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

FORM 10-K

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2021
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: 001-38441

ChampionX Corporation

(Exact name of registrant as specified in its charter)

Delaware	**82-3066826**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
2445 Technology Forest Blvd **Building 4, 12th Floor** **The Woodlands, Texas**	**77381**
(Address of principal executive offices)	(Zip Code)

(Registrant's telephone number, including area code) **(281) 403-5772**
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock, $0.01 par value	CHX	The Nasdaq Stock Market LLC

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 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. ☑

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

The aggregate market value of the registrant's common stock held by non-affiliates of the registrant, determined by multiplying the outstanding shares on June 30, 2021, by the closing price on such day of $25.65 as reported on the Nasdaq Stock Market, was $5,162,524,944. The registrant, solely for the purpose of this required presentation, deemed its Board of Directors and executive officers to be affiliates, and deducted their stockholdings in determining the aggregate market value.

The registrant had 202,912,106 shares of common stock, $0.01 par value, outstanding as of February 4, 2022.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement relating to its 2022 annual meeting of stockholders are incorporated by reference into Part III of this Annual Report on Form 10-K where indicated, or such information will be included in an amendment to this Form 10-K in accordance with Instruction G(3) of Form 10-K.

CHAMPIONX CORPORATION

TABLE OF CONTENTS

Cautionary Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K contains “forward-looking statements” intended to qualify for the safe harbors from liability established by the Private Securities Litigation Reform Act of 1995. All statements other than statements of historical fact contained in this report are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). Forward-looking statements usually relate to future events and anticipated revenues, earnings, cash flows or other aspects of our operations or operating results. Forward-looking statements are often identified by the words “believe,” “expect,” “anticipate,” “plan,” “intend,” “foresee,” “should,” “would,” “could,” “may,” “estimate,” “outlook,” “guidance,” “potential,” “target,” “forecast” and similar expressions, including the negative thereof. The absence of these words, however, does not mean that the statements are not forward-looking. These forward-looking statements are based on our current expectations, beliefs, and assumptions concerning future developments and business conditions and their potential effect on us. While management believes that these forward-looking statements are reasonable as and when made, there can be no assurance that future developments affecting us will be those that we anticipate.

All of our forward-looking statements involve risks and uncertainties (some of which are significant or beyond our control) and assumptions that could cause actual results to differ materially from our historical experience and our present expectations or projections. Known material factors that could cause our actual results to differ from those in the forward-looking statements are those described in Part I, Item 1A, “Risk Factors” of this Annual Report on Form 10-K. We caution you not to place undue reliance on any forward-looking statements, which speak only as of the date hereof. We undertake no obligation to publicly update or revise any of our forward-looking statements after the date they are made, whether as a result of new information, future events or otherwise, except to the extent required by law.

PART I

ITEM 1. BUSINESS

OVERVIEW

ChampionX Corporation, a Delaware corporation (“ChampionX,” “we,” “us,” “our,” or the “Company”), is a global leader in chemistry solutions and highly engineered equipment and technologies that help companies drill for and produce oil and gas safely, efficiently and sustainably around the world. Our products provide efficient and safe operations throughout the lifecycle of a well with a focus on the production phase of wells.

On June 3, 2020, the Company and Ecolab Inc. (“Ecolab”) completed a Reverse Morris Trust transaction in which we acquired the Chemical Technologies business (the “Merger”). In association with the completion of the Merger, the Company has changed its name from Apergy Corporation to ChampionX Corporation and its ticker symbol from “APY” to “CHX”. See Note 3—Merger Transaction, Acquisitions, and Dispositions to our consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K for more information.

BUSINESS STRATEGY

ChampionX has five clear strategic priorities, which drive our organization and are aligned with our operating principles of being customer advocates, people-oriented, delivering technology with impact, and being driven to improve.

Our strategic priorities include:

Realize Better Together Potential by continuing to build on our purpose of Improving Lives and maintaining a purpose-driven culture, seeking opportunities to leverage our production-optimization expertise into broader production solutions, and remaining focused on cost synergy initiatives.

Accelerate Digital and Digitally-enabled Revenue Streams by identifying opportunities to expand digitally-enabled products and digital revenue streams, and seeking to establish partnerships to leverage the industry digital ecosystem.

Leverage Global Footprint to Expand International Sales with a focus on opportunities to expand artificial lift products in targeted international areas and develop greater adoption of our artificial lift and chemical offerings by international and national oil companies.

Build Enterprise-wide Continuous Improvement Rigor by expanding upon our ChampionX Operational Excellence model, further integrating productivity improvements, and automating workflows to eliminate waste in business processes.

Evolve Portfolio for Sustained Growth by seeking opportunities to leverage our core capabilities across the energy industry and natural adjacencies, developing an Environmental, Social and Governance (“ESG”) framework and roadmap, and continuing to allocate capital consistent with our value creation framework to ensure success through the energy transition.

BUSINESS SEGMENTS

Our business is organized into four reportable segments: Production Chemical Technologies, Production & Automation Technologies, Drilling Technologies, and Reservoir Chemical Technologies. We refer to the Production Chemical Technologies segment and the Reservoir Chemical Technologies segments together as the Chemical Technologies business. See Note 5—Revenue in Part II, Item 8.—Financial Statements and Supplementary Data of this Annual Report on Form 10-K for revenue by geography for each of our reportable segments.

Production Chemical Technologies

Production Chemical Technologies offers products and services that cover a broad range of onshore and offshore chemical solutions in production and midstream operations that are built upon our foundation of deep expertise and capabilities in applications across the oil and natural gas value chain. The largest product lines in Production Chemical Technologies include corrosion inhibitors, scale inhibitors, emulsion breakers, and biocides. These offerings enhance the integrity of customer assets, ensure flow through pipelines and equipment, and effectively maximize production via efficiently separating oil, water, and gas. Our Production Chemical Technologies offerings include proprietary digital tools that monitor and optimize chemical treatment programs and enhance performance along with remotely connecting technical experts with field personnel to leverage our real-time technical expertise across the world.

Our reservoir modeling capability and chemistry expertise provides enhanced oil recovery solutions to oil producers. These solutions are intended to enable our customers to increase oil recovery in mature oilfields and improve return on investment by extending the economic life of such fields in a safe and responsible manner, both onshore and offshore, as well as reduce their carbon footprint.

The products and services within Production Chemical Technologies are sold and supported by our on-site experts and customer account leaders, as well as through distributors, sales agents, and joint ventures. More than half of our employees work directly with customers to provide expertise and support at their production sites or remotely. We support our customers directly by leveraging a global laboratory network and a team of more than 400 scientists, engineers, and technologists. Production Chemical Technologies has an extensive portfolio of intellectual property and provides differentiated solutions as a central theme of our commercial offering.

We help enable our customers to achieve their sustainability goals through maximizing production, minimizing environmental footprint, reducing emissions, and lowering fresh-water usage.

Production & Automation Technologies

Production & Automation Technologies offers products, technologies, and services that facilitate the safe, efficient, and cost-effective extraction of oil and gas through artificial lift and digital automation applications. We design, manufacture, market, and service a full range of artificial lift equipment, end-to-end automation and digital solutions, as well as other production equipment and emissions monitoring solutions. Artificial lift equipment is critical to oil and gas operators for increasing pressure within the reservoir and improving oil and gas production. Our product offerings include electrical submersible pumping systems (“ESP”), gas lift systems, jet pumps, and multiplex surface pumps supporting hydraulic lift, plunger lift equipment, progressive cavity pumping (“PCP”) systems, downhole rod lift systems, and methane emissions monitoring solutions.

Artificial lift is a key technology for increasing oil and gas production throughout the lifecycle of a producing well and is therefore directly linked to operator economics. Our comprehensive offering provides customers with cost effective solutions tailored to a well’s specific characteristics and production volumes. With sales, operations, and distribution networks around the globe, we offer all types of downhole equipment and industry-leading automation and optimization hardware and software to customers operating within the major oil and gas basins throughout the world.

Our proprietary digital products are aimed at creating an end-to-end production-optimization platform that enables oil and gas operators to monitor, predict, and optimize well performance and drive a higher return on investment during the production lifecycle. We are a leading provider of productivity tools and performance management software for artificial lift and asset integrity management, including emissions detection and monitoring. We provide advanced controls technology that allows operators to adjust the operation of downhole artificial lift systems to production rates either at the wellsite or remotely. Our optimization software has modular architecture that enables specific solutions to be tailored to meet exact customer needs. Real-time data is used by our customers to drive decisions, enhance well servicing and obtain an accurate picture of a well’s performance over time, resulting in a more connected, digital wellsite that operates more efficiently and safely. For operators that require support, we provide optimization teams that monitor customer wells and make timely adjustments to equipment operation to extend the life of the artificial lift system and mitigate production down time. In the current oil and gas industry, particularly in the current down cycle, operators are focused on lowering their total operating costs over the life of a well. Our methane monitoring technology, through ground-based continuous systems or aerial measurements taken by drone or manned aircraft, provide comprehensive solutions for detecting and quantifying emissions at oil and gas facilities. We believe our combination of digital products and strong artificial lift presence enables us to drive continued adoption of digital solutions by customers seeking to meet their sustainability goals and will improve our long-term revenues.

We also offer other production equipment including chemical injection systems, flow control valves, and gauges. These products are complementary to our artificial lift and digital technologies offerings. A portion of Production & Automation Technologies revenue is derived from activity-based consumable products, as customers routinely replace items such as sucker rods, plunger lift, and pump parts.

Drilling Technologies

Drilling Technologies offers innovative, top-quality polycrystalline diamond cutter ("PDC") inserts, bearings, valves, and mining tools to help customers drill the world's most demanding oil exploration and development projects, and for use in other industries. These highly specialized products are developed and produced based on more than 40 years of innovation and intellectual property development in material science applications. We press our own synthetic diamonds, known as polycrystalline diamonds, that meet the highest standards and match the requirements of the most demanding engineering projects. Our highly trained team members work with customers to develop custom-designed PDC inserts and bearings through a consultative process, ensuring that we tailor the products to generate the best outcomes for their operations.

We believe our highly engineered PDCs are distinguished by their quality, durability, rate of penetration, and longevity. PDCs are a relatively small cost to the oil and gas operator in the context of overall drilling costs, but are critical to cost-effective and efficient drilling. Our PDCs are primarily custom designed to meet unique customer requirements and are finished to exact customer specification to ensure optimal performance. PDCs are utilized in both vertical and horizontal drilling and are replaced as they wear during the drilling process.

We manufacture long-lasting diamond bearings for down-hole drilling motors, pumps, and turbines running in the most challenging environments. These diamond bearings are also used by customers in renewable energy applications, mixers, and agitators. These bearings have a high thermal conductivity to reduce localized temperature extremes that lead to bearing degradation, and they are very resistant to wear from abrasive particles in lubricants or process fluids. These process-fluid lubricated applications include underwater applications, downhole drilling tools, and industrial pumps.

We also manufacture high-density ceramic roof bolt mining tools focused on improving the production and safety of underground mining operations. The technically advanced and unique diamond technology of these products makes these tools incredibly long lasting for their respective applications.

Reservoir Chemical Technologies

Reservoir Chemical Technologies offers chemistry-oriented solutions and technologies to help customers meet their performance, efficiency, sustainability, and financial objectives for well drilling, cementing, fracturing, acidizing, and other well interventions. For example, we design high performance integrated fracturing fluid systems to improve the customer's operational efficiency, lower chemical program costs and enhance well productivity. We assist our customers in achieving their sustainability goals relating to fresh-water usage by increasing their ability to use recycled water, while mitigating the impact of fluid problems that can shorten the life of the well (e.g., scale, emulsion, and microbial growth).

We offer a range of fluid solutions that help our customers achieve more successful and efficient drilling and cementing operations and enhance well productivity. We also leverage our deep experience in water treatment and processing to offer our customers products that help to control scale and inhibit microbial growth and corrosion. Our expertise involves designing tailored products that help our customers create optimized fluid packages based on individual well dynamics. The largest product lines in Reservoir Chemical Technologies include fracturing fluid packages, drilling additives, cement additives and products that support acidizing activities.

OTHER BUSINESS INFORMATION

Competition

The businesses in which we operate are highly competitive. Key competitive factors in our businesses are customer service, product capability and availability, quality and performance, price, breadth of product offering, local content and geographic footprint, market expertise and innovation. We believe we differentiate ourselves from our competitors through our model of high customer intimacy, differentiated technology, innovation, supply assurance, a superior level of customer service, and a culture of continuous improvement.

We face competition from other manufacturers and suppliers of oil and gas production and drilling equipment. Key competitors for our Production Chemical Technologies and Reservoir Chemical Technologies segments include Baker Hughes; Clariant

AG; Multi-Chem, a Halliburton Service; M-I SWACO, a Schlumberger company; SNF; Kemira; Innospec; and Rockwater. Production & Automation Technologies segment key competitors include Baker Hughes, Halliburton, Schlumberger, NOV, Weatherford International, Tenaris, Exterran and Forum Energy Technologies. Drilling Technologies segment key competitors include DeBeers (Element 6), Schlumberger (Mega Diamond) and various suppliers in China.

Customers, Sales and Distribution

We have built our businesses through high customer intimacy and high-touch customer service, and we view our intense customer focus as being central to the goal of creating value for all of our stakeholders. Drawing on our industry experience, application engineering expertise, and technical expertise, we strive to develop close, collaborative relationships with our customers to help them achieve peak performance throughout the life-cycle of their assets by identifying and managing the challenges they face. We work closely with our customers' engineering teams to develop technologies and applications that help improve efficiency, reliability and productivity. Our business is sensitive to changes in customers' capital and operational expenditure budgets, including as they relate more directly to the exploration and development of new oil and natural gas reserves.

We have long-standing customer relationships with some of the largest operators in oil and gas drilling and production. Our customers include international and national oil and gas companies, large integrated operators as well as independent conventional and unconventional oil and gas companies, major oilfield equipment and service providers, and pipeline companies.

We market and sell our products and technologies through a combination of field sales personnel and corporate account leaders, technical seminars, trade shows, and various digital and print advertising. We sell directly to customers through our direct sales force and indirectly through independent distributors and sales representatives. Our sales employees partner with our customers to understand the customer's technical challenges and needs, and proactively work with customers to provide solutions and advise our customers on the advantages of our technologies and product offerings. We have developed an extensive network of sales and service locations globally to better serve our customers. In certain markets, we utilize joint ventures and independent third-party distributors and sales agents to sell and market products and services. We also host forums and training sessions, such as our Artificial Lift Academy, where our customers can share their experiences, learn best practices and accelerate the application of our technologies.

Our customer base is diverse, and our business does not depend on any single customer.

Intellectual Property

We own a large portfolio of patents, trademarks, licenses and other forms of intellectual property, which we acquired over many years and, to the extent applicable, expire at various times. A large portion of our intellectual property consists of patents, unpatented technology and proprietary information constituting trade secrets that we seek to protect in various ways, including confidentiality agreements with employees, customers, and suppliers where appropriate. We occasionally license third-party intellectual property to supplement our product and service offerings. We also have an active program to protect our intellectual property by filing for patents and registering trademarks around the world and pursuing legal action, when appropriate, to prevent infringement. While our intellectual property is important to our success, the loss or expiration of any of these rights, or any group of related rights, is not likely to materially affect our results of operations on a consolidated basis. We believe that our commitment to continuous engineering improvements, new product development and improved manufacturing techniques, as well as sales, marketing and service expertise, are significant to our leadership positions in the markets we serve.

Research and Development

We operate in markets that are characterized by changing technology and frequent new product introductions. Products and services offered within the oil and gas drilling and production industry will continue to evolve as customers transition to a lower-carbon economy and energy system and regulations related to greenhouse gases, pollution reduction, and alternative energy sources are adopted. As a result, our success is dependent on our ability to develop and introduce new technologies and products for our customers. Technology has become increasingly critical in our industry as global oil and natural gas reservoirs mature, depletion of production accelerates, customers utilize increasingly complex well designs, the industry witnesses an aging oil and gas industry workforce, while customers continue to stress higher operational efficiency from existing infrastructure and systems. Despite fluctuations in the number of wells drilled, exploration & production ("E&P") companies have consistently increased their expenditures on technology to improve oil and natural gas recovery and lower their costs. We have invested substantially in building our research, development, and engineering capabilities and digital and other technology offerings, all of which we believe help our customers minimize risk, achieve production targets, extend field life and maximize profitability in a safe and responsible manner.

