

We are encouraged by recent progress on many aspects of CCS. This progress includes overall system design, community outreach, financing, vendor negotiations, EPA application preparation and schedule alignment to procure equipment and install power and compression. We have also signed an exclusive non-binding letter of intent with Vault 44.01 and we are nearing the execution of definitive agreements to develop our CCS project. The project, as currently planned, involves our installation of equipment to capture CO_2 generated at our Pekin Campus and our project partner safely transporting and permanently storing those emissions deep underground in a secure geologic reservoir located in close proximity to the facility. Our intent is to substantially reduce CO_2 emissions from the alcohol production process while providing direct value to the surrounding communities. Unfortunately, the EPA has extended its CCS application approval process from 18 to 24 months, and equipment manufacturing and installation times have grown longer than originally anticipated. We intend to make positive use of this additional time to better align our various project schedules and reduce our overall financial risk. Overall, we believe we can generate over $30.0 million in EBITDA annually from our CCS project, after accounting for operating and storage costs, and excluding any of the substantial additional economic benefits of the environmental attributes associated with low carbon ethanol.

In addition to CCS, we are pursuing two attractive alternatives to increase energy capacity at our Pekin Campus with either our current utility provider or a highly regarded, independent energy company that would build, own and operate onsite energy facilities. Both alternatives would greatly reduce our capital requirements and long-term energy costs while lowering our carbon footprint. These capital-light energy alternatives may result in better earnings accretion from our CCS project than originally estimated.

We continue to assess our current portfolio of assets, especially our Western production facilities, as we evaluate our path to higher margins, improved profitability and the highest return to our shareholders. Our intent is to leverage the distinct strengths and opportunities of these facilities by investing in new equipment and applications. While we work on these projects, we may also consider disposing of one or both of our Western production facilities. As demonstrated with the sale of our California and Nebraska facilities, we remain steadfast in our commitment to appropriate decisions to optimize long-term value.

Over the past two years we have completed numerous upgrades. Some of our larger in-progress or completed initiatives over the prior twelve months include the completion in February 2024 of a new, high efficiency boiler at our Pekin Campus that replaced two inefficient, high-pressure boilers. We expect full boiler utilization by the end of the first quarter, reducing our energy needs and operating costs, and increasing annualized incremental EBITDA by $2.0 million. In addition, in the second quarter of 2023, our new grain silo at our Pekin Campus became fully operational, doubling our days of corn storage capacity. This achieved our goal to increase flexibility around the timing of corn deliveries while lowering costs related to quick or last-minute shipments and to reduce corn premiums during extended weekends and harsh weather conditions. This project has already exceeded our target of contributing annualized incremental EBITDA of $2.0 million.

We continue to expand into higher quality alcohol and our ability to differentiate our product offerings has been very important considering market trends. For example, in 2021 and for part of 2022, the higher margin for specialty alcohol attracted many new producers, increasing product availability and supply. These factors, combined with ebbing consumer demand growth and supply chain dynamics, resulted in margin compression over the past 18 months. Starting in 2022, in anticipation these changing market conditions, we began strategic investments to produce a higher volume of beverage grade alcohols that leverage the capabilities of our Pekin Campus. We developed our highly differentiated 192 proof and low-moisture 200 proof grain neutral spirits, or GNS, which became available in early 2023. These new products were well received by our customers and actively sold in the spot market, generating significant sales and bolstering our gross margins for the year.

In our pursuit to expand higher margin corn oil and high-protein products at our Magic Valley facility, working with our corn oil and high protein system vendor, Harvesting Technology, we engaged equipment manufacturers and independent third-party engineers in the fourth quarter of 2023 to conduct an in-depth analysis of our challenges. The team formulated a plan, including extensive design modifications, to achieve the intended production rate, quality and consistency. We decided in January 2024 to temporarily hot-idle the facility to minimize losses from negative regional crush margins and expedite the installation of additional equipment at the plant. Harvesting Technology has borne the direct costs associated with their design and equipment. We are confident in the extensive design modifications under way and in achieving our corn oil and high-protein targets in 2024. We intend to restart production in the second quarter once the upgrades are complete and crush margins have improved. The operation of the upgraded high-protein system at our Magic Valley facility will influence our decision and timing to roll out the system at our other dry mills. In the interim, we are operating the Magic Valley facility as a terminal to service our renewable fuel customers. We are also working with the local feed distributor and our feed customers to meet their supply requirements.

Going forward, we intend to discuss our various capital projects individually and not in the aggregate, using three categories: *In Operation*, which includes completed projects, such as our corn storage and boiler upgrades, our beverage grade GNS alcohols and Eagle Alcohol distribution infrastructure; *Under Development*, which includes high priority strategic opportunities that have the greatest expected returns as well as initiatives that support our near-term operational goals, such as CCS and potential partnerships for cogeneration and a natural gas pipeline; and *For Future Evaluation*, which includes potential opportunities with attractive expected returns to be assessed as resources permit, such as primary yeast, biogas conversion, the installation of higher margin corn oil and high protein systems at our three other dry mills, sustainable aviation fuel, blue ethanol, ethanol-to-jet fuel and synthetic natural gas.

As a renewables company, we remain dedicated to implementing sustainable best practices that are good for our business, our stakeholders and our planet. In December, we published our first Sustainability Summary. Our Sustainability Summary provides a review of our strategy and vision for advancements in sustainability, responsible sourcing and risk management. We are focused on continuous improvement in environmental, health and safety, product quality, and diversification by integrating innovative practices at our facilities to ensure optimal efficiency, contributing to a lower carbon footprint. Our efforts improved our sustainability scores across the board with all three rating agencies, which is important to our customers. Looking ahead, we are working to obtain third-party greenhouse gas verifications, improve transportation safety and earn additional EcoVadis awards.

Use of Non-GAAP Financial Measures

Management believes that certain financial measures not in accordance with generally accepted accounting principles, or GAAP, are useful measures of operations. Management provides EBITDA and Adjusted EBITDA as non-GAAP financial measures so that investors will have the same financial information that management uses, which may assist investors in properly assessing our performance on a period-over-period basis.

To increase transparency to our operating physical margins and conform our reporting to management’s evaluation of our financial performance, we now exclude the impact of unrealized non-cash derivative gains and losses when calculating Adjusted EBITDA. Unrealized derivative gains and losses are non-cash, mark-to-market adjustments of derivative instruments on open positions related to future period purchases and sales that are recorded as part of cost of goods sold.

A table is provided below to reconcile Adjusted EBITDA to its most directly comparable GAAP measure, consolidated net income (loss). EBITDA and Adjusted EBITDA are not measures of financial performance under GAAP and should not be considered as alternatives to consolidated net income (loss) or any other measure of performance under GAAP, or to cash flows from operating, investing or financing activities as an indicator of cash flows or as a measure of liquidity. EBITDA and Adjusted EBITDA have limitations as analytical tools and you should not consider these measures in isolation or as a substitute for analysis of our results as reported under GAAP.

Information reconciling forward-looking EBITDA or Adjusted EBITDA to forward-looking consolidated net income (loss) would require a forward-looking statement of consolidated net income (loss) prepared in accordance with GAAP, which is unavailable to us without unreasonable effort. We are not able to provide a quantitative reconciliation of forward-looking EBITDA or Adjusted EBITDA to forward-looking consolidated net income (loss) because certain items required for reconciliation are uncertain, outside of our control and/or cannot reasonably be predicted, such as net sales, cost of goods sold, unrealized derivative gains and losses, asset impairments and provision (benefit) for income taxes, which we view as the most material components of consolidated net income (loss) that are not presently estimable.

Reconciliation of Adjusted EBITDA to Consolidated Net Loss

(in thousands) (unaudited)	Three Months Ended December 31, 2023	Three Months Ended December 31, 2022	Years Ended December 31, 2023	Years Ended December 31, 2022
Consolidated net loss	$ (18,945)	$ (33,072)	$ (28,005)	$ (41,597)
Adjustments:				
Interest expense, net	2,126	968	7,425	1,827
Interest income	(265)	(169)	(854)	(510)
Unrealized derivative losses	8,162	8,037	9,679	4,017
Acquisition-related expense	700	875	2,800	3,500
Asset impairments	5,970	—	6,544	—
Provision for income taxes	97	1,925	97	1,925
Depreciation and amortization expense	5,698	5,973	23,080	25,095
Total adjustments	22,488	17,609	48,771	35,854
Adjusted EBITDA	$ 3,543	$ (15,463)	$ 20,766	$ (5,743)

2023 Financial Performance Summary

Our consolidated net sales declined by $0.1 billion to $1.2 billion for 2023 from $1.3 billion for 2022. Our net loss available to common stockholders improved by $13.6 million to a net loss of $29.3 million for 2023 from a net loss of $42.9 million for 2022.

Factors that contributed to these results of operations for 2023 include:

- *Net sales*. Our net sales declined by $0.1 billion to $1.2 billion for 2023 from $1.3 billion for 2022 due to a decrease in total alcohol gallons sold, a decline in our average sales price per gallon and fewer tons of essential ingredients sold.
  - Our total gallons sold declined by 36.4 million gallons, or 9%, to 382.5 million gallons for 2023 from 418.9 million gallons for 2022.
    - Our renewable fuel production sales volume declined by 5.3 million gallons, or 3%, to 203.2 million gallons for 2023 from 208.5 million gallons for 2022, primarily from reduced production in 2023 as our Magic Valley facility was hot-idled in the first quarter of 2023 coupled with unusually high unscheduled production downtime later in the year at our Pekin Campus for repairs and maintenance.
    - Our specialty alcohol production sales volume declined by 15.8 million gallons, or 17%, to 76.7 million gallons for 2023 from 92.5 million gallons for 2022 primarily due to reduced customer demand for specialty alcohols during the year, a portion of which was shifted to 2024.
    - Our third-party sales volume declined by 15.3 million gallons, or 13%, to 102.6 million gallons for 2023 from 117.9 million gallons for 2022. Consistent with our efforts over the past two years, we continued to intentionally reduce sales of third-party fuel-grade ethanol in geographic areas less important to our business to focus on sales of inventory from our own production in 2023.
  - Our average sales price per gallon declined by $0.17, or 6%, to $2.47 for 2023 from $2.64 for 2022. The decline was primarily driven by lower renewable fuel prices in 2023 largely due to lower oil and gasoline prices.
  - Our volume of essential ingredients sold declined by 0.1 million tons, or 7%, to 1.5 million tons for 2023 from 1.6 million tons for 2022 primarily due to lower alcohol production volumes during 2023. Our average sales price for our essential ingredients also declined primarily due to lower corn prices.

- *Gross Profit (Loss)*. Our gross profit improved by $43.2 million to a gross profit of $15.7 million for 2023 from a gross loss of $27.5 million for 2022 due to improved commodity crush margins from lower corn prices and successful efficiency initiatives. Our gross profit and margins were tempered, however, due to production challenges at our Magic Valley plant as we continued to implement our high-protein system at the facility coupled with unusually high unscheduled downtime at our Pekin Campus that reduced sales volumes, shifted our overall product mix toward lower margin products, and resulted in significant increases in repair and maintenance costs.

Sales and Margins

We generate sales by marketing all of the alcohols produced by our three production facilities in Illinois, all of the fuel-grade ethanol produced by our production facilities in Oregon and Idaho, and fuel-grade ethanol purchased from third-party suppliers throughout the United States. We also market essential ingredients produced by our production facilities, including dried yeast, corn gluten meal, corn gluten feed, corn germ, and distillers grains and liquid feed used in commercial animal feed and pet foods. We also sell yeast for human consumption.

Our profitability is highly dependent on various commodity prices, including the market prices of corn, natural gas and fuel-grade ethanol.

Our consolidated average alcohol sales price declined by 6% to $2.47 per gallon for 2023 compared to $2.64 per gallon for 2022. The average price of fuel-grade ethanol as reported by the Chicago Mercantile Exchange, or CME, declined by 10% to $2.22 per gallon for 2023 compared to $2.47 per gallon for 2022. Our average cost of corn declined by 15% to $6.58 per bushel for 2023 from $7.77 per bushel for 2022. The average price of corn as reported by the CME declined by 19% to $5.64 per bushel for 2023 from $6.94 per bushel for 2022.

We believe that our gross profit margins depend primarily on six key factors:

- the prices of our specialty alcohols and the market price of fuel-grade ethanol, the latter of which is impacted by the price of gasoline and related petroleum products, and government regulation, including government ethanol mandates;

- the market prices of key production input commodities, such as corn (including corn basis) and natural gas;

- the market prices of our essential ingredients;

- our ability to anticipate trends in the market and contracted prices of our alcohols, essential ingredients, and costs of key input commodities, and our ability to implement appropriate risk management through hedging and other means, and opportunistic pricing strategies;

- the proportion of our sales of specialty alcohols to our sales of fuel-grade ethanol produced at our facilities relative to their respective market and contracted prices; and

- the proportion of our sales of fuel-grade ethanol produced at our facilities to our sales of fuel-grade ethanol produced by unrelated third-parties relative to the market price of fuel-grade ethanol and marketing and distribution fees payable for third-party sales.

We seek to optimize our gross profit margins by anticipating the factors above and, when resources are available, implementing hedging transactions and taking other actions designed to lock in margins, limit risk and otherwise address these factors. For example, we may seek to reduce inventory levels in anticipation of declining alcohol or essential ingredient prices and increase production and inventory levels in anticipation of rising alcohol or essential ingredient prices. We may also seek to alter our proportion or timing, or both, of purchase and sales commitments.

Our inability to anticipate the factors described above or their relative importance, and adverse movements in the factors themselves, could result in declining or even negative gross profit margins over certain periods of time. Our ability to anticipate these factors or favorable movements in these factors may enable us to generate above-average gross profit margins. However, given the difficulty associated with successfully forecasting any of these factors, we are unable to estimate our future sales or gross profit margins.

Results of Operations

Selected Financial Information

The following selected financial information should be read in conjunction with our consolidated financial statements and notes to our consolidated financial statements included elsewhere in this report, and the other sections of “Management’s Discussion and Analysis of Financial Condition and Results of Operations” contained in this report.

Certain performance metrics that we believe are important indicators of our results of operations include:

Sales and Operating Metrics (unaudited)

	Years Ended December 31,			Percentage Change	
	2023	2022	2021	2023 vs 2022	2022 vs 2021
Alcohol Sales (gallons in millions)					
Pekin Campus renewable fuel gallons sold	136.2	116.1	123.5	17%	(6)%
Western production renewable fuel gallons sold	67.0	92.4	37.6	(27)%	146%
Third party renewable fuel gallons sold	102.6	117.9	229.0	(13)%	(49)%
Total renewable fuel gallons sold	305.8	326.4	390.1	(6)%	(16)%
Specialty alcohol gallons sold	76.7	92.5	89.5	(17)%	3%
Total gallons sold	382.5	418.9	479.6	(9)%	(13)%
Sales Price per Gallon					
Pekin Campus	$ 2.40	$ 2.55	$ 2.34	(6)%	9%
Western production	$ 2.49	$ 2.75	$ 2.87	(9)%	(4)%
Marketing and distribution	$ 2.56	$ 2.83	$ 2.69	(10)%	5%
Total	$ 2.47	$ 2.64	$ 2.46	(6)%	7%
Alcohol Production (gallons in millions)					
Pekin Campus	209.7	208.8	212.9	0%	(2)%
Western production	68.1	91.2	38.8	(25)%	135%
Total	277.8	300.0	251.7	(7)%	19%
Corn Cost per Bushel					
Pekin Campus	$ 6.32	$ 7.32	$ 6.06	(14)%	21%
Western production	$ 7.45	$ 8.97	$ 7.40	(17)%	21%
Total	$ 6.58	$ 7.77	$ 6.22	(15)%	25%
Average Market Metrics					
PLATTS Ethanol price per gallon	$ 2.22	$ 2.47	$ 2.29	(10)%	8%
CME Corn cost per bushel	$ 5.64	$ 6.94	$ 5.82	(19)%	19%
Board corn crush per gallon(1)	$ 0.21	$ -	$ 0.21		
Essential Ingredients Sold (thousand tons)					
Pekin Campus:					
Distillers grains	332.7	334.4	338.5	(1)%	(1)%
CO2	182.4	164.8	164.9	11%	0%
Corn wet feed	95.0	89.9	88.1	6%	2%
Corn dry feed	90.6	81.6	78.8	11%	4%
Corn oil and germ	73.8	66.7	69.0	11%	(3)%
Syrup and other	41.2	56.9	77.9	(28)%	(27)%
Corn meal	36.8	32.1	33.9	15%	(5)%
Yeast	25.9	23.9	24.0	8%	0%
Total Pekin Campus essential ingredients sold	878.4	850.3	875.1	3%	(3)%
Western production:					
Distillers grains	459.7	643.7	274.0	(29)%	135%
Syrup and other	119.1	77.4	26.3	54%	194%
CO2	55.5	55.8	57.1	(1)%	(2)%
Corn oil	8.0	10.2	3.7	(22)%	176%
Total Western production essential ingredients sold	642.3	787.1	361.1	(18)%	118%
Total Essential Ingredients Sold	1,520.7	1,637.4	1,236.2	(7)%	32%
Essential Ingredients Return %(2)					
Pekin Campus return	45.7%	41.3%	40.4%	11%	2%
Western production return	33.4%	31.6%	31.5%	6%	0%
Consolidated total return	42.4%	37.9%	38.8%	12%	(2)%

(1) Assumes corn conversion of 2.80 gallons of alcohol per bushel of corn.

(2) Essential ingredient revenues as a percentage of total corn costs consumed.

Year Ended December 31, 2023 Compared to the Year Ended December 31, 2022
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	Years Ended December 31, 2023	Years Ended December 31, 2022	Dollar Change Favorable (Unfavorable)	Percentage Change Favorable (Unfavorable)	Results as a Percentage of Net Sales for the Years Ended December 31, 2023	Results as a Percentage of Net Sales for the Years Ended December 31, 2022
	(dollars in thousands)					
Net sales	$ 1,222,940	$ 1,335,621	$ (112,681)	(8.4)%	100.0%	100.0%
Cost of goods sold	1,207,287	1,363,171	155,884	11.4%	98.7%	102.1%
Gross profit (loss)	15,653	(27,550)	43,203	*NM	1.3%	(2.1)%
Selling, general and administrative expenses	(32,664)	(31,579)	(1,085)	(3.4)%	(2.7)%	(2.4)%
Loss on disposal of assets	(293)	(2,230)	1,937	86.9%	(0.0)%	(0.2)%
Asset impairments	(6,544)	—	(6,544)	(100.0)%	(0.5)%	—%
Loss from operations	(23,848)	(61,359)	37,511	61.1%	(2.0)%	(4.6)%
Income from cash grant	2,812	22,652	(19,840)	(87.6)%	0.2%	1.7%
Interest expense, net	(7,425)	(1,827)	(5,598)	(306.4)%	(0.6)%	(0.1)%
Other income, net	553	862	(309)	(35.8)%	0.0%	0.1%
Loss before income taxes	(27,908)	(39,672)	11,764	29.7%	(2.3)%	(3.0)%
Provision for income taxes	97	1,925	1,828	95.0%	0.0%	0.1%
Consolidated net loss	$ (28,005)	$ (41,597)	$ 13,592	32.7%	(2.3)%	(3.1)%
Preferred stock dividends	(1,265)	(1,265)	—	—%	(0.1)%	(0.1)%
Loss available to common stockholders	$ (29,270)	$ (42,862)	$ 13,592	31.7%	(2.4)%	(3.2)%

* *Not meaningful.*

Net Sales

The decline in our consolidated net sales for 2023 as compared to 2022 was due to a decrease in the average sales price per gallon for our alcohols, fewer total gallons sold and lower volumes of essential ingredients sold at lower prices. Our average sales price per gallon decreased primarily due to lower fuel-grade ethanol prices largely driven by lower oil and gasoline prices. Fewer total gallons sold for 2023 as compared to 2022 resulted primarily from the hot-idling of our Magic Valley facility in the first quarter of 2023 coupled with unusually high unscheduled production downtime later in the year at our Pekin Campus for repairs and maintenance. In addition, we produced and sold fewer tons of essential ingredients primarily due to lower alcohol production in 2023 compared to 2022. Our average sales price for our essential ingredients declined primarily due to lower corn prices. As we did in 2021 and 2022, we continued to intentionally reduce sales of third-party fuel-grade ethanol in geographical areas less important to our business and to instead focus on sales of inventory from our own production in 2023.

Pekin Campus Production Segment

Net sales of alcohol from our Pekin Campus production segment declined by $19.1 million, or 4%, to $502.2 million for 2023 as compared to $521.3 million for 2022. Our total volume of production gallons sold, however, increased by 4.3 million gallons, or 2%, to 208.9 million gallons for 2023 as compared to 204.6 million gallons for 2022, due to an extended shut down for maintenance during the summer of 2022. At the segment's average sales price per gallon of $2.49 for 2023, we generated $10.3 million in additional net sales from the 4.3 million additional gallons of alcohol sold in 2023 as compared to 2022. However, a decrease of $0.14, or 6%, in the segment's average sales price per gallon in 2023 as compared to 2022 resulted in a $29.4 million decline in net sales as compared to 2022.

Net sales of essential ingredients declined by $8.2 million, or 4%, to $217.7 million for 2023 as compared to $225.9 million for 2022. Our total volume of essential ingredients sold increased by 28,100 tons, or 3%, to 878,400 tons for 2023 from 850,300 tons for 2022. Sales volumes of essential ingredients were higher in 2023 due to an extended shut down for maintenance during the summer of 2022. At our average sales price per ton of $247.84 for 2023, we generated $6.9 million in additional net sales from the 28,100 additional tons of essential ingredients sold in 2023 as compared to 2022. A decrease of $17.80, or 7%, in our average sales price per ton in 2023 as compared to 2022 resulted in a $15.1 million decline in net sales as compared to 2022.

