



**2023**  
**AMERICAN VANGUARD**  
**SUSTAINABILITY**  
**REPORT**

**Climate-Smart  
Solutions start  
right under our feet...**



# 2023 AMERICAN VANGUARD® SUSTAINABILITY REPORT



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## INTRODUCTION

At American Vanguard, we recognize the importance of our role and effect on the planet – from our local communities to the global environment. With this 2023 Sustainability Report, we reiterate our commitment to environmental and social responsibility throughout our organization. We strive to improve the well-being of our employees and those in our communities, while safely and responsibly operating our business with a sense of mindfulness – toward the climate, toward the environment, and toward the good of humans and other species.

We consider ourselves to be part of a broader mission – one of ensuring that people can rely upon a stable, affordable food supply, now and in the future. This mission is at the core of Sustainable Agriculture which we believe must include an emphasis on equity as it relates to climate, environment, and food (please see on our website [american-vanguard.com/esg](#), including our [Climate Change Commitment](#)).

In addition, we are mindful of our social responsibility including the fundamental nature of human rights. As outlined in our [Human Rights Policy](#), we believe it is fundamental to our humanity that we recognize, respect, and nurture the freedom and dignity of all persons.

It is upon this foundation of Sustainable Agriculture and corporate responsibility that we present this 2023 Sustainability Report.



## AMERICAN VANGUARD CORE VALUES

### SAFETY AT AMERICAN VANGUARD

We embrace a “Safety-First” culture at all levels of our organization

### MAKING A DIFFERENCE

Our employees are Making a Difference in our industry and the communities we serve

### CLIMATE-SMART AGRICULTURE

We are raising AgChem to Precision Ag with industry-leading technology-based solutions


### ENVIRONMENTAL STEWARDSHIP

We prioritize Stewardship and Conservation in our operations and product programs

### STAKEHOLDER ENGAGEMENT

Our Engagement with Stakeholders is the key to impactful, meaningful initiatives





“American Vanguard recognizes the importance of our role and effect on the planet – from our local communities to the global environment.

## CORPORATE SUSTAINABILITY STRATEGY

### New Year, New Opportunities

At the core of our sustainability strategy is the acknowledgment that the Agriculture industry, in general, and American Vanguard, in particular, can help to mitigate climate change. In fact, we are already doing so with our portfolio of products and technologies. As a foundation to our strategy, we believe that an important solution toward mitigating climate change lies beneath our feet – literally, in the form of soil, which is the single largest repository for sequestering carbon. As you will see in this report, we are placing an ever stronger emphasis on various forms of Climate-Smart Technology, including soil health, prescriptive application and the use of data to minimize cost and optimize yield.

Among the 130 GreenSolutions™ products currently offered by the Company, we develop and market AMVAC Greenplants™ micronutrients, which are tailored to accommodate plant development cycles in order to enable greater uptake of important nutrients while saving water and reducing the use of application equipment. In addition, we continue to develop Digital Agriculture solutions – to enable growers to leverage their data –through our SIMPAS® + Ultimus® benefit calculation tool by which a grower can readily calculate the benefit of prescriptively applying product versus whole-field application.

Further we are committed to environmental stewardship, and, in this issue, we provide updated metrics on greenhouse gas emissions, energy, water withdrawal and waste. This year, we have retained a third-party audit firm to give limited assurance the data supporting certain of these metrics under ISAE 3000. Looking forward, we will focus on establishing targets for future reduction of these factors.

**An important solution toward mitigating climate change lies beneath our feet – literally, in the form of soil, which is the single largest repository for sequestering carbon.**

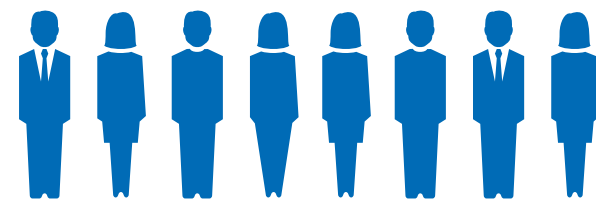




# COMPANY PROFILE

AMERICAN VANGUARD  
founded in  
**1969**

American Vanguard Corporation (NYSE: AVD) is a diversified specialty and agricultural products company that develops, manufactures, and markets solutions for crop protection and nutrition, turf and ornamentals management, and commercial and consumer pest control. We are known in the trade under the name of our principal operating subsidiary AMVAC Chemical Corporation (or simply, AMVAC®). Over the past 20 years, through product and business acquisitions, the Company has expanded its operations into 17 countries and now has over 1,000 product registrations in 56 nations. Its strategy rests on three growth initiatives – i) Core Business (through innovation of conventional products), ii) GreenSolutions (with over 130 biorational products – including fertilizers, microbials, nutritionals and non-conventional products) and iii) Precision Agriculture innovation (including SIMPAS prescriptive application and Ultimus measure/record/verify technologies).



**810** Employees  
as of  
12.31.2022

**\$609** MILLION  
2022 Net Sales

**1000**  
PRODUCT REGISTRATIONS  
IN  
**56** NATIONS

## GLOBAL HEADQUARTERS

Newport Beach, California, USA

## MANUFACTURING

Axis, Alabama, USA  
Hannibal, Missouri, USA  
Los Angeles, California, USA  
Marsing, Idaho, USA  
Clackamas, Oregon, USA  
Sonora, Mexico

## RESEARCH AND DEVELOPMENT

Commerce, California, USA  
Morrisville, North Carolina, USA  
San Carlos, Costa Rica

## SUBSIDIARIES

AMVAC Chemical Corporation  
GemChem, Inc. ("GemChem")  
AMVAC Mexico Sociedad de Responsabilidad Limitada  
AMVAC de Costa Rica Sociedad de Responsabilidad Limitada  
AMVAC do Brasil Representações Ltda  
AMVAC Netherlands BV  
Envance Technologies, LLC  
AMVAC Singapore Pte, Ltd  
OHP Inc.  
AgNova Technologies  
TyraTech, Inc.

## OPERATIONS AND SUPPLY CHAIN

AMVAC® operates six manufacturing and formulation facilities strategically located in North America that provide flexible production of high-quality products.

Our commitment to safe, efficient operations is demonstrated in the strategies, decisions, and ultimately the culture of responsibility and accountability at each of our locations.

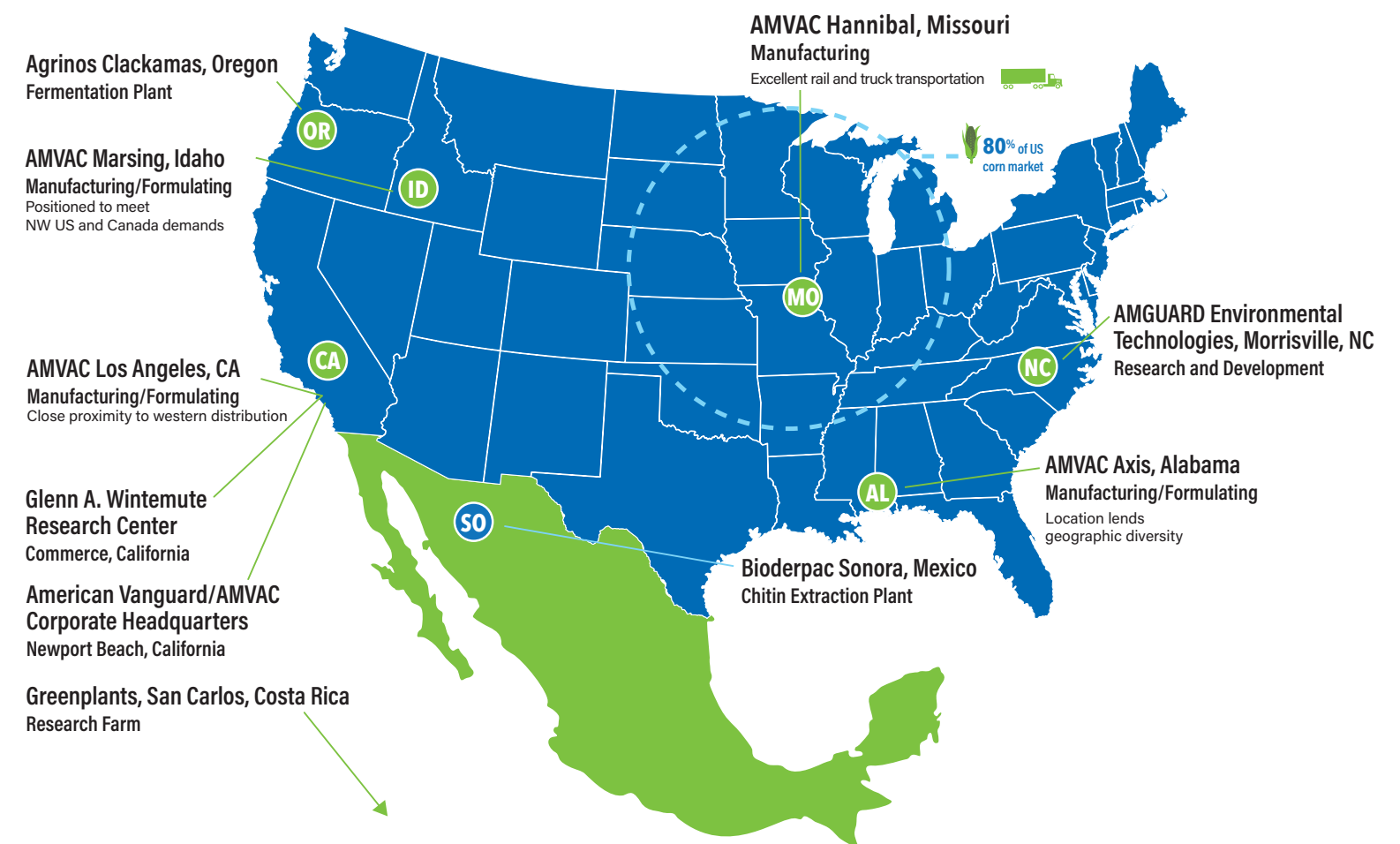
In addition to manufacturing a large percentage of our products in our North American facilities, we source raw materials, intermediates and finished products from partners both domestic and foreign.

Challenges brought on by the global pandemic required us to review our supply chain risk and resiliency with greater scrutiny. AMVAC reduced single-source supply risk by qualifying additional raw material sources from different geographies, allowing us to respond to delays and interruptions with minimal impact to our customers. We have become less reliant on distant supply points, and to the extent we continue to source from Asia Pacific for example, we have established a local procurement team who maintain relationships with those suppliers.