Our research and development program focuses on the following activities:

- Developing next-generation technology for all aspects of oil and natural gas production, including both conventional and unconventional, and across the entire life-cycle of a producing asset.
- Accelerating digitally-enabled solutions to automate workflows and eliminate waste in business processes.
- Enhancing our ability to predict, identify and solve our customers' operational challenges with our portfolio of products and services.
- Increasing product reliability and decreasing the cost of the products and services that we bring to market by using innovation to drive operational efficiency.
- Expanding revenue opportunities domestically and internationally.
- Maintaining or extending competitive advantages.

Our key research and development disciplines include analytical and material science, chemical synthesis, formulation science, microbiology, reservoir engineering, software engineering, process and equipment. We also have a robust external innovation program that leverages the capabilities and knowledge of key suppliers and joint development programs with start-up companies. Furthermore, we have a number of technical specialists embedded in key geographies to provide an efficient channel to deploy our new technologies in the major oil and natural gas basins around the world. We believe maintaining a robust innovation and product pipeline will allow us to continue to increase our market share in key businesses and with key customers.

Raw Materials

We use a wide variety of raw materials in manufacturing our products, including inorganic chemicals such as alkalis, acids, biocides, phosphonates, phosphorous materials, silicates and salts. We also use organic chemicals, such as acids, alcohols, amines, fatty acids, surfactants, solvents, monomers, polymers, metals, and semi-processed or finished components. We also purchase packaging materials for our manufactured products and components for our specialized dispensing equipment and systems. We have not historically experienced material impacts to our financial results due to shortages or the loss of any single supplier. Although the required raw materials are generally available, commodity pricing for metals, such as nickel, chrome, molybdenum, vanadium, manganese, and steel scrap fluctuate with market conditions. The reopening of the global economy in connection with the novel coronavirus ("COVID-19") pandemic and the associated tight labor market has resulted in unprecedented inflation in raw material costs. Tariffs also increase our material input costs, and further trade restrictions, retaliatory trade measures, or additional tariffs implemented could result in higher input costs to our products. Although cost increases in commodities may be recovered through increased prices to customers, our operating results are exposed to such fluctuations. We attempt to control such costs through short-duration, fixed-price contracts with suppliers and various other programs, such as our global supply chain initiatives. We source material internationally to achieve the most competitive cost structure. Our global supply chain is intended to provide us with cost-effective solutions for raw materials; however, our supply chain could be exposed to logistical disruptions, and was negatively impacted in 2021 by escalating global freight and transportation costs. We maintain domestic suppliers in most cases to provide for contingencies and back-up sources. Despite contingencies and back-up supply optionality, sustained inflation and unpredictable disruptions to supply and transportation sources could have an adverse impact on our business.

Human Capital

We are a purpose-driven company with a distinctive strategic vision that is focused on improving the lives of our customers, our employees, our shareholders, and the communities where we live and work. We bring more than a century of expertise and the unique skills, perspectives, and experiences of our global team members enable us to realize opportunities for growth, drive unmatched excellence, and contribute exponentially to our success.

Health & Safety; COVID-19

The safety of our employees, customers, shareholders, and communities is vitally important. From the way we operate, to the products we develop, to how we partner with customers, our goal is zero: zero accidents, zero incidents, and zero environmental releases. ChampionX's Health, Safety, and Environmental ("HSE") policy is to conduct business in a manner that protects people, assets, and the environment. All employees are committed to embody our safety culture through personal leadership, engagement, and empowerment. Our organization provides training and a culture of support for our employees to ensure they are equipped and prepared to do their jobs safely every day.

Our businesses are classified as critical infrastructure and it is important to us to protect the health and safety of our employees as we continue to support vital oil and gas infrastructure around the world. We responded to the COVID-19 pandemic with a comprehensive plan including enacting social distancing policies, equipping employees with additional personal protective equipment, and following government and health authority recommended protocols, including those of the Centers for Disease Control and the World Health Organization. Employee surveys demonstrated positive feedback regarding our implementation of protocols, proactive communications and maintaining the safety and health of our employees. Our comprehensive plan included additional paid leave for our employees who needed to recover from the virus or provide care to family members, adjusting the healthcare plan for employees and dependents for any COVID-19 related testing or healthcare expenditures, providing time for employees to get vaccinated, and implementing flexible-work programs to accommodate personal and family needs, especially as schools continued to utilize remote learning, while maintaining business continuity. For additional information, refer to Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Response to the COVID-19 Pandemic.”

Better Together

Our Driven to Improve principle is about eliminating waste, finding efficiencies, and getting better every day. To help us improve, employee feedback is important. We proactively engage with employees through surveys, including inquiries designed towards helping us measure our progress with integration efforts and maintaining our people-oriented, purpose-driven culture, which received positive results. The “Pipeline to the CEO” created in 2020 for employees to give feedback and ask questions, which they may choose to do anonymously, generated substantial engagement across the globe in 2021 on a variety of topics. Our Chief Executive Officer is committed to reading and responding to every message submitted and these are made available to all employees through our internal intranet.

Employee Footprint

At December 31, 2021, we had approximately 7,000 employees in 38 countries, with approximately 68% in North America, 10% in Middle East/Africa, 9% in Latin America, 8% in Europe, and 5% in Asia Pacific. Hiring and retaining top talent is important to our success and we believe our purpose-driven culture differentiates us as an employer of choice.

Diversity & Inclusion

ChampionX is committed to building and fostering a diverse and inclusive workplace where all employees feel a sense of belonging and alignment to our organization’s culture and purpose. We recognize the value of diversity and inclusion in increasing performance and cultivating strong teams. ChampionX currently supports several Employee Resource Groups (“ERG”) that are voluntary employee-led and leadership-supported groups representing unique cultures, experiences, backgrounds and ethnicities. ERGs allow for more purposeful alignment with our business strategy, enhance recruitment efforts and our talent pipeline, support professional development and improve retention, provide skill building and training and mentorship and guidance, and enhance engagement levels across the organization as well as with the communities in which our employees live and work. We are proud that just over 1,000 employees are involved in our ERGs and participate in elevating our goal of creating a workplace culture where everyone feels a sense of belonging.

In further support of our goal of continuous improvement and to strengthen our inclusive culture, we established an enterprise-wide Diversity & Inclusion (“D&I”) Council in 2021 chaired by our CEO. The D&I Council comprises senior leaders from a cross-section of our business and includes a rotating set of ERG leaders who will represent our ERGs and employees to enable and promote our D&I strategy through the following activities:

- Supporting D&I best practices by partnering on initiatives to attract, support, develop, and retain employees from diverse backgrounds.
- Identifying opportunities to develop and expand an appreciation of all cultures through mentoring, training, and coaching.
- Maintaining successful collaboration of ERGs through the promotion of and engagement in D&I activities and initiatives in our communities where we live and work.

The D&I Council focuses on supporting strategies that create an inclusive environment and help ensure our employees are active participants in building an even more robust culture of belonging.

Training & Development

We invest in engaging and developing employees to enable us to realize opportunities for growth and contribute to advancing progress on our strategic priorities. Our ongoing efforts and initiatives are aimed at attracting, engaging, and developing employees in a thoughtful and meaningful way to support a diverse and inclusive culture. Training programs are deployed across the organization in technical skills, product expertise, and health and safety measures, as well as in soft skill development such as communication and other interpersonal skills. In 2021, we launched our first Development Month with employees across the globe participating in 29 virtual sessions. Events ranged from workshops on creating plans for career development and success, improving financial acumen, applying continuous improvement principles and methodologies, and challenging implicit bias, to fireside chats on resiliency, overcoming adversity, and practicing allyship. All employees participate in annual ethics and compliance training at least once a year and we sponsor advanced training in manager essentials and leadership development. We recognize employee performance through incentives tied to our financial goals and strategic objectives, together with employee’s individual achievement.

Regulatory Requirements and Environmental and Occupational Health and Safety Matters

Our operations are subject to a variety of international, national, state, and local laws and regulations, including those relating to the safety of the sale and distribution of chemical substances, the manufacture and use of certain substances, discharge of materials into the environment, costs associated with transporting and managing hazardous materials, waste disposal and plant site cleanup, worker health and safety, or otherwise relating to human health and environmental protection. While we cooperate with governmental authorities and take what we believe are appropriate measures to meet regulatory requirements and avoid or limit environmental effects, environmental risks are inherent in our businesses. Failure to comply with these laws or regulations may result in the assessment of administrative, civil, and criminal penalties, imposition of remedial or corrective action requirements, and the imposition of injunctions to prohibit certain activities or force future compliance.

In addition, we depend on the demand for our products and services from the oil and gas industry and, therefore, are affected by changing taxes, price controls, tariffs and trade restrictions, and other laws and regulations relating to the oil and gas industry in general, including those specifically directed to hydraulic fracturing, onshore production, and air pollution. The adoption of laws and regulations curtailing exploration, drilling, or production in the oil and gas industry, or the imposition of more stringent enforcement of existing regulations, could adversely affect our operations by limiting demand for our products and services or restricting our customers' operations. Refer to Part I, Item 1A, "Risk Factors" for additional information related to certain risks regarding regulations and environmental matters.

We utilize behavioral-based safety practices to promote a safe working environment for all of our employees. Safety is prioritized, measured and promoted throughout all levels of our organization. We continued our "Journey to Zero" program which teaches that all incidents are preventable. The core tenets of our program advocate (i) constant awareness and education of safety principles, (ii) consistent safety behaviors and practices, and (iii) preventing and learning from incidents. Additionally, our operations are subject to a number of federal, state, and foreign laws and regulations relating to workplace safety and worker health, such as the Occupational Safety and Health Act and regulations promulgated thereunder.

Along with numerous other potentially responsible parties ("PRP"), we are currently involved with site clean-up activities pursuant to the federal Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA," also known as "Superfund") or state equivalents at 11 locations, the majority of which are in the U.S. Based on our experience with such environmental proceedings, and an analysis of the estimated share of investigation and remediation costs payable by the PRPs, we have accrued our best estimate of probable future costs relating to these sites. In establishing accruals, potential insurance reimbursements are not included in accruals and the accruals are not discounted. We are unable to predict when, or if, the amounts accrued will be paid due to the uncertainties inherent in the environmental remediation and associated regulatory processes.

We have incurred and will continue to incur operating and capital expenditures to comply with environmental, health and safety laws and regulations. Historically, there were no material effects upon our earnings and competitive position resulting from our compliance with such laws or regulations; however, there can be no assurance that such costs will not be material in the future or that such future compliance will not have a material adverse effect on our business or operational costs.

Website Access to Reports

Our internet website address is https://championx.com. Our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to each of those reports, are available free of charge through our website as soon as reasonably practicable after such material is electronically filed with, or furnished to, the U.S. Securities and Exchange Commission ("SEC"). Alternatively, our reports may be accessed through the website maintained by the SEC at www.sec.gov. Unless expressly noted, the information on our website or any other website is not incorporated by reference in this Annual Report on Form 10-K and should not be considered part of this Annual Report on Form 10-K or any other information we file with or furnish to the SEC.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

Name	Age	Current Position and Business Experience
Sivasankaran Somasundaram	56	President and Chief Executive Officer (2018-present) Vice President of Dover Corporation and President and Chief Executive Officer of Dover Energy (2013-2018)
Kenneth M. Fisher	60	Executive Vice President and Chief Financial Officer (2021-present) Executive Vice President and Chief Financial Officer, Noble Energy, Inc. (2009-2020)
Deric Bryant	49	Chief Operating Officer and President, Chemical Technologies (2020-present) Executive Vice President and President, Upstream—Nalco Champion, an Ecolab company (2019-2020) Executive Vice President and General Manager, Oilfield Chemicals—Nalco Champion, an Ecolab company (2017-2019) Senior Vice President, Oilfield Chemicals—Nalco Champion, an Ecolab company (2016-2017) Vice President, Oilfield Chemicals for Gulf of Mexico, West Africa and Latin America—Nalco Champion, an Ecolab company (2014-2016)
Robert K. Galloway	55	President, Drilling Technologies (2018-present) President—US Synthetic of Dover Corporation (2010-2018)
Paul E. Mahoney	57	President, Production & Automation Technologies (2018-present) President—Dover Artificial Lift of Dover Corporation (2014-2018)
William O’Dell, Jr.	51	President, Oilfield and Specialty Performance (2020-present) Vice President, North America Oilfield Chemicals – Nalco Champion, an Ecolab company (2018-2020) Vice President, Oilfield Chemicals for Gulf of Mexico, Sub Sahara Africa and Latin America—Nalco Champion, an Ecolab company (2017-2018) General Manager, Downstream Americas—Nalco Champion, an Ecolab company (2014-2017)
Syed Raza	55	Senior Vice President and Chief Digital Officer (2018-present) President—Dover Energy Automation of Dover Corporation (2016-2018) Vice President and General Manager—Advanced Solutions of Honeywell Process Solutions (2014-2016)
Julia Wright	46	Senior Vice President, General Counsel and Secretary (2018-present) Senior Vice President, General Counsel and Secretary—Dover Energy of Dover Corporation (2018) Vice President and General Counsel of Nabors Industries Ltd. (2016-2018) Interim General Counsel of Nabors Industries Ltd. (2016) Assistant General Counsel of Nabors Industries Ltd. (2013-2016)
Jordan Zweig	52	Senior Vice President and Chief Human Resources Officer (2020-present) Vice President and Head of Global Human Resources—ChampionX, an Ecolab company (2020) Vice President, Global Human Resources—Ecolab Inc. (2019-2020) Vice President and Head of Global Human Resources—Ecolab Inc. (2017-2019) Vice President and Head of Global Human Resources—Nalco Champion, an Ecolab company (2013-2017)

No family relationships exist among any of the above-listed officers or the members of the Board of Directors, and there are no arrangements or understandings between any of the above-listed officers and any other person pursuant to which they serve as an officer. During the past ten years, none of the above-listed officers was involved in any legal proceedings described in Item 401(f) of Regulation S-K. All officers are elected by the Board of Directors to hold office until their successors are elected and qualified.

ITEM 1A. RISK FACTORS

In addition to other information in this Annual Report on Form 10-K, you should carefully consider the following risk factors. Each of these risk factors could materially and adversely affect our business, results of operations and financial condition, as well as affect the value of an investment in our common stock.

Risks Related to Our Business

Trends in crude oil and natural gas prices may affect the drilling and production activity, profitability and financial stability of our customers and therefore the demand for, and profitability of, our products and services.

The oil and gas industry is cyclical in nature and experiences periodic downturns of varying length and severity. Demand for our products and services is sensitive to the level of capital spending by global oil and natural gas companies and the corresponding drilling and production activity. The level of drilling and production activity is directly affected by trends in crude oil and natural gas prices, which are influenced by numerous factors affecting the supply and demand for oil and gas, including:

- worldwide economic activity, including potential disruption to global trade;
- the level of exploration and production activity;
- the industry cost of, and access to, capital;
- environmental regulation;
- domestic and global political and economic uncertainty, socio-political unrest and instability, terrorism or hostilities;
- U.S. federal, state and foreign government policies and regulations regarding current and future exploration and development of oil and gas;
- the ability and/or desire of OPEC and other major international producers to set and maintain production levels and influence pricing;
- the cost of exploring and producing oil and gas;
- the availability, expiration date and price of onshore and offshore leases;
- the discovery rate of new oil and gas reserves in onshore and offshore areas;
- the success of drilling for oil and gas in unconventional resource plays such as shale formations;
- the depletion rate of existing oil and gas wells in productions;
- takeaway capacity within oil and gas producing basins;
- alternative investments in onshore exploration and production opportunities;
- shifts in business and personal travel with increased adoption of remote work arrangements;
- the COVID-19 pandemic or other health pandemics and epidemics;
- exceptional weather conditions, including severe weather events in the U.S. Gulf Coast; and
- the pace of adoption and cost of developing alternative energy sources.