Marketing and Distribution Segment

Net sales of renewable fuel from our marketing and distribution segment, excluding intersegment sales, increased by $34.1 million, or 15%, to $263.0 million for 2023 as compared to $228.9 million for 2022.

Our volume of third-party renewable fuel sold reported gross by the segment increased by 22.1 million gallons, or 28%, to 102.6 million gallons for 2023 as compared to 80.5 million gallons for 2022. This increase resulted from a shift in the source of renewable fuel from our Magic Valley facility, as we hot-idled the facility in early 2023, to third-party suppliers. At the segment's average sales price per gallon of $2.56 for 2023, net sales were $56.6 million higher as a result of the 22.1 million additional gallons sold in 2023 as compared to 2022. This increase was partially offset by the $0.27 decrease in our average sales price per gallon for 2023. The decrease of $0.27, or 10%, in our average sales price per gallon in 2023 as compared to 2022 resulted in a $21.6 million decline in net sales from our third-party renewable fuel sold by the segment compared to 2022.

Our volume of third-party fuel-grade ethanol sold reported net by the segment declined by 37.4 million gallons, or 100%, to no gallons sold net for 2023 as compared to 37.4 million gallons for 2022. The decline in sales reported net resulted in a decrease of $0.9 million in net sales.

Western Production Segment

Net sales of alcohol from our Western production segment declined by $86.6 million, or 34%, to $167.0 million for 2023 as compared to $253.6 million for 2022. Our total volume of gallons sold declined by 25.4 million gallons, or 27%, to 67.0 million gallons for 2023 as compared to 92.4 million gallons for 2022. This decline in sales volume primarily resulted from lower production from our Magic Valley facility as we hot-idled the facility in the first quarter of 2023. At the segment's average sales price of $2.49 per gallon for 2023, net sales were $63.2 million lower as a result of the 25.4 million fewer gallons sold in 2023 as compared to 2022. A decline of $0.26, or 9%, in our average sales price per gallon in 2023 as compared to 2022 resulted in a $23.4 million decrease in net sales of alcohol from the segment compared to 2022.

Net sales of essential ingredients declined by $32.9 million, or 36%, to $57.3 million for 2023 as compared to $90.2 million for 2022. Our total volume of essential ingredients sold declined by 144,800 tons, or 18%, to 642,300 tons for 2023 from 787,100 tons for 2022. At our average sales price of $89.15 per ton for 2023, net sales were $12.9 million lower as a result of the 144,800 fewer tons sold in 2023 as compared to 2022. In addition, our sales price declined by $25.45 per ton for 2023. The decline of $25.45, or 22%, in our average sales price per ton in 2023 as compared to 2022 resulted in a decrease of $20.0 million in net sales of essential ingredients from the segment compared to 2022.

Corporate and Other Segment

Net sales from our Corporate and other segment were flat at $15.8 million for each of 2023 and 2022. These sales are from Eagle Alcohol's business.

Cost of Goods Sold and Gross Profit (Loss)

Our consolidated gross profit (loss) improved to a gross profit of $15.7 million, representing a gross margin of 1.3% for 2023, from a gross loss of $27.6 million, representing a gross margin of negative 2.1%, for 2022. Our consolidated gross profit improved due to improved commodity crush margins, particularly for renewable fuel, primarily due to lower corn costs, but was partially offset by $9.7 million in unrealized non-cash derivative losses from mark-to-market adjustments on open positions related to future period sales and $2.2 million in lower-of-cost-or-market charges in the fourth quarter of 2023 on our ending renewable fuel inventories and related fixed corn purchase commitments due to negative crush margins heading into year-end 2023 and the first quarter of 2024.

Pekin Campus Production Segment

Our Pekin Campus production segment's gross profit improved by $35.5 million to a gross profit of $13.7 million from a gross loss of $21.8 million. Of this increase, $35.2 million is attributable to higher commodity crush margins and $0.3 million is attributable to increased sales volumes in 2023 as compared to 2022.

Marketing and Distribution Segment

Our marketing and distribution segment's gross profit improved by $4.1 million to a gross profit of $3.7 million for 2023 from a gross loss of $0.4 million for 2022. Of this increase, $3.3 million is attributable to higher margins from sales of third-party renewable fuel, and $0.8 million attributable to higher marketing volumes of third-party renewable fuel sold reported gross in 2023 as compared to 2022.

Western Production Segment

Our Western production segment's gross loss improved by $3.5 million to a gross loss of $5.5 million for 2023 as compared to a gross loss of $9.0 million for 2022, despite lower production from our Magic Valley facility during the year. Of this improvement, $1.4 million is attributable to higher margins for renewable fuel and $2.1 million is attributable to lower sales volumes at negative margins in 2023 as compared to 2022.

Corporate and Other Segment

Gross profit from our Corporate and other segment was flat at $3.7 million for each of 2023 and 2022. This gross profit was from Eagle Alcohol's business.

Selling, General and Administrative Expenses

Our selling, general and administrative, or SG&A, expenses increased by $1.1 million to $32.7 million for 2023 as compared to $31.6 million for 2022. SG&A expenses increased primarily due to higher compensation-related expenses and litigation accruals, partially offset by lower accruals for deferred cash payments attributable to our acquisition of Eagle Alcohol.

Asset Impairments

We recorded an asset impairment charge of $6.5 million for 2023 as compared to none for 2022, of which $6.0 million is attributable to an impairment to the goodwill associated with our acquisition of Eagle Alcohol in 2022. This charge primarily reflects revisions to current market premiums and adjustments to projections in our required annual goodwill valuation.

Income from Cash Grant

We received cash grants under the USDA's Biofuel Producer Program in the amount of $2.8 million and $22.7 million for 2023 and 2022, respectively. The program was created as part of the CARES Act of 2020, which allocated $700 million to support biofuel producers that experienced market losses due to the pandemic. We are neither required to repay the grants nor will they recur in the future.

Interest Expense, net

Interest expense, net, increased by $5.6 million to $7.4 million for 2023 from $1.8 million for 2022. The increase in interest expense, net, is primarily due to higher debt balances under our term loan to fund our capital improvement projects, as well as higher interest rates under Kinergy's line of credit consistent with an overall higher interest rate environment.

Year Ended December 31, 2022, Compared to the Year Ended December 31, 2021

An analysis of our financial results comparing 2022 to 2021 can be found under "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022, filed with the Securities and Exchange Commission on March 14, 2023, which is available free of charge on the Securities and Exchange Commission's website at www.sec.gov.

Liquidity and Capital Resources

During the year ended December 31, 2023, we funded our operations primarily from cash on hand, cash flow from operations and proceeds from Kinergy's operating line of credit. In addition to funding our operations, we used our capital resources to continue our capital improvement projects, make an annual payment related to our acquisition of Eagle Alcohol, repurchase shares of our common stock and pay preferred stock dividends.

As of December 31, 2023, we had $30.0 million in cash and cash equivalents and $33.3 million available for borrowing under Kinergy's operating line of credit. In addition, we have up to an additional $65.0 million that may be available for capital improvement projects under our Orion term loan, subject to certain conditions. We believe we have sufficient sources of liquidity to meet our anticipated working capital, debt service, capital expenditure and other liquidity needs for at least the next twelve months from the date of this report.

Quantitative Year-End Liquidity Status

We believe that the following amounts provide insight into our liquidity and capital resources. The following selected financial information should be read in conjunction with our consolidated financial statements and notes to consolidated financial statements included elsewhere in this report, and the other sections of "Management's Discussion and Analysis of Financial Condition and Results of Operations" contained in this report (dollars in thousands).

	December 31, 2023	December 31, 2022	Change
Cash, cash equivalents and restricted cash	$ 45,480	$ 49,525	(8.2)%
Current assets	$ 168,770	$ 199,121	(15.2)%
Property and equipment, net	$ 248,748	$ 239,069	4.0%
Current liabilities	$ 65,288	$ 78,017	(16.3)%
Long-term debt, noncurrent portion	$ 82,097	$ 68,356	20.1%
Working capital	$ 103,482	$ 121,104	(14.6)%
Working capital ratio	2.59	2.55	1.6%

Restricted Net Assets

At December 31, 2023, we had approximately $64.6 million of net assets at our subsidiaries that were not available to be transferred to Alto Ingredients, Inc. in the form of dividends, distributions, loans or advances due to restrictions contained in our subsidiaries' credit facilities.

Changes in Working Capital and Cash Flows

Working capital declined to $103.5 million at December 31, 2023 from $121.1 million at December 31, 2022 as a result of a $30.3 million decrease in current assets, partially offset by a $12.7 million decrease in current liabilities.

Current assets declined primarily due to decreases in cash and cash equivalents, accounts receivable, inventories and derivative instruments, partially offset by an increase in restricted cash.

Our current liabilities declined primarily due to decreases in accounts payable, accrued liabilities and other current liabilities, partially offset by increases in derivative instruments and the current portion of our operating lease payment obligations.

Our cash, cash equivalents and restricted cash declined by $4.0 million due to $33.0 million used in our investing activities primarily for our capital improvement projects, partially offset by $22.0 million in cash provided by our operating activities and $7.0 million in cash provided by our financing activities.

Cash provided by our Operating Activities

We generated $22.0 million in cash from our operating activities during 2023, as compared to $6.0 million in 2022. Specific factors that contributed significantly to the change in cash generated by our operating activities include:

- a decline of $13.6 million in net loss primarily due to improved commodity crush margins resulting from lower corn costs;
- an increase related to inventories of $27.3 million due to the timing of production and sales where an increase in production did not result in a commensurate increase in sales by the end of the period; and
- an increase of $27.3 million related to changes in the fair value of our derivative instruments due to changes in commodity prices at period end 2023 as compared to 2022.

These amounts were partially offset by:

- a decrease of $33.1 million related to accounts payable and accrued expenses due to lower corn costs and the timing of payments; and
- a decrease $14.5 million related to accounts receivable balances primarily due to the timing of sales and collections.

Cash used in our Investing Activities

We used $33.0 million of cash in our investing activities for 2023, of which $29.5 million is attributable to additions to property and equipment resulting from our capital improvement projects and $3.5 million is attributable to cash paid for our acquisition of Eagle Alcohol.

Cash provided by our Financing Activities

Cash provided by our financing activities was $7.0 million for 2023, of which $12.6 million is attributable to net proceeds from Kinergy's line of credit, partially offset by $3.7 million in repurchases of our common stock, $1.3 million of preferred stock dividends and $0.7 million of debt issuance costs.

Kinergy's Operating Line of Credit

Kinergy maintains an operating line of credit for an aggregate amount of up to $100.0 million. The credit facility matures on November 7, 2027. Interest accrues under the credit facility at a rate equal to (i) the daily Secured Overnight Financing Rate, plus (ii) a specified applicable margin ranging from 1.25% to 1.75%. The credit facility's monthly unused line fee is 0.25% to 0.375% of the amount by which the maximum credit under the facility exceeds the average daily principal balance during the immediately preceding month. Payments that may be made by Kinergy to Alto Ingredients, Inc. as reimbursement for management and other services provided by Alto Ingredients, Inc. to Kinergy are limited under the terms of the credit facility to $1.5 million per fiscal quarter. The credit facility also includes the accounts receivable of our indirect wholly-owned subsidiary, Alto Nutrients, LLC, or Alto Nutrients, as additional collateral. Payments that may be made by Alto Nutrients to Alto Ingredients, Inc. as reimbursement for management and other services provided by Alto Ingredients, Inc. to Alto Nutrients are limited under the terms of the credit facility to $0.5 million per fiscal quarter. Alto Nutrients markets our essential ingredients and also provides raw material procurement services to our subsidiaries. In addition, the amount of cash distributions that Kinergy or Alto Nutrients may make to us is also limited to up to 75% of excess cash flow.

For all monthly periods in which excess borrowing availability falls below a specified level, Kinergy and Alto Nutrients must collectively maintain a fixed-charge coverage ratio (calculated as a twelve-month rolling earnings before interest, taxes, depreciation and amortization divided by the sum of interest expense, capital expenditures, principal payments of indebtedness, indebtedness from capital leases and taxes paid during such twelve-month rolling period) of at least 1.1 and are prohibited from incurring certain additional indebtedness (other than specific intercompany indebtedness). The obligations of Kinergy and Alto Nutrients under the credit facility are secured by all of our tangible and intangible assets.

We believe Kinergy and Alto Nutrients are in compliance with the fixed-charge coverage ratio covenant as of the filing of this report. The following table sets forth the fixed-charge coverage ratio financial covenant and the actual results for the periods presented:

	Years Ended December 31,	
	2023	**2022**
Fixed Charge Coverage Ratio Requirement	1.10	1.10
Actual	5.22	3.54
Excess	4.12	2.44

Alto Ingredients, Inc. has guaranteed all of Kinergy's obligations under the credit facility. As of December 31, 2023, Kinergy had an outstanding balance of $30.7 million and $33.3 million of unused borrowing availability under the credit facility.

Orion Term Loan

On November 7, 2022, we entered into a credit agreement with certain funds managed by Orion Infrastructure Capital, or Lenders, under which the Lenders extended a senior secured credit facility in the amount of up to $125.0 million, or Term Loan. The Term Loan is secured by a first priority lien on certain of our assets and a second priority lien on certain assets of Kinergy and Alto Nutrients.

The Lenders agreed to advance to us up to $125.0 million upon the satisfaction of certain conditions. We committed to issue to the Lenders pro rata an aggregate of 1,282,051 shares of our common stock at the initial funding and up to an additional 320,513 shares of our common stock based upon certain further fundings under the credit facility. On November 23, 2022, we received our initial funding of $60.0 million under the credit facility and issued an aggregate of 1,282,051 shares of our common stock to the Lenders. We received no separate consideration for the shares of common stock issued.

Interest accrues on the unpaid principal amount of the Term Loan at a fixed rate of 10% per annum. The Term Loan matures on November 7, 2028, or earlier upon acceleration.

We must prepay amounts outstanding under the Term Loan on a semi-annual basis beginning with the six-month period ending December 31, 2023 in an amount equal to a percentage of our excess cash flow based on a specified leverage ratio, as follows: (i) if our leverage ratio is greater than or equal to 3.0x, then the mandatory prepayment amount will equal 100% of our excess cash flow, (ii) if our leverage ratio is less than 3.0x and greater than or equal to 1.5x, then the mandatory prepayment amount will equal 50% of our excess cash flow, and (iii) if our leverage ratio is less than 1.5x, then the mandatory prepayment amount will equal 25% of our excess cash flow.

As of December 31, 2023 and 2022, the principal amount outstanding under the Term Loan was $60.0 million.

Share Repurchase Program

For the three months ended December 31, 2023, we repurchased 436,000 shares of our common stock as part of our publicly announced share repurchase program at an average price per share of $2.27 for an aggregate expenditure of approximately $1.0 million during the period. See "Item 5 – Market For Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities – Purchases of Equity Securities by the Issuer and Affiliated Purchasers."

For the year ended December 31, 2023, we repurchased 1,685,000 shares of our common stock as part of our publicly announced share repurchase program at an average price per share of $2.18 for an aggregate expenditure of $3.7 million during the period.

Other Cash Obligations

As of December 31, 2023, we had future commitments for certain capital projects totaling $15.6 million. These commitments are scheduled to be satisfied through 2024.

In connection with our acquisition of Eagle Alcohol, we committed to contingent payments of up to $5.5 million in cash over the next two years if certain financial targets and other conditions are met.

Critical Accounting Policies and Estimates

Our discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of net sales and expenses for each period. The following represents a summary of our critical accounting policies and related estimates, defined as those policies that we believe are the most important to the portrayal of our financial condition and results of operations and that require management's most difficult, subjective or complex judgments, often as a result of the need to make estimates about the effects of matters that are inherently uncertain.

Accounting for Business Combinations

Determining the fair value of assets acquired and liabilities assumed in a business combination is considered a critical accounting estimate because the allocation of the purchase price to assets acquired and liabilities assumed based upon fair values requires significant management judgment and the use of subjective measurements. Variability in industry conditions and changes in assumptions or subjective measurements used to allocate fair value are reasonably possible and may have a material impact on our financial position, liquidity or results of operations.

Revenue Recognition

We recognize revenue primarily from sales of alcohols and essential ingredients.

We have five alcohol production facilities from which we produce and sell alcohols to our customers through our subsidiary, Kinergy. Kinergy enters into sales contracts with customers under exclusive intercompany sales agreements with each of our five production facilities. Kinergy also acts as a principal when it purchases third party fuel-grade ethanol which it resells to its customers. Finally, in 2022 and 2021, Kinergy had exclusive sales agreements with two third-party owned fuel-grade ethanol plants under which it sold the plants' fuel-grade ethanol production for a fee plus the costs to deliver the ethanol to Kinergy's customers. Kinergy has since terminated these contracts. These sales are referred to as third-party agent sales. Revenue from these third-party agent sales is recorded on a net basis, with Kinergy recognizing its predetermined fees and any associated delivery costs.

We have five production facilities from which we produce and sell essential ingredients to our customers through our subsidiary, Alto Nutrients. Alto Nutrients enters into sales contracts with essential ingredient customers under exclusive intercompany sales agreements with each of our five production facilities.

We recognize revenue from sales of alcohols and essential ingredients at the point in time when the customer obtains control of the products, which typically occurs upon delivery depending on the terms of the underlying contracts. In some instances, we enter into contracts with customers that contain multiple performance obligations to deliver volumes of alcohols or essential ingredients over a contractual period of less than 12 months. We allocate the transaction price to each performance obligation identified in the contract based on relative standalone selling prices and recognize the related revenue as control of each individual product is transferred to the customer in satisfaction of the corresponding performance obligations.

When we are the agent, the supplier controls the products before they are transferred to the customer because the supplier is primarily responsible for fulfilling the promise to provide the product, has inventory risk before the product has been transferred to a customer and has discretion in establishing the price for the product. When we are the principal, we control the products before they are transferred to the customer because we are primarily responsible for fulfilling the promise to provide the products, we have inventory risk before the product has been transferred to a customer and we have discretion in establishing the price for the product.

See "Note 5 – Segments" of the Notes to Consolidated Financial Statements for our revenue-breakdown by type of contract.

Impairment of Long-Lived Assets and Held-for-Sale Classification

Our long-lived assets have been primarily associated with our production facilities, reflecting their original cost, adjusted for depreciation and amortization and any subsequent impairment.

We assess the impairment of long-lived assets, including property and equipment, when events or changes in circumstances indicate that the fair value of an asset group could be less than the net book value of the asset group. Generally, we assess long-lived assets for impairment by first determining the forecasted, undiscounted cash flows each asset is expected to generate plus the net proceeds expected from the sale of the asset group. If the total amount of the undiscounted cash flows is less than the carrying value of the asset group, we then determine the fair value of the asset group. An impairment loss would be recognized when the fair value is less than the related net book value, and an impairment expense would be recorded in the amount of the difference. Forecasts of future cash flows are estimates based on our experience and knowledge of our operations and the industry in which we operate. These estimates could be significantly affected by future changes in market conditions, the economic environment, including inflation, and the purchasing decisions of our customers. As a result, we recorded an asset impairment of $0.6 million with respect to our right of use assets associated with our operating leases. We did not record any impairment on our right of use assets for the years ended December 31, 2022 and 2021.

We review our intangible assets, including goodwill, with indefinite lives at least annually or more frequently if impairment indicators arise. In our review, we determine the fair value of these assets using market multiples and discounted cash flow modeling and compare it to the net book value of the reporting unit. Any assessed impairments will be recorded permanently and expensed in the period in which the impairment is determined. We performed our annual review of impairment and recognized an asset impairment loss of $6.0 million against our goodwill for the year ended December 31, 2023. We recognized no asset impairments against intangible assets for the years ended December 31, 2022 and 2021.

Assets held-for-sale are assessed for impairment by comparing the carrying values to their expected net sales proceeds. In 2020, our Board of Directors approved a plan to sell our fuel-grade ethanol production facilities in Madera and Stockton, California, which were ultimately sold in 2021. We reviewed the criteria for held-for-sale classification of the long-lived assets associated with these asset groups. Our analysis concluded that these assets should be classified as held-for-sale as of December 31, 2020, and as such, we estimated an aggregate corresponding asset impairment of $22.3 million for 2020. We further evaluated the original estimate and recorded an additional asset impairment on these assets held-for-sale of $1.2 million for 2021. In 2021, we decided to sell our property and equipment located in Canton, Illinois. We reviewed the criteria for held-for-sale classification of the long-lived assets for this asset group. We concluded that these assets should be classified as held-for-sale as of December 31, 2021, and as such, we estimated a corresponding asset impairment of $1.9 million for 2021. We did not record any impairments for assets held-for-sale for December 31, 2023 or 2022.

Valuation Allowance for Deferred Taxes

We account for income taxes under the asset and liability approach, where deferred tax assets and liabilities are determined based on differences between financial reporting and tax bases of assets and liabilities, and are measured using enacted tax rates and laws that are expected to be in effect when the differences reverse. Valuation allowances are established when necessary to reduce deferred tax assets to the amounts expected to be realized.

We evaluate our deferred tax asset balance for realizability. To the extent we believe it is more likely than not that some portion or all of our deferred tax assets will not be realized, we will establish a valuation allowance against the deferred tax assets. Realization of our deferred tax assets is dependent upon future taxable income during the periods in which the associated temporary differences become deductible. We consider the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in making this assessment. These changes, if any, may require possible material adjustments to these deferred tax assets, resulting in a reduction in net income or an increase in net loss in the period when such determinations are made.