Further, as the supply chain changes, AMVAC also regularly reviews make-versus-buy decisions, making full use of our own production facilities whenever possible and economical.

At AMVAC, we source raw materials through GemChem, Inc., a Connecticut-based wholly-owned subsidiary of American Vanguard. GemChem and our Logistics and Transportation Departments manage every aspect required for the safe, secure and cost-efficient sourcing, logistics, transporting and handling of the high quality raw materials used in our products.

We have long-standing relationships with many key supply and logistics partners, including toll manufacturers and formulators, and we conduct quality assurance reviews that include raw materials sampling and analysis. In addition, AMVAC has established a [Supplier Code of Conduct](#) whereby our supply partners understand they must abide by quality and security-related policies and procedures, as well as comply with federal transportation and security requirements, the Foreign Corrupt Practices Act and similar laws and regulations as part of doing business with AMVAC.







# COMPANY CORE VALUES

We occupy a unique position within our industry segment, offering proven solutions for crop and non-crop applications, as well as Climate-Smart Technologies, such as GreenSolutions and precision application tools (such as SIMPAS®/Ultimus®). Paramount among our core values is safety, which we emphasize from factory to field. Further, we are still a company where employees can make a difference. This year we demonstrate our commitment to employee success through profiles in diversity, with a particular focus on women, on wellness, which helps to ensure the health of our workforce, and on community outreach, which demonstrates our concern for our neighbors. We are cognizant of our role as environmental stewards as well as our obligation to all stakeholders. Taken together, these core values give us a clear sense of purpose, direction and responsibility.



# SAFETY AT AMERICAN VANGUARD®



## SAFETY FIRST

Sustainability in agriculture is a key part of AMVAC's vision and success and is rooted in a commitment to protect the health and safety of our communities, customers, and employees.

Sound processes, collaboration, and communication are the foundation of our robust safety and health programs.

We strive to maintain a culture of individual responsibility for maintaining a workplace free of injury or illness so all employees are invested in a shared vision of employee health and safety.

Increases in recordable incident rates were seen in 2020, and gave us opportunity to examine and focus on trends and leading indicators across the enterprise, inclusive of recently acquired operating facilities.

We provide a comprehensive training program to ensure employees recognize hazards specific to their job responsibilities and ensure employees are prepared to perform their jobs safely. On-the-job and monthly safety training is provided on a variety of safety topics to further ensure employees can demonstrate safe work practices.

AMVAC also maintains Process Safety Management at certain facilities as required federally by OSHA and EPA. This enables us to recognize, evaluate and control hazards from manufacturing activities to protect our employees and the communities in which we operate.

**We embrace a  
"Safety-First"  
culture at all  
levels of our  
organization.**

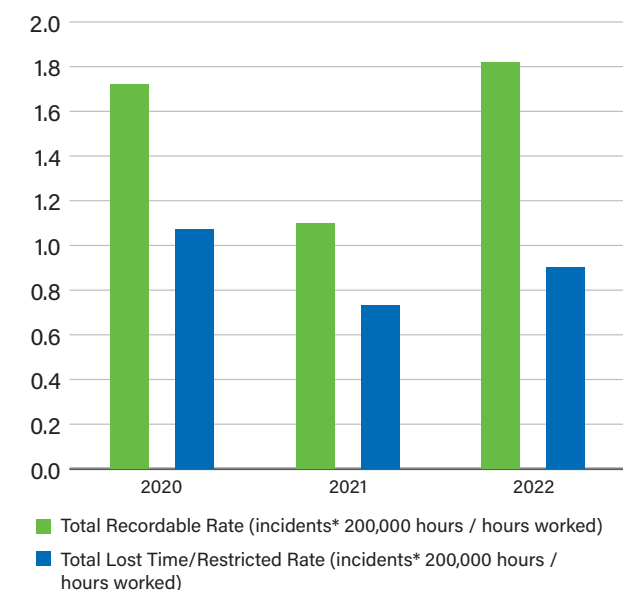


*Simone Vu, Health, Safety and Security Manager at AMVAC Los Angeles plant*

Reporting and transparency of all incidents is encouraged broadly, allowing us to evaluate our safety policies, procedures, and training materials and methods. In the event of any on-the-job injury, we conduct a thorough root cause investigation to prevent future accidents and injuries. Corrective actions are documented and communicated to establish best practices.

2022 Verified by ERM CVS Limited Assurance

### Recordable Occupational Incident Rates





# MAKING A DIFFERENCE



At AMVAC, we attract and retain people who want to make a difference, whether professionally, in their community or for the greater good. The following stories exemplify this core value.

## HELPING OUR COMMUNITY AND ENVIRONMENT

### Earth Day 2023

Earth Day is a time for people across the globe to come together to show support for environmental protection. For Earth Day 2023, Leon Dixon, environmental technician at AMVAC Axis Alabama, spearheaded AMVAC employees' participation in



"A Cause to Clean – Montlimar Creek Clean-Up", hosted by Partners for Environmental Progress (PEP). During the event, over 50 volunteers from local companies picked up litter along the Montlimar portion of the Dog River watershed in Mobile, Alabama, an area constantly affected by litter. Recyclables, such as aluminum cans and plastic bottles, were separated from disposable trash and taken to a nearby recycling center.

Among the 50-plus volunteers were (pictured left to right) Timothy Thomas, environmental compliance manager, employed by AMVAC for 14 years, Bryan Fuenmayor, engineering support (ten years), Addie Holmes, process engineer (two years), and Leon Dixon, environmental technician (nine years). All were excited to participate in the cleanup, and are inspiring additional employee volunteers for PEP's Earthday 2024 cleanup, which will take place on Highway 43, near the Axis plant. For more information about PEP, visit the PEP website: [pepmobile.org](http://pepmobile.org).

## AMVAC SUPPORTS FUTURE GENERATIONS

AMVAC has long supported high school and college students as they pursue their education and careers in agriculture, science, manufacturing and other essential industries. AMVAC employees have developed and supported scholarship programs, donated needed school and other supplies and assisted science classes and fairs.

### Growing Futures in the Cotton Industry

In 2019, AMVAC created our annual [Cotton Industry Advancement Scholarships](#) to help maintain a pipeline of quality individuals to work in this vital industry, according to Paul Vaculin, cotton marketing manager at AMVAC. "We're excited to help support the next generation of Ag professionals as the students pursue a career in agriculture and the cotton industry," AMVAC has since awarded 28 scholarships to students nominated by a practicing cotton consultant and who are either a senior in high school or enrolled full-time in an undergraduate or graduate-level agricultural program at an accredited college or university.



### Supporting Students in our Communities

Tim Thomas, environmental compliance manager for AMVAC's Axis, Alabama facility, serves as the lead for the Lemoyne Industrial Park (LIP) Sponsorship Program to support local students in their pursuit of higher education at Coastal Alabama Community College. Sponsorships are awarded to high school seniors from Citronelle, Saraland or Satsuma High Schools who plan to earn an Associate Degree from Coastal Alabama Community College. Selected students are awarded \$2,500 towards tuition and fees for both the Fall and Spring Semesters and the Sponsorship is renewable for the second academic year, if all requirements have been met.

In their partnership with the College, LIP and member industries, including AMVAC, provide financial support and, as lead for the Sponsorship Program, Tim assists with candidate interviews, tallies and coordinates interview results, and leads the discussion to determine the recipients. AMVAC is proud to have helped fifteen students who have been awarded Sponsorships since 2016.



## AMVACARE IN JABOTICABAL, BRASIL



AMVAC do Brasil has established a social action program called AMVACARE with a goal to help charitable community groups and other organizations having various needs. Employees develop and organize these campaigns and encourage fellow employees to participate to support the community. In 2022, employees launched a milk campaign and collected cartons of milk and cash, which was matched by the Company. The milk campaign collected 584 liters of milk, which were distributed to two local nursing homes and a community parish serving local families.



Delivery of milk donations by Vitor Cunha, CEO AMVAC do Brasil; Thallia Toledo, marketing and communications; Daniela Araujo, human resources manager.

## AMVAC MEXICO PROVIDES SUPPORT TO AT-RISK YOUTH

AMVAC Mexico and its employees are enthusiastic supporters of NAEA (Niños y Adolescentes en Armonía, A.C.), an award-winning association that provides a comprehensive array of services to children and adolescents in vulnerable situations. NAEA provides at-risk populations with housing; schooling and other educational support; nutritional, health and medical services; and/or job training and mentoring. For several years, AMVAC Mexico and employees have supported NAEA in a number of ways, both financially through monthly contributions, and by further involvement, such as sponsoring children and their specific needs, collecting clothing and reusable items for sale at NAEA's bazaar, and volunteering or participating in NAEA events as requested.



Recently, several employees developed and funded their own project to support young indigenous girls living in the NAEA house, by providing personal care items and other gifts as they prepare to go to university.

AMVAC Mexico's support of NAEA has been driven by employees Leticia Méndez, Citlalli Michel Reyes and Isamar Méndez López will help continue our valuable involvement with NAEA.

## BIODERPAC® EMPLOYEES MAKE A DIFFERENCE IN THEIR COMMUNITIES

Bioderpac and its employees have supported the surrounding community for many years. The Company sponsors annual donations of school supplies, and employees donate Christmas gifts for children in the local community. Employees also participate in community projects, most recently by planting trees in the area as part of an effort by the municipal ecology department.



Luis Alberto Gastelum, Jose Juan Zazueta, Carmen Priscila Espinoza, Hugo Alberto Sánchez, and Jesús María Moroyoqui

## PROMOTING GROWTH AND INCLUSION: FEMALE LEADERS DRIVING CHANGE IN TECHNOLOGY

Diversity, equity, and inclusion (DEI) are fundamental principles that drive innovation and success in any organization. The Technology department of American Vanguard has made significant strides in fostering a culture of growth through diversity, with six exceptional female leaders at the forefront. In fact, within Technology, six of the eight managers (that is, 75% of the department's leadership) are women. Their stories exemplify the impact of a supportive environment on individual growth and the organization's overall success.



RaiAnna Hopson, Jennifer Kelley, Ekaterina Wilson at AMVAC Axis plant

**Jennifer Kelley**  
Director of Environmental Compliance

Jennifer Kelley brings over 25 years of experience in environmental compliance for manufacturing facilities. Her passion for environmental sustainability drives her dedication to advancing the company's goals, products and values. A founding member of the Company's employee resource group, AMVAC Women's Network, Jennifer

A supportive environment and a value in diversity, has built individual growth and overall success in the organization.





observes that the company fosters growth by cultivating a receptive mindset, building networks and providing opportunities for leadership to engage in crucial conversations. This inclusive approach allows diverse perspectives to flourish, fueling innovation and progress.