We expect continued volatility in both crude oil and natural gas prices (including the possibilities that such prices could remain at current levels or decline further for an extended period of time), as well as in the level of drilling and production related activities as a result of the continuing COVID-19 pandemic, decisions of OPEC and other oil exporting nations regarding production, and the other factors listed above. Our ability to modify and adopt our operating activities in response to lower oilfield service activity levels during periodic industry downturns or in the transition to a lower carbon economy is important to our business, results of operations and prospects. However, a significant further decline and/or extended continuation of the recent downturn in the industry could continue to impact demand for our products and services and could have a material adverse effect on our business, results of operations, financial condition and cash flows, and could result in asset impairments, including an impairment of the carrying value of our goodwill, along with other accounting charges.

We could lose customers or generate lower revenue, operating profits and cash flows if there are significant increases in the cost of raw materials or if we are unable to obtain raw materials.

We purchase raw materials, sub-assemblies and components for use in manufacturing operations, which exposes us to volatility in prices for certain commodities. Significant price increases for these commodities could adversely affect our operating profits. Like others in our industry, in 2021 we faced, and continue to face, unprecedented inflation in raw materials cost. In addition to general inflationary pressures relating to the global economy reopening, we experienced a severe winter storm in Texas in the early months of 2021 that resulted in raw materials supply chain disruptions, which led to short-term raw materials cost inflation during the first half of 2021. While we will generally attempt to mitigate the impact of increased raw material prices by endeavoring to make strategic purchasing decisions, broadening our supplier base and passing along increased costs to customers, there may be a time delay between the increased raw material prices and the ability to increase the prices of our products. Additionally, we may be unable to increase the prices of products due to the terms of existing contracts, a competitor's pricing pressure or other factors. The inability to obtain necessary raw materials on acceptable terms could affect our ability to meet customer commitments and satisfy demand for certain products. Certain of our product lines depend on a limited number of third-party suppliers and vendors. The ability of these third parties to deliver raw materials may be affected by events beyond our control. In addition, public health threats, such as COVID-19, severe influenza and other highly communicable viruses or diseases could limit access to vendors and their facilities, or the ability to transport raw materials from our vendors, which would adversely affect our ability to obtain necessary raw materials for certain of our products or increase the costs of such materials. A significant price increase in or the unavailability of raw materials may result in a loss of customers and adversely impact our business, results of operations, financial condition and cash flows, and could result in asset impairments, including an impairment of the carrying value of our goodwill.

Continuing inflation and cost increases may impact our sales margins and profitability.

Cost inflation including significant increases in wholesale product costs, labor rates, and domestic transportation costs have and could continue to impact profitability. There is no guarantee that we can increase selling prices or reduce costs to fully mitigate the effect of inflation on our costs, which may adversely impact our sales margins and profitability.

We might be unable to successfully compete with other companies in our industry.

The business in which we operate is highly competitive. The principal competitive factors are customer service, product quality and performance, price, breadth of product offering, local content and geographic footprint, technical expertise and innovation. In some of our product and service offerings, we compete with the oil and gas industry's largest oilfield service providers. These large national and multi-national companies may have longer operating histories, greater brand recognition, and a stronger presence in geographies than us. They may also have more robust organizational and technical capabilities. In addition, we compete with many smaller companies capable of effectively competing on a regional or local basis. Our competitors may be able to respond more quickly to new or emerging technologies and services and for changes in customer requirements. Many contracts are awarded on a bid basis, which further increases competition based on price. As a result of the competitive environment in which we operate, we may lose competitive share, be unable to maintain or increase prices for our products and services, or be unable to develop new business opportunities, which could have a material adverse effect on our business, results of operations, financial condition and cash flows.

If we are unable to develop new products and technologies, our competitive position may be impaired, which could materially and adversely affect our sales and market share.

The businesses in which we operate are characterized by changing technologies and the introduction of new products and services. As a result, our success is dependent upon our ability to develop or acquire new products and services on a cost-effective basis, to introduce them into the marketplace in a timely manner, and to protect and maintain critical intellectual property assets related to these developments. Difficulties or delays in research, development or production of new products and technologies, or failure to gain customer acceptance of new products and technologies, may significantly reduce future revenue and materially and adversely affect our competitive position. While we intend to continue to commit financial resources and effort to the development of new products and services, our ability to do so may be impacted by the prolonged industry downturn and/or we may not be able to successfully differentiate our products and services from those of our competitors. Our customers may not consider our proposed products and services to be of value to them or may not view them as superior to our competitors' products and services. In addition, our competitors or customers may develop new technologies which are similar to, or improvements on, our existing technologies.

Further, we may not be able to adapt to evolving customer needs and technologies, including the transition to a lower-carbon economy and energy system by our customers, develop new products, and achieve and maintain technological advantages in developing products and services in support of the evolving industry. If we do not successfully compete through the development and introduction of new products and technologies, our business, results of operations, financial condition and cash flows could be materially adversely affected.

Our growth and results of operations may be adversely affected if we are unable to complete third party acquisitions on acceptable terms and integrate such acquisitions.

Over time, it is expected that we will acquire value creating, bolt-on capabilities that broaden our existing technological, geographic and cost position, thereby complementing our businesses. However, there can be no assurance that we will be able to find suitable opportunities to purchase or acquire such capabilities on acceptable terms. If we are unsuccessful in our acquisition efforts, our revenue growth could be adversely affected. In addition, we face the risk that a completed acquisition may underperform relative to expectations. We may not achieve the synergies originally anticipated, may become exposed to unexpected liabilities, or may not be able to sufficiently integrate completed acquisitions into our then current business and growth model. These factors could potentially have an adverse impact on our business, results of operations, financial condition and cash flows.

Our products are used in operations that are subject to potential hazards inherent in the oil and gas industry and, as a result, we are exposed to potential liabilities that may affect our financial condition and reputation.

Our products are used in potentially hazardous drilling, completion and production applications in the oil and gas industry where an accident or a failure of a product can potentially have catastrophic consequences. Risks inherent in these applications, such as equipment malfunctions and defects, failures, equipment misuse, explosions, blowouts and uncontrollable flows of oil, natural gas or well fluids can cause personal injury, loss of life, suspension of operations, damage to formations, damage to facilities, business interruption and damage to or destruction of property, surface and drinking water resources, equipment and the environment. While we currently maintain insurance protection against some of these risks and seek to obtain indemnity agreements from our customers requiring them to hold us harmless from some of these risks, our current insurance and contractual indemnity protection may not be sufficient or effective enough to protect us under all circumstances or against all risks. The occurrence of a significant event not fully insured or indemnified against, or the failure of a customer to meet its indemnification obligations to us could adversely affect our business, results of operations, financial condition and cash flows.

A chemical spill or release could materially and adversely affect our business.

As a manufacturer and supplier of chemical products, there is a potential for chemicals to be accidentally spilled, released or discharged, either in liquid or gaseous form, during production, transportation, storage or use. Such a release could result in environmental contamination as well as a human or animal health hazard, and result in significant remediation costs for us and potential disruption for, and damage to, our manufacturing facilities, customers, communities, and other stakeholders. Accordingly, such a release could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Our industry is undergoing continuing consolidation that may impact our results of operations.

The oil and gas industry continues to experience business consolidations and as a result, some of our largest customers have combined and are using their size and purchasing power to seek economies of scale and pricing concessions. This consolidation may result in reduced capital spending by some of our customers or the acquisition of one or more of our primary customers, which may lead to decreased demand for our products and services. There is no assurance that we will be able to maintain our level of sales to a customer that has consolidated, or replace that revenue with increased business activity with other customers. As a result, the acquisition of one or more of our primary customers may have a significant adverse impact on our business, results of operations, financial condition and cash flows. We are unable to predict what effect consolidations in the industry may have on prices, capital spending by our customers, our selling strategies, our competitive position, our ability to retain customers or our ability to negotiate favorable agreements with our customers.

The credit risks of our customer base could result in losses.

The majority of our customers are oil and gas companies that have faced or may in the future face liquidity constraints during adverse commodity price environments. These customers are also affected by prolonged changes in economic and industry conditions such as the COVID-19 pandemic and volatility in oil and gas prices as a result of associated changes in demand for such commodities. If a significant number of our customers experience prolonged business declines, disruptions, or bankruptcies, we may incur increased exposure to credit risk and losses from bad debts.

The loss of one or more significant customers could have an adverse impact on our financial results.

Our customers represent a combination of some of the largest operators in the oil and gas drilling and production markets, including major integrated, large, medium and small independents, and foreign national oil and gas companies, as well as oilfield equipment and service providers. While no single customer accounted for net sales equal to 10 percent or more of total revenues for the previous four years, and we are not dependent on any one customer or group of customers, the loss of one or more of our significant customers could have an adverse effect on our business, results of operations, financial condition and cash flows.

We are subject to information technology, cybersecurity and privacy risks.

We depend on various information technologies and other products and services to store and process business information and otherwise support our business activities. We also manufacture and sell hardware and software to provide monitoring, controls and optimization of customer critical assets in oil and gas production and distribution. In addition, certain of our customer offerings include digital components, such as remote monitoring of certain customer operations. We also provide services to maintain these systems. Additionally, our operations rely upon partners, suppliers and other third-party providers of information technology and other products and services. If any of these information technologies, products or services are damaged, cease to properly function, are breached due to employee error, malfeasance, system errors, or other vulnerabilities, or are subject to cybersecurity attacks, such as those involving unauthorized access, malicious software and/or other intrusions, we and our partners, suppliers or other third parties could experience: (i) production downtimes, (ii) operational delays, (iii) the compromising of confidential, proprietary or otherwise protected information, including personal and customer data, (iv) destruction, corruption, or theft of data, (v) security breaches, (vi) other manipulation, disruption, misappropriation or improper use of our systems or networks, (vii) hydrocarbon pollution from loss of containment, (viii) financial losses from remedial actions, (ix) loss of business or potential liability, (x) adverse media coverage, and (xi) legal claims or legal proceedings, including regulatory investigations and actions, and/or damage to our reputation. While we attempt to mitigate these risks by employing a number of measures, including employee training, technical security controls and maintenance of backup and protective systems, the Company's and our customers', partners', vendors' and other third- parties' systems, networks, products and services remain potentially vulnerable to known or unknown cybersecurity attacks and other threats, any of which could have a material adverse effect on our business, results of operations, financial condition and cash flows.

We are subject to risks relating to existing international operations and expansion into new geographical markets.

We continue to focus on expanding sales globally as part of our overall growth strategy and expect sales from outside the United States to continue to represent a significant and growing portion of our revenue. Our international operations and global expansion strategy are subject to general risks related to such operations, including:

- political, social and economic instability and disruptions;
- export controls, economic sanctions, embargoes or trade restrictions;
- the imposition of duties and tariffs and other trade barriers;
- limitations on ownership and on repatriation or dividend of earnings;
- transportation delays and interruptions;
- labor unrest and current and changing regulatory environments;
- increased compliance costs, including costs associated with disclosure requirements and related due diligence;
- difficulties in staffing and managing multi-national operations;
- limitations on our ability to enforce legal rights and remedies;
- access to or control of networks and confidential information due to local government controls and vulnerability of local networks to cyber risks; and
- fluctuations in foreign currency exchange rates.

If we are unable to successfully manage the risks associated with expanding our global business or adequately manage operational risks of our existing international operations, these risks could have a material adverse effect on our growth strategy into new geographical markets, our reputation, our business, results of operations, financial condition and cash flows.

Dependence on joint ventures and other local partners could adversely affect our profits.

We conduct some operations through joint ventures in which unaffiliated third parties may control or have significant influence on the operations of the joint venture. As with any joint venture arrangement, differences in views among the joint venture participants may result in the joint venture operating in a manner that is contrary to our preference, delayed decisions or in failures to agree on major issues. These factors could have a material adverse effect on the business and results of operations of our joint ventures and, in turn, our business and consolidated results of operations.

In addition to joint ventures, we rely on local third-party partners in a number of foreign jurisdictions to provide various services in support of our product sales, including sales and distribution, installation, field service, technical support, and the provision of equipment and personnel. If a local partner is unwilling or unable to deliver its services for any reason including, but not limited to, a dispute with us, the deterioration of its financial condition or a loss of personnel, we may be unable to engage an alternative partner or subcontractors to perform the same services, or on terms substantially similar to those with our existing partners. The failure to do so may cause us to breach the terms of existing contracts, impede our ability to complete orders, and/or result in damage to our customer relationships in that jurisdiction, any of which may damage our reputation and have a material adverse effect on our business in the impacted jurisdiction.

The COVID-19 pandemic and related economic repercussions have had, and may continue to have, an adverse effect on our business, liquidity, consolidated results of operations and consolidated financial condition.

The ongoing COVID-19 pandemic has resulted in periodic disruptions in demand for oil and gas commodities as various jurisdictions have attempted to implement or have implemented measures designed to contain the spread of the virus. The ongoing pandemic has related economic repercussions that could adversely impact our business, results of operations, financial condition and cash flows and include, but are not limited to:

- disruptions to our supply chain resulting from our limited access to our vendors, our vendors' limited access to their facilities or our ability to transport raw materials from our vendors, adversely affecting the price of, or our ability to obtain, materials essential to our products and our business which could result in a loss of customers and revenue;
- reduction in revenues as a result of lower demand for our products as upstream oil and gas companies across the industry reduce their drilling activities, lower budgeted capital expenditures and institute additional capital discipline measures;
- liquidity challenges, including impacts related to delayed customer payments and payment defaults associated with customer liquidity issues and bankruptcies, and, if a significant number of our customers experience a prolonged business decline or disruption, we may incur increased exposure to credit risk and bad debts; and
- workforce availability resulting from (i) exposure to or contraction of the virus, (ii) reluctance to comply with any vaccine, testing or other mandates that may be imposed by governmental regulations or other legal or contractual requirements, or (iii) the challenges to working caused by the COVID-19 pandemic and related restrictions, which may have an impact on our employees' wellness, which could impact employee retention, productivity and our culture.

Our operations could be adversely affected by global market and economic conditions in ways we may not be able to predict or control.

Concerns over global economic conditions, inflation, energy costs, geopolitical issues, supply chain disruptions, the availability and cost of credit and the worldwide COVID-19 pandemic have contributed to increased economic uncertainty. An economic slowdown or recession in the United States or in any other country that significantly affects the supply of or demand for oil or natural gas could negatively impact our operations and therefore adversely affect our results. Global economic conditions have a significant impact on oil and natural gas prices and any stagnation or deterioration in global economic conditions could result in less demand for our services and could cause our customers to reduce their planned spending on drilling and production activity. Adverse global economic conditions may cause our customers, vendors and/or suppliers to lose access to the financing necessary to sustain or increase their current level of operations, fulfill their commitments and/or fund future operations and obligations. Furthermore, challenging economic conditions may result in certain of our customers experiencing bankruptcy or otherwise becoming unable to pay vendors, including us. In the past, global economic conditions, and expectations for future global economic conditions, have sometimes experienced significant deterioration in a relatively short period of time and there can be no assurance that global economic conditions or expectations for future global economic conditions will recover in the near term or not quickly deteriorate again due to one or more factors. These conditions could have a material adverse effect on our business, financial condition and results of operations.

Failure to attract, retain and develop personnel could have an adverse effect on our results of operations, financial condition and cash flows.

The delivery of our services and products requires personnel with specialized skills and experience, and our growth, profitability and effectiveness in conducting our operations and executing our strategic plans depend in part on our ability to attract, retain and develop qualified personnel, and align them with appropriate opportunities for key management positions. We may experience employee turnover or labor shortages if our business requirements and/or expectations about when and how often employees work either on-site or remotely are inconsistent with the expectations of our employees or if employees pursue employment in fields with less volatility than in the energy industry. Additionally, during periods of increased investment in the oil and gas industry, competition for qualified personnel may increase and the availability of qualified personnel may be further constrained. Although we believe we generally offer competitive compensation packages, our costs of operations and selling, general and administrative expenses could increase in the future if required to attract and retain qualified personnel and there is no assurance that the prices of our products and services could be increased to offset any such increases. If we are unsuccessful in our efforts to attract and retain sufficient qualified personnel on terms acceptable to us, or do so at rates necessary to maintain our liquidity and competitive position, our business, results of operations, financial condition, cash flows, and market share could be adversely affected.