We had pre-tax consolidated net losses of $27.9 million and $39.7 million for the years ended December 31, 2023 and 2022, respectively. We had pre-tax consolidated net income of $47.6 million for the year ended December 31, 2021. Based on our current and prior results, we do not have significant evidence to support a conclusion that we will more likely than not be able to benefit from our remaining deferred tax assets. As such, we have recorded a valuation allowance against our net deferred tax assets.

Derivative Instruments

We evaluate our contracts to determine whether the contracts are derivative instruments. Management may elect to exempt certain forward contracts that meet the definition of a derivative from derivative accounting as normal purchases or normal sales. Normal purchases and normal sales are contracts that provide for the purchase or sale of something other than a financial instrument or derivative instrument that will be delivered in quantities expected to be used or sold over a reasonable period in the normal course of business. Contracts that meet the requirements of normal purchases or sales are documented as normal and exempted from the fair value accounting and reporting requirements of derivative accounting.

We enter into short-term cash, option and futures contracts as a means of securing purchases of corn, natural gas and sales of fuel-grade ethanol and managing exposure to changes in commodity prices. All of our exchange-traded derivatives are designated as non-hedge derivatives for accounting purposes, with changes in fair value recognized in net income. Although the contracts are economic hedges of specified risks, they are not designated or accounted for as hedging instruments.

Realized and unrealized gains and losses related to exchange-traded derivative contracts are included as a component of cost of goods sold in the accompanying financial statements. The fair values of contracts entered through commodity exchanges are presented on the accompanying balance sheet as derivative assets or liabilities. The selection of normal purchase or sales contracts, and use of hedge accounting, are accounting policies that can change the timing of recognition of gains and losses in the statement of operations.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

We are exposed to various market risks, including changes in commodity prices, as discussed below. Market risk is the potential loss arising from adverse changes in market rates and prices. In the ordinary course of business, we may enter into various types of transactions involving financial instruments to manage and reduce the impact of changes in commodity prices. We do not have material exposure to interest rate risk. We do not expect to have any exposure to foreign currency risk as we conduct all of our transactions in U.S. dollars.

We produce and distribute specialty alcohol, fuel-grade ethanol and essential ingredients. Our business is sensitive to changes in the prices of ethanol and corn. In the ordinary course of business, we may enter into various types of transactions involving financial instruments to manage and reduce the impact of changes in ethanol and corn prices. We do not enter into derivatives or other financial instruments for trading or speculative purposes.

We are subject to market risk with respect to ethanol and corn pricing. Ethanol prices are sensitive to global and domestic ethanol supply; crude-oil supply and demand; crude-oil refining capacity; carbon intensity; government regulation; and consumer demand for alternative fuels. Our ethanol sales are priced using contracts that are either based on a fixed price or an indexed price tied to a specific market, such as Chicago Ethanol (Platts) or the Oil Price Information Service. Under these fixed-priced arrangements, we are exposed to risk of a decrease in the market price of ethanol between the time the price is fixed and the time the alcohol is sold.

We satisfy our physical corn needs, the principal raw material used to produce alcohol and essential ingredients, based on purchases from our corn vendors. Generally, we determine the purchase price of our corn at or near the time we begin to grind. Additionally, we also enter into volume contracts with our vendors to fix the purchase price. As such, we are also subject to market risk with respect to the price of corn. The price of corn is subject to wide fluctuations due to unpredictable factors such as weather conditions, farmer planting decisions, governmental policies with respect to agriculture and international trade and global supply and demand. Under the fixed price arrangements, we assume the risk of a decrease in the market price of corn between the time the price is fixed and the time the corn is utilized.

Essential ingredients are sensitive to various demand factors such as numbers of livestock on feed, prices for feed alternatives and supply factors, primarily production of ethanol co-products by ethanol plants and other sources.

As noted above, we may attempt to reduce the market risk associated with fluctuations in the price of ethanol or corn by employing a variety of risk management and hedging strategies. Strategies include the use of derivative financial instruments such as futures and options executed on the CME and/or the New York Mercantile Exchange, as well as the daily management of physical corn.

These derivatives are not designated for special hedge accounting treatment, and as such, the changes in the fair values of these contracts are recorded on the balance sheet and recognized immediately in cost of goods sold. We recognized net losses of $8.0 million, net gains of $19.3 million and net gains of $21.6 million related to the change in the fair values of these contracts for the years ended December 31, 2023, 2022 and 2021, respectively.

We prepared a sensitivity analysis as of December 31, 2023 to estimate our exposure to ethanol and corn. Market risk related to these factors was estimated as the potential change in pre-tax income resulting from a hypothetical 10% adverse change in the prices of our expected ethanol and corn volumes. The analysis uses average CME prices for the year and does not factor in future contracted volumes. The results of this analysis for the year ended December 31, 2023, which may differ materially from actual results, are as follows (in millions):

Commodity	Volume	Unit of Measure	Approximate Adverse Change to Pre-Tax Income
Ethanol	305.9	Gallons	$ 45.5
Corn	72.6	Bushels	$ 41.0

Item 8. Financial Statements and Supplementary Data.

Reference is made to the financial statements, which begin at page F-1 of this report.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

We conducted an evaluation under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures. The term "disclosure controls and procedures," as defined in Rules 13a-15I and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by the company in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms. Disclosure controls and procedures also include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate, to allow timely decisions regarding required disclosure. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded as of December 31, 2023 that our disclosure controls and procedures were effective at a reasonable assurance level.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Our internal control over financial reporting includes those policies and procedures that:

(i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;

(ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and

(iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

A material weakness is defined by the Public Company Accounting Oversight Board's Audit Standards AS 2201 as being a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis by the company's internal controls.

Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework set forth in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under the framework set forth in *Internal Control — Integrated Framework (2013),* our management concluded that our internal control over financial reporting was effective as of December 31, 2023.

RSM US LLP, an independent registered public accounting firm, has issued an attestation report on our internal control over financial reporting as of December 31, 2023. That report is included in Part IV of this report.

Inherent Limitations on the Effectiveness of Controls

Management does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent or detect all errors and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control systems are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in a cost-effective control system, no evaluation of internal control over financial reporting can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, have been or will be detected.

These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns can occur because of a simple error or mistake. Controls can also be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the controls. The design of any system of controls is based in part on certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Projections of any evaluation of controls effectiveness to future periods are subject to risks. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with policies or procedures.

Changes in Internal Control over Financial Reporting

There has been no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the most recently completed fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

During the three months ended December 31, 2023, none of our directors or officers (as defined in Rule 16a-1(f) of the Securities Exchange Act of 1934, as amended) informed us of the adoption or termination of a Rule 10b5-1 trading arrangement or non-Rule 10b5-1 trading arrangement (as such terms are defined in Item 408 of Regulation S-K of the Securities Act of 1933, as amended).

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information under the captions “Information about our Board of Directors, Board Committees and Related Matters” appearing in the Proxy Statement, is hereby incorporated by reference.

Item 11. Executive Compensation.

The information under the caption “Executive Compensation and Related Information,” appearing in the Proxy Statement, is hereby incorporated by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information under the captions “Security Ownership of Certain Beneficial Owners and Management” and “Equity Compensation Plan Information,” appearing in the Proxy Statement, is hereby incorporated by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information under the captions “Certain Relationships and Related Transactions” and “Information about our Board of Directors, Board Committees and Related Matters—Director Independence” appearing in the Proxy Statement, is hereby incorporated by reference.

Item 14. Principal Accountant Fees and Services.

The information under the caption “Audit Matters—Principal Accountant Fees and Services,” appearing in the Proxy Statement, is hereby incorporated by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

(a)(1) Financial Statements

Reference is made to the financial statements listed on and attached following the Index to Consolidated Financial Statements contained on page F-1 of this report.

(a)(2) Financial Statement Schedules

None.

(a)(3) Exhibits

Reference is made to the exhibits listed on the Index to Exhibits.

Item 16. Form 10-K Summary.

None.

Index to Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Alto Ingredients, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Alto Ingredients, Inc. and its subsidiaries (the Company) as of December 31, 2023 and 2022, the related consolidated statements of operations, comprehensive income (loss), stockholders' equity and cash flows for each of the three years in the period ended December 31, 2023, and the related notes to the consolidated financial statements (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2023 and 2022, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2023, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2023, based on criteria established in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013, and our report dated March 13, 2024, expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinions on the critical audit matter or on the accounts or disclosures to which it relates.

Evaluation of indicators of long-lived asset impairment

As described in Note 1 to the financial statements, the Company assesses the impairment of long-lived assets, including property and equipment, when events or changes in circumstances indicate that the fair value of assets could be less than their net book value. The Company's assessment did not result in an impairment for the year ended December 31, 2023.

We identified the evaluation of impairment indicators for long-lived assets as a critical audit matter because of the significant assumptions management makes when determining whether events or changes in circumstances have occurred indicating that the carrying amounts of property and equipment may not be recoverable. This required a high degree of auditor judgment when performing audit procedures to evaluate whether management appropriately identified and evaluated impairment indicators.

Our audit procedures related to the assessment of long-lived assets for possible indications of impairment included the following, among others:

- We obtained an understanding of management's process and internal controls over management's evaluation of potential indicators of impairment and tested the operating effectiveness of the controls

- We obtained management's analysis of potential indicators of impairment and evaluated management's analysis by:

  - Agreeing current period operating profits or losses for all identifiable asset groups to respective trial balances

  - For asset groups in a current period loss, compared the current period operating loss to historical operating profits or losses

  - Prepared an independent expectation of the underlying fair value for one identified asset group that had both current period and historical operating losses by:

    - Evaluating publicly available information related to sales of comparable production facilities

    - Comparing the sales price per nameplate production gallons to the carrying value of the asset group

  - Reading board of directors meeting minutes, press releases, and publicly available information for indications of significant changes in the manner of or the use of the asset group

/s/ RSM US LLP

We have served as the Company's auditor since 2015.

Rochester, Minnesota
March 13, 2024

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Alto Ingredients, Inc.

Opinion on the Internal Control Over Financial Reporting

We have audited Alto Ingredients, Inc.'s (the Company) internal control over financial reporting as of December 31, 2023, based on criteria established in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2023, based on criteria established in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets as of December 31, 2023 and 2022, the related consolidated statements of operations, comprehensive income (loss), stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2023, and the related notes to the consolidated financial statements of the Company and our report dated March 13, 2024 expressed an unqualified opinion.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ RSM US LLP

Rochester, Minnesota
March 13, 2024

ALTO INGREDIENTS, INC.
CONSOLIDATED BALANCE SHEETS
(in thousands, except shares and par value)

	December 31, 2023	December 31, 2022
ASSETS		
Current Assets:		
Cash and cash equivalents	$ 30,014	$ 36,456
Restricted cash	15,466	13,069
Accounts receivable, net of allowance for credit losses of $85 and $105, respectively	58,729	68,655
Inventories	52,611	66,628
Derivative instruments	2,412	4,973
Other current assets	9,538	9,340
Total current assets	168,770	199,121
Property and equipment, net	248,748	239,069
Other Assets:		
Right of use operating lease assets, net	22,597	18,937
Intangible assets, net	8,498	9,087
Goodwill	—	5,970
Other assets	5,628	6,137
Total other assets	36,723	40,131
Total Assets	$ 454,241	$ 478,321

The accompanying notes are an integral part of these consolidated financial statements.

ALTO INGREDIENTS, INC.
CONSOLIDATED BALANCE SHEETS (CONTINUED)
(in thousands, except shares and par value)

LIABILITIES AND STOCKHOLDERS' EQUITY	December 31, 2023	December 31, 2022
Current Liabilities:		
Accounts payable	$ 20,752	$ 28,115
Accrued liabilities	20,205	26,556
Current portion – operating leases	4,333	3,849
Derivative instruments	13,849	6,732
Other current liabilities	6,149	12,765
Total current liabilities	65,288	78,017
Long-term debt, net	82,097	68,356
Operating leases, net of current portion	19,029	15,062
Other liabilities	8,270	8,797
Total Liabilities	174,684	170,232
Commitments and contingencies (Notes 1, 9, 10, 11 and 15)		
Stockholders' Equity:		
Preferred stock, $0.001 par value; 10,000,000 shares authorized:		
Series A: 1,684,375 shares authorized; no shares issued and outstanding as of December 31, 2023 and 2022	—	—
Series B: 1,580,790 shares authorized; 926,942 shares issued and outstanding as of December 31, 2023 and 2022; liquidation preference of $18,075 as of December 31, 2023	1	1
Common stock, $0.001 par value; 300,000,000 shares authorized; 75,703,100 and 75,154,495 shares issued and outstanding as of December 31, 2023 and 2022, respectively	76	75
Non-voting common stock, $0.001 par value; 3,553,000 shares authorized; 896 shares issued and outstanding as of December 31, 2023 and 2022	—	—
Additional paid-in capital	1,040,912	1,040,834
Accumulated other comprehensive income	2,481	1,822
Accumulated deficit	(763,913)	(734,643)
Total stockholders' equity	279,557	308,089
Total Liabilities and Stockholders' Equity	$ 454,241	$ 478,321

The accompanying notes are an integral part of these consolidated financial statements.

ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share data)

	Years Ended December 31,		
	2023	**2022**	**2021**
Net sales	$ 1,222,940	$ 1,335,621	$ 1,207,892
Cost of goods sold	1,207,287	1,363,171	1,140,108
Gross profit (loss)	15,653	(27,550)	67,784
Selling, general and administrative expenses	(32,664)	(31,579)	(29,185)
Gain (loss) on sale (disposal) of assets	(293)	(2,230)	4,571
Asset impairments	(6,544)	—	(3,100)
Income (loss) from operations	(23,848)	(61,359)	40,070
Income from cash grant	2,812	22,652	—
Income from loan forgiveness	—	—	9,860
Interest expense, net	(7,425)	(1,827)	(3,587)
Other income, net	553	862	1,208
Income (loss) before provision for income taxes	(27,908)	(39,672)	47,551
Provision for income taxes	97	1,925	1,469
Consolidated net income (loss)	$ (28,005)	$ (41,597)	$ 46,082
Preferred stock dividends	$ (1,265)	$ (1,265)	$ (1,265)
Income allocated to participating securities	$ —	$ —	$ (600)
Income (loss) available to common stockholders	$ (29,270)	$ (42,862)	$ 44,217
Income (loss) per share, basic	$ (0.40)	$ (0.60)	$ 0.62
Income (loss) per share, diluted	$ (0.40)	$ (0.60)	$ 0.61
Weighted-average shares outstanding, basic	73,339	71,944	71,098
Weighted-average shares outstanding, diluted	73,339	71,944	72,219

The accompanying notes are an integral part of these consolidated financial statements.

ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(in thousands)

	Years Ended December 31,		
	2023	**2022**	**2021**
Consolidated net income (loss)	$ (28,005)	$ (41,597)	$ 46,082
Other comprehensive income – net gain arising during the period on defined benefit pension plans	659	2,106	3,594
Total comprehensive income (loss)	$ (27,346)	$ (39,491)	$ 49,676

The accompanying notes are an integral part of these consolidated financial statements.

ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in thousands)

	Preferred Stock		Common Stock and Non-Voting Common		Additional Paid-In Capital	Accumulated Deficit	Accum. Other Comprehensive Income (Loss)	Total
	Shares	Amount	Shares	Amount				
Balances, December 31, 2020	927	$ 1	72,487	$ 72	$ 1,036,638	$ (736,598)	$ (3,878)	$ 296,235
Stock-based compensation	—	—	—	—	2,883	—	—	2,883
Restricted stock issued to employees and directors, net of cancellations and tax	—	—	167	1	(2,778)	—	—	(2,777)
Common stock issuances	—	—	124	—	462	—	—	462
Pension plan adjustment	—	—	—	—	—	—	3,594	3,594
Preferred stock dividends	—	—	—	—	—	(1,265)	—	(1,265)
Net income	—	—	—	—	—	46,082	—	46,082
Balances, December 31, 2021	927	$ 1	72,778	$ 73	$ 1,037,205	$ (691,781)	$ (284)	$ 345,214
Stock-based compensation	—	—	—	—	3,333	—	—	3,333
Restricted stock issued to employees and directors, net of cancellations and tax	—	—	496	—	(2,291)	—	—	(2,291)
Shares issued for Eagle	—	—	949	1	—	—	—	1
Shares issued to Orion	—	—	1,282	1	3,912	—	—	3,913
Stock repurchases	—	—	(351)	—	(1,325)	—	—	(1,325)
Pension plan adjustment	—	—	—	—	—	—	2,106	2,106
Preferred stock dividends	—	—	—	—	—	(1,265)	—	(1,265)
Net loss	—	—	—	—	—	(41,597)	—	(41,597)
Balances, December 31, 2022	927	$ 1	75,154	$ 75	$ 1,040,834	$ (734,643)	$ 1,822	$ 308,089
Stock-based compensation	—	—	—	—	3,896	—	—	3,896
Restricted stock issued to employees and directors, net of cancellations and tax	—	—	2,234	2	(145)	—	—	(143)
Stock repurchases	—	—	(1,685)	(1)	(3,673)	—	—	(3,674)
Pension plan adjustment	—	—	—	—	—	—	659	659
Preferred stock dividends	—	—	—	—	—	(1,265)	—	(1,265)
Net loss	—	—	—	—	—	(28,005)	—	(28,005)
Balances, December 31, 2023	927	$ 1	75,703	$ 76	$ 1,040,912	$ (763,913)	$ 2,481	$ 279,557

The accompanying notes are an integral part of these consolidated financial statements.

ALTO INGREDIENTS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	For the Years Ended December 31,		
	2023	2022	2021
Operating Activities:			
Consolidated net income (loss)	$ (28,005)	$ (41,597)	$ 46,082
Adjustments to reconcile consolidated net income (loss) to cash provided by operating activities:			
Depreciation and amortization of intangibles	23,080	25,095	23,292
Asset impairments	6,544	—	3,100
Income from loan forgiveness	—	—	(9,860)
(Gain) loss on (sale) disposal of assets	293	2,230	(4,571)
Inventory valuation	2,201	4,612	—
Losses (gains) on derivative instruments	8,031	(19,263)	(21,619)
Amortization of deferred financing costs	1,048	177	778
Amortization of debt discounts (premiums)	801	126	(230)
Noncash compensation	3,896	3,333	2,883
Bad debt expense (recovery)	427	(217)	158
Changes in operating assets and liabilities:			
Accounts receivable	9,499	23,967	(43,554)
Inventories	11,816	(15,479)	(16,448)
Other current assets	310	7,690	38,989
Operating leases	(5,362)	(5,128)	(4,216)
Assets held-for-sale	—	—	(3,483)
Liabilities held-for-sale	—	—	2,305
Accounts payable and accrued expenses	(12,554)	20,503	13,215
Net cash provided by operating activities	$ 22,025	$ 6,049	$ 26,821
Investing Activities:			
Additions to property and equipment	$ (29,531)	$ (37,744)	$ (16,384)
Deferred purchase price payments for Eagle Alcohol	(3,500)	—	—
Purchase of Eagle Alcohol, net of cash acquired	—	(14,685)	—
Proceeds from principal payments on notes receivable	—	14,766	—
Proceeds from sale of Stockton	—	—	24,000
Proceeds from sale of Madera	—	—	19,500
Net cash (used in) provided by investing activities	$ (33,031)	$ (37,663)	$ 27,116
Financing Activities:			
Net proceeds from (payments on) Kinergy's line of credit	$ 12,614	$ (32,325)	$ 17,889
Net proceeds from term loan	—	59,100	—
Stock repurchases	(3,674)	(1,325)	—
Preferred stock dividend payments	(1,265)	(1,265)	(2,853)
Debt issuance costs	(714)	(5,171)	—
Proceeds from issuances of common stock and warrants	—	—	462
Payments on plant borrowings	—	—	(29,964)
Payments on senior notes	—	—	(25,533)
Net cash provided by (used in) financing activities	$ 6,961	$ 19,014	$ (39,999)
Net increase (decrease) in cash, cash equivalents and restricted cash	(4,045)	(12,600)	13,938
Cash, cash equivalents and restricted cash at beginning of period	49,525	62,125	48,187
Cash, cash equivalents and restricted cash at end of period	$ 45,480	$ 49,525	$ 62,125
Reconciliation of total cash, cash equivalents and restricted cash:			
Cash and cash equivalents	$ 30,014	$ 36,456	$ 50,612
Restricted cash	15,466	13,069	11,513
Total cash, cash equivalents and restricted cash	$ 45,480	$ 49,525	$ 62,125
Supplemental Information:			
Interest paid (net of capitalized interest)	$ 7,923	$ 2,208	$ 3,489
Capitalized interest	$ 2,454	$ 720	$ 628
Income tax payments	$ 324	$ 2,262	$ 448

The accompanying notes are an integral part of these consolidated financial statements.

ALTO INGREDIENTS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. ORGANIZATION AND SIGNIFICANT ACCOUNTING POLICIES.

Organization and Business – The consolidated financial statements include, for all periods presented, the accounts of Alto Ingredients, Inc., a Delaware corporation ("Alto Ingredients"), and its direct and indirect wholly-owned subsidiaries (collectively, the "Company"), including Kinergy Marketing LLC, an Oregon limited liability company ("Kinergy"), Alto Nutrients, LLC, a California limited liability company ("Alto Nutrients"), Alto Op Co., a Delaware corporation, Alto Pekin, LLC, a Delaware limited liability company ("Alto Pekin") and Alto ICP, LLC, a Delaware limited liability company ("ICP"), and the Company's production facilities in Oregon and Idaho. As discussed in Note 3, on May 14, 2021 and November 4, 2021, the Company completed the sale of its production facilities located in Madera and Stockton, California, respectively.