**RaiAnna Hopson**

*Senior Scientist*

RaiAnna Hopson plays a vital role in ensuring manufacturing support and product specifications alignment with the engineering team. During the interview process, RaiAnna was struck by the company's genuine concern for her continued professional growth. This factor was pivotal in her decision to join the Company after completing graduate school and a fellowship program with the Air Force. RaiAnna appreciates that the goals set at the beginning of her journey have been consistently followed up, creating a culture of growth and development. Beyond her assigned scope, RaiAnna actively provides technical advice to the production team and plant manager. This level of involvement reinforces her belief that her input is valued and appreciated.

**Ekaterina Wilson**

*Quality Manager*

Ekaterina Wilson joined the organization after spending 17 years in the oil and gas industry. She was pleasantly surprised to discover the Company's culture of encouraging continued development within a friendly and supportive environment. She appreciates the Company's commitment to nurturing growth, including opportunities to attend conferences, join industry associations, and actively engage in research and development and ISO standards. These avenues have allowed her to stay at the forefront of technological advancements and contribute her expertise to the organization's growth.

**Jing Sun**

*Global SDS and Manager of the Quality Assurance Unit*

Jing Sun brings invaluable expertise in SDS authoring, compliance, and quality standards. In addition to reviewing SDS and identifying



*Jing Sun, Lisiane Zeni, Chhavi Roy*

hazards associated with raw materials, she audits the work of others and collaborates closely with study directors from the analytical services team. This collaborative partnership facilitates problem resolution and contributes to the successful registration of products. Jing recognizes the importance of employee and community safety and values the company's commitment to educating and equipping its workforce to foster a "safety-first" culture. According to Jing, the Company also recognizes the importance of staying updated with industry best practices and benchmarks. She was actively encouraged to join the QA Professional Society, enabling her to enhance her in-house skills and better prepare for audits. Jing finds purpose in her role and values the company's global outreach and footprint. The Company's support for her growth journey and its emphasis on personal development have nurtured her professional advancement while helping to continuously improve her performance.

**Chhavi Roy**

*Director of Quality and Analytical Services*

Chhavi Roy leads the analytical services team, which focuses on separation solutions for products. Right from the interview process, she perceived that the Company expressed a genuine interest in understanding her as a person. The interview panel saw her as both a professional and an individual with unique experiences and perspectives. This

personal approach continued with an offer letter that outlined areas for growth and milestones, reflecting the company's commitment to her professional development.

Chhavi's team plays a vital role in ensuring stability and maintaining active ingredients within the desired specifications, supporting processes ranging from lab scale to pilot scale. As the director responsible for developing the quality team for the future, Chhavi's experience has been one of consistently being heard at the table, where her opinions carry weight. She possesses great confidence in her capabilities and independence in managing projects and mentoring teams, thus motivating her to co-found the AMVAC Women's Network. Within her group, she has helped to develop a culture marked by confidence, camaraderie, and open and honest lines of communication.

**Lisiane Zeni**

*Formulation Development Group Leader*

Lisiane Zeni plays a crucial role in driving innovation and delivering impactful solutions in the field of agricultural formulation development. She recognizes the importance of her team staying ahead of the curve, continuously innovating, and keeping growers at the center of the innovation process.

During the interview process, it was evident to Lisiane that AMVAC fosters a culture that stimulates creativity. One aspect that delighted Lisiane was the company's allocation of resources for employees to pursue new knowledge and skills. This investment in professional development fosters a dynamic team that remains at the forefront of cutting-edge agricultural technologies.

Lisiane, too, has been energized and motivated by the nurturing professional development environment fostered by the upper management of the Technology and Manufacturing departments. Their mentorship extends beyond day-to-day tasks, encompassing broader career planning, skill-building, and continuous learning. Their guidance and support helped to motivate Lisiane to co-found the AMVAC Women's Network.



**AMVAC Women's Network**

Jennifer Kelley, Lisiane Zeni and Chhavi Roy, leaders in the Technology department, and Bonnie MacCulloch, Product Manager in the Regulatory Affairs department, share a passion for collaboration, breaking down silos, and fostering connection and sense of community among employees across our global organization. As part of our commitment to fostering diversity and recognizing significant contributions of employees across the Company, they teamed up to develop the **AMVAC Women's Network**, the Company's first (formal) Employee Resource Group. With the support and sponsorship of Anne Turnbough, AMVAC Vice President of Regulatory Affairs, the AMVAC Women's Network was established in 2023 with a goal "to provide individuals across our organization with relevant, research-based resources, knowledge, and education specifically designed to enhance leadership, management, and production skills. By embracing innovation through collaboration and knowledge sharing, we empower a global community of professionals within AMVAC and affiliated companies to make a positive difference."

All global employees are welcome and encouraged to join and benefit from learning about the latest insights in agriculture, networking with internal peers and leaders, understanding the diverse talents of co-workers across the company, and fostering relationships with all personnel, whether located remotely or in our global offices and plants. As the Network is established and developed in the coming months and years, we will report on some of the resulting tangible benefits and opportunities in future sustainability reports.





**IMPORTANT:**  
Regular health  
screenings,  
healthy  
nutrition,  
an active  
lifestyle, and  
prioritizing  
mental health.

Another example of making a difference within AMVAC's culture is the Company's commitment to generous health and wellness benefits. This commitment translates directly into a healthier workforce while making a tangible difference in the lives of our employees and their families.

## PRIORITIZING EMPLOYEE WELLNESS AND HEALTH

Early detection and prevention of serious illness was one of the Company's primary goals when it established its wellness program in 2010. In designing its wellness program, AMVAC emphasized bringing awareness to employees and their families of the importance of regular health screenings, along with encouraging healthy nutrition, an active lifestyle, and prioritizing mental health. We expanded our voluntary, no-cost employee wellness program in 2015 to include annual biometric screening of weight, waist-to-hip ratio, pulse, and blood pressure, along with a blood draw for comprehensive testing. Health coaching is also included to ensure employees understand their personal screening results and possible health risks.

### Regular Health Screenings and Early Detection for Better Outcomes

According to the [Prevent Cancer Foundation](#), "Early Detection equals Better Outcomes", because early detection of cancer can mean more treatment options, less extensive treatment, and better chances of survival. This approach had a meaningful result with long-time AMVAC employee Aldo Ochoa.

In 2018, Aldo participated in on-site biometric screening, and in conjunction with a health coach, noted that his prostate-specific antigen (PSA) level was slightly above normal, which can indicate prostate cancer risk. Over the course of the next three years, with annual on-site biometric screenings, Aldo found that his PSA values continued to rise such that his health coach recommended further intervention by his primary care physician.

Once under the care of specialists, whom he was able to choose under the Company's health insurance program, Aldo found that he had early-stage prostate cancer. With a promising prognosis (given his overall good health, non-smoking and non-drinking habits), his doctors

recommended a prostatectomy. With a plan of treatment in-hand, Aldo was able to attend his daughter's wedding (he is giving away the bride in the photo) comforted by the knowledge that he was in good hands. He underwent robotic-assisted laparoscopic surgery, a cutting-edge surgical procedure, known for its precision and minimally invasive nature and, within six months, was diagnosed as cancer-free.

Aldo is grateful that the Company's biometric screening program and its provision of health coaching, which alerted him to his condition before it had advanced to the point of being untreatable. By bringing medical care to the workplace free of charge and making health advisers available to help with interpreting the results, the Company is making a difference for its employees. In Aldo's case, the difference may have added years to his life.





# CLIMATE- SMART AGRICULTURE

Among growers, the asset of greatest value is their land. Without it, there would be no way to grow food or natural fiber or certain fuels. The industry, then, is properly focused on the long-term viability and health of the soil. Not just because it's good for business, but also because it is the key to a viable future. But soil is not just a medium for growing plants. It also happens to be the greatest repository for sequestration of carbon on the planet. To the extent that we can manage growing practices to minimize carbon emissions (and maximize sequestration), we, as an industry, can make a difference with respect to climate change.



In this section, we set the stage with a brief discussion of recent climate change events and then shift to AMVAC's Climate-Smart technologies – including examples of bionutritional products that save water, while reducing carbon dioxide equivalents and our Digital Agriculture technologies, SIMPAS and Ultimus, that give growers a way to realize immediate savings through prescriptive application.





...within Agriculture, there is something that we can do about the weather.

CLIMATE CHANGE: THE CURRENT STATE

As reported by the National Oceanic and Atmospheric Administration (NOAA), the prevalence of multi-billion-dollar climate-related disasters has risen dramatically over the past three decades. Further, between 1980 and 2022, the frequency of these disasters has increased markedly. The past three years (2020-2022) averaged 20 disasters, while the average number over the entire period was closer to eight.

<https://www.ncei.noaa.gov/access/billions/>

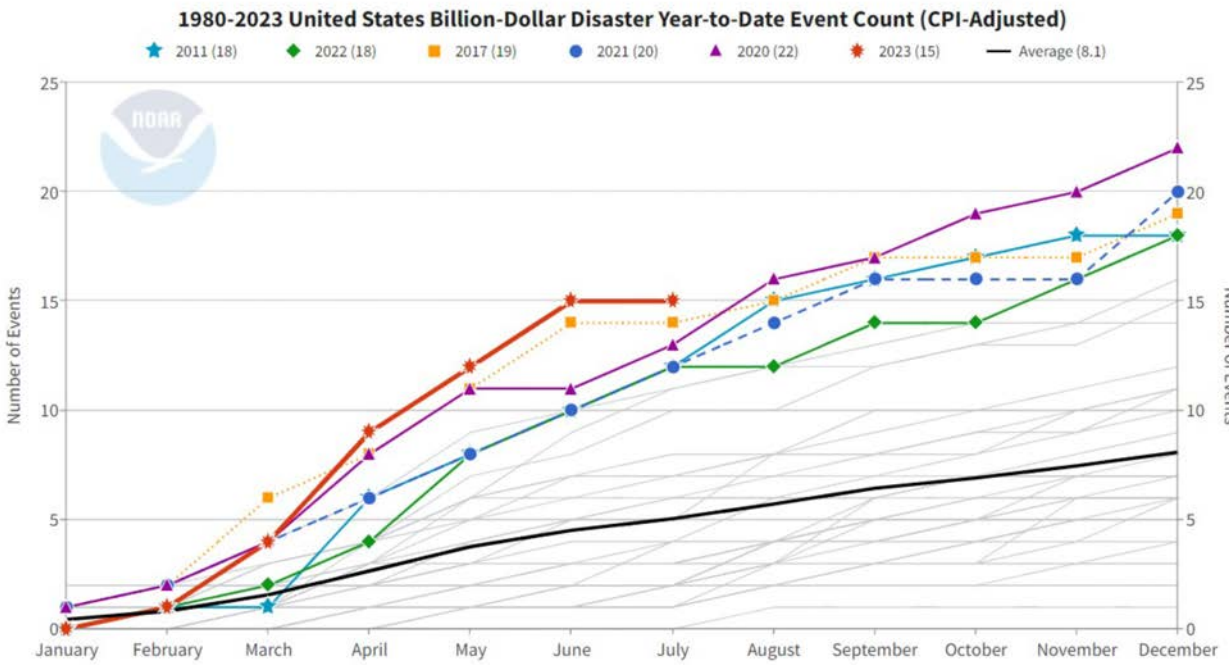
Farming and ranching are challenging enough with favorable weather. However, severe, unpredictable weather can turn a profitable growing season into a loss. There is an old adage that “Everyone talks about the weather, but no one does anything about it.” As we discuss below, within Agriculture, there is something that we can do about the weather.