The inability to protect or obtain patent and other intellectual property rights could adversely affect our revenue, operating profits and cash flows.

We own patents, trademarks, licenses and other intellectual property related to our products and services, and we continuously invest in research and development that may result in innovations and intellectual property rights. We employ various measures to develop, maintain and protect our innovations and intellectual property rights. These measures may not be effective in capturing intellectual property rights, and they may not prevent our intellectual property from being challenged, invalidated, circumvented, infringed, misappropriated or otherwise violated, particularly in countries where intellectual property rights are not highly developed or protected. We also may not be successful in fully protecting innovations and intellectual property we develop or acquire. In addition, if licenses to certain intellectual property are no longer available, we may not be able to continue providing services or products relating to that license, which could adversely affect our financial condition, results of operations and cash flows. Unauthorized use of our intellectual property rights and any potential litigation we may initiate or have initiated against us in respect of our intellectual property rights could adversely impact our competitive position and have a negative impact on our business, results of operations, financial condition and cash flows.

Natural disasters and unusual weather conditions could have an adverse impact on our business.

Our business could be materially and adversely affected by natural disasters or severe weather conditions, including the effects of climate change. Hurricanes, tropical storms, flash floods, blizzards, cold weather and other natural disasters or severe weather conditions, which may increase in frequency or intensity as a result of climate change, could result in evacuation of personnel, curtailment of services, damage to equipment and facilities, interruption in transportation of products and materials and loss of productivity. For example, certain of our manufactured products and components are manufactured at a single facility, and disruptions in operations or damage to any such facilities could reduce our ability to manufacture our products and satisfy customer demand. If our customers are unable to operate or are required to reduce operations due to natural disasters or severe weather conditions, our business could be adversely affected as a result of curtailed deliveries of our products and services. Our headquarters and certain manufacturing facilities are located in the U.S. Gulf Coast and this region is also home to many of our customers and suppliers. Hurricanes or other severe weather events impacting the Gulf Coast could materially and adversely affect our operations, our ability to obtain raw materials at reasonable cost, or at all, and our customers in the region.

Risks Related to Financial Condition and Markets

Investor sentiment towards climate change, fossil fuels and other ESG matters could adversely affect our access to and cost of capital and stock price.

There have been efforts within the investment community (including investment advisors, investment fund managers, sovereign wealth funds, public pension funds, universities and individual investors) to promote the divestment of, or limit investment in, the stock of companies in the oil and gas industry. There has also been pressure on lenders and other financial services companies to limit or curtail financing of companies in the oil and gas industry. If these efforts continue or expand, our stock price and our ability to raise capital may be negatively impacted.

Members of the investment community are also increasing their focus on ESG practices and disclosures, including practices and disclosures related to climate change and sustainability, D&I initiatives, and heightened governance standards, among companies more generally. As a result, we may continue to face increasing pressure regarding our ESG disclosures and practices. Over the past few years, there has also been an acceleration in investor demand for ESG investing opportunities, and many large institutional investors have committed to increasing the percentage of their portfolios that are allocated towards ESG investments. With respect to any of these investors, our ESG disclosures and efforts may not satisfy the investor requirements or their requirements may not be made known to us. If we are unable to meet the ESG standards or investment criteria set by these investors and funds, we may lose investors or investors may allocate a portion of their capital away from us, our cost of capital may increase, and our stock price may be negatively impacted.

Restrictions imposed by our debt instruments may limit the ability of our subsidiaries to operate their business and to finance their future operations or capital needs or to engage in other business activities.

The terms of our debt instruments restrict certain of our subsidiaries from engaging in specified types of transactions. These covenants restrict the ability of the Company and our restricted subsidiaries, among other things, to:

- incur or guarantee additional indebtedness;
- pay dividends on capital stock or redeem, repurchase or retire capital stock or indebtedness, as applicable;
- make investments, loans, advances and acquisitions;
- engage in transactions with our affiliates;

- sell assets, including capital stock of subsidiaries; and
- consolidate or merge.

In addition, the debt instruments contain certain financial maintenance covenants. Our ability to comply with these restrictions can be affected by events beyond our control, and we may not be able to maintain compliance with them. A breach of any of these covenants would be an event of default.

In the event of a default under any of the debt instruments, the lenders could elect to declare all amounts outstanding under such debt instruments to be immediately due and payable, or in the case of our revolving credit facility, may terminate their commitments to lend additional money. If the indebtedness under any of our debt instruments were to be accelerated, our assets may not be sufficient to repay such indebtedness in full. In addition, our senior secured credit facilities are secured by substantially all of our and our domestic subsidiaries' assets. If an event of default occurs under our debt instruments, the lenders could exercise their rights under the related security documents, and an event of default may be triggered under other debt instruments. Any acceleration of amounts due under our debt instruments or the substantial exercise by the lenders of their rights under the security documents would have a material adverse effect on us.

Our exposure to exchange rate fluctuations on cross-border transactions and the translation of local currency results into U.S. dollars could negatively impact our results of operations.

A portion of our business is transacted and/or denominated in foreign currencies, and fluctuations in currency exchange rates or the inability to exchange or repatriate foreign currencies could have a significant impact on our results of operations, financial condition and cash flows, which are presented in U.S. dollars. Cross-border transactions, both with external parties and intercompany relationships, result in increased exposure to foreign exchange effects. Although the impact of foreign currency fluctuations on our results of operations has historically not been material, significant changes in currency exchange rates, could negatively affect our results of operations. Additionally, a future strengthening of the U.S. dollar potentially exposes us to competitive threats from lower cost producers in other countries and could result in unfavorable translation effects as the results of foreign locations are translated into U.S. dollars for reporting purposes.

Our indebtedness could adversely affect our financial condition and operating flexibility.

Our ability to make payments on, and to refinance, our indebtedness, as well as any future indebtedness that we may incur, will depend upon the level of cash flows generated by our operations, our ability to sell assets, availability under our revolving credit facility and our ability to access the capital markets and/or other sources of financing. Our ability to generate cash is subject to general economic, industry, financial, competitive, legislative, regulatory and other factors that are beyond our control. If we are not able to repay or refinance our indebtedness as it becomes due, we may be forced to sell assets or take other disadvantageous actions, including (i) reducing financing in the future for working capital, capital expenditures, acquisitions and general corporate purposes or (ii) dedicating an unsustainable level of cash flow from operations to the payment of principal and interest on the indebtedness. In addition, our ability to withstand competitive pressures and to react to changes in the oil and gas industry could be impaired.

Disruptions in the capital and credit markets, low commodity prices, our debt level and other factors may restrict our ability to raise capital on favorable terms, or at all.

Disruptions in the capital and credit markets, in particular with respect to companies in the energy sector, could limit our ability to access these markets or may significantly increase our cost to borrow. Continued low commodity prices, among other factors, have caused some lenders to increase interest rates, enact tighter lending standards which we may not satisfy as a result of our debt level or otherwise, refuse to refinance existing debt at maturity on favorable terms, or at all, and in certain instances have reduced or ceased to provide funding to borrowers. If we are unable to access the capital and credit markets on favorable terms or at all, it could adversely affect our business, financial condition, results of operations and cash flows.

Risks Related to the Merger

We may not realize the anticipated cost synergies and growth opportunities from the Merger.

We expect to realize cost synergies, growth opportunities and other financial and operating benefits as a result of the Merger. Our success in realizing these benefits, and the timing of this realization, depends on the successful integration of the Chemical Technologies business operations with the Company. Even if we are able to integrate the Chemical Technologies business successfully, we cannot predict with certainty if or when these cost synergies, growth opportunities and benefits will occur, or the extent to which they will actually be achieved.

The integration of the Chemical Technologies business following the Merger may present significant challenges.

There is a significant degree of difficulty inherent in the process of integrating the Chemical Technologies business with the Company. These difficulties include the ability to ensure the effectiveness of internal control over financial reporting, integrating certain information technology, accounting, finance, and other systems, and retention of key officers and personnel.

The successful or cost-effective integration of the Chemical Technologies business cannot be assured. The failure to do so could have a material adverse effect on our business, financial condition or results of operations.

Our ability to engage in certain activities competitive with Ecolab is limited.

In connection with the Merger, the Chemical Technologies business is restricted from competing in the water and downstream fields of use for three years following the Merger, subject to certain exceptions set forth in the Separation and Distribution Agreement. In addition, Ecolab may have the ability to terminate certain rights, including patent licenses, if the Chemical Technologies business begins to compete in the downstream or water fields of use even after the expiration of the non-compete period. These restrictions may limit our ability to engage in certain activities, may potentially lead to disputes and may materially and adversely affect our business, financial condition and results of operations.

We may be obligated to indemnify Ecolab for certain tax liability imposed on Ecolab, which could be significant.

Immediately prior to the Merger, Ecolab received an opinion of its counsel (the “Distribution Tax Opinion”), substantially to the effect that the contribution of Ecolab’s upstream energy business to ChampionX Holding Inc. (the “Contribution”) and the distribution of the shares of ChampionX Holding Inc. (“legacy ChampionX”) to certain shareholders of Ecolab immediately prior to legacy ChampionX’s merger with our subsidiary (the “Distribution”), taken together, will qualify as a transaction described in Sections 355 and 368(a)(1)(D) of the Internal Revenue Code of 1986, as amended (the “Code”), and an opinion from KPMG LLP (“KPMG”), that addressed the tax treatment of certain aspects of the Contribution, Distribution and the Merger (the “KPMG Tax Opinion”). Except for certain taxable income or gain possibly arising as a result of certain internal restructuring transactions and certain “intercompany transactions,” Ecolab will not recognize any gain or loss as a result of the Distribution. Neither the Distribution Tax Opinion nor the KPMG Tax Opinion are binding on the Internal Revenue Service (the “IRS”) (or any applicable foreign taxing authorities) or the courts, and the IRS (or any applicable foreign taxing authorities) or the courts may not agree with the conclusions reached therein. There can be no assurance that the IRS (or any applicable foreign taxing authorities) will not successfully assert that the Distribution, or certain internal restructuring transactions undertaken in the separation of the Chemical Technologies business from Ecolab, are taxable transactions, and that a court will not sustain such assertion, which could result in tax being incurred by Ecolab.

Even if the Contribution and Distribution, taken together, otherwise qualify as a transaction described in Sections 355 and 368(a)(1)(D) of the Code, the Distribution will nonetheless be taxable to Ecolab if one or more persons acquire a 50% or greater interest in the stock of Ecolab or legacy ChampionX, directly or indirectly (including through acquisitions of the stock of the Company after the Merger), as part of a plan or series of related transactions that includes the Distribution. If the IRS were to determine that other acquisitions of Ecolab stock, either before or after the Distribution, or the Company’s stock after the Merger, are part of a plan or series of related transactions that includes the Distribution, such determination could result in the recognition of gain by Ecolab for U.S. federal income tax purposes, and the amount of taxes on such gain could be substantial.

Under the Tax Matters Agreement, we may be obligated, in certain cases, to indemnify Ecolab against taxes and certain tax-related losses of the Contribution, separation of the Chemical Technologies business from Ecolab, Distribution or Merger (collectively, the “Transactions”) that arise as a result of our actions, or failure to act. Any such indemnification obligation would likely be substantial and would likely have a material adverse effect on us.

We are restricted from taking certain actions that could adversely affect the intended tax treatment of the Transactions, and such restrictions could significantly impair our ability to implement strategic initiatives that otherwise would be beneficial.

The Tax Matters Agreement generally restricts us from taking certain actions after the Distribution that could adversely affect the intended tax treatment of the Transactions. Failure to adhere to these restrictions could result in tax being imposed on Ecolab for which we could bear responsibility and for which we could be obligated to indemnify Ecolab. Any such indemnification obligation would likely be substantial and would likely have a material adverse effect on us. In addition, even if we are not responsible for tax liabilities of Ecolab under the Tax Matters Agreement, legacy ChampionX nonetheless could be liable under applicable tax law for such liabilities if Ecolab were to fail to pay such taxes. Because of these provisions in the Tax Matters Agreement, we are restricted from taking certain actions, particularly for the two (or, in certain cases three) years following the Merger, including (among other things) the ability to freely issue stock, to make acquisitions and to raise additional equity capital. These restrictions could have a material adverse effect on our liquidity and financial condition, and otherwise could impair our ability to implement strategic initiatives. Also, our indemnity obligation to Ecolab might discourage, delay or prevent a change of control that our shareholders may consider favorable.

Legal and Regulatory Risks

War, terrorism or civil unrest could harm our business.

Due to the unsettled political conditions in many natural gas and oil-producing countries, our operations, revenue and profits are subject to adverse consequences of war, terrorism, civil unrest, strikes, currency controls, and governmental actions. These risks could result in the loss of our personnel or assets, cause us to evacuate our personnel from certain countries, cause us to increase spending on security worldwide, cause us to cease operating in certain countries, disrupt financial and commercial markets, including the supply of and pricing for oil and natural gas, and generate political and economic instability in some of the geographic areas in which we operate. Areas where we operate that have significant risks include, but are not limited to, the Middle East, North Africa, West Africa, the Caspian Sea region, Southeast Asia and Indonesia, Mexico, Russia, and Venezuela and other countries in South America. In addition, any possible reprisals as a consequence of military or other action, such as acts of terrorism in the United States or elsewhere, could have a material adverse effect on our business, results of operations and financial condition.

Federal, state and local legislative and regulatory initiatives relating to oil and gas development and the potential for related litigation could result in increased costs and additional operating restrictions or delays for our customers, which could reduce demand for our products.

Environmental laws and regulations could limit our customers' exploration and production activities. Although we do not directly engage in drilling or hydraulic fracturing activities, we provide products and services to operators in the oil and gas industry. There has been significant growth in opposition to oil and gas development both in the United States and globally. This opposition is focused on attempting to limit or stop hydrocarbon development in certain areas. Examples of such opposition include: (i) efforts to reduce access to public and private lands, (ii) delaying or canceling permits for drilling or pipeline construction, (iii) limiting or banning industry techniques such as hydraulic fracturing, and/or adding restrictions on the use of water and associated disposal, (iv) delaying or denying air-quality permits, and (v) advocating for increased regulations, punitive taxation, or citizen ballot initiatives or moratoriums on industry activity.

In addition, various state and local governments have implemented, or are considering, increased regulatory oversight of oil and gas development through additional permitting requirements, operational restrictions, including on the time, place and manner of drilling activities, disclosure requirements and temporary or permanent bans on hydraulic fracturing or other facets of crude oil and natural gas exploration and development in certain areas such as environmentally sensitive watersheds. Increased regulation and opposition to oil and gas activities could increase the potential for litigation concerning these activities, and could include companies who provide products and services used in hydrocarbon development, such as us.

The adoption of new laws or regulations at the federal, state, or local levels imposing reporting obligations, or otherwise limiting or delaying hydrocarbon development, could make it more difficult for our customers to complete oil and gas wells, increase our customers' costs of compliance and doing business, and otherwise adversely affect the oil and gas activities they pursue. Such developments could negatively impact demand for our products and services. In addition, heightened political, regulatory and public scrutiny, including lawsuits, could expose us or our customers to increased legal and regulatory proceedings, which could be time-consuming, costly, or result in substantial legal liability or significant reputational harm. We could be directly affected by adverse litigation or indirectly affected if the cost of compliance or the risks of liability limit the ability or willingness of our customers to operate. Such costs and scrutiny could directly or indirectly, through reduced demand for our products and services, have a material adverse effect on our business, results of operations, financial condition and cash flows.

We and our customers are subject to extensive environmental and health and safety laws and regulations that may increase our costs, limit the demand for our products and services or restrict our operations.