As discussed in Note 2, on January 14, 2022, the Company acquired Eagle Alcohol Company LLC, a Missouri limited liability company ("Eagle Alcohol"). On that date, Eagle Alcohol became a wholly-owned subsidiary of the Company. Eagle Alcohol specializes in break bulk distribution of specialty alcohols. Eagle Alcohol purchases bulk alcohol from suppliers, including the Company. Then it stores, denatures, packages, and resells alcohol products in smaller sizes, including tank trucks, totes and drums that typically garner a premium price to bulk alcohols. Eagle Alcohol delivers products to customers in the beverage, food, industrial and related-process industries via its own dedicated trucking fleet and common carrier. The acquisition has provided the Company further vertical integration and access to new markets in the specialty alcohol industry.

The Company produces and distributes renewable fuel, essential ingredients and specialty alcohols. The Company also produces and markets fuel-grade ethanol. The Company's production facilities in Pekin, Illinois are located in the heart of the Corn Belt. The Company's two production facilities in Oregon and Idaho are located in close proximity to both feed and fuel-grade ethanol customers.

The Company has a combined alcohol production capacity of 350 million gallons per year and produces, on an annualized basis, over 1.6 million tons of essential ingredients, such as dried yeast, corn gluten meal, corn gluten feed, corn germ, and distillers grains and liquid feed used in commercial animal feed and pet foods. In addition, the Company markets and distributes fuel-grade ethanol produced by third parties.

The Company focuses on five key markets: *Health, Home & Beauty*; *Food & Beverage*; *Industry & Agriculture; Essential Ingredients*; and *Renewable Fuels*. Products for the Health, Home & Beauty market include specialty alcohols used in mouthwash, cosmetics, pharmaceuticals, hand sanitizers, disinfectants and cleaners. Products for the Food & Beverage markets include grain neutral spirits used in alcoholic beverages and vinegar as well as corn germ used for corn oils. Products for Industry & Agriculture markets include alcohols and other products for paint applications and fertilizers. Products for Essential Ingredients markets include dried yeast, corn gluten meal, corn gluten feed, corn germ, and distillers grains and liquid feed used in commercial animal feed and pet foods. Products for Renewable Fuels markets include fuel-grade ethanol and distillers corn oil used as a feedstock for renewable diesel and biodiesel fuels.

The Company's production facilities were operating for all of 2022, subject to scheduled and unscheduled downtimes to address facility repair and maintenance. On January 1, 2023, the Company temporarily hot-idled its Magic Valley production facility due to extreme natural gas prices, other unfavorable market conditions and to facilitate the installation of its new corn oil and high protein system, bringing the facility back online in April 2023. In January 2024, the Company again temporarily hot-idled the facility to minimize losses from negative regional crush margins and to expedite the installation of additional equipment needed to achieve the Company's intended production rate, quality and consistency from the corn oil and high protein system. As market conditions change, the Company may increase, decrease or idle production at one or more operating facilities or resume operations at any idled facility.

Basis of Presentation – The consolidated financial statements and related notes have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP") and include the accounts of the Company. All significant intercompany accounts and transactions have been eliminated in consolidation.

Segments – A segment is a component of an enterprise whose operating results are regularly reviewed by the enterprise's chief operating decision maker to make decisions about resources to be allocated to the segment and assess its performance, and for which discrete financial information is available. The Company determines and discloses its segments in accordance with the Financial Accounting Standards Board's ("FASB") Accounting Standards Codification ("ASC") Section 280, *Segment Reporting*, which defines how to determine segments. The Company reports financial and operating performance in three reportable segments (1) Pekin production, which includes the entire campus in Pekin, Illinois ("Pekin Campus"), (2) marketing and distribution, which includes marketing and merchant trading for Company-produced specialty alcohols, fuel-grade ethanol and essential ingredients, and sales of fuel-grade ethanol sourced from third parties, and (3) Western production, which includes the Company's two western production facilities on an aggregated basis ("Western production").

Cash and Cash Equivalents – The Company considers all highly-liquid investments with an original maturity of three months or less to be cash equivalents. The Company maintains its accounts at several financial institutions. These cash balances regularly exceed amounts insured by the Federal Deposit Insurance Corporation; however, the Company does not believe it is exposed to any significant credit risk on these balances.

Restricted Cash – The Company's restricted cash comprises cash collateral balances held in derivative brokerage accounts.

Accounts Receivable and Allowance for Credit Losses – Trade accounts receivable are presented at original invoice amount, net of the allowance for credit losses. The Company sells specialty alcohols to large consumer product companies, sells fuel-grade ethanol to gasoline refining and distribution companies, sells essential ingredients to animal feed customers, including distillers grains and other feed co-products to dairy operators and animal feedlots and corn oil to poultry and biodiesel customers, in each case generally without requiring collateral. Due to a limited number of customers, the Company had significant concentrations of credit risk from sales as of December 31, 2023 and 2022, as described below.

The carrying amount of accounts receivable is reduced by a valuation allowance that reflects the Company's best estimate of the amounts that will not be collected. The Company regularly reviews accounts receivable and based on assessments of current customer creditworthiness, estimates the portion, if any, of the customer balance that will not be collected.

Of the accounts receivable balance, approximately $51,315,000 and $55,667,000 at December 31, 2023 and 2022, respectively, were used as collateral under Kinergy's operating line of credit. The allowance for credit losses was $85,000 and $105,000 as of December 31, 2023 and 2022, respectively. The Company recorded a bad debt expense of $427,000, a bad debt recovery of $217,000 and a bad debt expense of $158,000 for the years ended December 31, 2023, 2022 and 2021, respectively. The Company does not have any off-balance sheet credit exposure related to its customers.

Concentration Risks – Credit risk represents the accounting loss that would be recognized at the reporting date if counterparties failed completely to perform as contracted. Concentrations of credit risk, whether on- or off-balance sheet, that arise from financial instruments exist for groups of customers or counterparties when they have similar economic characteristics that would cause their ability to meet contractual obligations to be similarly affected by changes in economic or other conditions described below. Financial instruments that subject the Company to credit risk consist of cash balances maintained in excess of federal depository insurance limits and accounts receivable which have no collateral or security. The Company has not experienced any significant losses in such accounts.

The Company sells specialty alcohols to consumer product companies and fuel-grade ethanol to gasoline refining and distribution companies. The Company sold to customers representing 10% or more of the Company's total net sales, as follows.

	Years Ended December 31,		
	2023	2022	2021
Customer A	9%	10%	13%
Customer B	7%	10%	9%

The Company had accounts receivable due from these customers totaling $4,302,000 and $10,469,000, representing 7% and 15% of total accounts receivable, as of December 31, 2023 and 2022, respectively.

The Company purchases corn, its largest cost component in producing alcohols, from its suppliers. The Company purchased corn from suppliers representing 10% or more of the Company's total corn purchases, as follows:

	Years Ended December 31,		
	2023	2022	2021
Supplier A	14%	11%	12%
Supplier B	12%	12%	14%
Supplier C	—%	15%	2%

As of December 31, 2023, approximately 44% of the Company's employees were covered by a collective bargaining agreement.

Inventories – Inventories consisted primarily of bulk ethanol, specialty alcohols, corn, essential ingredients and unleaded fuel, and are valued at the lower of cost or net realizable value, with cost determined on a first-in, first-out basis. Inventory is net of valuation adjustments of $2,201,000 and $4,612,000 as of December 31, 2023 and 2022, respectively. Of the inventory balance, approximately $41,041,000 and $43,484,000 at December 31, 2023 and 2022, respectively, were used as collateral under Kinergy's operating line of credit. Inventory balances consisted of the following (in thousands):

	December 31,	
	2023	2022
Finished goods	$ 35,765	$ 47,736
Work in progress	5,063	6,396
Raw materials	10,313	11,197
Other	1,470	1,299
Total	$ 52,611	$ 66,628

Property and Equipment – Property and equipment are stated at cost. Depreciation is computed using the straight-line method over the following estimated useful lives:

Buildings	40 years
Facilities and plant equipment	10 – 25 years
Other equipment, vehicles and furniture	5 – 10 years

The cost of normal maintenance and repairs is charged to operations as incurred. Significant capital expenditures that increase the life of an asset are capitalized and depreciated over the estimated remaining useful life of the asset. The cost of property and equipment sold, or otherwise disposed of, and the related accumulated depreciation or amortization are removed from the accounts, and any resulting gains or losses are reflected in current operations.

Intangible Assets – The Company amortizes intangible assets with definite lives using the straight-line method over their estimated lives of 10-12 years. Additionally, the Company assesses indefinite-lived intangible assets for impairment annually, or more frequently if circumstances indicate impairment may have occurred. If the carrying value of an indefinite-lived intangible asset exceeds its fair value, an impairment loss is recognized in an amount equal to that excess. If the Company determines that an impairment charge is needed, the charge will be recorded as an asset impairment in the consolidated statements of operations.

Leases – The Company accounts for leases under ASC Section 842, *Leases* ("ASC 842), whereby lessees are required to recognize the following for all leases (with the exception of short-term leases) at the commencement date: (1) a lease liability, which is a lessee's obligation to make lease payments arising from a lease, measured on a discounted cash flow basis; and (2) a "right of use" asset, which is an asset that represents the lessee's right to use the specified asset for the lease term. See Note 10 for further information.

Derivative Instruments and Hedging Activities – Derivative transactions, which can include exchange-traded futures contracts, options and futures positions on the New York Mercantile Exchange or the Chicago Mercantile Exchange, are recorded on the balance sheet as assets and liabilities based on the derivative's fair value. Changes in the fair value of derivative contracts are recognized currently in income unless specific hedge accounting criteria are met. If derivatives meet those criteria, and hedge accounting is elected, effective gains and losses are deferred in accumulated other comprehensive income (loss) and later recorded together with the hedged item in consolidated income (loss). For derivatives designated as a cash flow hedge, the Company formally documents the hedge and assesses the effectiveness with associated transactions. The Company has designated and documented contracts for the physical delivery of commodity products to and from counterparties as normal purchases and normal sales.

Revenue Recognition – The Company recognizes revenue under ASC Section 606, *Revenue from Contracts with Customers* ("ASC 606"). The provisions of ASC 606 include a five-step process by which an entity will determine revenue recognition, depicting the transfer of goods or services to customers in amounts reflecting the payment to which an entity expects to be entitled in exchange for those goods or services. ASC 606 requires the Company to apply the following steps: (1) identify the contract with the customer; (2) identify the performance obligations in the contract; (3) determine the transaction price; (4) allocate the transaction price to the performance obligations in the contract; and (5) recognize revenue when, or as, the Company satisfies the performance obligation.

The Company recognizes revenue primarily from sales of alcohols and essential ingredients.

The Company has five production facilities from which it produces and sells alcohols to its customers through Kinergy. Kinergy enters into back-to-back sales contracts with its customers under exclusive intercompany sales agreements with each of the Company's five production facilities. Kinergy also acts as a principal when it purchases third party fuel-grade ethanol which it resells to its customers. Finally, for the years ended December 31, 2022 and 2021, Kinergy had exclusive sales agreements with certain third-party owned fuel-grade ethanol production facilities under which it sold the facilities' fuel-grade ethanol for a fee plus the costs to deliver the ethanol to Kinergy's customers. These sales were referred to as third-party agent sales. Revenue from these third-party agent sales was recorded on a net basis, with Kinergy recognizing its predetermined fees and any associated delivery costs. Kinergy has terminated these contracts, and as a result, did not have any related sales for the year ended December 31, 2023.

The Company has five production facilities from which it produces and sells essential ingredients to its customers through Alto Nutrients. Alto Nutrients enters into sales contracts with essential ingredient customers under exclusive intercompany sales agreements with each of the Company's five production facilities.

The Company recognizes revenue from sales of alcohols and essential ingredients at the point in time when the customer obtains control of the products, which typically occurs upon delivery depending on the terms of the underlying contracts. In some instances, the Company enters into contracts with customers that contain multiple performance obligations to deliver volumes of alcohols or essential ingredients over a contractual period of less than 12 months. The Company allocates the transaction price to each performance obligation identified in the contract based on relative standalone selling prices and recognizes the related revenue as control of each individual product is transferred to the customer in satisfaction of the corresponding performance obligations.

When the Company is the agent, the supplier controls the products before they are transferred to the customer because the supplier is primarily responsible for fulfilling the promise to provide the product, has inventory risk before the product has been transferred to a customer and has discretion in establishing the price for the product. When the Company is the principal, the Company controls the products before they are transferred to the customer because the Company is primarily responsible for fulfilling the promise to provide the products, has inventory risk before the product has been transferred to a customer and has discretion in establishing the price for the product.

See the tables in Note 5 for the Company's revenue by type of contracts.

Shipping and Handling Costs – The Company accounts for shipping and handling costs relating to contracts with customers as costs to fulfill its promise to transfer its products. Accordingly, the costs are classified as a component of cost of goods sold in the accompanying consolidated statements of operations.

Selling Costs – Selling costs associated with the Company's product sales are classified as a component of selling, general and administrative expenses in the accompanying consolidated statements of operations.

Stock-Based Compensation – The Company accounts for the cost of employee services received in exchange for the award of equity instruments based on the fair value of the award, determined on the date of grant. The expense is recognized over the period during which an employee is required to provide services in exchange for the award. The Company accounts for forfeitures as they occur. The Company recognizes stock-based compensation expense as a component of either cost of goods sold or selling, general and administrative expenses in the consolidated statements of operations.

Goodwill – Goodwill represents the excess of cost of an acquired entity over the net of the amounts assigned to net assets acquired and liabilities assumed. Annually, or more frequently, if indications of impairment arise, the Company performs a review for impairment. This review includes the determination of each reporting unit's fair value using market multiples and discounted cash flow modeling. The estimates of future cash flows are judgments based on management's experience and knowledge of the Company's operations and the industries in which the Company operates. These estimates can be significantly affected by future changes in market conditions, the economic environment, including inflation, and capital spending decisions of the Company's customers. Any assessed impairments will be permanent and expensed in the period in which the impairment is determined. If the Company determines through its assessment process that any of its goodwill requires impairment charges, the charges will be recorded in asset impairment expenses in the consolidated statements of operations.

The Company performed its annual review of impairment of goodwill and recognized an asset impairment loss of $6.0 million for the year ended December 31, 2023. No impairment losses for goodwill were recognized for the years ended December 31, 2022 and 2021.

Impairment of Long-Lived Assets – The Company assesses the impairment of long-lived assets, including property and equipment, internally developed software and purchased intangibles subject to amortization, when events or changes in circumstances indicate that the fair value of assets could be less than their net book value. In such event, the Company assesses long-lived assets for impairment by first determining the forecasted, undiscounted cash flows the asset group is expected to generate plus the net proceeds expected from the sale of the asset group. If this amount is less than the carrying value of the asset, the Company will then determine the fair value of the asset group. An impairment loss would be recognized when the fair value is less than the related asset group's net book value, and an impairment expense would be recorded in the amount of the difference. Forecasts of future cash flows are judgments based on the Company's experience and knowledge of its operations and the industries in which it operates. These forecasts could be significantly affected by future changes in market conditions, the economic environment, including inflation, and purchasing decisions of the Company's customers. The Company's assessment resulted in an asset impairment of $574,000, $0 and $3,100,000 for the years ended December 31, 2023, 2022 and 2021, respectively.

Deferred Financing Costs – Deferred financing costs are costs incurred to obtain debt financing, including all related fees, and are amortized as interest expense over the term of the related financing using the straight-line method, which approximates the effective interest rate method. Amortization of deferred financing costs, included in interest expense, net, in the accompanying consolidated statements of operations, was approximately $1,048,000, $177,000 and $778,000 for the years ended December 31, 2023, 2022 and 2021, respectively. Unamortized deferred financing costs were approximately $4,700,000 and $5,034,000 as of December 31, 2023 and 2022, respectively, and are recorded as a reduction of long-term debt in the consolidated balance sheets.

Provision for Income Taxes – Income taxes are accounted for under the asset and liability approach, where deferred tax assets and liabilities are determined based on differences between financial reporting and tax basis of assets and liabilities and are measured using enacted tax rates and laws that are expected to be in effect when the differences reverse. Valuation allowances are established when necessary to reduce deferred tax assets to the amounts expected to be realized.

The Company accounts for uncertainty in income taxes using a two-step approach to recognizing and measuring uncertain tax positions. The first step is to evaluate the tax position for recognition by determining whether it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount which is more than 50% likely of being realized upon ultimate settlement. An uncertain tax position is considered effectively settled on completion of an examination by a taxing authority if certain other conditions are satisfied. Should the Company incur interest and penalties relating to tax uncertainties, such amounts would be classified as a component of interest expense, net, and other income (expense), net, respectively. Deferred tax assets and liabilities are classified as noncurrent in the Company's consolidated balance sheets.

The Company files a consolidated federal income tax return. This return includes all wholly owned subsidiaries as well as the Company's pro-rata share of taxable income from pass-through entities in which the Company owns less than 100%. State tax returns are filed on a consolidated, combined or separate basis depending on the applicable laws relating to the Company and its subsidiaries. The Company does not have any foreign operations.

Income (Loss) Per Share – Basic income (loss) per share is computed on the basis of the weighted-average number of shares of common stock outstanding during the period. Preferred dividends are deducted from net income (loss) attributed to Alto Ingredients, Inc. and are considered in the calculation of income (loss) available to common stockholders in computing basic income (loss) per share. Common stock equivalents to preferred stock are considered participating securities and are also included in this calculation when dilutive.

The following tables compute basic and diluted income (loss) per share (in thousands, except per share data):

	Year Ended December 31, 2023		
	Loss Numerator	Shares Denominator	Per-Share Amount
Consolidated net loss	$ (28,005)		
Less: Preferred stock dividends	(1,265)		
Basic and diluted loss per share:			
Loss available to common stockholders	$ (29,270)	73,339	$ (0.40)

	Year Ended December 31, 2022		
	Loss Numerator	Shares Denominator	Per-Share Amount
Consolidated net loss	$ (41,597)		
Less: Preferred stock dividends	(1,265)		
Basic and diluted loss per share:			
Loss available to common stockholders	$ (42,862)	71,944	$ (0.60)

	Year Ended December 31, 2021		
	Income Numerator	Shares Denominator	Per-Share Amount
Consolidated net income	$ 46,082		
Less: Preferred stock dividends	(1,265)		
Less: Income allocated to participating securities	(600)		
Basic income per share:			
Income available to common stockholders	$ 44,217	71,098	$ 0.62
Add: Dilutive securities	—	1,121	
Diluted income per share:			
Income available to common stockholders	$ 44,217	72,219	$ 0.61

There were an aggregate of 981,000, 964,000 and 964,000 potentially dilutive shares from convertible securities outstanding for the years ended December 31, 2023, 2022 and 2021, respectively. These convertible securities were not considered in calculating diluted loss per common share for the years ended December 31, 2023, 2022 and 2021 as their effect would be anti-dilutive. In addition, there were an aggregate of 3,188,000 and 8,900,500 weighted-average anti-dilutive shares from outstanding out-of-the-money warrants for the years ended December 31, 2022 and 2021, respectively.

Financial Instruments – The carrying values of cash and cash equivalents, restricted cash, accounts receivable, derivative instruments, accounts payable and accrued liabilities are reasonable estimates of their fair values because of the short maturity of these items. The Company believes the carrying value of its long-term debt instruments are not considered materially different than fair value because they were recently issued.

Business Combinations – Business acquisitions are accounted for in accordance with ASC Section 805, *Business Combinations*. ASC 805 requires the reporting entity to identify the acquirer, determine the acquisition date, recognize and measure the identifiable tangible and intangible assets acquired and liabilities assumed and recognize and measure goodwill or a gain from the purchase. Assets acquired and liabilities assumed are recorded at their fair values and the excess of the purchase price over the amounts assigned is recorded as goodwill. Adjustments to fair value assessments are recorded to goodwill over the measurement period (not longer than twelve months).

Income from Cash Grant – For the years ended December 31, 2023 and 2022, the Company received $2,812,000 and $22,652,000, respectively, in cash from the USDA's Biofuel Producer Program. The program was created as part of the CARES Act of 2020, which allocated $700,000,000 to support biofuel producers who experienced market losses due to the pandemic. The Company is not required to repay the grants. Since these funds are provided to subsidize historical losses of the Company, and are not required to be repaid, the Company accounted for the proceeds by analogy to International Accounting Standards 20, *Accounting for Government Grants and Disclosure of Government Assistance*, and reported the amount as income from cash grant in the accompanying consolidated statements of operations.

Employment-related Benefits – Employment-related benefits associated with pensions and postretirement health care are expensed based on actuarial analysis. The recognition of expense is affected by estimates made by management, such as discount rates used to value certain liabilities, investment rates of return on plan assets, increases in future wage amounts and future health care costs. Discount rates are determined based on a spot yield curve that includes bonds with maturities that match the expected timing of benefit payments under the plan.

Share Repurchase Program – On September 12, 2022, the Company announced a share repurchase program under which it may repurchase up to $50,000,000 of its common stock with an initial purchase authorization of $10,000,000. The Company's lender has further limited the Company's purchase authorization to $5,000,000. Amounts in excess of the purchase authorization of $5,000,000 will require additional lender consent and amounts in excess of the initial purchase authorization of $10,000,000 will require additional board and preferred stockholder authorization. The share repurchase program does not have an expiration date, does not require the repurchase of any particular amount of shares, and may be implemented, modified, suspended or discontinued in whole or in part at any time and without further notice. As repurchases are made, the Company will retire the shares, resulting in a reduction of issued and outstanding shares. For the years ended December 31, 2023 and 2022, the Company repurchased an aggregate of 1,685,000 shares and 351,000 shares for $3,674,000 and $1,325,000 in cash, respectively.