The Role of Agriculture in Climate Change

First, it is useful to establish a common set of definitions. According to National Geographic, climate is sometimes mistaken for weather. But

climate is different from weather, because it is measured over a long period of time; whereas weather can change from day to day, or from year to year. <https://education.nationalgeographic.org/resource/climate-change>. We can go further and say that climate change is the long-term alteration of temperature and typical weather patterns in a place. Climate change may cause weather patterns to be less predictable. These unexpected weather patterns can, for example, make it difficult to maintain and grow crops in regions that rely on farming because expected temperature and rainfall levels can no longer be relied on. (Ibid.)

According to the United Nations, shifts in climate can be natural, due to changes in the sun’s activity or large volcanic eruptions. But since the 1800s, these changes have been caused primarily by the burning of fossil fuels and other activities that generate greenhouse gases (GHGs). (<https://www.un.org/en/climatechange/what-is-climate-change>) These, in turn, trap the sun’s heat, raise temperatures and can otherwise alter ecosystems.

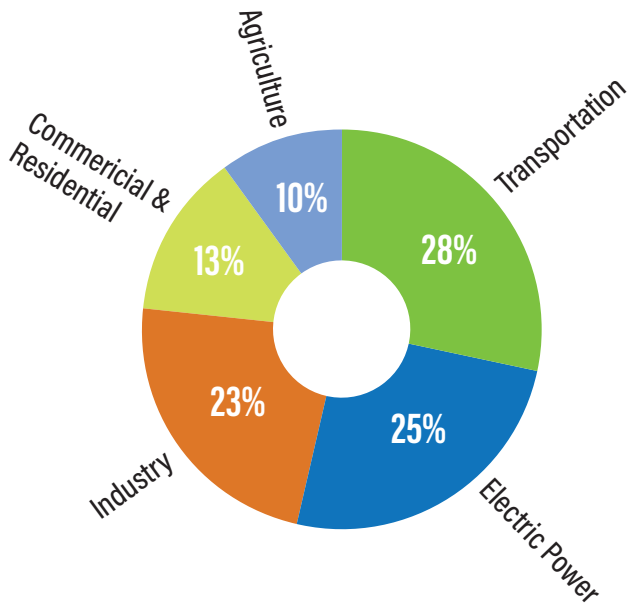


Updated August 8, 2023

Event statistics are added according to the date on which they ended

Many types of activities can generate GHGs. The US Environmental Protection Agency (USEPA) reports that the Agriculture sector contributes only about 10 percent of the GHGs (commonly carbon dioxide, nitrous oxide (N2O), and methane) among domestic economic sectors. In this graph, USEPA depicts the relative proportion of emissions by sector during 2021, assuming 6,034 million metric tons of CO2 equivalent. (<https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>).

US Greenhouse Gas Emissions



Management of soils accounts for over one-half of the agriculture sector’s GHG emissions, specifically N2O. Specific activities that contribute to N2O emissions from agricultural lands include the application of synthetic and organic fertilizers, the drainage of organic soils, and irrigation practices. Other activities, such as enteric fermentation from livestock, manure management, liming, urea application, rice cultivation and burning crop residues, largely account for the emission of the balance of GHGs from agricultural activity. (Ibid.)



Thus, even while Agriculture is dependent upon climate for a sustainable future, there are measures within our control to helping to mitigate N2O and other GHG production and, by implication, climate change. In fact, the solution is at our very feet. According to the US Farmers & Ranchers Alliance (USFRA) 2019 study entitled “The Power of Resiliency in Agriculture’s Ecosystem Services”, US carbon stocks in the soil are 100-times greater than the annual CO2 equivalent emissions from Agriculture in the US. (<https://usfarmersandranchers.org/wp-content/uploads/2020/06/USFRA-2019-Report.pdf>) This means that, while certain agricultural practices may contribute to GHG emissions, we have a potential solution for sequestering that carbon and reducing those emissions, namely, the soil – the very resource on which Agriculture is most dependent.



Soil Health

The recognition of the symbiotic relationship between Agriculture and climate has given rise to the concept of regenerative agriculture, which, according to the American Soybean Association (“ASA”), “refers to the regeneration of renewable resources essential to achieving a more sustainable



form of agriculture.” <https://soygrowers.com/key-issues-initiatives/key-issues/sustainability/climate-friendly-farming/>. Further, a recent meta-analysis of 229 studies and 25 practitioner websites concluded that soil health is the number one outcome for regenerative agriculture (Newton et al., 2020). (<https://soilhealthinstitute.org/our-strategy/>)

These concepts – climate change, regenerative agriculture and soil health – come together under the umbrella of Climate-Smart Agriculture (CSA) which, according to the USFRA “is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate.” While proposing a panoply of climate-smart practices that are uniquely within the purview of farmers and ranchers (e.g., no-tillage, conservation-tillage, cover crops and rotational grazing), USFRA also points out a number of practices that relate directly American Vanguard technologies – namely, variable rate application technology, biopesticides and microbial fertilizers.

In this Corporate Sustainability Report, we will focus on the Company’s efforts to promote climate-smart practices and technologies, including with respect to use of utilities and finite natural resources, the commercialization of biorationals and soil health products and our leading-edge solutions in the realm of Digital Agriculture.



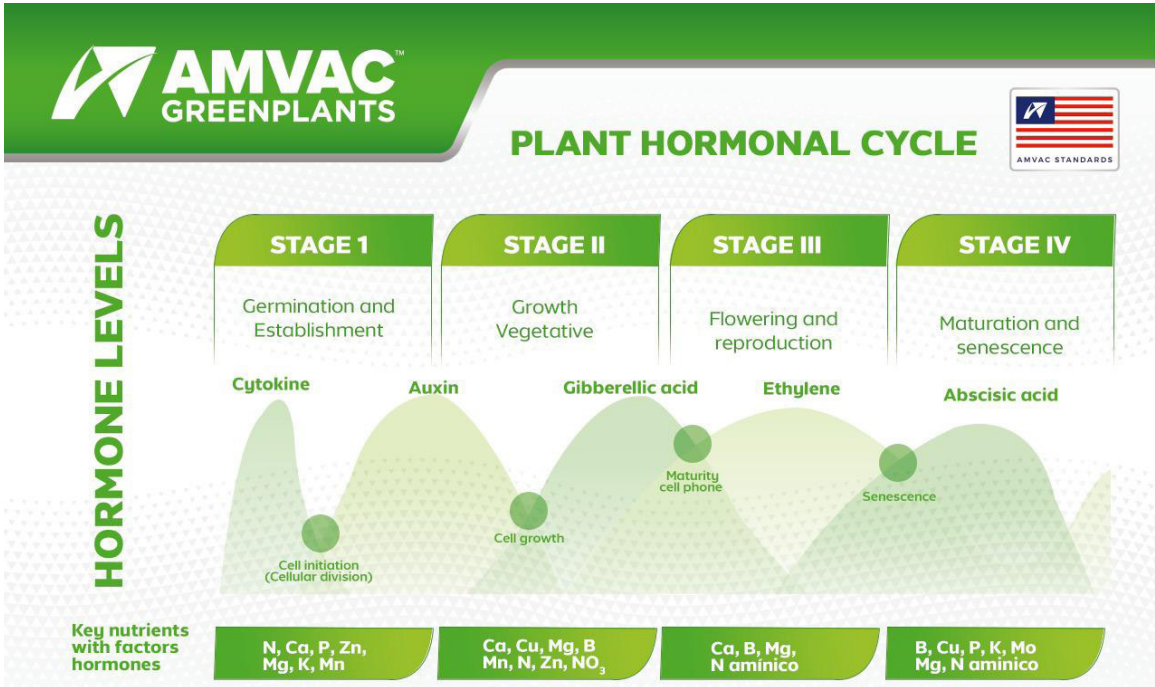
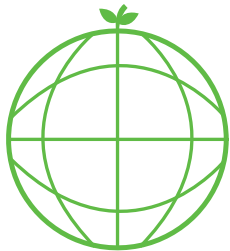
TAILORING NUTRIENTS TO PLANT DEVELOPMENT

AMVAC GREENPLANTS™

Climatic stresses, such as longer dry spells, changes in water availability and increased temperatures, make it more difficult to grow food. In order to help plants to tolerate these “abiotic” stresses, we develop and market soil health solutions within our GreenSolutions™ portfolio, including our Greenplants™ product line. AMVAC Greenplants™ products are tailored micronutrient products – designed by specialists who study the biological cycles – or phenology – of specific plants. By understanding both the types of nutrients that best benefit a plant and when, in the plant’s growth cycle, that plant is most inclined to take up those

In short, AMVAC Greenplants™ products help farmers to grow stronger plants in healthier soil in spite of abiotic stresses while, at the same time, promoting climate-healthy practices. This approach fits squarely within the concept of Climate-Smart Agriculture.

The company continues to expand AMVAC Greenplants™ nutrients and micronutrients into new geographical territories. Since being acquired as part of the larger Grupo Agricenter transaction in 2017, AMVAC Greenplants™ has expanded beyond Central America into South America, Asia Pacific and North America. By exporting AMVAC Greenplants™ nutritional products into multiple areas, we are also advancing interregional equity as it relates to both food and climate. Further, in



nutrients, the researcher can design solutions and application protocols to maximize plant nutrition. In addition, with greater uptake of, for example, nitrogen, in a crop from these micronutrient solutions, growers who are facing regional environmental requirements or are participating in carbon credit programs can reduce their use of synthetic fertilizer and improve their carbon score.

order to maximize the use of AMVAC Greenplants™ products within the carbon credit markets, we anticipate packaging and labeling them for use in our patented delivery system SIMPAS (which we discuss more fully below). This would enable growers to apply nutritional products at plant in-furrow, while simultaneously measuring and recording application data.