Our operations and the operations of our customers are subject to numerous and complex federal, state, local and foreign laws and regulations relating to the protection of human health, safety and the environment. These laws and regulations may adversely affect us by limiting or curtailing our customers' exploration, drilling and production activities, impacting the products and services we design, market and sell and the facilities where we manufacture our products. For example, our operations and the operations of our customers are subject to numerous and complex laws and regulations that, among other things: may regulate the management and disposal of hazardous and non-hazardous wastes; may require acquisition of environmental permits related to our operations; may restrict the types, quantities and concentrations of various materials that can be released into the environment; may limit or prohibit operational activities in certain ecologically sensitive and other protected areas; may regulate specific health and safety criteria addressing worker protection; may require compliance with operational and equipment standards; may impose testing, reporting and record-keeping requirements; and may require remedial measures to mitigate pollution from former and ongoing operations. Sanctions for noncompliance with such laws and regulations may include revocation of permits, corrective action orders, administrative or civil penalties, criminal prosecution and the imposition of injunctions to prohibit certain activities or force future compliance.

Some environmental laws and regulations provide for joint and several strict liability for remediation of spills and releases of hazardous substances. In addition, we or our customers may be subject to claims alleging personal injury or property damage as a result of alleged exposure to hazardous substances, as well as damage to natural resources. These laws and regulations may expose us or our customers to liability for the conduct of or conditions caused by others, or for our acts or for the acts of our customers that were in compliance with all applicable laws and regulations at the time such acts were performed. Any of these laws and regulations could result in claims, fines or expenditures that could be material to our business, results of operations, financial condition and cash flows.

Environmental laws and regulations, and the interpretation and enforcement thereof, frequently change, and have tended to become more stringent over time. New laws, regulations treaties, or international agreements related to greenhouse gases and climate change, including incentives to conserve energy or use alternative energy sources, may have a material adverse effect on our customers by limiting or curtailing their exploration, drilling, and production activities, which may adversely affect our operations by limiting demand for our products and services. Additionally, the implementation of new laws and regulations may have a material adverse effect on our operating results by requiring us to modify our operations or products or shut down some or all of our facilities.

Various laws and regulations exist or are under development that seek to regulate the emission of greenhouse gases (“GHG”), including establishing GHG “cap and trade” programs, increased efficiency standards, participation in international climate agreements, issuance of executive orders by the U.S. presidential administration and incentives or mandates for pollution reduction, use of renewable energy sources, or use of alternative fuels with lower carbon content. Any regulation of GHG emissions could result in increased compliance costs or additional operating restrictions for us and/or our customers and limit or curtail exploration, drilling and production activities of our customers, which could directly or indirectly, through reduced demand for our products and services, adversely affect our business, results of operations, financial condition and cash flows.

Our reputation, ability to do business and results of operations may be impaired by violations of U.S. and international laws and regulations regarding, anti-bribery, trade control, trade sanctions, anti-corruption and similar laws.

Our operations require us to comply with a number of U.S. and international laws and regulations, including those relating to anti-corruption, anti-bribery, fair competition, export and import compliance, money laundering and data privacy. In particular, our international operations are subject to the regulations imposed by the Foreign Corrupt Practices Act and the United Kingdom Bribery Act 2010 as well as anti-bribery and anti-corruption laws of various jurisdictions in which we operate. While we strive to maintain high ethical standards and robust internal controls, we cannot provide assurance that our internal controls and compliance systems will always protect us from acts committed by our employees, agents or business partners that would violate such U.S. or international laws or regulations. Any such violations of law or improper actions could subject us to civil or criminal investigations in the United States or other jurisdictions, could lead to substantial civil or criminal, monetary and non-monetary penalties and related shareholder lawsuits, could lead to increased costs of compliance and could damage our reputation, business, results of operations, financial condition and cash flows.

Tariffs and other trade measures could adversely affect our results of operations, financial position and cash flows.

In 2020, the U.S. government continued to impose tariffs on steel and aluminum and a broad range of other products imported into the United States. In response to the tariffs imposed by the U.S. government, a number of jurisdictions, including the European Union, Canada, Mexico, India and China announced tariffs on U.S. goods and services. These tariffs have increased our material input costs, and any further trade restrictions, retaliatory trade measures and additional tariffs could result in higher input costs for our products. We may not be able to fully mitigate the impact of these increased costs or pass price increases on to our customers. While tariffs and other retaliatory trade measures imposed by other countries on U.S. goods have not yet had a significant impact on our business or results of operations, we cannot predict further developments, and such existing or future tariffs could have a material adverse effect on our results of operations, financial position and cash flows.

Changes in domestic and foreign governmental laws, regulations and policies, risks associated with emerging markets, changes in statutory tax rates and laws, and unanticipated outcomes with respect to tax audits could adversely affect our business, profitability and reputation.

Our domestic and international sales and operations are subject to risks associated with changes in laws, regulations and policies (including environmental and employment regulations, export/import laws, local content and local ownership requirements, tax policies such as export subsidy programs and research and experimentation credits, carbon emission regulations and other similar programs). Failure to comply with any of the foregoing laws, regulations and policies could result in civil and criminal, monetary and non-monetary penalties, as well as damage to our reputation. In addition, we cannot provide assurance that costs of complying with new and evolving regulatory reporting requirements and current or future laws, including environmental protection, employment, data security, data privacy and health and safety laws, will not exceed our estimates. In addition, we have made investments in certain countries, and we may in the future invest in other countries, which may carry high levels of currency, political, compliance, or economic risk. While these risks or the impact of these risks are difficult to predict, any one or more of them could adversely affect our business, results of operations and reputation.

We are subject to taxation in a number of jurisdictions. Accordingly, our effective tax rate is impacted by changes in the mix among earnings in countries with differing statutory tax rates. A material change in the statutory tax rate or interpretation of local law in a jurisdiction in which we have significant operations could adversely impact our effective tax rate and impact our financial results. For example, the U.S. Tax Cuts and Jobs Act (the "Tax Reform Act"), enacted in December 2017, significantly changed U.S. tax law by, among other things, imposing a repatriation tax on deemed repatriated earnings of foreign subsidiaries and imposing limitations on the ability to deduct interest expense.

Our tax returns are subject to audit and taxing authorities could challenge our operating structure, taxable presence, application of treaty benefits or transfer pricing policies. If changes in statutory tax rates or laws or audits result in assessments different from amounts estimated, then our business, results of operations, financial condition and cash flows may be adversely affected. In addition, changes in tax laws could have an adverse effect on our customers, resulting in lower demand for our products and services.

Certain of our subsidiaries are defendants in pending lawsuits alleging negligence and injury resulting from the use of COREXIT™ dispersant in response to the Deepwater Horizon oil spill, which could expose us to monetary damages or settlement costs.

As described in Note 9—Commitments and Contingencies in Part II, Item 8.—Financial Statements and Supplementary Data, certain of our subsidiaries (collectively the "COREXIT Defendants") are among the defendants in a number of individual plaintiff lawsuits arising from the use of COREXIT™ dispersant in response to the Deepwater Horizon oil spill, which could expose the Company to monetary damages or settlement costs. The plaintiffs in these matters have claimed damages under products liability, tort and other theories.

While three cases remain pending against the COREXIT Defendants and are expected to be dismissed pursuant to a November 28, 2012 order granting the COREXIT Defendants' motion for summary judgment in the Deepwater Horizon multidistrict litigation proceeding, we cannot predict whether there will be an appeal of the dismissal, the involvement we might have in these matters in the future or the potential for future litigation. Although we believe we have rights to contribution and/or indemnification from third parties in connection with these lawsuits, if an appeal by plaintiffs in these lawsuits is brought and won, these suits could have a material adverse effect on us and our financial condition, results of operations or cash flows.

The COREXIT Defendants continue to sell the COREXIT™ oil dispersant product and previously sold product remains in the inventories of individual customers and oil spill response organizations. We cannot predict the potential for future litigation with respect to such sales or inventory. However, if one or more of such lawsuits are brought and won, these suits could have a material adverse impact on our financial results.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

We lease our corporate headquarters in The Woodlands, Texas. We lease or own technical customer support offices and operating facilities in North America, Australia, the Middle East, Asia Pacific, and Latin America. We operate research and technology centers in Sugar Land, Texas; Calgary, Canada; Aberdeen, Scotland; and Kazan, Russia. We have significant regional administrative facilities located in Singapore, The Republic of Singapore; Moscow, Russia; Dubai, United Arab Emirates; Buenos Aires, Argentina; Aberdeen, Scotland; and Kazan, Russia. We also have a network of small leased sales offices around the world.

We believe our properties and facilities are suitable and adequate for their present and intended purposes and are operating at a level consistent with the requirements of the industry in which we operate.

ITEM 3. **LEGAL PROCEEDINGS**

We are involved in various pending or potential legal actions in the ordinary course of our business. Management is unable to predict the ultimate outcome of these actions because of the inherent uncertainty of litigation. However, management believes the most probable, ultimate resolution of these matters will not have a material adverse effect on our consolidated financial position, results of operations or cash flows. See Note 9—Commitments and Contingencies in Part II, Item 8.—Financial Statements and Supplementary Data for a description of such proceedings.

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

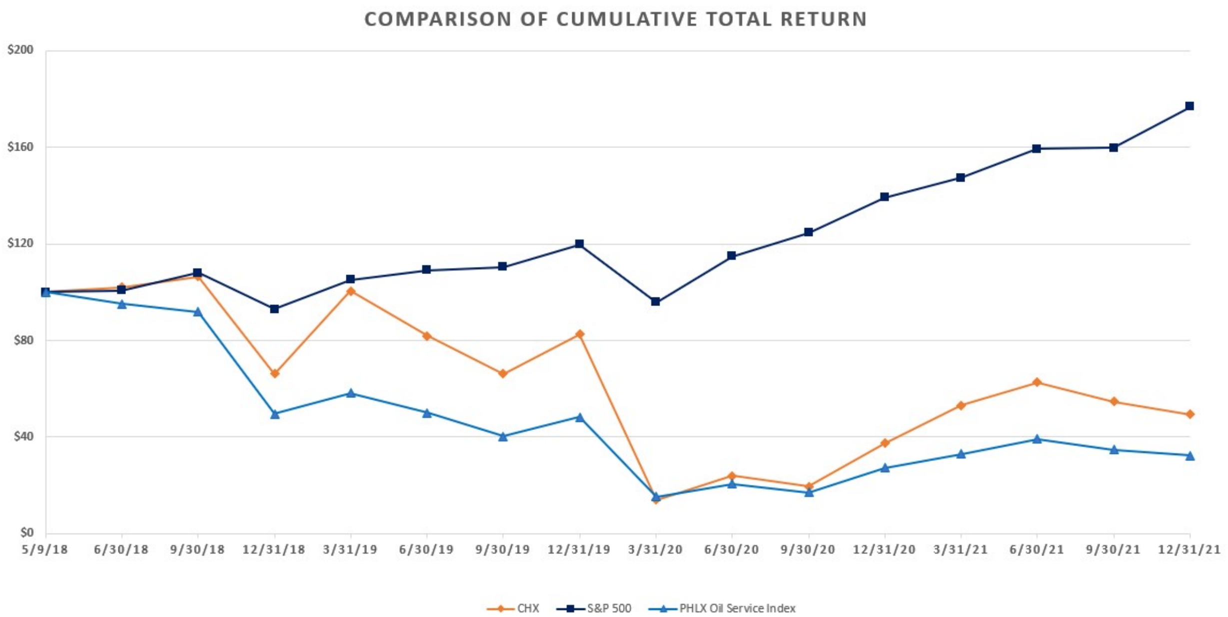
Our common stock is listed on Nasdaq under the "CHX" symbol. At February 4, 2022, our number of common stockholders of record was 987.

We have not previously paid a cash dividend on our common shares. However, on February 4, 2022, our Board of Directors ("Board") approved a plan to initiate a regular quarterly cash dividend of $0.075 per share on the Company's common stock. The first declared dividend is payable on April 29, 2022 to shareholders of record on April 8, 2022. Subsequent dividend declarations, if any, including the amounts and timing of future dividends, are subject to approval by the Board and will depend on future business conditions, financial conditions, results of operations and other factors.

We had no unregistered sales of equity securities during the year ended December 31, 2021. We had no repurchases of our common stock during the year ended December 31, 2021.

The following performance graph and related information shall not be deemed "soliciting material" or "filed" with the SEC, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933 or the Exchange Act, each as amended, except to the extent that we specifically incorporate it by reference into such filing.

Comparison of Cumulative Total Return
Among ChampionX Corporation, the S&P 500 Index, and
the PHLX Oil Service Sector Index



The chart compares the percentage change in the cumulative stockholder return on our common stock against the cumulative total return of the Philadelphia Oil Service Sector Index, and the S&P Composite 500 Stock Index. The comparison is for a period beginning May 9, 2018 and ending December 31, 2021. The chart assumes the investment of $100 on the closing price of May 9, 2018, and the reinvestment of all dividends.

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This discussion includes forward-looking statements. See "Cautionary Note Regarding Forward-Looking Statements" for certain cautionary information regarding forward-looking statements and see "Risk Factors" in Part I, Item 1A, for certain factors that could cause actual results to differ materially from those predicted in those statements. This discussion should also be read in conjunction with the consolidated financial statements included in "Item 8. Financial Statements and Supplementary Data."

EXECUTIVE OVERVIEW AND BUSINESS OUTLOOK

We are a global leader in chemistry solutions and highly engineered equipment and technologies that help companies drill for and produce oil and gas safely, efficiently and sustainably around the world. Our products provide efficient and safe operations throughout the lifecycle of a well with a focus on the production phase of wells. Our business is organized into four reportable segments: Production Chemical Technologies, Production & Automation Technologies, Drilling Technologies, and Reservoir Chemical Technologies and we refer to the Production Chemical Technologies segment and Reservoir Chemical Technologies segment together as the Chemical Technologies business.

Recent Events

On July 2, 2021, we acquired Scientific Aviation, Inc. ("Scientific"), a market leader in site-specific and regional methane emissions monitoring solutions for periodic and continuous monitoring applications. Under the terms of the agreement, we paid an initial amount of $10.0 million, net of cash acquired. We may also be required to make future payments of up to an additional $10.0 million, contingent on the future performance of Scientific. The results of Scientific are included within our Production & Automation Technologies segment.

On September 7, 2021, we sold certain assets associated with our chemical manufacturing plant in Corsicana, Texas (the "Corsicana Plant"), including all of the property, plant and equipment associated therewith and all other assets necessary to operate the plant. We received $68.8 million in cash and recognized a net gain of $38.0 million, which is included in our Reservoir Chemical Technologies segment. Proceeds from the sale were used to pay a portion of the $90.0 million of the Notes redeemed on September 23, 2021.

On December 8, 2021, we acquired Tomson Technologies LLC and Group 2 Technologies LLC, leaders in nano technology platforms with proven commercial applications helping energy companies lower the carbon footprint and operating expenses of their oil and gas production operations. Under the terms of the agreement, we paid an initial amount of $10.1 million, net of cash acquired and results have been included in our Production Chemical Technologies segment. We may also be required to make future payments of up to an additional $13.0 million, contingent on the future performance of the business.

Business Environment

We monitor macro-economic conditions and industry-specific drivers and key risk factors affecting our business segments as we formulate our strategic plans and make decisions related to allocating capital and human resources. Our business segments provide a broad range of technologies and products to support oil and gas production, exploration and development and the midstream sector. As a result, we are substantially dependent upon global oil production levels, as well as new investment activity levels in the oil and gas and midstream sectors. Demand for our products, technologies and services is impacted by overall global demand for oil and gas, ongoing depletion rates of existing oil and gas wells, and our customers' willingness to invest in the exploration and development of new oil and gas resources. Our customers determine their operating and capital budgets based on current and expected future crude oil and natural gas prices, U.S. and worldwide rig count, U.S. well completions and expectation of industry cost levels, among other factors. Crude oil and natural gas prices are impacted by supply and demand, which are influenced by geopolitical, macroeconomic, and local events, and have historically been subject to substantial volatility and cyclicality. Rig count, footage drilled, and E&P investment by oil and gas operators have often been used as leading indicators for the level of drilling and development activity and future production levels in the oil and gas sector.