Nonvoting Common Stock – In 2015, the Company issued nonvoting common stock convertible at a holder's election into voting common stock. As of December 31, 2023, an aggregate of 3,539,236 shares of nonvoting common stock had been converted into an equal number of shares of the Company's voting common stock. As of December 31, 2023, there were 896 shares of nonvoting common stock outstanding.

Estimates and Assumptions – The preparation of the consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant estimates are required as part of determining the allowance for credit losses, net realizable value of inventory, long-lived asset impairments, goodwill impairment, valuation allowances on deferred income taxes and the potential outcome of future tax consequences of events recognized in the Company's financial statements or tax returns, and the valuation of assets acquired and liabilities assumed as a result of business combinations. Actual results and outcomes may materially differ from management's estimates and assumptions.

Subsequent Events – Management evaluates, as of each reporting period, events or transactions that occur after the balance sheet date through the date that the financial statements are issued for either disclosure or adjustment to the consolidated financial results.

2. ACQUISITION OF EAGLE ALCOHOL.

On January 14, 2022, the Company purchased 100% of the membership interests of Eagle Alcohol. The purchase price was $14.0 million in cash plus an estimated net working capital adjustment of $1.3 million in cash. The selling members of Eagle Alcohol were eligible to receive up to an additional $14.0 million of contingent consideration, payable through a combination of $9.0 million in cash over the succeeding three years and an aggregate of $5.0 million in the Company's common stock on the fourth- and fifth-year anniversaries of the closing date, subject to the satisfaction of certain conditions, including continued employment with the Company. With respect to these payments, the Company accrued $2.8 million and $3.5 million in other current liabilities in the accompanying consolidated balance sheets as of December 31, 2023 and 2022, respectively, with the expense included in selling, general and administrative expenses in the accompanying consolidated statements of operations for the years then ended.

Eagle Alcohol specializes in break bulk distribution of specialty alcohols. Eagle Alcohol purchases bulk alcohol from suppliers and then stores, denatures, packages, and resells alcohol products in smaller sizes, including tank trucks, totes and drums that typically garner a premium price to bulk alcohols. Eagle Alcohol delivers products to customers in the beverage, food, industrial and related-process industries via its own dedicated trucking fleet and common carrier. The acquisition has provided the Company further vertical integration and access to new markets in the specialty alcohol industry.

As part of the Company's allocation of purchase price for its acquisition of Eagle Alcohol, the Company recorded a customer relationships intangible asset of $6.5 million, a trade name intangible asset of $0.4 million and goodwill of $6.0 million. See Note 7.

3. ASSET SALES.

Stockton and Madera

In October 2020, the Company's Board of Directors approved a plan to sell the Company's fuel-grade ethanol production facilities located in Madera and Stockton, California. The analysis of these potential sales resulted in an aggregate asset impairment of $1.2 million in the Company's Western production segment for the year ended December 31, 2021.

On May 14, 2021, the Company closed the sale of its Madera facility for total consideration of $28.3 million, comprised of $19.5 million in cash and $8.8 million in assumption of liabilities, resulting in a net loss on sale of less than $0.1 million, included in gain (loss) on sale (disposal) of assets in the Company's consolidated statements of operations. All of the cash proceeds were used to repay a significant portion of the Company's term debt and accrued interest.

On November 5, 2021, the Company closed the sale of its Stockton facility for gross proceeds of $24.0 million in cash, resulting in a net gain on sale of $4.6 million, recorded in gain (loss) on sale (disposal) of assets in the Company's consolidated statements of operations. With the net cash proceeds, the Company repaid in full its senior secured notes and loans made to Alto Pekin and ICP.

For the year ended December 31, 2021, net sales attributed to the results of operations for Stockton and Madera were $2.6 million and $0, respectively. For the year ended December 31, 2021, pre-tax loss attributed to the results of operations for Stockton and Madera was $2.8 million and $2.0 million, respectively. The above pre-tax results include asset impairments associated with Stockton and Madera recorded for the year ended December 31, 2021 of $0 and $1.2 million, respectively.

Canton

During 2021, the Company agreed to sell certain assets of the Company's property and equipment in Canton, Illinois. The analysis of the potential sale resulted in an asset impairment of $1.9 million in the Company's Western production segment for the year ended December 31, 2021. The Company sold these assets in 2022. For the years ended December 31, 2022 and 2021, there were no sales from Canton. For the years ended December 31, 2022 and 2021, pre-tax losses attributed to Canton were less than $1.0 million for each year.

4. INTERCOMPANY AGREEMENTS.

The Company, directly or through one of its subsidiaries, has entered into the following management and marketing agreements:

Affiliate Management Agreement – Alto Ingredients entered into an Affiliate Management Agreement ("AMA") with its operating subsidiaries under which Alto Ingredients agreed to provide operational, administrative and staff support services. These services generally include, but are not limited to, administering the subsidiaries' compliance with their credit agreements and performing billing, collection, record keeping and other administrative and ministerial tasks. Alto Ingredients agreed to supply all labor and personnel required to perform its services under the AMA, including the labor and personnel required to operate and maintain the production facilities and marketing activities. These services are billed at a predetermined amount per subsidiary each month plus out of pocket costs such as employee wages and benefits.

The AMAs had an initial term of one year and have automatic successive one year renewal periods. Alto Ingredients may terminate the AMA, and any subsidiary may terminate the AMA, at any time by providing at least 90 days prior notice of termination.

Alto Ingredients recorded revenues of approximately $13,200,000 $12,403,000 and $9,774,000 related to the AMAs in place for the years ended December 31, 2023, 2022 and 2021, respectively. These amounts have been eliminated upon consolidation.

Ethanol Marketing Agreements – Kinergy entered into separate marketing agreements with each of the Company's production facilities which granted Kinergy the exclusive right to purchase, market and sell the alcohols produced at those facilities. Under the terms of the marketing agreements, within ten days after delivering alcohol to Kinergy, an amount is paid to Kinergy equal to (i) the estimated purchase price payable by the third-party purchaser of the alcohol, minus (ii) the estimated amount of transportation costs to be incurred, minus (iii) the estimated incentive fee payable to Kinergy, which equals 1% of the aggregate third-party purchase price, provided that the marketing fee shall not be less than $0.015 per gallon and not more than $0.0225 per gallon. Each of the marketing agreements had an initial term of one year and has successive one year renewal periods at the option of the production facility.

Kinergy recorded revenues of approximately $5,431,000, $5,746,000 and $4,496,000 related to the marketing agreements for the years ended December 31, 2023, 2022 and 2021, respectively. These amounts have been eliminated upon consolidation.

Corn Procurement and Handling Agreements – Alto Nutrients entered into separate corn procurement and handling agreements with each of the Company's production facilities. Under the terms of the corn procurement and handling agreements, each facility appointed Alto Nutrients as its exclusive agent to solicit, negotiate, enter into and administer, on its behalf, corn supply arrangements to procure the corn necessary to operate the facility. Alto Nutrients also provides grain handling services including, but not limited to, receiving, unloading and conveying corn into the facility's storage and, in the case of whole corn delivered, processing and hammering the whole corn.

Under these agreements, Alto Nutrients receives a fee of $0.03 per bushel of corn delivered to each production facility as consideration for its procurement and handling services, payable monthly. Each corn procurement and handling agreement had an initial term of one year and successive one year renewal periods at the option of the individual facility. Alto Nutrients recorded revenues of approximately $3,007,000, $3,207,000 and $2,694,000 related to the corn procurement and handling agreements for the years ended December 31, 2023, 2022 and 2021, respectively. These amounts have been eliminated upon consolidation.

Essential Ingredients Marketing Agreements – Alto Nutrients entered into separate marketing agreements with each of the Company's production facilities (except for the Company's Magic Valley facility), which grant Alto Nutrients the exclusive right to market, purchase and sell the various essential ingredients produced at each facility. Under the terms of the marketing agreements, within ten days after a facility delivers essential ingredients to Alto Nutrients, the production facility is paid an amount equal to (i) the estimated purchase price payable by the third-party purchaser of the essential ingredients, minus (ii) the estimated amount of transportation costs to be incurred, minus (iii) the estimated amount of fees and taxes payable to governmental authorities in connection with the tonnage of the essential ingredients produced or marketed, minus (iv) the estimated incentive fee payable to the Company, which equals (a) 5% of the aggregate third-party purchase price for wet corn gluten feed, wet distillers grains, corn condensed distillers solubles and distillers grains with solubles, or (b) 1% of the aggregate third-party purchase price for corn gluten meal, dry corn gluten feed, dry distillers grains, corn germ and corn oil. Each marketing agreement had an initial term of one year and has successive one year renewal periods at the option of the production facility.

Alto Nutrients recorded revenues of approximately $3,216,500, $3,505,000 and $2,871,000 related to the marketing agreements for the years ended December 31, 2023, 2022 and 2021, respectively. These amounts have been eliminated upon consolidation.

5. SEGMENTS.

The Company reports its financial and operating performance in three segments: (1) Pekin Campus production, which includes the production and sale of alcohols and essential ingredients produced at the Company's Pekin, Illinois campus, (2) marketing and distribution, which includes marketing and merchant trading for Company-produced alcohols and essential ingredients on an aggregated basis, and sales of fuel-grade ethanol sourced from third parties, and (3) Western production, which includes the production and sale of fuel-grade ethanol and essential ingredients produced the Company's two western production facilities on an aggregated basis, none of which are individually so significant to be considered a separately reportable segment.

Income before provision for income taxes includes management fees charged by Alto Ingredients to the segments. The Pekin Campus production segment incurred $5,280,000, $5,046,000 and $4,344,000 in management fees for the years ended December 31, 2023, 2022 and 2021, respectively. The marketing and distribution segment incurred $3,960,000, $3,840,000 and $3,480,000 in management fees for the years ended December 31, 2023, 2022 and 2021, respectively. The Western production segment incurred $2,640,000, $2,400,000 and $1,950,000 in management fees for the years ended December 31, 2023, 2022 and 2021, respectively. Corporate and other includes the results of Eagle Alcohol and selling, general and administrative expenses, consisting primarily of corporate employee compensation, professional fees and overhead costs not directly related to a specific operating segment.

During the normal course of business, the segments do business with each other. The preponderance of this activity occurs when the Company's marketing and distribution segment markets alcohol produced by the production segments for a marketing fee, as discussed in Note 4. These intersegment activities are considered arms'-length transactions. Consequently, although these transactions impact segment performance, they do not impact the Company's consolidated results since all revenues and corresponding costs are eliminated upon consolidation.

For the years ended December 31, 2023, 2022 and 2021, capital expenditures incurred by the Pekin Campus segment were approximately $17.7 million, $25.7 million and $14.3 million, and capital expenditures incurred by the Western production segment were approximately $11.8 million, $12.3 million $2.1 million, respectively.

The following tables set forth certain financial data for the Company's operating segments (in thousands):

	Years Ended December 31,		
Net Sales:	2023	2022	2021
Pekin Campus production, recorded as gross:			
Alcohol sales	$ 502,217	$ 521,273	$ 498,195
Essential ingredient sales	217,702	225,871	189,535
Intersegment sales	1,427	1,212	1,193
Total Pekin Campus sales	721,346	748,356	688,923
Marketing and distribution:			
Alcohol sales, gross	$ 262,587	$ 227,626	$ 379,422
Alcohol sales, net	365	1,225	1,753
Intersegment sales	11,654	12,459	10,061
Total marketing and distribution sales	274,606	241,310	391,236
Western Production, recorded as gross:			
Alcohol sales	$ 166,971	$ 253,605	$ 107,931
Essential ingredient sales	57,264	90,209	31,056
Intersegment sales	134	22	964
Total Western production sales	224,369	343,836	139,951
Corporate and other	15,834	15,812	—
Intersegment eliminations	(13,215)	(13,693)	(12,218)
Net sales as reported	$ 1,222,940	$ 1,335,621	$ 1,207,892
Cost of goods sold:			
Pekin Campus production	$ 710,088	$ 772,755	$ 638,371
Marketing and distribution	259,234	229,288	371,371
Western production	230,445	353,775	136,401
Corporate and other	12,122	12,167	—
Intersegment eliminations	(4,602)	(4,814)	(6,035)
Cost of goods sold as reported	$ 1,207,287	$ 1,363,171	$ 1,140,108
Income (loss) before provision for income taxes:			
Pekin Campus production	$ (1,560)	$ (27,376)	$ 41,622
Marketing and distribution	7,644	3,748	11,756
Western production	(13,506)	(7,209)	(3,762)
Corporate and other	(20,486)	(8,835)	(2,065)
	$ (27,908)	$ (39,672)	$ 47,551
Depreciation and amortization expense:			
Pekin Campus production	$ 19,789	$ 19,136	$ 17,352
Western production	2,381	5,085	5,890
Corporate and other	910	874	50
	$ 23,080	$ 25,095	$ 23,292
Interest expense, net of capitalized interest:			
Pekin Campus production	$ (207)	$ (381)	$ 756
Marketing and distribution	822	1,658	963
Western production	1,164	(339)	167
Corporate and other	5,646	889	1,701
	$ 7,425	$ 1,827	$ 3,587

The following table sets forth the Company's total assets by operating segment (in thousands):

	December 31, 2023	December 31, 2022
Total assets:		
Pekin Campus production	$ 251,048	257,089
Marketing and distribution	101,196	114,755
Western production	57,533	51,886
Corporate and other	44,464	54,591
	$ 454,241	$ 478,321

6. PROPERTY AND EQUIPMENT.

Property and equipment consisted of the following (in thousands):

	December 31,	
	2023	2022
Facilities and plant equipment	$ 405,010	$ 386,932
Land	3,687	3,687
Other equipment, vehicles and furniture	9,719	9,876
Construction in progress	50,505	37,538
	468,921	438,033
Accumulated depreciation	(220,173)	(198,964)
	$ 248,748	$ 239,069

Depreciation expense was $22,492,000, $24,528,000 and $23,292,000 for the years ended December 31, 2023, 2022 and 2021, respectively.

The Company capitalized interest of $2,454,000, $720,000 and $628,000 for the years ended December 31, 2023, 2022 and 2021, respectively, related to its capital investment activities.

The Company's property and equipment are substantially collateralized under the Company's Term Loan.

7. INTANGIBLE ASSETS.

Intangible assets, including goodwill, consisted of the following (in thousands):

		December 31, 2023			December 31, 2022		
	Useful Life (Years)	Gross	Accumulated Amortization/ Impairment	Net Book Value	Gross	Accumulated Amortization	Net Book Value
Non-Amortizing:							
Goodwill		$ 5,970	$ (5,970)	$ —	$ 5,970	$ —	$ 5,970
Kinergy tradename		2,678	—	2,678	2,678	—	2,678
Amortizing:							
Customer relationships	12	6,556	(1,074)	5,482	6,556	(527)	6,029
Eagle Alcohol tradename	10	420	(82)	338	420	(40)	380
Total goodwill and intangible assets		$ 15,624	$ (7,126)	$ 8,498	$ 15,624	$ (567)	$ 15,057

Goodwill – As discussed in Note 2, the Company's recorded goodwill of $5,970,000 in its Corporate and other segment resulted from the Company's acquisition of Eagle Alcohol. As part of the Company's annual goodwill testing, it impaired the full amount of goodwill of $5,970,000 and recognized the amount in asset impairments in the consolidated statements of operations for the year ended December 31, 2023. The Company did not record any goodwill impairment for the years ended December 31, 2022 and 2021.

Kinergy Tradename – The Company recorded tradename of $2,678,000 as part of the Company's merger with Kinergy in 2006. The Company determined that the tradename has an indefinite life and therefore, rather than being amortized, will be tested annually for impairment. The Company did not record any impairment on its tradename for the years ended December 31, 2023, 2022 and 2021.

Customer Relationships – The Company recorded customer relationships of $6,556,000 from the Company's acquisition of Eagle Alcohol. See Note 2. The Company has established a useful life of twelve years for these customer relationships.

Eagle Alcohol Tradename – The Company recorded tradename of $420,000 from the Company's acquisition of Eagle Alcohol. See Note 2. The Company has established a useful life of ten years for the tradename.

Amortization expense associated with intangible assets totaled $588,000 and $567,000 for the years ended December 31, 2023 and 2022. The weighted-average unamortized life of the customer relationships and tradename is 9.9 years.

The expected amortization expense relating to amortizable intangible assets in each of the five years after December 31, 2023 are (in thousands):

Years Ended December 31,	**Amount**
2024	$ 588
2025	588
2026	588
2027	588
2028	588
Thereafter	2,880
Total	$ 5,820

8. DERIVATIVES.

The business and activities of the Company expose it to a variety of market risks, including risks related to changes in commodity prices. The Company monitors and manages these financial exposures as an integral part of its risk management program. This program recognizes the unpredictability of financial markets and seeks to reduce the potentially adverse effects that market volatility could have on operating results.

Commodity Risk – Cash Flow Hedges – The Company uses derivative instruments to protect cash flows from fluctuations caused by volatility in commodity prices for periods of up to twelve months in order to protect gross profit margins from potentially adverse effects of market and price volatility on alcohol sales and purchase commitments where the prices are set at a future date and/or if the contracts specify a floating or index-based price. In addition, the Company hedges anticipated sales of alcohol to minimize its exposure to the potentially adverse effects of price volatility. These derivatives may be designated and documented as cash flow hedges and effectiveness is evaluated by assessing the probability of the anticipated transactions and regressing commodity futures prices against the Company's purchase and sales prices. Ineffectiveness, which is defined as the degree to which the derivative does not offset the underlying exposure, is recognized immediately in cost of goods sold. For the years ended December 31, 2023, 2022 and 2021, the Company did not designate any of its derivatives as cash flow hedges.

Commodity Risk – Non-Designated Hedges – The Company uses derivative instruments to lock in prices for certain amounts of corn and alcohols by entering into exchange-traded futures contracts or options for those commodities. These derivatives are not designated for hedge accounting treatment. The changes in fair value of these contracts are recorded on the balance sheet and recognized immediately in cost of goods sold. The Company recognized net losses of $8,031,000 and net gains of $19,263,000 and $21,619,000 as the change in the fair value of these contracts for the years ended December 31, 2023, 2022 and 2021, respectively.

Non-Designated Derivative Instruments – The classification and amounts of the Company's derivatives not designated as hedging instruments, and related cash collateral balances, are as follows (in thousands):

	As of December 31, 2023			
	Assets		Liabilities	
Type of Instrument	**Balance Sheet Location**	**Fair Value**	**Balance Sheet Location**	**Fair Value**
Cash collateral balance	Restricted cash	$ 15,466		
Commodity contracts	Derivative instruments	$ 2,412	Derivative instruments	$ 13,849

	As of December 31, 2022			
	Assets		Liabilities	
Type of Instrument	**Balance Sheet Location**	**Fair Value**	**Balance Sheet Location**	**Fair Value**
Cash collateral balance	Restricted cash	$ 13,069		
Commodity contracts	Derivative instruments	$ 4,973	Derivative instruments	$ 6,732

The above amounts represent the gross balances of the contracts; however, the Company does have a right of offset with each of its derivative brokers, but the Company's intent is to close out positions individually, therefore the positions are reported at gross.

The classification and amounts of the Company's recognized gains (losses) for its derivatives not designated as hedging instruments are as follows (in thousands):

		Realized Gains		
		For the Years Ended December 31,		
Type of Instrument	**Statements of Operations Location**	**2023**	**2022**	**2021**
Commodity contracts	Cost of goods sold	$ 1,647	$ 23,280	$ 32,618
		$ 1,647	$ 23,280	$ 32,618

		Unrealized Losses		
		For the Years Ended December 31,		
Type of Instrument	**Statements of Operations Location**	**2023**	**2022**	**2021**
Commodity contracts	Cost of goods sold	$ (9,678)	$ (4,017)	$ (10,999)
		$ (9,678)	$ (4,017)	$ (10,999)

9. DEBT.

Long-term borrowings are summarized as follows (in thousands):

	December 31, 2023	December 31, 2022
Kinergy line of credit	$ 30,690	$ 18,076
Orion term loan	60,000	60,000
	90,690	78,076
Less unamortized debt discount	(3,893)	(4,686)
Less unamortized debt financing costs	(4,700)	(5,034)
Less current portion	—	—
Long-term debt	$ 82,097	$ 68,356

Kinergy Line of Credit – Kinergy has an operating line of credit for an aggregate amount of up to $100,000,000. The line of credit matures on November 7, 2027. The credit facility is based on Kinergy's eligible accounts receivable and inventory levels, subject to certain concentration reserves. The credit facility is subject to certain other sublimits, including inventory loan limits. Interest accrues under the line of credit at a rate equal to (i) the daily Secured Overnight Financing Rate, plus (ii) a specified applicable margin ranging between 1.25% and 1.75%. The applicable margin was 1.25%, for a total rate of 6.74%, at December 31, 2023. The credit facility's monthly unused line fee is an annual rate equal to 0.25% to 0.375% depending on the average daily principal balance during the immediately preceding month. Payments that may be made by Kinergy to the Company as reimbursement for management and other services provided by the Company to Kinergy are limited under the terms of the credit facility to $1,500,000 per fiscal quarter. The credit facility also includes the accounts receivable of Alto Nutrients as additional collateral. Payments that may be made by Alto Nutrients to the Company as reimbursement for management and other services provided by the Company to Alto Nutrients are limited under the terms of the credit facility to $500,000 per fiscal quarter. Kinergy and Alto Nutrients may also make distributions to the Company of up to 75% of their excess cash flow.