## CLIMATE-SMART POTASSIUM FOR PINEAPPLES

Within our AMVAC Greenplants™ business in Costa Rica, an R&D unit called “LIFE-RID®” (for Research, Innovation and Development) specializes in developing tailored micronutrient and fertilizer solutions for regional crops. “K35” was launched seven years ago as a tool for the nutritional management of potassium in pineapple cultivation. Through field studies involving several pineapple farms in the North Zone of Costa Rica, our team has found that K35 leads not only to greater plant health and leaf mass but also can significantly reduce both water use and CO2 equivalent emissions from application equipment.

First, some background is necessary. Traditionally, growers use soluble salts (such as KCl) to fertilize pineapple crops. However, because these salts can be corrosive to the plant – reducing growth rate and potentially causing leaf injury – growers have been compelled to increase dilution through increased volume of water per hectare to protect the plants. This, in turn, has led to higher use of diesel-powered application equipment.

To address this situation, researchers at Greenplants developed K35, which contains

Table 1

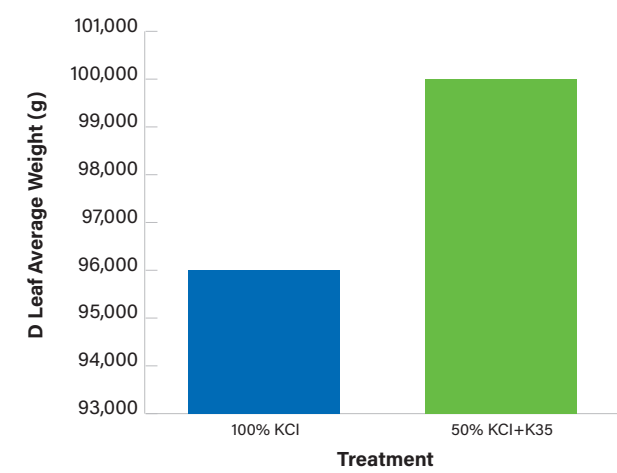
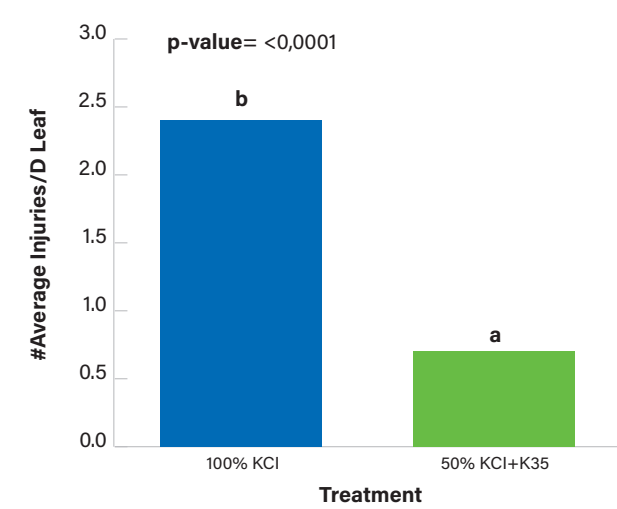


Table 2



potassium citrate, a form of the nutrient that is more readily available and less harmful to the pineapple plant. Because K35 enhances the potassium absorption of the pineapple plant, growers were able to deliver the same dose of potassium to the plant using less fertilizer solution. Using a solution that was one-half K35 and one-half KCl, growers observed higher average leaf weight with K35 (as captured in Table 1), and significantly less damage to the plants (as depicted in Table 2).

Climate-Smart Ag: greater plant health, lower water use and reduced GHGs

## Significant Water Reduction

H <sub>2</sub> O/ha	Applied has/ Spray Boom	Impact in applied hectares/spray boom	H <sub>2</sub> O/ha Consumption/ha in 18 Cycles	Impact on H <sub>2</sub> O/ha Consumption (L)/ha	Observation
2 223a	2.5	1,2	40 014	13 014	Considering 18 cycles of foliar fertilization
1 500	3.7		27 000		

In addition, because less fertilizer solution was required over the 18 application cycles, growers found that they could extend coverage of a single spray boom from 2.5 hectares to 3.7 hectares and, in the process, saved 13,014 liters of water per hectare over the course of the 18-cycle application. Thus, a grower who treated 100 hectares using K35 would be able to save over 1 million liters of water per year.

But there’s more. By reducing the number of trips to the supply tank (to recharge the spray boom),

growers found that diesel fuel consumption was reduced (on average from 1,820 liters to 1,200 liters of diesel fuel per 100 applied hectares). This translates into a drop in CO2 equivalent emissions of 34% (from 4.78 tons with KCl alone to 3.15 tons using K35). Thus, for a 250 hectare farm (which is the reach of a single set of application equipment), reduced operational and input costs can exceed \$50K per year. In short, K35 offers a trifecta in Climate-Smart Ag – greater plant health, lower water use and reduced GHGs – and all of this at lower cost.

## CREATING VALUABLE BIOSTIMULANT PRODUCTS FROM SEAFOOD BY-PRODUCT

AMVAC’s Agrinos Mexico team (operating as “Bioderpac”) produces high quality biostimulant crop nutrition products for the domestic and international markets at our ISO 9001:2015 certified facility in Etchojoa, Sonora, Mexico. Established in 2006 and acquired by American Vanguard in 2020, the Bioderpac manufacturing facility utilizes locally and naturally derived raw materials, most notably millions of kilograms of shrimp by-product (i.e., chitin-rich shells and tails) from local seafood farms. Our patented robust fermentation process gently extracts amino acids and other valuable macro and micronutrients from shrimp processing waste to create our certified organic\* products BSure® and UpLift®.

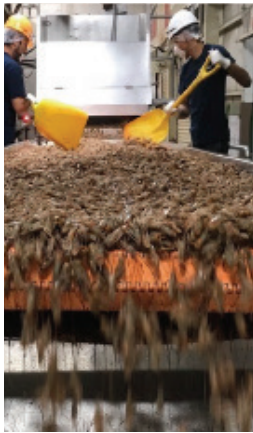
As part of our GreenSolutions™ portfolio of products, BSure is a nutrient solution that improves plant metabolism, and UpLift is a fertility solution that increases crop productivity and supports soil vigor.

Production quality at our Bioderpac facility is assured throughout the high output process, with 14 quality checks from the reception of ingredients through fermentation, processing, packaging and shipment to customers, with in-process and end-product quality verification by the on-site laboratory.

*\*Certified organic by OMRI (Organic Materials Review Institute); OIM (Organic Input Materials) certification under review.*

2021 SHRIMP BY-PRODUCT UTILIZED  
**2.04** million Kg

2022 SHRIMP BY-PRODUCT UTILIZED  
**1.47** million Kg



Shrimp by-product processing at Bioderpac, Sonora, Mexico.



Leading-edge Digital Agriculture solutions benefit day-to-day farm operations.

DIGITAL AGRICULTURE AT AVD

In addition to soil-health products, AMVAC offers leading-edge solutions in Digital Agriculture, namely, its precision application system known as SIMPAS® and its MRV (measure, record, verify) platform known as Ultimus. Before getting into those offerings, it is first useful to get our definitions straight. USDA Economic Research Service, in its February 2023 publication, “[Precision Agriculture in the Digital Era: Recent Adoption on U.S. Farms](#)”, Digital Agriculture “refers to the diffusion of information technologies (e.g.,

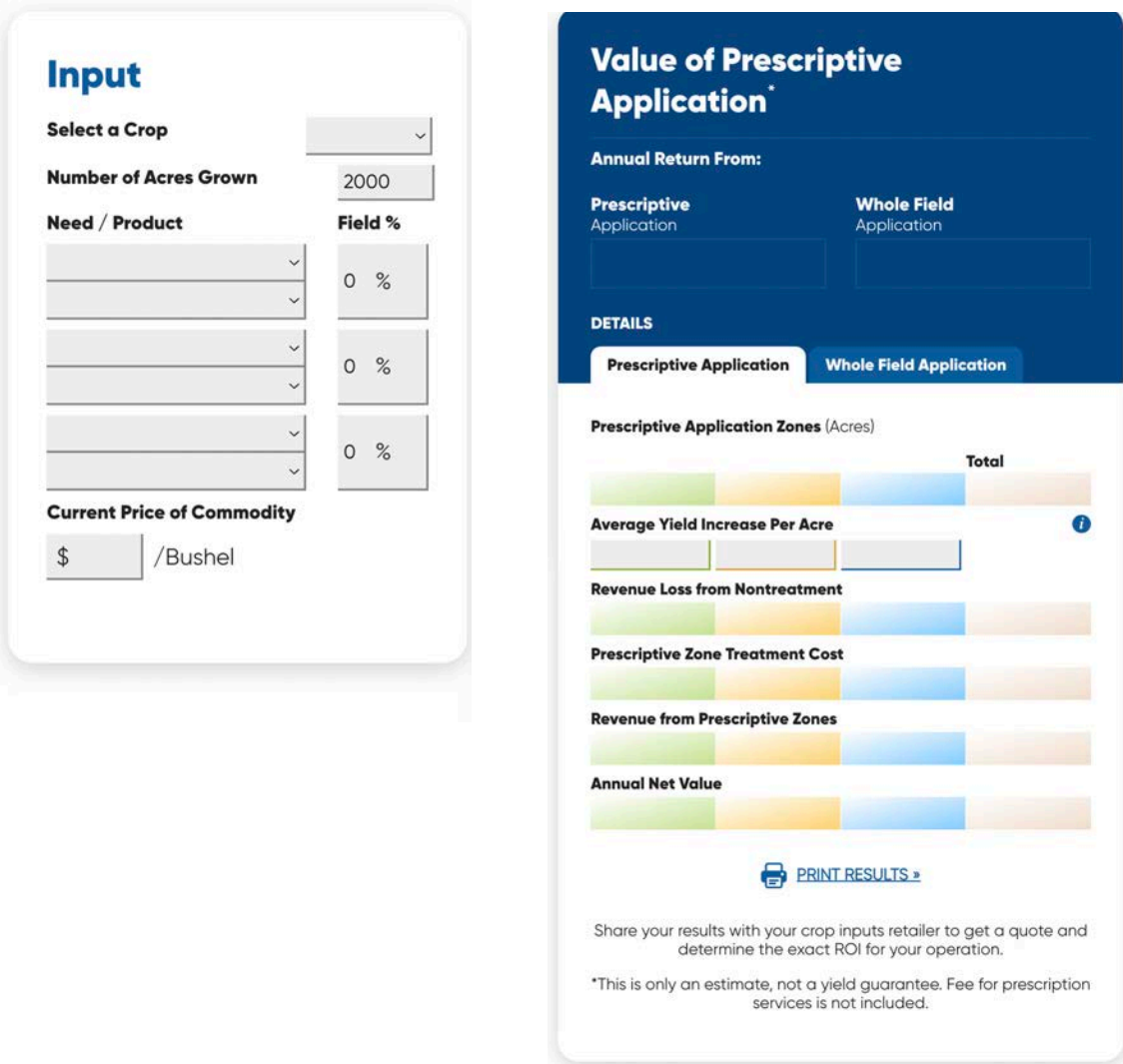
the Internet and Internet of Things, mobile devices, and predictive analytics) to enhance the collection, exchange, combination, analysis and access of digital content within the agricultural sector.” In USDA’s words, “[t]he agricultural digitization process entails greater use of precision agriculture technologies; the promotion of data-sharing between farmers, data aggregators and input companies; and reliance on data-driven decision making for day-to-day management of farm operations.”