Market Conditions and Outlook

The COVID-19 pandemic significantly disrupted the oil and gas markets with unprecedented fluctuations in the supply and demand of crude oil and resulting rapid decline of oil prices during 2020. In response to the significant reduction in oil prices, customer spending for E&P activity deteriorated at a rapid pace due to reduced drilling activities, lower budgeted capital spending and options to reduce operating expenditures via cost cutting initiatives.

Throughout 2021, crude oil prices increased, reaching a peak of $86 in October, the highest since 2018. This is attributed to an increase in demand as the global economy reopened from the COVID-19 lockdowns coupled with continuing OPEC+ production curtailments and reduced U.S. oil production resulting from COVID-19 impacts and public U.S. oil and gas companies focus on free cash generation and capital investment restraints. The U.S. oil and gas rig count has also grown steadily during 2021, although it remains below pre-pandemic levels and OPEC+ production curtailments are being reduced. We continue to experience positive momentum across the industry. However, as our sales volumes have increased, we are experiencing raw material and logistics cost inflation and supply chain constraints. As we look to 2022, we expect continued sales volume improvements, selling price increase realization, and cost synergy delivery to offset raw material cost inflation.

CONSOLIDATED RESULTS OF OPERATIONS

	Years Ended December 31,		Variance
(dollars in thousands)	**2021**	**2020**	**$**
Revenue	$ 3,074,990	$ 1,899,996	$ 1,174,994
Cost of goods and services	2,331,715	1,490,824	840,891
Gross profit	743,275	409,172	334,103
Selling, general and administrative expense	570,357	463,767	106,590
Goodwill impairment	—	616,271	(616,271)
Long-lived asset impairment	—	40,980	(40,980)
Interest expense, net	51,921	51,731	190
Other (income) expense, net	(31,688)	(828)	(30,860)
Income (loss) before income taxes	152,685	(762,749)	915,434
Provision for (benefit from) income taxes	38,445	(20,396)	58,841
Net income (loss)	114,240	(742,353)	856,593
Net income attributable to noncontrolling interest	941	1,577	(636)
Net income (loss) attributable to ChampionX	$ 113,299	$ (743,930)	$ 857,229

Revenue. Revenue for the consolidated entity increased $1.2 billion, or 62%, in 2021 compared to the prior year primarily due to $975.3 million of incremental revenues associated with a full year of results within our acquired Chemical Technologies business. The increase in revenue was further supplemented by an increase in Production & Automation Technologies revenue of $146.5 million and Drilling Technologies revenue of $55.9 million year-over-year as a result of an increase in U.S. land-based rig count and associated increase in customer spending on drilling activities, which positively impacted sales volumes.

Gross profit. Gross profit increased $334.1 million, or 82%, year-over year, primarily due to $207.1 million generated by our Chemical Technologies business, supplemented by increased volumes in our Production & Automation Technologies and Drilling Technologies segments noted above as well as cost savings from restructuring actions and other cost reduction efforts in response to the COVID-19 pandemic.

Selling, general and administrative expense. Selling, general and administrative expense increased $106.6 million, or 23%, year-over-year, primarily due to $113.8 million of incremental expenses associated with our acquired Chemical Technologies business as well as the restoration of salaries from the temporary employee salary and benefit reduction instituted during 2020 to address the COVID-19 pandemic impact on commodity prices and oil and gas production. These increases were partially offset by fewer acquisition and integration related costs associated with the acquisition of the Chemical Technologies business

Interest expense, net. Interest expense, net remained flat year-over-year.

Other income (expense), net. Other income (expense), net increased $30.9 million year-over-year primarily due to a $38.0 million net gain recognized on the sale of the Corsicana Plant during 2021.

Provision for (benefit from) income taxes. The effective tax rates for 2021 and 2020 were 25.2% and 2.7%, respectively. The increase in the effective tax rate was primarily due to the absence of impairment on non-taxable goodwill and a full year of activities from our Chemical Technologies business, which increased foreign earnings and withholding taxes, as well as valuation allowances in loss jurisdictions and on foreign tax credits.

SEGMENT RESULTS OF OPERATIONS

(in thousands)	Years Ended December 31, 2021	Years Ended December 31, 2020	Variance $
Segment revenue:			
Production Chemical Technologies	$ 1,842,400	$ 992,805	$ 849,595
Production & Automation Technologies	762,371	615,918	146,453
Drilling Technologies	172,066	116,186	55,880
Reservoir Chemical Technologies	141,095	61,507	79,588
Corporate and other	157,058	113,580	43,478
Total revenue	$ 3,074,990	$ 1,899,996	$ 1,174,994
Income (loss) before income taxes:			
Segment operating profit (loss):			
Production Chemical Technologies	$ 165,463	$ 94,294	$ 71,169
Production & Automation Technologies	45,635	(697,937)	743,572
Drilling Technologies	30,409	2,574	27,835
Reservoir Chemical Technologies	30,311	(6,198)	36,509
Total segment operating profit (loss)	271,818	(607,267)	879,085
Corporate and other	67,212	103,751	(36,539)
Interest expense, net	51,921	51,731	190
Income (loss) before income taxes	$ 152,685	$ (762,749)	$ 915,434

Production Chemical Technologies

Revenue. Production Chemical Technologies revenue increased $849.6 million, or 86%, compared to the prior year mainly due to incremental revenues associated with a full year of operating results. We also experienced continued sales increases in North America as customers secured additional products to mitigate the effect of supply chain constraints. Additionally, global pricing increases were implemented to mitigate raw material inflation.

Operating profit. Production Chemical Technologies operating profit increased $71.2 million in 2021 compared to the prior year primarily due to the higher pricing and sales volumes noted above, partially offset by certain raw materials inflation.

Production & Automation Technologies

Revenue. Revenue increased $146.5 million, or 24%, as compared to the prior year, primarily due to an increase in customer spending, market share expansion and price increases to mitigate raw material inflation. Customer spending was driven by the strong market recovery, which led to higher volumes across our product offerings in North America. Additionally, the acquisition of Scientific on July 2, 2021 contributed $7.0 million to the increased revenue in 2021.

Operating profit. Operating profit increased $743.6 million compared to the prior year primarily due to goodwill and long-lived asset impairment charges of $657.3 million recognized during 2020. Absent the impairment charges, operating profit increased due to higher sales volumes as noted above, partially offset by material cost inflation and supply chain disruptions.

Drilling Technologies

Revenue. Revenue increased $55.9 million, or 48%, compared to the prior year primarily due to an increase in the North American and international land drilling activity which has positively impacted sales volumes of our diamond cutters and diamond bearings products. During 2020, there was a steep decline in U.S. land-based rig count as a result of the pandemic which resulted in a decline in customer spending on drilling activities, which negatively impacted sales volumes of our diamond cutters and diamond bearings products during 2020.

Operating profit. Operating profit increased $27.8 million compared to the prior year as a result of increased sales volumes and cost savings from restructuring actions as well as other cost reduction efforts taken during 2020.

Reservoir Chemical Technologies

Revenue. Reservoir Chemical Technologies revenue increased $79.6 million, or 129%, compared to the prior year mainly due to incremental revenues associated with a full year of operating results. Additionally, revenue increased due to growth in direct sales to E&P companies in North America.

Operating profit. Reservoir Chemical Technologies operating profit increased $36.5 million compared to the prior year primarily due to a $38.0 million net gain recognized on the sale of the Corsicana Plant.

CAPITAL RESOURCES AND LIQUIDITY

Overview

Our primary source of cash is from operating activities. We have historically generated, and expect to continue to generate, positive cash flow from operations. Cash generated from operations is generally allocated to working capital requirements, investments to support profitable revenue growth and maintain our facilities and systems, acquisitions that create value through add-on capabilities that broaden our existing businesses and deliver our growth strategy, as well as debt repayments to reduce our leverage.

During 2021, the Company completed the redemption of certain of the Company's 6.375% Senior Notes (the "Senior Notes") at 104.781% of the principal amount thereof. We repurchased $185.0 million in aggregate principal amount of the Senior Notes for $196.6 million in cash, including $2.7 million in accrued interest.

At December 31, 2021, we had cash and cash equivalents of $251.7 million compared to $201.4 million at December 31, 2020, primarily for working capital and operational purposes. At December 31, 2021, we had total liquidity of $611.4 million, comprised of $251.7 million of cash, excluding $3.5 million of restricted cash, and $359.7 million of available capacity on our revolver.

At December 31, 2021, we had a long-term debt balance of $697.7 million, net of the current portion of long-term debt of $26.9 million, primarily consisting of our term loan due 2027 with a principal amount of $496.7 million, the Notes due in 2026 with a principal amount of $92.0 million, and our term loan due in 2025 with a principal amount of $140.0 million. We also have access to a revolving credit facility of $359.7 million which expires in May 2023, which was undrawn at December 31, 2021.

As of December 31, 2021, approximately $116.4 million, or 46%, of our cash balances were held outside the U.S. for the primary purpose of working capital and operational support needs. All of our cash held outside the U.S. could be repatriated and could be subject to foreign withholding taxes; however, the majority of our prior year foreign earnings are permanently reinvested and therefore no deferred taxes are recorded. We have $20.2 million in deferred tax liabilities associated with foreign withholding taxes on our foreign earnings from jurisdictions which are not asserted to be permanently reinvested.

Outlook

We expect to generate cash to support liquidity and business requirements through operations and, if necessary, through our revolving credit facility. Volatility in credit, equity and commodity markets can create uncertainty for our businesses. However, the Company believes, based on our current financial condition and current expectations of future market conditions, that we will meet our short- and long-term needs with a combination of cash on hand, cash generated from operations, our revolving credit facility and access to capital markets.

Over the next year, we expect to fund our capital expenditures and reduce outstanding debt through earnings and working capital improvements. In 2022, we project capital spending to be approximately 3.5% of revenue inclusive of capital investments for our electric submersible pump leased assets.

Additionally, we have other purchase obligations as well as operating and finance leases for real estate, vehicles and equipment that include future minimum payments with initial terms of one year or more. Our lease terms may include options to extend or terminate the lease when it is reasonably certain that we will exercise that option. See Note 9—Commitments and Contingencies and Note 10—Leases included in Part II, Item 8.—Financial Statements and Supplementary Data of this Annual Report on Form 10-K.

We continue to evaluate acquisitions that meet our strategic priorities, expand our technology and product portfolio, improve our cost position or productivity, or broaden our geographic reach.

As of December 31, 2021, we had approximately $80.2 million in outstanding letters of credit, surety bonds, and guarantees which expire at various dates through 2039. These financial instruments are primarily maintained as security for insurance, warranty, and other performance obligations. Generally, we would only be liable for the amount of these letters of credit and surety bonds in the event of default in the performance of our obligations, the probability of which we believe is remote.

Cash Flows

	Years Ended December 31,	
(in thousands)	**2021**	**2020**
Cash provided by operating activities	$ 328,219	$ 310,040
Cash provided by (used for) investing activities	(37,411)	22,130
Cash used for financing activities	(234,347)	(175,366)
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(2,704)	9,327
Net increase (decrease) in cash and cash equivalents and restricted cash	$ 53,757	$ 166,131

Operating Activities

Cash provided by operating activities in 2021 increased $18.2 million compared to 2020. The increase in cash provided by operating activities was primarily driven by an increase in our results of operations. The results of our Chemical Technologies business include twelve months of activity in 2021 as compared to 2020 including the period from the acquisition date of June 3, 2020 through the end of the period. Changes in working capital items used cash of $6.3 million during 2021 compared to cash generated of $157.7 million during 2020. The change in working capital items primarily related to cash outflows for inventory procurement and an increase in accounts receivable as a result of revenue growth during the period, partially offset by an increase in accounts payable.

Expenditures for assets that are placed into our lease asset program expected to be recovered through sale are reported in leased assets in the operating section of our consolidated statements of cash flows. All other capitalizable expenditures for assets that are placed into our lease asset program are classified as capital expenditures in the investing section of our consolidated statements of cash flows.

Investing Activities

Cash used in investing activities was $37.4 million in 2021, and was comprised of capital expenditures of $84.5 million, acquisitions, net of cash acquired, of $20.1 million, and purchases of investments of $4.9 million. This was partially offset by $72.0 million of cash proceeds from the sale of fixed assets, primarily related to the sale of the Corsicana Plant.

Cash provided by investing activities was $22.1 million in 2020 and was primarily comprised of cash acquired in the Merger of $57.6 million and $9.7 million of cash proceeds on sale of fixed assets, partially offset by capital expenditures of $45.2 million.

Capital expenditures in the investing cash flows section of our consolidated statement of cash flows include expenditures for long-term equipment expected to be placed into our leased asset program. During the years ended December 31, 2021 and 2020, capital expenditures consisted mostly of infrastructure related capital spending and investment in assets for our leased asset program of $37.1 million and $20.8 million, respectively.

Financing Activities

Cash used in financing activities of $234.3 million in 2021, was primarily the result of repayments totaling $223.4 million on our long-term debt, payments related to taxes withheld on stock-based compensation of $9.8 million, payments of finance lease obligations of $6.3 million, and distribution of $3.7 million to our non-controlling interests. This was partially offset by $8.8 million in cash proceeds from the exercise of stock options.

Cash used in financing activities of $175.4 million in 2020 was primarily the result of repayments totaling $161.5 million on our long-term debt, $4.4 million in debt issuance costs related to the amendment of the credit agreement in contemplation of the Merger, $5.1 million of payments of finance lease obligations, payments related to taxes withheld on stock-based compensation of $3.1 million, and a distribution of $2.2 million to one of our non-controlling interests. Net borrowings under our revolving credit facility totaled zero in 2020 as we borrowed and fully repaid the borrowing within the same period.

Revolving Credit Facility

A summary of our revolving credit facility as of December 31, 2021 was as follows:

(in millions)	**Amount**	**Debt Outstanding**	**Letters of Credit**	**Unused Capacity**	**Maturity**
Five-year revolving credit facility	$ 400.0	$ —	$ 40.3	$ 359.7	May 2023

Additionally, we have three letters of credit outside of the revolving credit facility totaling approximately $1.5 million. As of December 31, 2021, we were in compliance with all restrictive covenants under our revolving credit facility.

See Note 8—Debt included in Part II, Item 8.—Financial Statements and Supplementary Data of this Annual Report on Form 10-K.

CRITICAL ACCOUNTING ESTIMATES

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make certain estimates, judgments and assumptions about future events that affect the reported amounts of assets and liabilities at the date of the financial statements, the reported amounts of revenue and expenses during the periods presented and the related disclosures in the accompanying notes to the consolidated financial statements. Management reviewed these critical accounting estimates with the Audit Committee of the Board of Directors. We believe the following critical accounting estimates used in preparing our consolidated financial statements address all important areas where the nature of the estimates or assumptions is material due to the levels of subjectivity and judgment necessary to account for highly uncertain matters or the susceptibility of such matters to change. See Note 1—Basis of Presentation and Summary of Significant Accounting Policies in Part II, Item 8.—Financial Statements and Supplementary Data of this Annual Report on Form 10-K for a description of our significant accounting policies.

Determination of Fair Value in Business Combinations

Accounting for the acquisition of a business requires allocation of the purchase price to the various assets acquired and liabilities assumed at their respective fair values. The determination of fair value requires the use of significant estimates and assumptions, and in making these determinations management uses all available information. If necessary, we have up to one year after the acquisition closing date to finalize these fair value determinations. For tangible and identifiable intangible assets acquired in a business combination, the determination of fair value utilizes several valuation methodologies including discounted cash flows which has assumptions with respect to the timing and amount of future revenue and expenses associated with an asset. The assumptions made in performing these valuations include, but are not limited to, discount rate, future revenues and operating costs, projections of capital costs, royalty rate, and other assumptions believed to be consistent with those used by principal market participants. Depending on the magnitude of the acquisition and the specialized nature of these calculations, we often engage third-party specialists to assist management in evaluating our assumptions as well as appropriately measuring the fair value of assets acquired and liabilities assumed.