If the monthly excess borrowing availability of Kinergy and Alto Nutrients falls below certain thresholds, they are collectively required to maintain a fixed-charge coverage ratio (calculated as a twelve-month rolling earnings before interest, taxes, depreciation and amortization divided by the sum of interest expense, capital expenditures, principal payments of indebtedness, indebtedness from capital leases and taxes paid during such twelve-month rolling period) of at least 1.1 and are prohibited from incurring certain additional indebtedness (other than specific intercompany indebtedness).

The obligations of Kinergy and Alto Nutrients under the credit facility are secured by first-priority security interests in all of their assets in favor of the lender. Alto Ingredients has guaranteed all of Kinergy's obligations under the line of credit. As of December 31, 2023, Kinergy had $33.3 million in unused borrowing availability under the credit facility.

Orion Term Loan – On November 7, 2022, the Company entered into a credit agreement with certain funds managed by Orion Infrastructure Capital (collectively, the "Lenders"), and OIC Investment Agent, LLC, as administrative agent and collateral agent ("OIC"), under which the Lenders agreed to extend a senior secured credit facility in the amount of up to $125,000,000 (the "Term Loan"). The Term Loan is secured by a first priority lien on certain assets of the Company and a second priority lien on certain assets of Kinergy and Alto Nutrients.

The Lenders agreed to advance to the Company up to $100,000,000, with up to an additional $25,000,000 upon the satisfaction of certain conditions. The Company also agreed to issue to the Lenders upon its first funding request, an aggregate of 1,282,051 shares of the Company's common stock, and up to an additional 320,513 shares of the Company's common stock upon additional funding or fundings.

On November 23, 2022, the Company received its initial funding of $60,000,000 and issued 1,282,051 shares of common stock. As of December 31, 2023 and 2022, the principal amount outstanding under the Term Loan was $60,000,000. The Company allocated $3,912,000 of the loan proceeds to additional paid-in capital for the common stock issued based on the relative fair values of the debt and equity instruments and recorded a corresponding amount as a debt issuance discount that will be amortized to interest expense over the term of the loan.

Interest accrues on the unpaid principal amount of the Term Loan at a fixed rate of 10% per annum. The Term Loan matures on November 7, 2028, or earlier upon acceleration.

The Company must prepay amounts outstanding under the Term Loan on a semi-annual basis beginning with the six-month period ended December 31, 2023 in an amount equal to a percentage of the Company's excess cash flow based on a specified leverage ratio, as follows: (i) if the leverage ratio is greater than or equal to 3.0x, then the mandatory prepayment amount will equal 100% of the Company's excess cash flow, (ii) if the leverage ratio is less than 3.0x and greater than or equal to 1.5x, then the mandatory prepayment amount will equal 50% of the Company's excess cash flow and (iii) if the leverage ratio is less than 1.5x, then the mandatory prepayment amount will equal 25% of the Company's excess cash flow.

The terms and conditions of the Term Loan also contain customary and other representations, warranties, covenants and obligations, including events of default, and other terms and conditions.

Registration Rights Agreement - On November 7, 2022, the Company entered into a registration rights agreement with the Lenders and agreed to register for resale with the Securities and Exchange Commission the shares of common stock issued to the Lenders under the Term Loan. The related registration statement has been declared effective by the Securities and Exchange Commission.

CARES Act Loans – On May 4, 2020, Alto Ingredients and Alto Pekin, received loan proceeds from Bank of America, NA under the Coronavirus Aid, Relief, and Economic Security Act of 2020 ("CARES Act"), through the Paycheck Protection Program administered by the U.S. Small Business Administration ("SBA"). Alto Ingredients received $6.0 million and Alto Pekin received $3.9 million in loan proceeds. Under the terms of the loans, certain amounts may be forgiven if they are used for qualifying expenses as described in the CARES Act. In June 2021, the SBA approved Alto Pekin's forgiveness application for the full amount of $3.9 million. In September 2021, the SBA approved Alto Ingredients' forgiveness application for the full amount of $6.0 million. As a result, the Company recognized income from loan forgiveness of $9.9 million for the year ended December 31, 2021. The SBA may audit the loan forgiveness applications and further examine eligibility for forgiveness, including the facts and circumstances existing at the time the loans were made. The Company can provide no assurance that any loan forgiven will not require repayment following an audit by the SBA.

Maturities of Long-term Debt – The Company's long-term debt matures as follows (in thousands):

December 31:	
2027	$ 30,690
2028	60,000
	$ 90,690

10. LEASES.

The Company leases equipment and land for certain of its facilities. Operating lease right of use assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. The Company uses its estimated incremental borrowing rate, unless an implicit rate is readily determinable, as the discount rate for each lease in determining the present value of lease payments. For the years ended December 31, 2023 and 2022, the Company's weighted-average discount rate was 7.50%. Operating lease expense is recognized on a straight-line basis over the lease term.

Upon the adoption of ASC 842, the Company elected the following practical expedients allowable under the guidance: not to reassess whether any expired or existing contracts are or contain leases; not to reassess the lease classification for any expired or existing leases; not to reassess initial direct costs for any existing leases; not to separately identify lease and non-lease components; and not to evaluate historical land easements. Additionally, the Company elected the short-term lease exemption policy, applying the requirements of ASC 842 to only long-term (greater than 1 year) leases.

The Company determines if an arrangement is a lease or contains a lease at inception. The Company's leases have remaining lease terms of approximately 1 year to 52 years, which includes options to extend the lease when it is reasonably certain the Company will exercise those options. For the year ended December 31, 2023, the weighted-average remaining lease terms of equipment and land-related leases were 4.73 years and 15.41 years, respectively. The Company does not have lease arrangements with residual value guarantees, sale-leaseback terms or material restrictive covenants. The Company does not have any material finance lease obligations nor sublease agreements.

Leases consist of the following (in thousands):

		December 31,	
	Classification	**2023**	**2022**
Assets:			
Operating	Right of use operating lease assets, net	$ 22,597	$ 18,937
Liabilites:			
Operating - Current	Current portion, operating leases	$ 4,333	$ 3,849
Operating - Noncurrent	Operating leases, net of current portion	$ 19,029	$ 15,062

The Components of lease costs were as follows (in thousands):

	Years Ended December 31, 2023	2022	2021
Fixed lease cost	$ 5,722	$ 5,224	$ 4,500
Variable lease cost	871	124	238
Net lease cost	$ 6,593	$ 5,348	$ 4,738

The following table summarizes the remaining maturities of the Company's operating lease liabilities, assuming all land lease extensions are taken, as of December 31, 2023 (in thousands):

Year Ended:	**Equipment**	**Land Related**
2024	$ 4,959	$ 991
2025	4,506	1,178
2026	3,860	1,156
2027	3,350	1,129
2028	2,655	1,142
2029-76	1,278	4,666
Less interest	(3,720)	(3,788)
	$ 16,888	$ 6,474

11. PENSION PLANS.

Retirement Plan - The Company sponsors a defined benefit pension plan (the "Retirement Plan") that is noncontributory, and covers only "grandfathered" unionized employees at its Alto Pekin production facilities. Benefits are based on a prescribed formula based upon the employee's years of service. Employees hired after November 1, 2010, are not eligible to participate in the Retirement Plan. The Company uses a December 31st measurement date for its Retirement Plan. The Company's funding policy is to make the minimum annual contribution required by applicable regulations.

Information related to the Retirement Plan as of and for the years ended December 31, 2023 and 2022 is presented below (dollars in thousands):

	2023	**2022**
Changes in plan assets:		
Fair value of plan assets, beginning	$ 16,688	$ 19,987
Actual gains (losses)	2,376	(3,315)
Benefits paid	(834)	(784)
Company contributions	255	800
Participant contributions	—	—
Fair value of plan assets, ending	$ 18,485	$ 16,688
Less: projected accumulated benefit obligation	$ 18,590	$ 17,956
Funded status, (underfunded)/overfunded	$ (105)	$ (1,268)
Amounts recognized in the consolidated balance sheets:		
Other liabilities	$ (105)	$ (1,268)
Accumulated other comprehensive loss	$ (2,231)	$ (1,166)
Assumptions used in computation of benefit obligations:		
Discount rate	4.90%	5.15%
Expected long-term return on plan assets	6.50%	6.50%
Rate of compensation increase	—	—

	Years Ended December 31,		
	2023	2022	2021
Components of net periodic benefit costs are as follows:			
Service cost	$ 249	$ 404	$ 436
Interest cost	900	655	605
Amortization of net loss	—	—	98
Expected return on plan assets	(993)	(1,090)	(952)
Net periodic cost (benefit)	$ 156	$ (31)	$ 187

The Company does not expect to make any contributions in the year ending December 31, 2024. Net periodic benefit cost for 2024 is estimated at less than $0.1 million.

The following table summarizes the expected benefit payments for the Company's Retirement Plan for each of the next five fiscal years and in the aggregate for the five fiscal years thereafter (in thousands):

December 31:	
2024	$ 960
2025	1,030
2026	1,070
2027	1,100
2028	1,140
2029-33	6,280
	$ 11,580

See Note 16 for discussion of the Retirement Plan's fair value disclosures.

Historical and future expected returns of multiple asset classes were analyzed to develop a risk-free real rate of return and risk premiums for each asset class. The overall rate for each asset class was developed by combining a long-term inflation component, the risk-free real rate of return, and the associated risk premium. A weighted-average rate was developed based on those overall rates and the target asset allocation of the Retirement Plan.

The Company's pension committee is responsible for overseeing the investment of pension plan assets. The pension committee is responsible for determining and monitoring the appropriate asset allocations and for selecting or replacing investment managers, trustees, and custodians. The Retirement Plan's current investment target allocations are 50% equities and 50% debt. The pension committee periodically reviews the actual asset allocation in light of these targets and rebalances investments as necessary. The pension committee also evaluates the performance of investment managers as compared to the performance of specified benchmarks and peers and monitors the investment managers to ensure adherence to their stated investment style and to the Retirement Plan's investment guidelines.

Postretirement Plan - The Company also sponsors a health care plan and life insurance plan (the "Postretirement Plan") that provides postretirement medical benefits and life insurance to certain "grandfathered" unionized employees at its Alto Pekin production facilities. Employees hired after December 31, 2000, are not eligible to participate in the Postretirement Plan. The plan is contributory, with contributions required at the same rate as active employees. Benefit eligibility under the plan reduces at age 65 from a defined benefit to a defined dollar cap based upon years of service.

Information related to the Postretirement Plan as of December 31, 2023 and 2022 is presented below (dollars in thousands):

	2023	2022
Amounts at the end of the year:		
Accumulated/projected benefit obligation	$ 4,294	$ 3,907
Fair value of plan assets	—	—
Funded status, (underfunded)/overfunded	$ (4,294)	$ (3,907)
Amounts recognized in the consolidated balance sheets:		
Accrued liabilities	$ (320)	$ (310)
Other liabilities	$ (3,974)	$ (3,597)
Accumulated other comprehensive loss	$ (250)	$ (656)
Discount rate used in computation of benefit obligations	4.75%	4.95%

	Years Ended December 31,		
	2023	2022	2021
Components of net periodic benefit costs are as follows:			
Service cost	$ 14	$ 26	$ 42
Interest cost	186	105	105
Amortization of prior service cost	(53)	—	25
Net periodic benefit cost	$ 147	$ 131	$ 172
Amounts recognized in the plan for the year:			
Participant contributions	$ 36	$ 43	$ 32
Benefits paid	$ 201	$ 215	$ 217

The Company does not expect to recognize any amortization of net actuarial loss during the year ended December 31, 2024.

The following table summarizes the expected benefit payments for the Company's Postretirement Plan for each of the next five fiscal years and in the aggregate for the five fiscal years thereafter (in thousands):

December 31:	
2024	$ 320
2025	350
2026	430
2027	440
2028	450
2029-2033	1,940
	$ 3,930

For purposes of determining the cost and obligation for pre-Medicare postretirement medical benefits, a 7.50% annual rate of increase in the per capita cost of covered benefits (i.e., health care trend rate) was assumed for the Postretirement Plan in 2025, adjusted to a rate of 4.50% in 2034. Assumed health care cost trend rates have a significant effect on the amounts reported for health care plans.

12. INCOME TAXES.

The Company recorded a provision for income taxes as follows (in thousands):

	Years Ended December 31,		
	2023	2022	2021
Current provision	$ 97	$ 1,925	$ 1,469
Deferred provision	—	—	—
Total	$ 97	$ 1,925	$ 1,469

A reconciliation of the differences between the United States statutory federal income tax rate and the effective tax rate as provided in the consolidated statements of operations is as follows:

	Years Ended December 31,		
	2023	2022	2021
Statutory rate	21.0%	21.0%	21.0%
State income taxes, net of federal benefit	4.6	5.8	6.0
Change in valuation allowance	(23.4)	(33.9)	(18.8)
Stock-based compensation	(2.3)	3.1	—
Non-deductible items	0.8	(1.6)	0.4
Income from loan forgiveness	—	—	(5.5)
Other	(1.0)	0.6	(0.1)
Effective rate	(0.3)%	(5.0)%	3.0%

Deferred income taxes are provided using the asset and liability method to reflect temporary differences between the financial statement carrying amounts and the tax bases of assets and liabilities using presently enacted tax rates and laws. The components of deferred income taxes included in the consolidated balance sheets were as follows (in thousands):

	December 31,	
	2023	2022
Deferred tax assets:		
Net operating loss carryforwards	$ 57,870	$ 58,131
Capital loss	26,518	26,043
Disallowed interest	3,457	2,395
R&D, Energy and AMT credits	3,742	3,742
Derivatives	3,051	460
Intangibles	1,201	89
Pension liability	1,173	1,354
Railcar contracts	818	786
Stock-based compensation	696	634
Allowance for credit losses and other assets	296	311
Other	3,340	3,208
Total gross deferred tax assets	102,162	97,153
Less: valuation allowance	(93,506)	(87,949)
Total deferred tax assets, net of valuation allowance	8,656	9,204
Deferred tax liabilities:		
Property and equipment	(7,720)	(9,125)
Other	(1,172)	(315)
Total deferred tax liabilities	(8,892)	(9,440)
Net deferred tax liabilities, included in other liabilities	$ (236)	$ (236)

A portion of the Company's net operating loss carryforwards are subject to provisions of the tax law that limit the use of losses incurred by a corporation prior to the date certain ownership changes occur. These limitations also apply to certain depreciation deductions associated with assets on hand at the time of the ownership change and otherwise allowable during the five-year period following the ownership change. As the five-year limitation period lapsed in 2019, these disallowed deductions are reflected in property and equipment in the schedule above but continue to be subject to the annual limitation that applies to the pre-change net operating losses. Due to the limitation on the use of net operating losses and depreciation deductions, a significant portion of these carryforwards will expire regardless of whether the Company generates future taxable income. After reducing these net operating loss carryforwards for the amount which will expire due to this limitation, the Company had remaining federal net operating loss carryforwards of approximately $207,481,000 and state net operating loss carryforwards of approximately $227,772,000 at December 31, 2023. These net operating loss carryforwards expire as follows (in thousands):

Tax Years	**Federal**	**State**
2024–2028	$ —	$ 94,913
2029–2033	15,245	5,637
2034–2038	83,771	93,390
2039 and after*	108,465	33,832
Total NOLs	$ 207,481	$ 227,772

* Includes indefinite life federal net operating losses of $108.5 million generated after 2017.

Approximately $135,260,000 is available to utilize against federal taxable income for 2024.

To the extent amounts are not utilized in any year, they may be carried forward to the next year until expiration. These amounts may change if there are future additional limitations on their utilization.

Federal capital loss of $100,487,000 may be carried forward for 5 years and will expire in 2025. State capital loss of $95,469,000 may be carried forward for 5 years for most of the states in which the Company files returns and will expire in 2025.

In assessing whether the deferred tax assets are realizable, a more likely than not standard is applied. If it is determined that it is more likely than not that deferred tax assets will not be realized, a valuation allowance must be established against the deferred tax assets. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which the associated temporary differences become deductible. Management considers the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in making this assessment.

A valuation allowance was established in the amount of $93,506,000 and $87,949,000 as of December 31, 2023 and 2022, respectively, based on the Company's assessment of the future realizability of certain deferred tax assets. The valuation allowance on deferred tax assets is related to future deductible temporary differences and net operating loss carryforwards for which the Company has concluded it is more likely than not that these items will not be realized in the ordinary course of operations.

For the year ended December 31, 2023, the Company recorded an increase in valuation allowance of $5,557,000. This was primarily related to additional net operating losses accumulated for the year. For the year ended December 31, 2022, the Company recorded an increase in valuation allowance of $12,365,000. This was primarily related to additional net operating losses accumulated for the year. For the year ended December 31, 2021, the Company recorded a decrease in valuation allowance of $10,104,000. This was primarily related to utilization of net operating losses as the Company generated taxable income for the year.

Unrecognized Tax Benefits

A reconciliation of the beginning balance and the ending balance of gross unrecognized tax benefits, before interest and penalties, for the period presented is as follows (in thousands):

	December 31,	
	2023	2022
Unrecognized tax benefits at beginning of year	$ 739	$ —
Increases related to current year tax positions	—	—
Decreases related to current year tax positions	—	—
Increases related to prior year tax positions	—	739
Decreases related to prior year tax positions	—	—
Decreases related to expiration of prior year tax positions	—	—
Decreases related to settlements of prior year tax positions	—	—
Unrecognized tax benefits at end of year	$ 739	$ 739

The Company recorded unrecognized tax benefits for uncertain tax positions of approximately $739,000 as of December 31, 2023, of which $739,000 would impact the effective tax rate, if recognized.

The Company recognizes interest and penalties related to income tax matters as a component of interest expense and other income, net, respectively. As of December 31, 2023, the Company accrued penalties of $74,000 and interest of $75,000 related to uncertain tax positions. The Company does not expect the unrecognized tax benefits to change significantly over the next 12 months.

The Company is subject to income tax in the United States federal jurisdiction and various state jurisdictions and has identified its federal tax return and tax returns in state jurisdictions below as “major” tax filings. These jurisdictions, along with the years still open to audit under the applicable statutes of limitation, are as follows:

Jurisdiction	Tax Years
Federal	2020 – 2022
Alabama	2020 – 2022
Arizona	2019 – 2022
Arkansas	2020 – 2022
California	2019 – 2022
Colorado	2019 – 2022
Connecticut	2020 – 2022
Georgia	2020 – 2022
Idaho	2020 – 2022
Illinois	2020 – 2022
Indiana	2020 – 2022
Iowa	2020 – 2022
Kansas	2020 – 2022
Louisiana	2020 – 2022
Michigan	2020 – 2022
Minnesota	2020 – 2022
Mississippi	2020 – 2022
Missouri	2020 – 2022
Nebraska	2020 – 2022
New Mexico	2020 – 2022
Oklahoma	2020 – 2022
Oregon	2020 – 2022
Pennsylvania	2020 – 2022
Rhode Island	2020 – 2022
South Carolina	2020 – 2022
Tennessee	2020 – 2022
Texas	2019 – 2022

However, because the Company had net operating losses and credits carried forward in several of the jurisdictions, including the United States federal and California jurisdictions, certain items attributable to closed tax years are still subject to adjustment by applicable taxing authorities through an adjustment to tax attributes carried forward to open years.

13. PREFERRED STOCK.

The Company has 6,734,835 undesignated shares of authorized and unissued preferred stock, which may be designated and issued in the future on the authority of the Company's Board of Directors. As of December 31, 2023, the Company had the following designated classes of preferred stock:

Series A Preferred Stock – The Company has authorized 1,684,375 shares of Series A Cumulative Redeemable Convertible Preferred Stock ("Series A Preferred Stock"), with none outstanding at December 31, 2023 and 2022. Shares of Series A Preferred Stock that are converted into shares of the Company's common stock revert to undesignated shares of authorized and unissued preferred stock.

Upon any issuance, the Series A Preferred Stock would rank senior in liquidation and dividend preferences to the Company's common stock. Holders of Series A Preferred Stock would be entitled to quarterly cumulative dividends payable in arrears in cash in an amount equal to 5% per annum of the purchase price per share of the Series A Preferred Stock. The holders of the Series A Preferred Stock would have conversion rights initially equivalent to two shares of common stock for each share of Series A Preferred Stock, subject to customary antidilution adjustments. Certain specified issuances will not result in antidilution adjustments. The shares of Series A Preferred Stock would also be subject to forced conversion upon the occurrence of a transaction that would result in an internal rate of return to the holders of the Series A Preferred Stock of 25% or more. Accrued but unpaid dividends on the Series A Preferred Stock are to be paid in cash upon any conversion of the Series A Preferred Stock.

The holders of Series A Preferred Stock would have a liquidation preference over the holders of the Company's common stock equivalent to the purchase price per share of the Series A Preferred Stock plus any accrued and unpaid dividends on the Series A Preferred Stock. A liquidation would be deemed to occur upon the happening of customary events, including transfer of all or substantially all of the Company's capital stock or assets or a merger, consolidation, share exchange, reorganization or other transaction or series of related transactions, unless holders of 66 2/3% of the Series A Preferred Stock vote affirmatively in favor of or otherwise consent to such transaction.