AMVAC® FARM BENEFIT TOOL

One example of bringing Digital Agriculture to growers is the Farm Benefit Tool that AMVAC makes available to users of SIMPAS-applied Solutions™ (<https://www.simpas.com/simpas-applied-solutions/solution-costs/#/forms>). With this tool, a grower can input assumptions relating to “whole-field” application (that is, use of standard application rates on the entire field) versus prescriptive application (using SIMPAS equipment). By employing prescriptive application – that is, treating only those areas of the field with what is needed – a grower can reduce the cost of crop inputs, while maintaining yield, resulting in higher margins per acre.

The Company plans to continue advancing its technology within the field of Digital Agriculture. Over the course of 2023, the SIMPAS business team at AMVAC will be focusing on demonstrating the relative benefit of using SIMPAS equipment with nitrogen fixating solutions (and reduced fertilizer). With the benefit of Ultimus MRV technology, growers will soon be able to calculate the CO2 equivalent savings of applying soil health products (partly in lieu of nitrogen-laden synthetic fertilizer) through SIMPAS. With these innovative tools, growers will benefit from improved soil health, a lower climate impact and a data-driven record for use in carbon credit markets.





American Vanguard is committed to being a part of the global solution to reduce the overall impact on the environment.

# ENVIRONMENTAL STEWARDSHIP

American Vanguard is committed to be a part of the global solution to reduce the overall impact on the environment through our focused improvement efforts that minimize energy consumption, greenhouse gas emissions, waste generation, and water consumption at our manufacturing and laboratory facilities. Future updates will include targets and goals to track our progress in this improvement effort. The scope of this 2022 report covers January 1, 2022, to December 31, 2022, and consists of the six manufacturing sites as well as the two US Research & Development laboratories, of which American Vanguard operationally controls. Excluded from the 2022 report are our warehouse and office space impacts including a research farm in Costa Rica as these are estimated to have minimal impact on our overall footprint. However, in order to improve transparency, we will detail plans to expand reporting to include Scope 3 GHG Emissions, warehouses, office spaces, and a 6-acre research farm in Costa Rica. The scope of reporting will also expand to include additional disclosures of Social and Governance metrics and will incorporate the results of an in-process effort to conduct a thorough Materiality Assessment to drive our efforts in the areas deemed most important to both external and internal stakeholders.

### External Data Assurance

The scope of this assurance includes Energy & Energy Intensity, Scope 1 & Scope 2 Emissions & Intensity, Other Emissions (NOx, SOx, VOC's, CO, and PM), Risk Management & Compliance data including Training Hours, Fines & Penalties, Notices of Violation & Notices To Comply, and Number of Reportable Spills as defined by CERCLA, as well as Safety (Total Recordable Rate, Lost Time & Restricted Rate, and Fatalities).

American Vanguard's GHG emissions are calculated according to the Greenhouse Gas

Protocol. Following Scope 1 guidance for Direct Emissions, we use emission factors such as the Intergovernmental Panel on Climate Change (IPCC) 2006 Guidelines for National Greenhouse Gas Inventories and the U.S. Environmental Protection Agency (EPA) Fugitive Emissions Guidance. For Scope 2 emissions (Indirect Emissions), we follow accepted factors such as the EPA's 2022 eGrid Subregion emission factors and steam factors, and report location-based emissions data in this report, which follow methodologies provided in the Scope 2 guidance of the GHG Protocol. Our reporting is structured to follow the guidance provided by the GRI standards and SASB guidance for the Chemical Industry. We also use the global warming potentials provided in the IPCC's Fifth Assessment Report, where available.

American Vanguard retained Environmental Resources Management (ERM CVS) to provide limited assurance for the 2022 environmental and safety data presented in this report. ERM CVS assessed whether the 2022 information and data for specified indicators are fairly presented in accordance with the reporting criteria. ERM CVS conducted two site visits, as well as a headquarters visit to interview subject matter experts and review data systems. Additional documentation to support corporate claims and operational data was provided to ERM CVS as needed. For more information on the assurance standards used, the level of assurance obtained, and the assurance process, please see the ERM CVS Assurance Statement at the end of this report, which details the scope, activities and conclusions of their engagement.

This assessment provides a solid foundation for us to establish and measure progress on future aggressive goals for our organization. Local Sustainability Teams will drive projects to meet these goals and will be overseen by our Corporate Sustainability Steering Team which reports to the ESG Liaison to the Board of Directors.

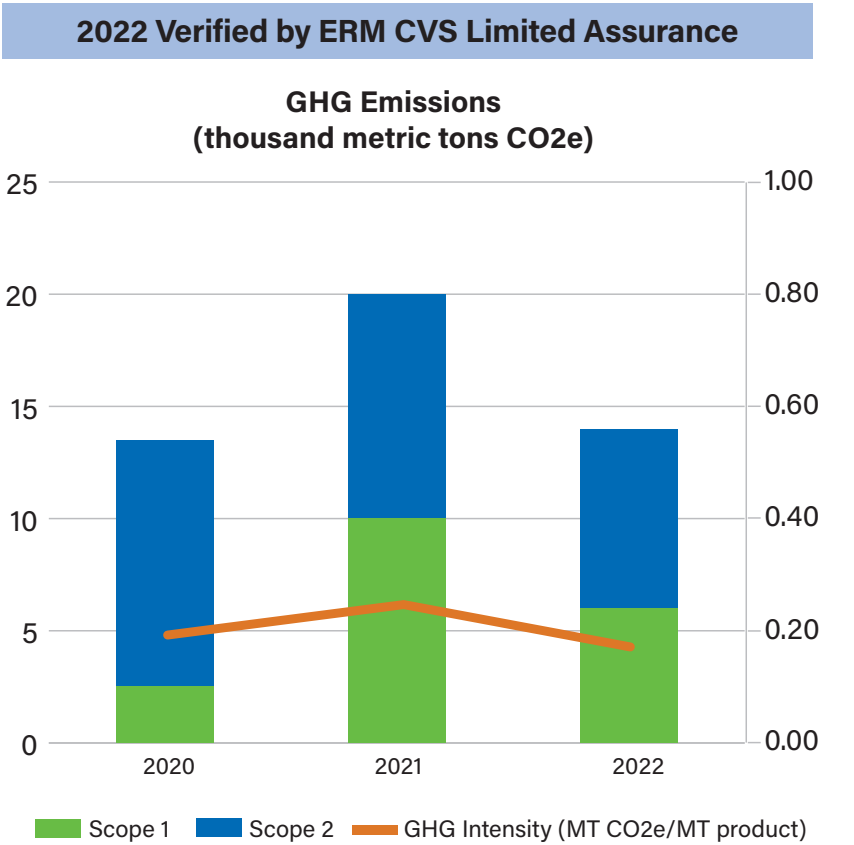
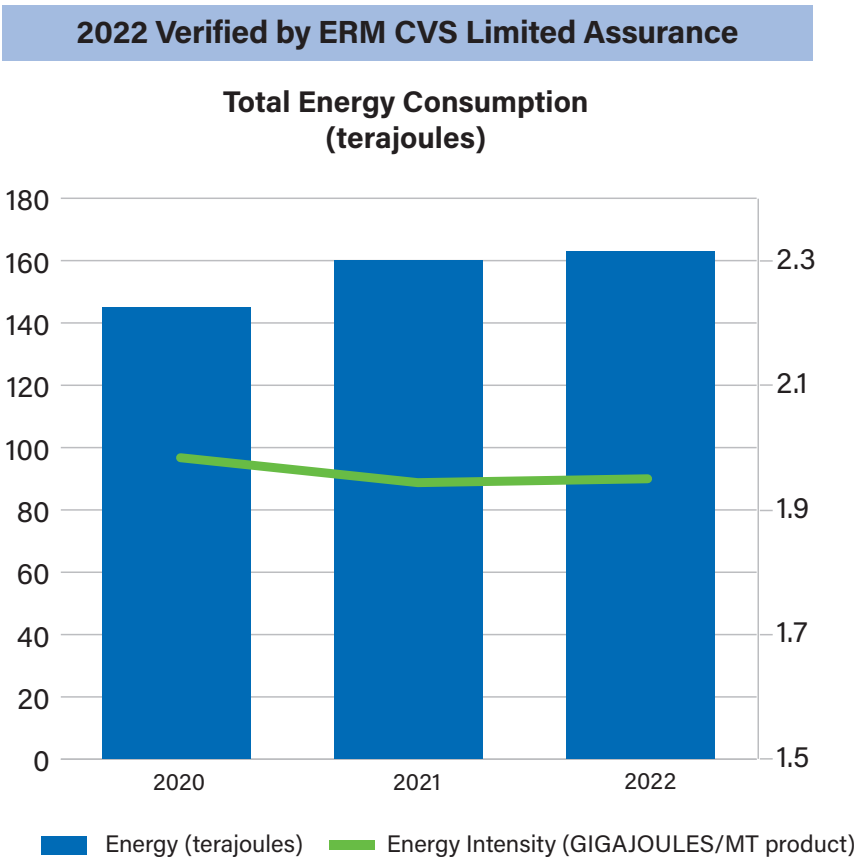
## ENERGY

The energy we consume for our production, formulating, and laboratories is comprised of: electricity; purchased steam and cooling water; and natural gas and other fuels (such as diesel, gasoline, and propane). With the addition of Agrinos, which produces soil health products, to the American Vanguard portfolio in October 2020, the amount of energy consumed within our operational footprint overall increased slightly in 2021 and remained relatively constant in 2022. When normalized for total annual production, however, the intensity in 2021 (gigajoules/MT product) was slightly lower than 2020 and remained relatively unchanged in 2022. Energy Intensity is calculated using ton of finished product ready for sale as managed in American Vanguard's inventory management software.