Inventory Valuation

Inventory is recorded at the lower of cost or net realizable value. We evaluate the components of inventory on a regular basis for excess and obsolescence. We record the decline in the carrying value of estimated excess or obsolete inventory as a reduction of inventory and as an expense included in cost of goods and services in the period in which it is identified. Our estimate of excess and obsolete inventory is susceptible to change from period to period and requires management to make judgments about the future demand of inventory. Factors that could materially impact our estimate include changes in crude oil prices and its effect on the oil and gas industry, which would impact the demand for our products and services, as well as changes in the pattern of demand for the products that we offer. We believe our inventory valuation reserve is adequate to properly value potential excess and obsolete inventory as of December 31, 2021. However, any significant changes to the factors mentioned above could lead our estimate to change.

Long-Lived and Intangible Assets Valuation

Long-lived assets to be held and used, including property, plant and equipment, identifiable intangible assets being amortized and capitalized software costs are reviewed for impairment whenever events or circumstances indicate the carrying amount of the long-lived asset may not be recoverable. The carrying amount of a long-lived asset is not recoverable if it exceeds the sum of the undiscounted cash flows expected to result from the use and eventual disposition of the asset. If it is determined that an impairment loss occurred, the loss is measured as the amount by which the carrying amount of the long-lived asset exceeds its fair value. The determination of future cash flows as well as the estimated fair value of long-lived assets involves significant estimates on the part of management. Because there usually is a lack of quoted market prices for long-lived assets, the fair value of impaired assets is typically determined based on the present values of expected future cash flows using discount rates believed to be consistent with those used by principal market participants, or based on a multiple of operating cash flow validated with historical market transactions of similar assets, where possible. The expected future cash flows used for impairment reviews and related fair value calculations are based on judgmental assessments of future productivity of the asset, operating costs and capital decisions and all available information at the date of review. If future market conditions deteriorate from our current expectations or assumptions, impairment of long-lived assets may be identified if we conclude that the carrying amounts are no longer recoverable. Long-lived assets classified as held for sale are reported at the disposal group’s fair value, less cost to sell, beginning in the period in which the held-for-sale criteria have been met. An impairment loss is recognized in the amount in which the carrying amount of the disposal group exceeds its fair value. The fair value of a disposal group is measured based on market information when available, such as negotiated selling price. Because there usually is a lack of quoted market prices for long-lived assets, the fair value of impaired held for sale assets is typically determined based on the present values of expected future cash flows using discount rates believed to be consistent with those used by principal market participants.

Valuation of Goodwill

We review goodwill for impairment on an annual basis during the fourth quarter of each fiscal year, or more frequently if events or changes in circumstances indicate that our carrying amount of such goodwill may exceed the fair value. Goodwill is tested at the reporting unit level, which is at or one level below our operating segments. Our reporting units consist of Production Chemical Technologies, Production & Automation Technologies, Drilling Technologies, and Reservoir Chemical Technologies.

Determining the fair value of a reporting unit is judgmental in nature and involves the use of significant estimates and assumptions. The fair values calculated in these impairment tests are determined using the discounted cash flow models, which require the use of significant unobservable inputs, representative of a Level 3 fair value measurement. The assumptions include discount rate, revenue growth rates, future operating margins, future capital expenditures, changes in working capital requirements and terminal growth rates. The goodwill impairment test involves comparing management’s estimate of fair value of a reporting unit with its carrying value, including goodwill. If the fair value of the reporting unit is less than the carrying value, then goodwill is impaired to the extent of the difference; however, the impairment may not exceed the balance of goodwill assigned to that reporting unit.

Accounting for Income Taxes

Our income tax expense, and deferred tax asset and liability balances reflect management’s best assessment of estimated future taxes to be paid. We are subject to income taxes in the United States and certain foreign jurisdictions. Significant judgments and estimates are required in determining our consolidated income tax expense. In determining our current income tax provision, we assess temporary differences resulting from differing treatments of items for tax and accounting purposes. These differences result in deferred tax assets and liabilities, which are recorded on our consolidated balance sheets. Deferred tax assets and liabilities are measured using the tax rates that are expected to apply to taxable income for the years in which those tax assets and liabilities are expected to be realized or settled. When we maintain deferred tax assets, we must assess the likelihood that these assets will be recovered through adjustments to future taxable income. To the extent we believe recovery is not likely, we establish a valuation allowance to reduce the asset to a value we believe will be recoverable based on our expectation of future taxable income. We believe the accounting estimate related to the valuation allowance is a critical accounting estimate because it is susceptible to change from period to period, requires management to make assumptions about our future income over the lives of the deferred tax assets, and because the impact of increasing or decreasing the valuation allowance is potentially material to our results of operations.

The calculation of our income tax expense involves dealing with uncertainties in the application of complex tax laws and regulations in numerous jurisdictions in which we operate. We recognize tax benefits related to uncertain tax positions when, in our judgment, it is more likely than not that such positions will be sustained on examination, including resolutions of any related appeals or litigation, based on the technical merits. We adjust our liabilities for uncertain tax positions when our judgment changes as a result of new information previously unavailable. We routinely monitor the potential impact of these situations. The company has no unrecognized tax benefits as of December 31, 2021.

Recently Issued Accounting Standards

See Note 2—New Accounting Standards in Part II, Item 8.—Financial Statements and Supplementary Data of this Annual Report on Form 10-K.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We may be exposed to certain market risks arising from the use of financial instruments in the ordinary course of business. This risk arises primarily as a result of potential changes in the fair value of financial instruments due to adverse fluctuations in commodity prices, foreign currency exchange rates, and interest rates as discussed below. We do not use derivative financial instruments where the objective is to generate profits solely from trading activities.

Commodity Price Risk

We use a variety of raw materials, primarily metals and semi-processed or finished components, that are generally available from various sources. Commodity pricing for metals, such as nickel, chrome, molybdenum, vanadium, manganese and steel scrap, fluctuate with the market. As a result, our earnings are exposed to commodity market price fluctuations. Although some cost increases may be recovered through increased prices to customers, we attempt to control such costs through fixed-price contracts with suppliers and various other programs, such as our global supply chain activities.

Foreign Currency Risk

We conduct operations around the world in a number of different currencies. Many of our foreign subsidiaries have designated the local currency as their functional currency. Our earnings are therefore subject to change due to fluctuations in foreign currency exchange rates when the earnings in foreign currencies are translated into U.S. dollars. We do not hedge this translation impact on earnings. A 10% increase or decrease in the average exchange rates of all foreign currencies would have changed our revenue and income before income taxes by approximately 3.3% and 7.9%, respectively, for the year ended December 31, 2021.

When transactions are denominated in currencies other than our subsidiaries' respective functional currencies, both with external parties and intercompany relationships, these transactions result in increased exposure to foreign currency exchange effects. The Company uses foreign currency forward contracts to manage risks associated with foreign currency exchange rates. As of December 31, 2021, the amount of gain or loss in the fair value of derivative instruments that would have resulted from a 10% increase or decrease in the underlying price of the contracts was not material.

Interest Rate Risk

Our use of fixed- or variable-rate debt directly exposes us to interest rate risk. Fixed-rate debt, such as the Senior Notes, exposes us to changes in the fair value of our debt due to changes in market interest rates. Fixed-rate debt also exposes us to the risk that we may need to refinance maturing debt with new debt at higher rates, or that we may be obligated to pay rates higher than the current market rate. Variable-rate debt, such as our term loans or borrowings under our revolving credit facility, exposes us to short-term changes in market rates that impact our interest expense.

As of December 31, 2021, we had unhedged variable rate debt of $140.0 million related to our 2018 Term Loan Facility with a weighted average interest rate of 2.63%. A hypothetical 10% adverse movement in the interest rate, or 26 basis points, would result in an increase to interest expense of $0.4 million on an annualized basis. We also had unhedged variable rate debt of $496.7 million related to our 2020 Term Loan Facility with an interest rate of 6.00%. A hypothetical 10% adverse movement in the interest rate, or 60 basis points, would result in an increase to interest expense of $3.0 million.

Fair Value of Financial Instruments

The fair value of our fixed-rate long-term debt and variable rate debt is estimated based on quoted market prices or prices quoted from third-party financial institutions. We do not currently intend to enter into any interest rate hedging agreements, but will continue to monitor interest rate exposure. See Note 16—Fair Value Measurements in Part II, Item 8.—Financial Statements and Supplementary Data of this Annual Report on Form 10-K for further discussion of our financial instruments.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of ChampionX Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of ChampionX Corporation and its subsidiaries (the "Company") as of December 31, 2021 and 2020, and the related consolidated statements of income (loss), of comprehensive income (loss), of stockholders' equity and of cash flows for each of the three years in the period ended December 31, 2021, including the related notes and schedule of valuation and qualifying accounts for each of the three years in the period ended December 31, 2021 appearing under Item 16 (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Annual Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the 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 audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated 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 consolidated 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 consolidated financial statements. Our audit of internal control over financial reporting 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 audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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 (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (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 receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) 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.

Critical Audit Matters

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

Goodwill Impairment Assessments – Production & Automation Technologies and Reservoir Chemical Technologies Reporting Units

As described in Note 1 and 7 to the consolidated financial statements, the Company's consolidated goodwill balance was approximately $703 million as of December 31, 2021, of which approximately $205 million and $40 million related to the Production & Automation Technologies and Reservoir Chemical Technologies reporting units, respectively. Management reviews goodwill for impairment annually, or more frequently if events or changes in circumstances indicate that the carrying amount of such goodwill allocated to reporting units may exceed their fair value. As disclosed by management, goodwill is tested at the reporting unit level, which is at or one level below the operating segments of the Company. Determining the fair value of a reporting unit is judgmental in nature and involves the use of significant estimates and assumptions by management. The fair values calculated in these impairment tests are determined by management using discounted cash flow models. The goodwill impairment test involves comparing management's estimate of fair value of a reporting unit with its carrying value, including goodwill. If the fair value of the reporting unit is less than the carrying value, then goodwill is impaired to the extent of the difference. The significant assumptions used by management include the discount rate, revenue growth rates, future operating margins, future capital expenditures, changes in working capital requirements and terminal growth rates.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessments for the Production & Automation Technologies and Reservoir Chemical Technologies reporting units is a critical audit matter are (i) the significant judgment by management when developing the fair value of the reporting units; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to future operating margins and the discount rate for the Production & Automation Technologies reporting unit and revenue growth rates, future operating margins and the discount rate for the Reservoir Chemical Technologies reporting unit (hereinafter collectively referred to as the "revenue growth rates, future operating margins, and the discount rate"); and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment assessments, including controls over the valuation of the Production & Automation Technologies and Reservoir Chemical Technologies reporting units. These procedures also included, among others, (i) testing management's process for developing the fair value estimates of the reporting units; (ii) evaluating the appropriateness of the discounted cash flow models; (iii) testing the completeness and accuracy of the underlying data used in the models; and (iv) evaluating the reasonableness of the significant assumptions used by management related to revenue growth rates, future operating margins, and the discount rate. Evaluating management's significant assumptions related to revenue growth rates, future operating margins, and the discount rate involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the reporting units; (ii) the consistency with external market and industry data; and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's discounted cash flow models and the discount rate assumption.

/s/ PricewaterhouseCoopers LLP
Houston, Texas
February 10, 2022

We have served as the Company's auditor since 2017.

CHAMPIONX CORPORATION
CONSOLIDATED STATEMENTS OF INCOME (LOSS)

	Years Ended December 31,		
(in thousands, except per share data)	**2021**	**2020**	**2019**
Revenue:			
Product revenue	$ 2,656,184	$ 1,623,464	$ 986,341
Service revenue	343,086	218,089	96,310
Lease and other revenue	75,720	58,443	48,600
Total revenue	3,074,990	1,899,996	1,131,251
Cost of goods and services	2,331,715	1,490,824	754,147
Gross profit	743,275	409,172	377,104
Costs and expenses:			
Selling, general and administrative expense	570,357	463,767	274,268
Goodwill impairment	—	616,271	—
Long-lived asset impairment	—	40,980	1,746
Interest expense, net	51,921	51,731	39,301
Other expense (income), net	(31,688)	(828)	2,603
Income (loss) before income taxes	152,685	(762,749)	59,186
Provision for (benefit from) income taxes	38,445	(20,396)	6,226
Net income (loss)	114,240	(742,353)	52,960
Less: Net income attributable to noncontrolling interest	941	1,577	796
Net income (loss) attributable to ChampionX	$ 113,299	$ (743,930)	$ 52,164
Earnings (losses) per share attributable to ChampionX:			
Basic	$ 0.56	$ (5.01)	$ 0.67
Diluted	$ 0.54	$ (5.01)	$ 0.67
Weighted-average shares outstanding:			
Basic	201,579	148,370	77,427
Diluted	208,325	148,370	77,624

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

CHAMPIONX CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

	Years Ended December 31,		
(in thousands)	**2021**	**2020**	**2019**
Net income (loss)	$ 114,240	$ (742,353)	$ 52,960
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments	(4,465)	20,245	936
Cash flow hedges	3,601	(2,320)	—
Pension and other post-retirement benefit plans:			
Net actuarial gain (loss) arising during period	8,517	(5,526)	(2,521)
Prior service cost arising during period	195	22	(190)
Reclassification adjustment for net actuarial loss included in net income	1,206	356	272
Reclassification of adjustment for prior service costs included in net income	76	—	1
Reclassification of adjustment for settlement losses included in net income	—	505	371
Total pension and other post-retirement benefit plans	9,994	(4,643)	(2,067)
Other comprehensive income (loss)	9,130	13,282	(1,131)
Comprehensive income (loss)	123,370	(729,071)	51,829
Less: Comprehensive income attributable to noncontrolling interest	941	1,577	796
Comprehensive income (loss) attributable to ChampionX	$ 122,429	$ (730,648)	$ 51,033

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

CHAMPIONX CORPORATION
CONSOLIDATED BALANCE SHEETS

	December 31,	
(in thousands)	**2021**	**2020**
ASSETS		
Current Assets:		
Cash and cash equivalents	$ 251,678	$ 201,421
Restricted cash	3,500	—
Receivables, net	584,440	559,545
Inventories, net	542,910	430,112
Prepaid expenses and other current assets	78,372	74,767
Total current assets	1,460,900	1,265,845
Property, plant and equipment, net of accumulated depreciation	776,813	854,536
Goodwill	702,867	680,594
Intangible assets, net	401,470	479,009
Operating lease right-of-use assets	115,458	122,481
Other non-current assets	77,193	73,311
Total assets	$ 3,534,701	$ 3,475,776
LIABILITIES AND EQUITY		
Current Liabilities:		
Current portion of long-term debt	$ 26,850	$ 26,850
Accounts payable	473,561	299,666
Accrued compensation and employee benefits	93,131	70,303
Current portion of operating lease liabilities	36,389	33,234
Accrued distributor fees	25,621	37,465
Accrued expenses and other current liabilities	146,773	155,042
Total current liabilities	802,325	622,560
Long-term debt	697,657	905,764
Deferred income taxes	137,971	156,283
Operating lease liabilities	73,521	83,553
Other long-term liabilities	68,920	95,041
Total liabilities	1,780,394	1,863,201
Stockholders' equity:		
Common stock (2.5 billion shares authorized, $0.01 par value) 202.9 million shares and 200.4 million shares issued and outstanding in 2021 and 2020, respectively	2,029	2,004
Capital in excess of par value of common stock	2,315,399	2,293,179
Retained earnings (accumulated deficit)	(525,158)	(638,457)
Accumulated other comprehensive loss	(21,625)	(30,755)
ChampionX stockholders' equity	1,770,645	1,625,971
Noncontrolling interest	(16,338)	(13,396)
Total equity	1,754,307	1,612,575
Total liabilities and equity	$ 3,534,701	$ 3,475,776