Series B Preferred Stock – The Company has authorized 1,580,790 shares of Series B Cumulative Convertible Preferred Stock ("Series B Preferred Stock"), with 926,942 shares outstanding at December 31, 2023 and 2022. Shares of Series B Preferred Stock that are converted into shares of the Company's common stock revert to undesignated shares of authorized and unissued preferred stock.

The Series B Preferred Stock ranks senior in liquidation and dividend preferences to the Company's common stock. Holders of Series B Preferred Stock are entitled to quarterly cumulative dividends payable in arrears in cash in an amount equal to 7.00% per annum of the purchase price per share of the Series B Preferred Stock; however, subject to the provisions of the Letter Agreement described below, such dividends may, at the option of the Company, be paid in additional shares of Series B Preferred Stock based initially on the liquidation value of the Series B Preferred Stock. In addition to the quarterly cumulative dividends, holders of the Series B Preferred Stock are entitled to participate in any common stock dividends declared by the Company to its common stockholders. The holders of Series B Preferred Stock have a liquidation preference over the holders of the Company's common stock initially equivalent to $19.50 per share of the Series B Preferred Stock plus any accrued and unpaid dividends on the Series B Preferred Stock. A liquidation will be deemed to occur upon the happening of customary events, including the transfer of all or substantially all of the capital stock or assets of the Company or a merger, consolidation, share exchange, reorganization or other transaction or series of related transaction, unless holders of 66 2/3% of the Series B Preferred Stock vote affirmatively in favor of or otherwise consent that such transaction shall not be treated as a liquidation. The Company believes that such liquidation events are within its control and therefore has classified the Series B Preferred Stock in stockholders' equity.

As of December 31, 2023, the Series B Preferred Stock was convertible into 980,712 shares of the Company’s common stock. The conversion ratio is subject to customary antidilution adjustments. In addition, antidilution adjustments are to occur in the event that the Company issues equity securities, including derivative securities convertible into equity securities (on an as-converted or as-exercised basis), at a price less than the conversion price then in effect. The shares of Series B Preferred Stock are also subject to forced conversion upon the occurrence of a transaction that would result in an internal rate of return to the holders of the Series B Preferred Stock of 25% or more. The forced conversion is to be based upon the conversion ratio as last adjusted. Accrued but unpaid dividends on the Series B Preferred Stock are to be paid in cash upon any conversion of the Series B Preferred Stock.

The holders of Series B Preferred Stock vote together as a single class with the holders of the Company’s common stock on all actions to be taken by the Company’s stockholders. Each share of Series B Preferred Stock entitles the holder to approximately 0.03 votes per share on all matters to be voted on by the stockholders of the Company. Notwithstanding the foregoing, the holders of Series B Preferred Stock are afforded numerous customary protective provisions with respect to certain actions that may only be approved by holders of a majority of the shares of Series B Preferred Stock.

In 2008, the Company entered into Letter Agreements with Lyles United LLC (“Lyles United”) and other purchasers under which the Company expressly waived its rights under the Certificate of Designations relating to the Series B Preferred Stock to make dividend payments in additional shares of Series B Preferred Stock in lieu of cash dividend payments without the prior written consent of Lyles United and the other purchasers.

Registration Rights Agreement – In connection with the sale of its Series B Preferred Stock, the Company entered into a registration rights agreement with Lyles United. The registration rights agreement is effective until the holders of the Series B Preferred Stock, and their affiliates, as a group, own less than 10% for each of the series issued, including common stock into which such Series B Preferred Stock has been converted. The registration rights agreement provides that holders of a majority of the Series B Preferred Stock, including common stock into which such Series B Preferred Stock has been converted, may demand and cause the Company to register on their behalf the shares of common stock issued, issuable or that may be issuable upon conversion of the Preferred Stock and as payment of dividends thereon, and upon exercise of the related warrants (collectively, the “Registrable Securities”). The Company is required to keep such registration statement effective until such time as all of the Registrable Securities are sold or until such holders may avail themselves of Rule 144 for sales of Registrable Securities without registration under the Securities Act of 1933, as amended. The holders are entitled to two demand registrations on Form S-1 and unlimited demand registrations on Form S-3; provided, however, that the Company is not obligated to effect more than one demand registration on Form S-3 in any calendar year. In addition to the demand registration rights afforded the holders under the registration rights agreement, the holders are entitled to unlimited “piggyback” registration rights. These rights entitle the holders who so elect to be included in registration statements to be filed by the Company with respect to other registrations of equity securities. The Company is responsible for all costs of registration, plus reasonable fees of one legal counsel for the holders, which fees are not to exceed $25,000 per registration. The registration rights agreement includes customary representations and warranties on the part of both the Company and the holders and other customary terms and conditions.

14. STOCK-BASED COMPENSATION.

On June 16, 2016, the Company’s shareholders approved the 2016 Stock Incentive Plan, which authorizes the issuance of incentive stock options and non-qualified stock options, restricted stock, restricted stock units, stock appreciation rights, direct stock issuances and other stock-based awards to the Company’s officers, directors or key employees or to consultants that do business with the Company initially for up to an aggregate of 1,150,000 shares of common stock. On June 14, 2018, the Company’s shareholders approved an increase to the aggregate number of shares authorized under the 2016 Stock Incentive Plan to 3,650,000 shares. On November 7, 2019, the Company’s shareholders approved an increase to the aggregate number of shares authorized under the 2016 Stock Incentive Plan to 5,650,000 shares. On November 18, 2020, the Company’s shareholders approved an increase to the aggregate number of shares authorized under the 2016 Stock Incentive Plan to 7,400,000 shares. On June 23, 2022, the Company’s shareholders approved an increase to the aggregate number of shares authorized under the 2016 Stock Incentive Plan to 8,900,000 shares. On June 22, 2023, the Company’s shareholders approved an increase to the aggregate number of shares authorized under the 2016 Stock Incentive Plan to 11,400,000 shares.

Restricted Stock – A summary of unvested restricted stock activity is as follows (shares in thousands):

	Number of Shares	Weighted-Average Grant Date Fair Value Per Share
Unvested at December 31, 2021	1,387	$ 3.30
Issued	872	$ 6.21
Vested	(1,051)	$ 2.66
Canceled	(39)	$ 6.23
Unvested at December 31, 2022	1,169	$ 5.95
Issued	2,375	$ 1.87
Vested	(547)	$ 5.61
Canceled	(56)	$ 3.14
Unvested at December 31, 2023	2,941	$ 2.77

The fair value of the common stock at vesting aggregated $929,000, $6,900,000 and $8,810,000 for the years ended December 31, 2023, 2022 and 2021, respectively. Stock-based compensation expense related to employee and non-employee restricted stock and option grants recognized in the accompanying consolidated statements of operations, was as follows (in thousands):

	Years Ended December 31,		
	2023	2022	2021
Employees	$ 3,345	$ 2,689	$ 1,758
Non-employees	551	644	1,125
Total stock-based compensation expense	$ 3,896	$ 3,333	$ 2,883

Employee grants typically have a two or three-year vesting schedule, while non-employee grants have a one-year vesting schedule. At December 31, 2023, the total compensation expense related to unvested awards which had not been recognized was $8,281,000 and the associated weighted-average period over which the compensation expense attributable to those unvested awards will be recognized was approximately 0.67 years.

15. COMMITMENTS AND CONTINGENCIES.

Commitments – The following is a description of significant commitments at December 31, 2023:

Sales Commitments – At December 31, 2023, the Company had entered into sales contracts with its major customers to sell certain quantities of alcohol and essential ingredients. The Company had open alcohol indexed-price contracts for 102,874,000 gallons as of December 31, 2023 and open fixed-price alcohol sales contracts totaling $285,802,000 as of December 31, 2023. The Company had open fixed-price sales contracts for essential ingredients totaling $6,374,000 and open indexed-price sales contracts of essential ingredients for 85,000 tons as of December 31, 2023. These sales contracts are scheduled for completion over the next twelve months.

Purchase Commitments – At December 31, 2023, the Company had indexed-price purchase contracts to purchase 26,332,000 gallons of alcohol and fixed-price purchase contracts to purchase $1,705,000 of alcohol from its suppliers. The Company had fixed-price purchase contracts to purchase $30,100,000 of corn from its suppliers as of December 31, 2023. The Company had fixed-price purchase contracts for natural gas totaling $4,663,000. The Company also had future commitments for certain capital projects totaling $15,629,000. These purchase commitments are scheduled to be satisfied through 2024.

Contingencies – The following is a description of significant contingencies at December 31, 2023:

Litigation – The Company is subject to various claims and contingencies in the ordinary course of its business, including those related to litigation, business transactions, employee-related matters, and others. When the Company is aware of a claim or potential claim, it assesses the likelihood of any loss or exposure. If it is probable that a loss will result and the amount of the loss can be reasonably estimated, the Company will record a liability for the loss. If the loss is not probable or the amount of the loss cannot be reasonably estimated, the Company discloses the claim if the likelihood of a potential loss is reasonably possible, and the amount involved could be material. While the Company can provide no assurances, the Company does not expect that any of its pending legal proceedings will have a material financial impact on the Company's operating results.

16. FAIR VALUE MEASUREMENTS.

The fair value hierarchy prioritizes the inputs used in valuation techniques into three levels, as follows:

- Level 1 – Observable inputs – unadjusted quoted prices in active markets for identical assets and liabilities;
- Level 2 – Observable inputs other than quoted prices included in Level 1 that are observable for the asset or liability through corroboration with market data; and
- Level 3 – Unobservable inputs – includes amounts derived from valuation models where one or more significant inputs are unobservable. For fair value measurements using significant unobservable inputs, a description of the inputs and the information used to develop the inputs is required along with a reconciliation of Level 3 values from the prior reporting period.

Pooled Separate Accounts – Pooled separate accounts invest primarily in domestic and international stocks, commercial paper or single mutual funds. The net asset value is used as a practical expedient to determine fair value for these accounts. Each pooled separate account provides for redemptions by the Retirement Plan at reported net asset values per share, with little to no advance notice requirement, therefore these funds are classified within Level 2 of the valuation hierarchy.

Other Derivative Instruments – The Company's other derivative instruments consist of commodity positions. The fair values of the commodity positions are based on quoted prices on the commodity exchanges and are designated as Level 1 inputs.

The following table summarizes recurring and nonrecurring fair value measurements by level at December 31, 2023 (in thousands):

	Fair Value	Level 1	Level 2	Level 3	Benefit Plan Percentage Allocation
Assets:					
Derivative financial instruments	$ 2,412	$ 2,412	$ —	$ —	
Defined benefit plan assets(1) (pooled separate accounts):					
Large U.S. Equity(2)	5,608	—	5,608	—	30%
Small/Mid U.S. Equity(3)	3,350	—	3,350	—	18%
International Equity(4)	2,682	—	2,682	—	15%
Fixed Income(5)	6,845	—	6,845	—	37%
	$ 20,897	$ 2,412	$ 18,485	$ —	
Liabilities:					
Derivative financial instruments	$ 13,849	$ 13,849	$ —	$ —	

The following table summarizes recurring and nonrecurring fair value measurements by level at December 31, 2022 (in thousands):

	Fair Value	Level 1	Level 2	Level 3	Benefit Plan Percentage Allocation
Assets:					
Derivative financial instruments	$ 4,973	$ 4,973	$ —	$ —	—
Defined benefit plan assets(1) (pooled separate accounts):					
Large U.S. Equity(2)	4,586	—	4,586	—	28%
Small/Mid U.S. Equity(3)	2,986	—	2,986	—	18%
International Equity(4)	2,406	—	2,406	—	14%
Fixed Income(5)	6,710	—	6,710	—	40%
	$ 21,661	$ 4,973	$ 16,688	$ —	
Liabilities:					
Derivative financial instruments	$ 6,732	$ 6,732	$ —	$ —	

(1) See Note 11 for accounting discussion.
(2) This category includes investments in funds comprised of equity securities of large U.S. companies. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund.
(3) This category includes investments in funds comprised of equity securities of small- and medium-sized U.S. companies. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund.
(4) This category includes investments in funds comprised of equity securities of foreign companies, including emerging markets. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund.
(5) This category includes investments in funds comprised of U.S. and foreign investment-grade fixed income securities, high-yield fixed income securities that are rated below investment-grade, U.S. treasury securities, mortgage-backed securities, and other asset-backed securities. The funds are valued using the net asset value method in which an average of the market prices for the underlying investments is used to value the fund.

INDEX TO EXHIBITS

Exhibit Number	Description*	Where Located Form	File Number	Exhibit Number	Filing Date	Filed Herewith
2.1	Asset Purchase Agreement dated April 23, 2021 by and among the Registrant, Pacific Ethanol Madera LLC and Seaboard Energy California, LLC	10-Q	000-21467	10.1	08/10/2021	
2.2	First Amendment to Asset Purchase Agreement dated July 30, 2021 by and among the Registrant, Pacific Ethanol Madera LLC and Seaboard Energy California, LLC	10-Q	000-21467	10.2	08/10/2021	
2.3	Asset Purchase Agreement dated November 5, 2021 by and among the Registrant, Pacific Ethanol Stockton LLC and Pelican Acquisition LLC	10-K	000-21467	2.3	03/15/2022	
3.1	Certificate of Incorporation	10-Q	000-21467	3.1	11/06/2015	
3.2	Certificate of Designations, Powers, Preferences and Rights of the Series A Cumulative Redeemable Convertible Preferred Stock	10-Q	000-21467	3.2	11/06/2015	
3.3	Certificate of Designations, Powers, Preferences and Rights of the Series B Cumulative Convertible Preferred Stock	10-Q	000-21467	3.3	11/06/2015	
3.4	Certificate of Amendment to Certificate of Incorporation dated June 3, 2010	10-Q	000-21467	3.4	11/06/2015	
3.5	Certificate of Amendment to Certificate of Incorporation effective June 8, 2011	10-Q	000-21467	3.5	11/06/2015	
3.6	Certificate of Amendment to Certificate of Incorporation effective May 14, 2013	10-Q	000-21467	3.6	11/06/2015	
3.7	Certificate of Amendment to Certificate of Incorporation effective July 1, 2015	10-Q	000-21467	3.7	11/06/2015	
3.8	Certificate of Amendment to Certificate of Incorporation effective January 12, 2021	8-K	000-21467	3.1	01/13/2021	
3.9	Amended and Restated Bylaws	8-K	000-21467	3.1	03/06/2024	
4.1	Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934	10-K	000-21467	4.1	03/30/2020	
10.1	2016 Stock Incentive Plan, as amended#	S-8	333-272836	4.11	06/22/2023	
10.2	Form of Employee Restricted Stock Agreement under 2016 Stock Incentive Plan#	10-K	000-21467	10.5	03/15/2018	

INDEX TO EXHIBITS

Exhibit Number	Description*	Where Located Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.3	Form of Non-Employee Director Restricted Stock Agreement under 2016 Stock Incentive Plan#	10-K	000-21467	10.6	03/15/2017	
10.4	Second Amended and Restated Executive Employment Agreement dated September 17, 2023 between the Registrant and Bryon T. McGregor#	8-K	000-21467	10.1	09/20/2023	
10.5	Amended and Restated Executive Employment Agreement dated November 7, 2016 between the Registrant and James R. Sneed#	10-K	000-21467	10.12	03/15/2017	
10.6	Third Amended and Restated Employment Agreement dated September 18, 2023 between the Registrant and Michael D. Kandris#	8-K	000-21467	10.2	09/20/2023	
10.7	Employment Agreement dated February 1, 2022 between the Registrant and Auste M. Graham#	10-K	000-21467	10.9	03/15/2022	
10.8	Second Amended and Restated Employment Agreement dated September 17, 2023 between the Registrant and Robert R. Olander#	8-K	000-21467	10.3	09/20/2023	
10.9	Form of Indemnity Agreement between the Registrant and each of its Executive Officers and Directors#	10-K	000-21467	10.46	03/31/2010	
10.10	Policy for Recoupment of Incentive Compensation dated March 29, 2018#	10-K	000-21467	10.17	03/18/2019	
10.11	Form of Clawback Policy Acknowledgement and Agreement#	10-K	000-21467	10.18	03/18/2019	
10.12	Registration Rights Agreement dated March 27, 2008 between the Registrant and Lyles United, LLC	8-K	000-21467	10.4	03/27/2008	
10.13	Letter Agreement dated March 27, 2008 between the Registrant and Lyles United, LLC	8-K	000-21467	10.5	03/27/2008	
10.14	Letter Agreement dated May 22, 2008 among the Registrant, Neil M. Koehler, Bill Jones, Paul P. Koehler and Thomas D. Koehler#	8-K	000-21467	10.3	05/23/2008	

INDEX TO EXHIBITS

Exhibit Number	Description*	Where Located: Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.15	Second Amended and Restated Credit Agreement dated August 2, 2017 among Kinergy Marketing LLC, Pacific Ag. Products, LLC, Wells Fargo Bank, National Association, and the parties thereto from time to time as lenders	8-K	000-21467	10.1	08/08/2017	
10.16	Amendment No. 1 to Second Amended and Restated Credit Agreement dated March 27, 2019 by and among Kinergy Marketing LLC, Pacific Ag. Products, LLC and Wells Fargo Bank, National Association	10-Q	000-21467	10.7	05/03/2019	
10.17	Amendment No. 2 to Second Amended and Restated Credit Agreement dated July 31, 2019 by and among Kinergy Marketing LLC, Pacific Ag. Products, LLC, the parties thereto from time to time as lenders and Wells Fargo Bank, National Association	8-K	000-21467	10.1	08/06/2019	
10.18	Amendment No. 3 to Second Amended and Restated Credit Agreement dated November 19, 2019 by and among Kinergy Marketing LLC, Pacific Ag. Products, LLC, the parties thereto from time to time as lenders and Wells Fargo Bank, National Association	10-K	000-21467	10.61	03/30/2020	
10.19	Waiver, Consent and Amendment No. 4 to Second Amended and Restated Credit Agreement dated March 8, 2021 by and among Kinergy Marketing LLC, Alto Nutrients, LLC and Wells Fargo Bank, National Association	10-K	000-21467	10.20	03/15/2022	
10.20	Waiver, Consent, and Amendment No. 5 to Second Amended and Restated Credit Agreement dated June 10, 2021 by and among Kinergy Marketing LLC, Alto Nutrients, LLC and Wells Fargo Bank, National Association	10-K	000-21467	10.21	03/15/2022	
10.21	Amendment No. 6 to Second Amended and Restated Credit Agreement dated November 7, 2022 by and among Kinergy Marketing LLC, Alto Nutrients, LLC and Wells Fargo Bank, National Association	8-K	000-21467	10.2	11/14/2022	

INDEX TO EXHIBITS

Exhibit Number	Description*	Where Located Form	File Number	Exhibit Number	Filing Date	Filed Herewith
10.22	Second Amended and Restated Guarantee dated August 2, 2017 by the Registrant in favor of Wells Fargo Bank, National Association, for and on behalf of the lenders	8-K	000-21467	10.2	08/08/2017	
10.23	Credit Agreement dated November 7, 2022 by and among the Registrant, the subsidiary guarantors signatory thereto, Orion Energy Credit Opportunities Fund III, L.P., Orion Energy Credit Opportunities Fund III GPFA PV, L.P., Orion Energy Credit Opportunities Fund III GPFA, L.P., Orion Energy Credit Opportunities Fund III PV, L.P., and OIC Investment Agent, LLC	8-K	000-21467	10.1	11/14/2022	
10.24	First Amendment to Credit Agreement dated November 6, 2023 between the Registrant and OIC Investment Agent, LLC					X
10.25	Registration Rights Agreement dated November 7, 2022 by and among Alto Ingredients, Inc., Orion Energy Credit Opportunities Fund III, L.P., Orion Energy Credit Opportunities Fund III GPFA PV, L.P., Orion Energy Credit Opportunities Fund III GPFA, L.P. and Orion Energy Credit Opportunities Fund III PV, L.P.	8-K	000-21467	10.3	11/14/2022	
21.1	Subsidiaries of the Registrant	10-K	000-21467	21.1	03/14/2023	
23.1	Consent of Independent Registered Public Accounting Firm					X
31.1	Certification Required by Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X
31.2	Certification Required by Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X
32.1	Certification of Chief Executive Officer and Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002					X
97.1	Alto Ingredients, Inc. Dodd-Frank Clawback Policy					X
101.INS	Inline XBRL Instance Document					X
101.SCH	Inline XBRL Taxonomy Extension Schema					X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase					X
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase					X
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase					X
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase					X
104	Cover Page Interactive Data File (formatted as Inline XBRL with applicable taxonomy extension information contained in Exhibits 101)					X

(#) A contract, compensatory plan or arrangement to which a director or executive officer is a party or in which one or more directors or executive officers are eligible to participate.

(*) Certain of the agreements filed as exhibits contain representations and warranties made by the parties thereto. The assertions embodied in such representations and warranties are not necessarily assertions of fact, but a mechanism for the parties to allocate risk. Accordingly, investors should not rely on the representations and warranties as characterizations of the actual state of facts or for any other purpose at the time they were made or otherwise.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized on this 13th day of March, 2024.

ALTO INGREDIENTS, INC.