2022 data attributed a 25% reduction in steam usage at our largest operating facility.

## GREENHOUSE GAS EMISSIONS

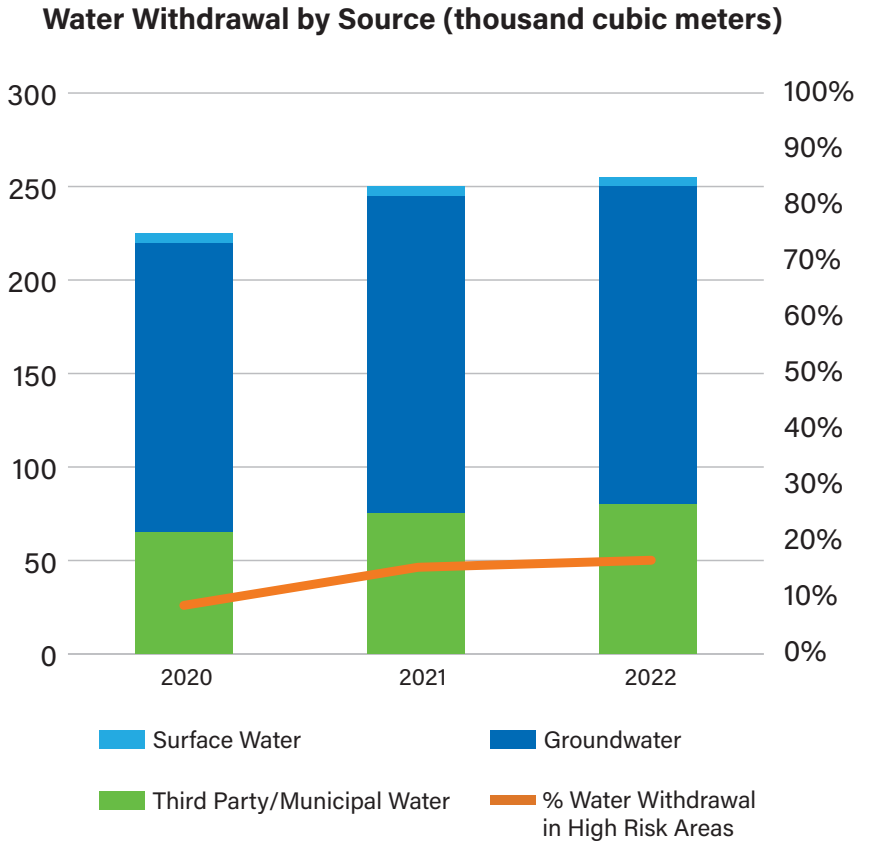
Our greenhouse gas emission inventory includes both Scope 1 (from direct combustion and refrigerants) as well as Scope 2 (from indirect sources such as electricity and purchased cooling water and steam). Both emissions were down in 2022 versus 2021. Most of the reduction in Scope 1 was due to focus and repairs of an equipment failure in 2021 which resulted in larger than normal refrigerant releases that year. The majority of the Scope 2 reduction observed in 2022 was attributed to a 25% reduction in steam usage at our largest operating facility. These improvements were implemented through a focused project to identify and address energy usage and efficiencies across the site. Similar efforts are being planned and conducted at our other sites. We are aware of our impact and ability to affect Scope 3 (from upstream and downstream sources as well as employee travel) on our carbon footprint and are in the process of assessing means to capture and quantify these impacts. GHG Emission Intensity is calculated using ton of finished product ready for sale as managed in American Vanguard's inventory management software and was down in 2022 versus 2021.





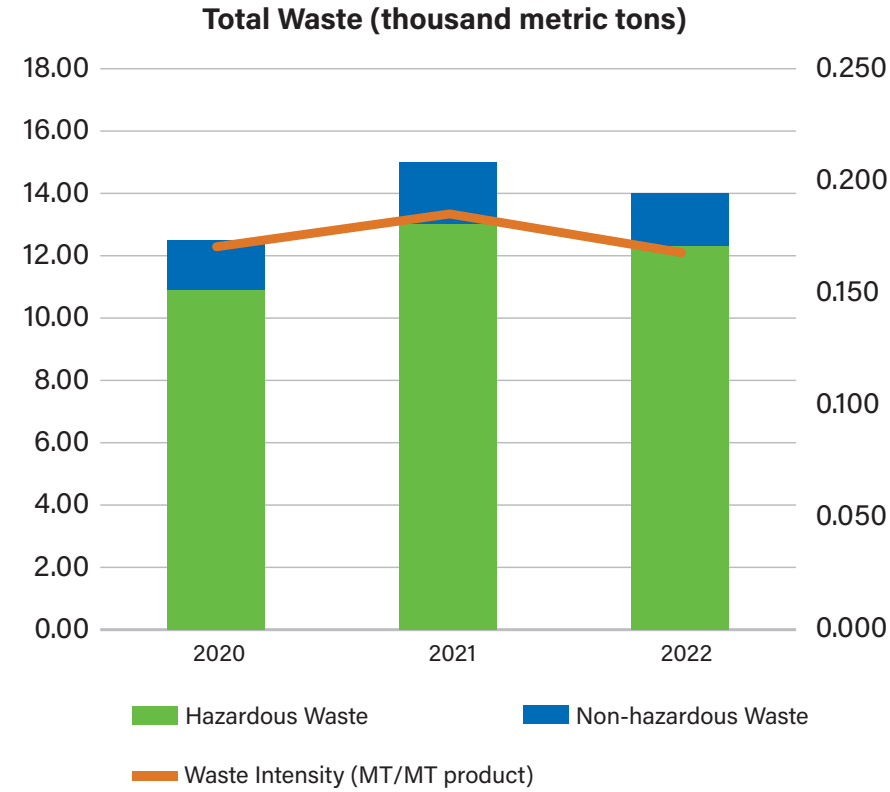
WATER

We conducted a thorough water risk assessment of all manufacturing and laboratory sites in 2022 using the Aqueduct Water Risk Atlas tool. Two areas were identified as high risk, and we will prioritize these locations as focus areas for American Vanguard. While some of these data are currently estimated, efforts are underway to install meters where possible to provide the usage detail for identifying and prioritizing specific opportunities for future reductions in overall water withdrawal and consumption.



WASTE

This graph depicts a summary of our total waste accounting classified as Hazardous and Non-hazardous along with the resulting Waste Intensity. We are capturing these data across all of our manufacturing and laboratory operations, and as shown here, have experienced a decrease in total waste generated as well as waste intensity in 2022 as compared to 2021.



AMERICAN VANGUARD 2023 PERFORMANCE TABLE

★ 2022 Verified by ERM CVS Limited Assurance

Environmental	2020	2021	2022	GRI Index Reference	SASB Reference
GHG emissions - Scope 1 and 2					
Total Scope 1 (thousand metric tons CO2e) <sub>1</sub> ★	2.9	10	5.5	305-1	RT-CH-110a.1
Total Scope 2 (thousand metric tons CO2e) ★	10.8	10.2	8.7	305-2	
Total Emissions - Scope 1 + Scope 2 (thousand metric tons CO2e) ★	13.7	20.2	14.1		
GHG Intensity (Total metric ton CO2e/ metric ton product) ★	0.19	0.25	0.17	305-4	
Other Emissions (metric tons)					
Volatile Organic Compounds VOCs (metric tons) <sub>2</sub> ★	0.5	0.4	0.5	305-7	RT-CH-120a.1
NOx (metric tons) ★	7.1	8.9	11.2	305-7	RT-CH-120a.1
SOx (metric tons) ★	2.9	3.9	2.7	305-7	RT-CH-120a.1
TRI Releases (metric tons)	2.5	4.1	6.9	305-7	RT-CH-120a.1
Other Regulated Emissions - CO (metric tons) <sub>2</sub> ★	3.3	2.4	2.7	305-7	RT-CH-120a.1
Other Regulated Emissions - PM (metric tons) <sub>2</sub> ★	3.4	5.8	10.5	305-7	RT-CH-120a.1
TOTAL - ALL OTHER EMISSIONS (metric tons)	19.6	25.5	34.5	305-7	RT-CH-120a.1
Total Energy Consumption					
Total energy (terajoules) ★	145.5	159	162.3	302-1	RT-CH-130a.1
Energy Intensity (gigajoules/metric ton product) ★	2	1.9	2	302-3	
Water Withdrawal					
Total Water Withdrawal (thousand cubic meters)	228.9	251.5	257	303-3	RT-CH-140a.1
Third Party Water Withdrawal (thousand cubic meters)	71.4	80.5	86.6	303-3	
Groundwater Withdrawal (thousand cubic meters)	150	163.8	163.3	303-3	
Surface Water Withdrawal (thousand cubic meters)	7.5	7.2	7.2	303-3	
Total Water Withdrawal in Regions with High or Extremely High Water Stress (thousand cubic meters)	20.5	39.4	43.9	303-1	
Total Water Discharge (thousand cubic meters) ★	58.1	57.8	59.7	303-4	
Total Water Consumption (thousand cubic meters)	170.8	193.7	197.3	303-5	RT-CH-140a.1
Total Water Consumption in Regions with High or Extremely High Water Stress (thousand cubic meters)	14.3	29.4	25.9	303-1	RT-CH-140a.1
Total Water Consumption Intensity (cubic meters/metric ton product)	2.3	2.4	2.4		
Waste					
Hazardous Waste Total (thousand metric tons)	10.92	12.75	12.40	306-3	RT-CH-150a.1
Hazardous Waste Directed to Disposal (thousand metric tons)	10.92	12.75	12.40		
Hazardous Waste Diverted from Disposal (thousand metric tons)	0	0.001	0.002		
Total of Non-Hazardous Waste (thousand metric tons)	1.77	2.03	1.60	306-3	
Non-Hazardous Waste Directed to Disposal (thousand metric tons)	1.65	1.91	1.48	306-3	
Non-Hazardous Waste Diverted from Disposal (thousand metric tons)	0.12	0.12	0.12		
Total Waste Intensity (metric tons/metric ton product)	0.17	0.18	0.17	306-4	
Risk Management & Compliance					
Environmental Training Hours (count) ★	424	927	616		
Notices of Violation (NOVs) and Notices to Comply (NTCs) (count) <sub>3</sub> ★	1	3	0		
Total Quantity of Fines and Penalties (kUS\$) <sub>4</sub> ★	0	88	0	307-1	
Number of Reportable Spills as defined by CERCLA (count)	1	0	0		
Safety					
Total Number of Fatalities <sub>5</sub> ★	0	0	0		
Total Recordable Rate (incidents*200,000 hours / hours worked) <sub>5</sub> ★	1.72	1.09	1.84	403-9	RT-CH-320a.1
Total Lost Time/Restricted Rate (incidents*200,000 hours / hours worked) <sub>5</sub> ★	1.08	0.73	0.92		

<sub>1</sub>2021 Scope 1 emissions adjusted to include refrigerant losses due to failure  
<sub>2</sub>All emissions are calculated per local regulatory agency reporting criteria  
<sub>3</sub>Issued by environmental agencies  
<sub>4</sub>Fines and Penalties assessed by environmental agencies. 2021 updated to include \$88k fine assessed  
<sub>5</sub>Included in incidents are any directly supervised contractors however hours worked by contractors are not included





# STAKEHOLDER ENGAGEMENT

Engaging with our stakeholders benefits all of us – the Company as well as our customers, employees, neighbors, suppliers, investors, to name a few. Many internal groups and individuals are responsible for interacting with our stakeholders, whether by direct communication, training sessions, organizing or participating in events, and through many other avenues. Engagement and communication varies depending on the stakeholder – there is no one point of contact with all stakeholders. By gaining valuable information and feedback from each interaction, we use this

information to hone and improve our products, services, operations, and interactions.

To further confirm we understand the interests and concerns of our stakeholders, we will conduct a thorough materiality assessment in the coming year. This effort will ensure our operations, as well as our sustainability strategy and program, properly address the most important issues valued by our stakeholders. We will report on the results of the materiality assessment in our future sustainability reports.

Understanding  
the most  
important issues  
valued by our  
stakeholders,  
benefits all of us.

Stakeholder	Engagement	Key Issues
Employees	<ul style="list-style-type: none"><li>• Company intranet and interactive smartphone app</li><li>• Cross-functional team meetings</li><li>• Wellness program</li><li>• Training and education</li><li>• Regular performance reviews</li></ul>	<ul style="list-style-type: none"><li>• Compensation</li><li>• Benefits</li><li>• Company strategy</li><li>• Employee satisfaction and well-being</li><li>• Employee development</li></ul>
Customers/End-Users	<ul style="list-style-type: none"><li>• Product training</li><li>• Product research and development</li><li>• Trade shows</li><li>• User groups</li><li>• Task force</li></ul>	<ul style="list-style-type: none"><li>• Product quality</li><li>• Product use</li><li>• Distribution</li><li>• Waste minimization</li><li>• Security</li></ul>
Analysts/Institutional Investors	<ul style="list-style-type: none"><li>• Quarterly updates</li><li>• Presentation at conferences</li><li>• Website</li></ul>	<ul style="list-style-type: none"><li>• Financial stability</li><li>• Risk management</li></ul>
Communities	<ul style="list-style-type: none"><li>• Community action committees</li><li>• Volunteerism</li><li>• Training and education</li></ul>	<ul style="list-style-type: none"><li>• Safe operation</li><li>• Environmental compliance</li><li>• Waste minimization</li><li>• Resource conservation</li></ul>
Suppliers, Contractors and other Third Parties	<ul style="list-style-type: none"><li>• Supplier audits and reviews</li><li>• Signed declarations</li></ul>	<ul style="list-style-type: none"><li>• Timely and ensured supply</li><li>• Product quality</li><li>• Security</li><li>• Fair labor practices</li></ul>
Government Agencies	<ul style="list-style-type: none"><li>• Policy discussions</li><li>• Inspections</li><li>• Product registrations</li><li>• Data submissions</li></ul>	<ul style="list-style-type: none"><li>• Product approval</li><li>• Compliance</li></ul>



ASSURANCE STATEMENT

Independent Limited Assurance Report to American Vanguard Corporation

ERM Certification & Verification Services Incorporated (“ERM CVS”) was engaged by American Vanguard Corporation (“AMVAC”) to provide limited assurance in relation to the selected information set out below and presented in the AMVAC Corporate Sustainability Report 2023 (the “Report”).

Engagement summary	
Scope of our assurance engagement	Whether the 2022 selected performance metrics for AMVAC’s 2023 Corporate Sustainability Report are fairly presented in the Report, in all material respects, in accordance with the reporting criteria.
	<ul style="list-style-type: none"><li>• <b>GHG emissions -Scope 1 and 2</b><ul style="list-style-type: none"><li>○ Total Scope 1 (thousand metric tons CO2e)</li><li>○ Total Scope 2 (thousand metric tons CO2e) (location based)</li><li>○ Total Emissions - Scope 1 + Scope 2 (location based) (thousand metric tons CO2)</li><li>○ GHG Intensity (Total metric ton CO2e/ metric ton product)*</li></ul></li><li>• <b>Other Emissions (metric tons)</b><ul style="list-style-type: none"><li>○ Volatile Organic Compounds VOCs (metric tons)</li><li>○ NOx (metric tons)</li><li>○ SOx (metric tons)</li><li>○ Other Regulated Emissions - CO (metric tons)</li><li>○ Other Regulated Emissions - PM (metric tons)</li></ul></li><li>• <b>Total Energy Consumption</b><ul style="list-style-type: none"><li>○ Total energy (terajoules)</li><li>○ Energy Intensity (gigajoules/metric ton product)*</li></ul></li><li>• <b>Water</b><ul style="list-style-type: none"><li>○ Water Discharge (thousand cubic meters)</li></ul></li><li>• <b>Risk Management</b><ul style="list-style-type: none"><li>○ Environmental Training Hours (count)</li></ul></li><li>• <b>Compliance</b><ul style="list-style-type: none"><li>○ Number of Notices of Violation (NOVs) and Notice to Comply</li><li>○ Total Quantity of Fines and Penalties (US\$)</li><li>○ Number of Reportable Spills as defined by CERLCA (count)</li></ul></li><li>• <b>Safety</b><ul style="list-style-type: none"><li>○ Total Number of Fatalities</li><li>○ Total Recordable Rate (incidents*200,000 hours / hours worked)</li><li>○ Total Lost Time/Restricted Rate (incidents*200,000 hours / hours worked)</li></ul></li></ul>
	<p>*Note: For all intensity metrics that relate to production, ERM CVS will place reliance on financial reporting production figures.</p> <p>Our assurance engagement does not extend to information in respect of earlier periods or to any other information included in the Report</p>
Reporting period	January 1, 2022 – December 31, 2022
Reporting criteria	<ul style="list-style-type: none"><li>- WBCSD/WRI GHG Protocol: A Corporate Accounting Standard (2004, as updated January 2015) (<b>GHG emissions - Scope 1 and 2</b>)</li><li>- Applicable local air emissions requirements (<b>for Other Regulated Emissions- CO &amp; PM</b>)</li><li>- GRI Sustainability Reporting Standards (<b>Water discharge, VOCs, NOx, SOx, GHG emissions-Scope 1 and Scope 2 and Total Energy</b>)</li><li>- OSHA Injury and Illness Recordkeeping and Reporting definitions for <b>Safety</b> metrics</li><li>- AMVAC’s Basis of Reporting (internal reporting criteria and definitions) for <b>Risk Management</b> and <b>Compliance</b> metrics</li></ul>

ASSURANCE STATEMENT

Assurance standard and level of assurance	<p>We performed a limited assurance engagement, in accordance with the International Standard on Assurance Engagements ISAE 3000 (Revised) ‘Assurance Engagements other than Audits or Reviews of Historical Financial Information’ issued by the International Auditing and Standards Board.</p> <p>The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for a reasonable assurance engagement and consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.</p>
Respective responsibilities	<p>AMVAC is responsible for preparing the Report and for the collection and presentation of the information within it, and for the designing, implementing, and maintaining of internal controls relevant to the preparation and presentation of the Report.</p> <p>ERM CVS’ responsibility is to provide conclusions to AMVAC on the agreed scope based on our engagement terms with AMVAC, the assurance activities performed and exercising our professional judgement.</p>

Our conclusion

Based on our activities, as described below, nothing has come to our attention to indicate that the 2022 data and information for the disclosures listed under ‘Scope’ above are not fairly presented in the Report, in all material respects, in accordance with the reporting criteria.

Our assurance activities

Considering the level of assurance and our assessment of the risk of material misstatement of the Report a multi-disciplinary team of sustainability and assurance specialists performed a range of procedures that included, but was not restricted to, the following:

- Evaluating the appropriateness of the reporting criteria for the Report.
- Performing an analysis of the external environment, including a media search, to identify sustainability risks and issues in the reporting period that may be relevant to the assurance scope.
- Interviews with management representatives responsible for managing the selected issues.
- Interviews with relevant staff to understand and evaluate the management systems and processes (including internal review and control processes) used for collecting and reporting the selected disclosures.
- A review at corporate level of a sample of qualitative and quantitative evidence supporting the reported information.
- An analytical review of the year-end data submitted by all locations included in the consolidated 2022 group data for the selected disclosures which included testing the completeness and mathematical accuracy of conversions and calculations, and consolidation in line with the stated reporting boundary.
- A visit to AMVAC HQ in Newport Beach, California to review corporate data processes.
- Visits to 2 manufacturing sites in Los Angeles, California and Axis, Alabama to review source data and local reporting systems and controls.
- Confirming conversion and emission factors and assumptions used.
- Reviewing the presentation of information relevant to the scope of our work in the Report to ensure consistency with our findings.

The limitations of our engagement

The reliability of the assured information is subject to inherent uncertainties, given the available methods for determining, calculating, or estimating the underlying information. It is important to understand our assurance conclusions in this context.



ASSURANCE STATEMENT

Our independence, integrity and quality control

ERM CVS is an independent certification and verification body accredited by UKAS to ISO 17021:2015. Accordingly, we maintain a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements. Our quality management system is at least as demanding as the relevant sections of ISQM-1 and ISQM-2 (2022).

ERM CVS applies a Code of Conduct and related policies to ensure that its employees maintain integrity, objectivity, professional competence and high ethical standards in their work. Our processes are designed and implemented to ensure that the work we undertake is objective, impartial and free from bias and conflict of interest. Our certified management system covers independence and ethical requirements that are at least as demanding as the relevant sections of the IESBA Code relating to assurance engagements.

ERM CVS has extensive experience in conducting assurance on environmental, social, ethical and health and safety information, systems and processes, and provides no consultancy related services to AMVAC in any respect.

*Beth C. B. Wyke*

Beth Wyke  
Head of Corporate Assurance Services  
Malvern, PA

Aug, 04 2023

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AMVAC NETHERLANDS BV

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