/s/ BRYON T. MCGREGOR
Bryon T. McGregor
President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ DOUGLAS L. KIETA Douglas L. Kieta	Chairman of the Board and Director	March 13, 2024
/s/ BRYON T. MCGREGOR Bryon T. McGregor	President and Chief Executive Officer (Principal Executive Officer)	March 13, 2024
/s/ ROBERT R. OLANDER Robert R. Olander	Chief Financial Officer (Principal Financial and Accounting Officer)	March 13, 2024
/s/ MICHAEL D. KANDRIS Michael D. Kandris	Acting Chief Operating Officer and Director	March 13, 2024
/s/ GILBERT E. NATHAN Gilbert E. Nathan	Director	March 13, 2024
/s/ DIANNE S. NURY Dianne S. Nury	Director	March 13, 2024
/s/ MARIA G. GRAY Maria G. Gray	Director	March 13, 2024

Exhibit 10.24

FIRST AMENDMENT TO CREDIT AGREEMENT

This **FIRST AMENDMENT TO CREDIT AGREEMENT** (this "Amendment") is dated as of November 6, 2023 (the "Amendment Effective Date"), by and between "**Alto Ingredients, Inc.,** a Delaware corporation as Borrower ("Borrower"), and **OIC Investment Agent, LLC,** a Delaware limited liability company as Administrative Agent and Collateral Agent (in such capacities, "Administrative Agent"). Buyer and Administrative Agent may occasionally be referred to collectively herein as the "Parties" or individually as a "Party."

WHEREAS Borrower and Administrative Agent entered into that certain Credit Agreement dated as of November 7, 2022, among Borrower, the Subsidiary Guarantors signatory thereto, the Lenders from time to time party thereto, and Administrative Agent, as Administrative Agent and Collateral Agent (the "Existing Credit Agreement" and the Existing Credit Agreement as expressly amended by this Amendment, the "Credit Agreement"); and

WHEREAS, pursuant and subject to Section 10.02(b) of the Credit Agreement, the Parties now desire to modify certain portions of the Existing Credit Agreement, all as set forth herein.

NOW THEREFORE, for and in consideration of the mutual covenants and premises set forth herein, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound hereby, the Parties agree as follows:

1. **Amendments to the Existing Credit Agreement.** Effective as of the Amendment Effective Date, each of the Administrative Agent (acting on behalf of the Required Lenders) and Borrower hereby agrees to amend the Existing Credit Agreement as follows:

a. The term "Specified CapEx Commitment Expiration Date", as defined in Section 1.01, shall be amended by replacing "November 7, 2023" with "November 7, 2024".

b. Section 4.03 shall be amended by adding a new Subsection 4.03(h) as follows:

"(h) Investment Committee approval (which shall be at the Investment Committee's sole and absolute discretion) for such Specified CapEx Loan shall have been obtained."

2. **Representations and Warranties.**

a. **Authorization, Etc.** Borrower has full corporate, limited liability company, limited partnership or other organizational powers, authority and legal right to enter into, deliver and perform its respective obligations under this Amendment and to consummate each of the transactions contemplated herein, and has taken all necessary corporate, limited liability company, limited partnership or other organizational action to authorize the execution, delivery and performance by it of this Amendment. This Amendment has been duly executed and delivered by Borrower and is in full force and effect and constitutes a legal, valid and binding obligation of Borrower, enforceable against Borrower in accordance with its terms, except as enforcement may be limited (i) by Bankruptcy, insolvency, reorganization, moratorium, fraudulent conveyance or other similar laws affecting creditors' rights generally, (ii) by general principles of equity (regardless of whether such enforceability is considered in a proceeding in equity or at law) or (iii) by implied covenants of good faith and fair dealing.

b. **No Conflict.** The execution, delivery and performance by Borrower of this Amendment, as well as the consummation of the transactions contemplated herein, do not and will not (i) conflict with the Organizational Documents of Borrower, (ii) conflict with or result in a breach of, or constitute a default under, any indenture, loan agreement, mortgage, deed of trust or other instrument or agreement to which any Loan Party is a party or by which it is bound or to which any Loan Party's property or assets are subject, except where such contravention, breach or default, individually or in the aggregate, could not reasonably be expected to result in a Material Adverse Effect, (iii) conflict with or result in a breach of, or constitute a default under, in any material respect, any Applicable Law (including, assuming the accuracy of the representations and warranties of the Lenders set forth in a certificate or certificates delivered by the Lenders to Borrower at or prior to any issuance of Participation Shares, federal and state securities laws and regulations and the rules and regulations of any self-regulatory organization to which Borrower or its securities are subject), except where such contravention or breach could not reasonably be expected to have a Material Adverse Effect, or (iv) with respect to each Loan Party, result in the creation or imposition of any Lien (other than a Permitted Lien) upon any Loan Party's property or the Collateral.

c. No Default or Event of Default has occurred and is continuing.

d. The representations and warranties of each Loan Party set forth in the Financing Documents are true and correct in all material respects (except where already qualified by materiality or Material Adverse Effect, in which case, such representations and warranties are true and correct in all respects) on and as of the Amendment Effective Date (unless stated to relate solely to an earlier date, in which case such representations and warranties were true and correct as of such earlier date).

3. **<u>Miscellaneous.</u>**

a. This Amendment shall become effective on the date first set forth above. On and after the Amendment Effective Date, each reference in the Credit Agreement to "this Agreement", "hereunder", "hereof" or words of like import, referring to the Credit Agreement and each reference in each other Financing Document to "the Credit Agreement", "thereunder", "thereof" or words of like import referring to the Credit Agreement shall mean and be a reference to the Existing Credit Agreement as amended or otherwise modified by this Amendment. This Amendment shall constitute a Financing Document for purposes of the Credit Agreement.

b. THIS AMENDMENT AND THE RIGHTS AND OBLIGATIONS OF THE PARTIES UNDER THIS AMENDMENT AND ANY DISPUTE OF CLAIMS ARISING IN CONNECTION THEREWITH SHALL BE GOVERNED BY, AND CONSTRUED AND INTERPRETED IN ACCORDANCE WITH, THE LAW OF THE STATE OF NEW YORK.

c. Except as expressly set forth in this Amendment, all other terms and conditions of the Credit Agreement shall remain in full force and effect and the execution, delivery and effectiveness of this Amendment shall not operate as a waiver of any default of the Borrower or any right, power or remedy of the Administrative Agent or the Lenders under any of the Financing Documents, nor constitute a waiver of any provision of any of the Financing Documents. All capitalized terms used herein and not otherwise defined or redefined herein shall have the meanings assigned to them in the Credit Agreement, and all terms defined or redefined herein shall be given the meaning set out herein.

d. Sections 10.07 (Severability), 10.09 (Governing Law; Jurisdiction; Etc.) and 10.11 (Headings) of the Credit Agreement are hereby incorporated by reference herein, mutatis mutandis.

e. This Amendment shall constitute an integral part of the Credit Agreement and be effective as stipulated above and upon signature by the respective Parties and shall remain valid until the date the Credit Agreement expires or otherwise terminates.

f. The undersigned hereby acknowledge that it has read and fully understands the terms of this Amendment, the terms and conditions of which are hereby incorporated and acknowledged by this reference. This Amendment may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This Amendment is binding upon and shall inure to the benefit of the Administrative Agent, the Lenders and the Loan Parties and their respective successors and permitted assigns.

g. The undersigned individuals certify that they are competent and authorized to enter into this Amendment on behalf of the Party for whom he or she purports to sign.

IN WITNESS WHEREOF, the Parties, by their authorized representatives, have duly executed this Amendment as of the Amendment Effective Date.

ALTO INGREDIENTS, INC.	OIC INVESTMENT AGENT, LLC
By: /s/ Robert R. Olander	By: /s/ Ethan Shoemaker
Name: Robert R. Olander	Name: Ethan Shoemaker
Title: CFO	Title: Investment Partner

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in Registration Statements (Nos. 333-234613, 333-250180, 333-266035 and 333-272836) on Form S-8 and (Nos. 333-268583 and 333-272884) on Form S-3 of Alto Ingredients, Inc. of our reports dated March 13, 2024, relating to the consolidated financial statements and the effectiveness of internal control over financial reporting of Alto Ingredients, Inc., appearing in this Annual Report on Form 10-K of Alto Ingredients, Inc. for the year ended December 31, 2023.

/s/ RSM US LLP

Rochester, Minnesota
March 13, 2024

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Bryon T. McGregor, certify that:

1. I have reviewed this Annual Report on Form 10-K of Alto Ingredients, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 13, 2024

/s/ Bryon T. McGregor
Bryon T. McGregor
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Robert R. Olander, certify that:

1. I have reviewed this Annual Report on Form 10-K of Alto Ingredients, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 13, 2024

/s/ Robert R. Olander
Robert R. Olander
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATIONS OF
CHIEF EXECUTIVE OFFICER AND CHIEF FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Alto Ingredients, Inc. (the “Company”) for the year ended December 31, 2023 (the “Report”), the undersigned hereby certify in their capacities as Chief Executive Officer and Chief Financial Officer of the Company, respectively, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: March 13, 2024	By:	/s/ Bryon T. McGregor
		Bryon T. McGregor President and Chief Executive Officer (Principal Executive Officer)
Dated: March 13, 2024	By:	/s/ Robert R. Olander
		Robert R. Olander Chief Financial Officer (Principal Financial Officer)

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signatures that appear in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 97.1

ALTO INGREDIENTS, INC.

DODD-FRANK CLAWBACK POLICY

The Compensation Committee (the "***Compensation Committee***") of the Board of Directors (the "***Board***") and the full Board of Alto Ingredients, Inc., a Delaware corporation (the "***Company***") have adopted the following Dodd-Frank Clawback Policy (this "***Policy***") on September 6, 2023, effective as of October 2, 2023 (the "***Effective Date***").

1. Purpose. The purpose of this Policy is to provide for the recoupment of certain incentive compensation pursuant to Section 954 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, in the manner required by Section 10D of the Securities Exchange Act of 1934, as amended (the "***Exchange Act***"), Rule 10D-1 promulgated thereunder, and the Applicable Listing Standards (as defined below) (collectively, the "***Dodd-Frank Rules***").

2. Administration. This Policy shall be administered by the Compensation Committee. Any determinations made by the Compensation Committee shall be final and binding on all affected individuals.

3. Definitions. For purposes of this Policy, the following capitalized terms shall have the meanings set forth below.

(a) "***Accounting Restatement***" shall mean an accounting restatement of the Company's financial statements due to the material noncompliance of the Company with any financial reporting requirement under the securities laws, including any required accounting restatement (i) to correct an error in previously issued financial restatements that is material to the previously issued financial statements (*i.e.,* a "Big R" restatement), or (ii) that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period (*i.e.,* a "little r" restatement).

(b) "***Affiliate***" shall mean each entity that directly or indirectly controls, is controlled by, or is under common control with the Company.

(c) "***Applicable Exchange***" shall mean (i) The Nasdaq Stock Market, if the Company's securities are listed on such national stock exchange, or (ii) the New York Stock Exchange, if the Company's securities are listed on such national stock exchange.

(d) "***Applicable Listing Standards***" shall mean (i) Nasdaq Listing Rule 5608, if the Company's securities are listed on The Nasdaq Stock Market, or (ii) Section 303A.14 of the New York Stock Exchange Listed Company Manual, if the Company's securities are listed on the New York Stock Exchange.

(e) "***Clawback Eligible Incentive Compensation***" shall mean Incentive-Based Compensation Received by a Covered Executive (i) on or after the Effective Date, (ii) after beginning service as a Covered Executive, (iii) if such individual served as a Covered Executive at any time during the performance period for such Incentive-Based Compensation (irrespective of whether such individual continued to serve as a Covered Executive upon or following the Restatement Trigger Date), (iv) while the Company has a class of securities listed on a national securities exchange or a national securities association, and (v) during the applicable Clawback Period. For the avoidance of doubt, Incentive-Based Compensation Received by a Covered Executive on or after the Effective Date could, by the terms of this Policy, include amounts approved, awarded, or granted prior to such date.

(f) "***Clawback Period***" shall mean, with respect to any Accounting Restatement, the three completed fiscal years of the Company immediately preceding the Restatement Trigger Date and any transition period (that results from a change in the Company's fiscal year) within or immediately following those three completed fiscal years (except that a transition period between the last day of the Company's previous fiscal year end and the first day of its new fiscal year that comprises a period of at least nine months shall count as a completed fiscal year).

(g) "***Company Group***" shall mean the Company and its Affiliates.

(h) "***Covered Executive***" shall mean any "executive officer" of the Company as defined under the Dodd-Frank Rules, and, for the avoidance of doubt, includes each individual identified as an executive officer of the Company in accordance with Item 401(b) of Regulation S-K under the Exchange Act.

(i) "***Erroneously Awarded Compensation***" shall mean the amount of Clawback Eligible Incentive Compensation that exceeds the amount of Incentive-Based Compensation that otherwise would have been Received had it been determined based on the restated amounts, computed without regard to any taxes paid. With respect to any compensation plan or program that takes into account Incentive-Based Compensation, the amount contributed to a notional account that exceeds the amount that otherwise would have been contributed had it been determined based on the restated amount, computed without regard to any taxes paid, shall be considered Erroneously Awarded Compensation, along with earnings accrued on that notional amount.

(j) "***Financial Reporting Measures***" shall mean measures that are determined and presented in accordance with the accounting principles used in preparing the Company's financial statements, and all other measures that are derived wholly or in part from such measures. Stock price and total shareholder return (and any measures that are derived wholly or in part from stock price or total shareholder return) shall for purposes of this Policy be considered Financial Reporting Measures. For the avoidance of doubt, a measure need not be presented in the Company's financial statements or included in a filing with the U.S. Securities and Exchange Commission (the "SEC") in order to be considered a Financial Reporting Measure.

(k) "***Incentive-Based Compensation***" shall mean any compensation that is granted, earned or vested based wholly or in part upon the attainment of a Financial Reporting Measure.

(l) "***Received***" shall mean the deemed receipt of Incentive-Based Compensation. Incentive-Based Compensation shall be deemed received for this purpose in the Company's fiscal period during which the Financial Reporting Measure specified in the applicable Incentive-Based Compensation award is attained, even if payment or grant of the Incentive-Based Compensation occurs after the end of that period.

(m) "***Restatement Trigger Date***" shall mean the earlier to occur of (i) the date the Board, a committee of the Board, or the officer(s) of the Company authorized to take such action if Board action is not required, concludes, or reasonably should have concluded, that the Company is required to prepare an Accounting Restatement, or (ii) the date a court, regulator or other legally authorized body directs the Company to prepare an Accounting Restatement.

4. Recoupment of Erroneously Awarded Compensation. Upon the occurrence of a Restatement Trigger Date, the Company shall recoup Erroneously Awarded Compensation reasonably promptly, in the manner described below. For the avoidance of doubt, the Company's obligation to recover Erroneously Awarded Compensation under this Policy is not dependent on if or when restated financial statements are filed following the Restatement Trigger Date.

(a) ***Process.*** The Compensation Committee shall use the following process for recoupment:

(i) First, the Compensation Committee will determine the amount of any Erroneously Awarded Compensation for each Covered Executive in connection with such Accounting Restatement. For Incentive-Based Compensation based on (or derived from) stock price or total shareholder return where the amount of Erroneously Awarded Compensation is not subject to mathematical recalculation directly from the information in the applicable Accounting Restatement, the amount shall be determined by the Compensation Committee based on a reasonable estimate of the effect of the Accounting Restatement on the stock price or total shareholder return upon which the Incentive-Based Compensation was Received (in which case, the Company shall maintain documentation of such determination of that reasonable estimate and provide such documentation to the Applicable Exchange).

(ii) Second, the Compensation Committee will provide each affected Covered Executive with a written notice stating the amount of the Erroneously Awarded Compensation, a demand for recoupment, and the means of recoupment that the Company will accept.

(b) ***Means of Recoupment.*** The Compensation Committee shall have discretion to determine the appropriate means of recoupment of Erroneously Awarded Compensation, which may include without limitation: (i) recoupment of cash or shares of Company stock, (ii) forfeiture of unvested cash or equity awards (including those subject to service-based and/or performance-based vesting conditions), (iii) cancellation of outstanding vested cash or equity awards (including those for which service-based and/or performance-based vesting conditions have been satisfied), (iv) to the extent consistent with Section 409A of the Internal Revenue Code of 1986, as amended ("***Section 409A***"), offset of other amounts owed to the Covered Executive or forfeiture of deferred compensation, (v) reduction of future compensation, and (vi) any other remedial or recovery action permitted by law. Notwithstanding the foregoing, the Company Group makes no guarantee as to the treatment of such amounts under Section 409A, and shall have no liability with respect thereto. For the avoidance of doubt, appropriate means of recoupment may include amounts approved, awarded, or granted prior to the Effective Date. Except as set forth in Section 4(d) below, in no event may the Company Group accept an amount that is less than the amount of Erroneously Awarded Compensation in satisfaction of a Covered Executive's obligations hereunder.

(c) ***Failure to Repay.*** To the extent that a Covered Executive fails to repay all Erroneously Awarded Compensation to the Company Group when due (as determined in accordance with Section 4(a) above), the Company shall, or shall cause one or more other members of the Company Group to, take all actions reasonable and appropriate to recoup such Erroneously Awarded Compensation from the applicable Covered Executive. The applicable Covered Executive shall be required to reimburse the Company Group for any and all expenses reasonably incurred (including legal fees) by the Company Group in recouping such Erroneously Awarded Compensation.

(d) ***Exceptions.*** Notwithstanding anything herein to the contrary, the Company shall not be required to recoup Erroneously Awarded Compensation if one of the following conditions is met and the Compensation Committee determines that recoupment would be impracticable:

(i) The direct expense paid to a third party to assist in enforcing this Policy against a Covered Executive would exceed the amount to be recouped, after the Company has made a reasonable attempt to recoup the applicable Erroneously Awarded Compensation, documented such attempts, and provided such documentation to the Applicable Exchange;

(ii) Recoupment would violate home country law where that law was adopted prior to November 28, 2022, provided that, before determining that it would be impracticable to recoup any amount of Erroneously Awarded Compensation based on violation of home country law, the Company has obtained an opinion of home country counsel, acceptable to the Applicable Exchange, that recoupment would result in such a violation and a copy of the opinion is provided to the Applicable Exchange; or

(iii) Recoupment would likely cause an otherwise tax-qualified retirement plan, under which benefits are broadly available to employees, to fail to meet the requirements of 26 U.S.C. 401(a)(13) or 26 U.S.C. 411(a) and regulations thereunder.

5. Reporting and Disclosure. The Company shall file all disclosures with respect to this Policy in accordance with the requirements of the Dodd-Frank Rules.

6. Indemnification Prohibition. No member of the Company Group shall be permitted to indemnify any current or former Covered Executive against (i) the loss of any Erroneously Awarded Compensation that is recouped pursuant to the terms of this Policy, or (ii) any claims relating to the Company Group's enforcement of its rights under this Policy. The Company may not pay or reimburse any Covered Executive for the cost of third-party insurance purchased by a Covered Executive to fund potential recoupment obligations under this Policy.

7. Acknowledgment. To the extent required by the Compensation Committee, each Covered Executive shall be required to sign and return to the Company the acknowledgement form attached hereto as Exhibit A pursuant to which such Covered Executive will agree to be bound by the terms of, and comply with, this Policy. For the avoidance of doubt, each Covered Executive will be fully bound by, and must comply with, the Policy, whether or not such Covered Executive has executed and returned such acknowledgment form to the Company.

8. Interpretation. The Compensation Committee is authorized to interpret and construe this Policy and to make all determinations necessary, appropriate, or advisable for the administration of this Policy. The Compensation Committee intends that this Policy be interpreted consistent with the Dodd-Frank Rules.

9. Amendment; **Termination**. The Compensation Committee may amend or terminate this Policy from time to time in its discretion, including as and when it determines that it is legally required to do so by any federal securities laws, SEC rule or the rules of any national securities exchange or national securities association on which the Company's securities are listed.

10. Other Recoupment Rights. The Compensation Committee intends that this Policy be applied to the fullest extent of the law. The Compensation Committee may require that any employment agreement, equity award, cash incentive award, or any other agreement entered into be conditioned upon the Covered Executive's agreement to abide by the terms of this Policy. Any right of recoupment under this Policy is in addition to, and not in lieu of, any other remedies or rights of recoupment that may be available to the Company Group, whether arising under applicable law, regulation or rule, pursuant to the terms of any other policy of the Company Group, pursuant to any employment agreement, equity award, cash incentive award, or other agreement applicable to a Covered Executive, or otherwise (the "***Separate Clawback Rights***"). Notwithstanding the foregoing, there shall be no duplication of recovery of the same Erroneously Awarded Compensation under this Policy and the Separate Clawback Rights, unless required by applicable law.

11. Successors. This Policy shall be binding and enforceable against all Covered Executives and their beneficiaries, heirs, executors, administrators or other legal representatives.

Exhibit A

ALTO INGREDIENTS, INC.

DODD-FRANK CLAWBACK POLICY

ACKNOWLEDGEMENT FORM

By signing below, the undersigned acknowledges and confirms that the undersigned has received and reviewed a copy of the Alto Ingredients, Inc. Dodd-Frank Clawback Policy (the "***Policy***"). Capitalized terms used but not otherwise defined in this Acknowledgement Form (this "***Acknowledgement Form***") shall have the meanings ascribed to such terms in the Policy.

By signing this Acknowledgement Form, the undersigned acknowledges and agrees that the undersigned is and will continue to be subject to the Policy and that the Policy will apply both during and after the undersigned's employment with the Company Group. Further, by signing below, the undersigned agrees to abide by the terms of the Policy, including, without limitation, by returning any Erroneously Awarded Compensation to the Company Group reasonably promptly to the extent required by, and in a manner permitted by, the Policy, as determined by the Compensation Committee of the Company's Board of Directors in its sole discretion.

The governing law and any forum selection applicable to any dispute between the undersigned and the Company and/or any Affiliate in connection with the Policy shall be the same as set forth in the undersigned's latest employment agreement with the Company and/or any Affiliate.

Sign: ______________________________
Name: [Employee]

Date: ______________________________