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

CHAMPION X CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)	Years Ended December 31, 2021	2020	2019
Cash provided by (used for) operating activities:			
Net income (loss)	$ 114,240	$ (742,353)	$ 52,960
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	237,285	214,362	119,938
Stock-based compensation	23,178	19,536	10,250
Loss (gain) on disposal of fixed assets	(40,371)	8,037	(2,046)
Loss on goodwill and long-lived asset impairment	—	657,251	1,746
Loss on sale of business	—	—	2,475
Loss on debt extinguishment	11,098	—	—
Provision (recovery) of bad debt	(2,018)	3,523	4,955
Provision for inventory obsolescence and write-downs	4,968	23,841	(141)
Amortization of deferred loan costs and accretion of discount	3,543	3,799	2,590
Deferred income tax expense (benefit)	(20,552)	(41,998)	(13,874)
Employee benefit plan expense	2,605	3,054	1,883
Other	510	3,306	3,733
Changes in operating assets and liabilities (net of effects of acquisitions and foreign exchange):			
Receivables	(28,736)	58,210	25,948
Inventories	(124,154)	85,893	19,065
Prepaid expenses and other current assets	(2,342)	17,539	(10,742)
Accounts payable	171,398	(18,389)	(20,526)
Accrued compensation and employee benefits	20,920	9,669	(6,358)
Accrued expenses and other liabilities	(40,844)	6,674	4,406
Leased assets	(5,151)	(4,606)	(40,700)
Other	2,642	2,692	337
Net cash provided by operating activities	328,219	310,040	155,899
Cash provided by (used for) investing activities:			
Proceeds from sale of fixed assets	72,022	9,705	4,598
Capital expenditures	(84,464)	(45,163)	(39,780)
Acquisitions, net of cash acquired	(20,095)	57,588	(12,500)
Purchase of investments	(4,874)	—	—
Payment on sale of business	—	—	(2,194)
Net cash provided by (used for) investing activities	(37,411)	22,130	(49,876)
Cash provided by (used for) financing activities:			
Proceeds from long-term debt	—	125,000	36,500
Payment of debt issue costs	—	(4,356)	—
Repayment of long-term debt	(223,413)	(286,493)	(141,500)
Proceeds from exercise of stock options	8,819	886	—
Payments related to taxes withheld on stock-based compensation	(9,777)	(3,089)	(1,848)
Distribution to noncontrolling interest	(3,718)	(2,175)	—
Payment of finance lease obligations	(6,258)	(5,139)	(5,555)
Net cash used for financing activities	(234,347)	(175,366)	(112,403)
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(2,704)	9,327	(162)
Net increase (decrease) in cash and cash equivalents and restricted cash	53,757	166,131	(6,542)
Cash and cash equivalents and restricted cash at beginning of period	201,421	35,290	41,832
Cash and cash equivalents and restricted cash at end of period	$ 255,178	$ 201,421	$ 35,290

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

CHAMPIONX CORPORATION
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY

	Common stock						
(in thousands)	**Shares**	**Par Value**	**Capital in excess of par value**	**Retained Earnings (Accum. Deficit)**	**Accum. Other Comp. Loss**	**Non-controlling Interest**	**Total**
December 31, 2018	77,353	$ 774	$ 960,773	$ 54,884	$ (42,906)	$ 2,458	$ 975,983
Net income	—	—	—	52,164	—	796	52,960
Other comprehensive loss	—	—	—	—	(1,131)	—	(1,131)
Stock-based compensation	107	1	10,249	—	—	—	10,250
Taxes withheld on issuance of stock-based awards	—	—	(1,848)	—	—	—	(1,848)
December 31, 2019	77,460	775	969,174	107,048	(44,037)	3,254	1,036,214
Cumulative effect of accounting changes	—	—	—	(1,575)	—	—	(1,575)
Issuance of common stock related to the Merger	122,237	1,223	1,262,708	—	—	—	1,263,931
Issuance of replacement awards related to the Merger	—	—	43,964	—	—	—	43,964
Non-controlling interest acquired in the Merger	—	—	—	—	—	(16,052)	(16,052)
Net income (loss)	—	—	—	(743,930)	—	1,577	(742,353)
Other comprehensive income	—	—		—	13,282	—	13,282
Stock-based compensation	548	4	19,536	—	—	—	19,540
Stock options exercised	135	2	886	—	—	—	888
Taxes withheld on issuance of stock-based awards	—	—	(3,089)	—	—	—	(3,089)
Distributions declared and paid to noncontrolling interest	—	—	—	—	—	(2,175)	(2,175)
December 31, 2020	200,380	2,004	2,293,179	(638,457)	(30,755)	(13,396)	1,612,575
Net income	—	—	—	113,299	—	941	114,240
Other comprehensive income	—	—		—	9,130	—	9,130
Stock-based compensation	840	9	23,178	—	—	—	23,187
Stock options exercised	1,646	16	8,819	—	—	—	8,835
Taxes withheld on issuance of stock-based awards	—	—	(9,777)	—	—	—	(9,777)
Distributions declared and paid to noncontrolling interest	—	—	—	—	—	(3,718)	(3,718)
Currency translation adjustments	—	—	—	—	—	(165)	(165)
December 31, 2021	202,866	$ 2,029	$ 2,315,399	$ (525,158)	$ (21,625)	$ (16,338)	$ 1,754,307

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

CHAMPIONX CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE 1—BASIS OF PRESENTATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Description of the Business

ChampionX Corporation is a global leader in chemistry solutions and highly engineered equipment and technologies that help companies drill for and produce oil and gas safely and efficiently around the world. Our products provide efficient functioning throughout the lifecycle of a well with a focus on the production phase of wells.

Unless the context requires otherwise, references in this report to “we,” “us,” “our,” “the Company,” or “ChampionX” mean ChampionX Corporation, together with our subsidiaries where the context requires.

On June 3, 2020, the Company and Ecolab Inc. (“Ecolab”) completed a Reverse Morris Trust transaction in which we acquired the Chemical Technologies business (the “Merger”). At the completion of the Merger, the Company changed its name from Apergy Corporation (“Apergy”) to ChampionX Corporation.

Basis of Presentation

Our consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles (“GAAP”). All intercompany accounts and transactions have been eliminated.

As a result of the Merger, the results of operations of the Chemical Technologies business have been reflected in our accompanying consolidated financial statements from the closing date of the Merger. Results for the periods prior to June 3, 2020 reflect the financial and operating results of Apergy and do not include the financial and operating results of the Chemical Technologies business. See Note 3—Merger Transaction, Acquisitions, and Dispositions for additional information on the Merger.

Significant Accounting Policies

Use of estimates—The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates. Such estimates include, but are not limited to, net realizable value of inventories, allowance for doubtful accounts, pension and post-retirement plans, future cash flows associated with impairment testing of goodwill, indefinite-lived intangible assets and other long-lived assets, estimates related to income taxes, and estimates related to contingencies.

Cash and cash equivalents—Cash equivalents are highly liquid, short-term investments with original maturities of three months or less from their date of purchase.

Receivables, net of allowances—Accounts receivable are carried at the invoiced amounts, less an allowance for doubtful accounts, and generally do not bear interest. The Company estimates the allowance for doubtful accounts for expected credit losses by analyzing accounts receivable balances through the application of historical write-off and collection trend rates, as well as current economic and market conditions. Specific allowance amounts are established to record the appropriate provision for customers that have a higher probability of default. Account balances are written off against the allowance when it is determined the receivable will not be recovered.

The following table provides a rollforward of our allowance for credit losses balance:

(in thousands)	Allowance for Credit Losses	
December 31, 2020	$	10,192
Provision for expected credit losses		(2,018)
Accounts written off		(7,002)
Recoveries		6,436
Foreign currency translation		54
December 31, 2021	$	7,662

Inventories—Inventories are stated at the lower of cost or net realizable value. The majority of our inventory costs are determined on the first-in, first-out (FIFO) basis. As of December 31, 2021 and 2020, approximately 33% and 35%, respectively, of our total net inventories were accounted for using the last-in, first-out (LIFO) basis, or market. Under the LIFO method, the cost assigned to items sold is based on the cost of the most recent items purchased. As a result, the costs of the first items purchased remain in inventory and are used to value ending inventory.

Inventories consisted of the following:

	December 31,			
(in thousands)	2021		2020	
Raw materials	$	186,516	$	137,038
Work in progress		13,615		9,509
Finished goods		421,702		323,144
		621,833		469,691
Inventory reserve		(24,646)		(24,769)
LIFO adjustments [(1)]		(54,277)		(14,810)
Inventories, net	$	542,910	$	430,112

(1) Represents the amount by which the current cost of LIFO inventories exceeded their carrying value.

Property, plant and equipment—Property, plant and equipment is recorded at cost, or fair value for those assets acquired in a business combination. Depreciation is applied on the straight-line basis over the estimated useful lives of our assets as follows: buildings and improvements 5 to 40 years; machinery and equipment 1 to 20 years; and software 3 to 7 years. Expenditures for maintenance and repairs are expensed as incurred. Gains and losses are realized upon the sale or disposition of assets and are recorded in other expense, net on our consolidated statements of income (loss).

Property, plant and equipment are reviewed for impairment whenever events or changes in circumstances indicate the carrying value of the long-lived asset may not be recoverable. The carrying value of a long-lived asset is not recoverable to the extent it exceeds the sum of undiscounted cash flows expected to result from the use and eventual disposition of the asset. If it is determined that an impairment loss has occurred, the impairment loss is measured as the amount by which the carrying value of the long-lived asset exceeds its fair value.

Goodwill and other intangible assets—We review goodwill for impairment annually or more frequently if events or changes in circumstances indicate that the carrying amount of such goodwill allocated to reporting units may exceed their fair value. We initially assess goodwill for impairment based on qualitative factors to determine whether it is necessary to perform a goodwill impairment test. When performing the quantitative assessment, we estimate fair value of our reporting units using an income approach. Our income-based valuation method determines the present value of estimated future cash flows to estimate the fair value of a reporting unit, which requires the use of significant unobservable inputs, and represents a Level 3 fair value measurement. Significant assumptions used in estimating our reporting unit fair values include discount rate, revenue growth rates, future operating margins, future capital expenditures, changes in working capital requirements and terminal growth rates. If the carrying amount exceeds the fair value, an impairment charge will be recognized in an amount equal to the excess; however, the loss recognized should not exceed the total amount of goodwill allocated to that reporting unit.

During the fourth quarter of 2021, the Company changed its annual goodwill and indefinite lived intangible assets impairment assessment date from May 31 to October 1 for two reporting units. We completed an annual goodwill impairment assessment on May 31 for these reporting units and concluded that the goodwill was not impaired. We have historically used October 1 as the date of our annual test for impairment of goodwill for our remaining reporting units. The change in measurement date represents a change in method of applying an accounting principle. This change was preferable because it aligned the Company's impairment testing dates for all reporting units with its annual business planning and budgeting process and with the timing of the development of its multi-year strategic plan. This change in accounting principle related to the annual testing date did not delay, accelerate, or avoid an impairment charge. This change was not applied retrospectively as it was impracticable to do so because retrospective application would have required application of significant estimates and assumptions with the use of hindsight. Accordingly, the change was applied prospectively. In addition, this change did not have an impact on the Company's consolidated financial statements.

Our finite-lived acquired intangible assets are amortized on a straight-line basis over their estimated useful lives, which generally range from 3 to 15 years. Intangible assets are reviewed for impairment whenever events or changes in circumstances indicate the carrying amount of the intangible asset may not be recoverable. The carrying amount of an intangible asset is not recoverable to the extent it exceeds the sum of the undiscounted cash flows expected to result from the use and eventual disposition of the asset. If it is determined that an impairment loss has occurred, the loss is measured as the amount by which the carrying amount of the intangible asset exceeds its fair value. We have one intangible asset with an indefinite life which is tested annually for impairment.

See Note 7—Goodwill and Intangible Assets for additional information related to our impairment analysis.

***Revenue Recognition*—**Revenue is recognized upon the transfer of control of the related goods and services to the customer. The majority of our revenue is generated through the manufacture and sale of a broad range of specialized products and components, with revenue recognized upon transfer of control, which typically occurs as title and risk of loss transfers. We account for shipping and handling activities performed after control of a good has been transferred to the customer as a contract fulfillment cost rather than a separate performance obligation. Revenue arrangements with customers often require delivery, installation, testing, or other acceptance provisions to be satisfied before revenue is recognized. Service revenue is recognized as the services are performed.

Estimates are used to determine the amount of variable consideration in contracts, as well as the determination of the standalone selling price among separate performance obligations. We estimate variable consideration at the most likely amount to determine the total consideration which we expect to be entitled. Estimated amounts are included in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Our estimates of variable consideration and the determination of whether to include estimated amounts in the transaction price are largely based on an assessment of our anticipated performance and all information that is reasonably available. We exclude all taxes assessed by a governmental authority that are both imposed on and concurrent with a specific revenue-producing transaction and collected from a customer (e.g., sales, use, value added, and some excise taxes) from the determination of the transaction price.

Lessor accounting—Our lease arrangements generally allow customers to rent equipment on a daily basis with no stated end date. Customers may return the equipment at any point subsequent to the lease commencement date without penalty. We account for these arrangements as a daily renewal option beginning on the lease commencement date, with the lease term determined as the period in which it is reasonably certain the option will be exercised. Based on our assessment of the lease classification criteria, our lease arrangements have been classified as operating leases. Our lease arrangements generally include lease and non-lease components for which revenue is recognized based on each component's standalone selling price. Lease revenue is recognized on a straight-line basis over the term of the lease and is included in lease and other revenue in the consolidated statements of income (loss). Non-lease revenue related to our lease arrangements is recognized in accordance with our revenue recognition accounting policy. Assets in our lease program are reported in property, plant, and equipment, net on our consolidated balance sheets and are depreciated over their estimated useful lives. Certain contracts allow for leased equipment damaged in operation to be charged to the customer. Charges for damaged leased equipment is recorded as product revenue and the remaining net book value of the leased asset is expensed as costs of goods and services in the consolidated statements of income (loss).

Lessee accounting—Lease liabilities are measured at the lease commencement date and are based on the present value of remaining payments contractually required under the contract. Payments that are variable in nature are excluded from the measurement of our lease liabilities and are recorded as an expense as incurred. Options to renew or extend a lease are included in the measurement of our lease liabilities only when it is reasonably certain that we will exercise these rights. In estimating the present value of our lease liabilities, payments are discounted at our incremental borrowing rate ("IBR"), which we apply utilizing a portfolio approach. We utilize information publicly available from companies within our industry with similar credit profiles to construct a company-specific yield curve in order to estimate the rate of interest we would pay to borrow at various lease terms. At lease commencement, we recognize a lease right-of-use asset equal to our lease liability, adjusted for lease payments paid to the lessor prior to the lease commencement date, and any initial direct costs incurred. Operating lease expense is recorded on a straight-line basis over the lease term. For finance leases, we amortize our right-of-use assets on a straight-line basis over the shorter of the asset's useful life or the lease term. Additionally, interest expense is recognized each period related to the accretion of our lease liabilities over their respective lease terms.

Stock-based compensation**—**The cost of stock-based awards is measured at the grant date and is based on the fair value of the award. The value of the portion of the award that is expected to ultimately vest is recognized as expense on a straight-line basis, generally over the explicit service period and is included in selling, general and administrative expense in our consolidated statements of income. Forfeitures are accounted for as they occur. Expense for awards granted to retirement-eligible employees is recorded over the period from the date of grant through the date the employee first becomes eligible to retire and is no longer required to provide service.

Research and development costs**—**Research and development costs are expensed as incurred and amounted to $46.5 million, $31.2 million, and $12.9 million for the years ended December 31, 2021, 2020, and 2019, respectively.

Income Taxes**—**The Global Intangible Low-Taxed Income ("GILTI") provisions of the Tax Reform Act require us to include in our U.S. income tax return foreign subsidiary earnings in excess of an allowable return on the foreign subsidiary's tangible assets. We have elected to account for GILTI tax in the period in which it is incurred.

Deferred tax assets and liabilities are measured using the tax rates that are expected to apply to taxable income for the years in which those tax assets and liabilities are expected to be realized or settled. We record valuation allowances related to our deferred tax assets when we determine it is more likely than not the benefits will not be realized. Interest and penalties related to unrecognized tax benefits are recorded as a component of our provision for income taxes. We have approximately $20.2 million of foreign withholding taxes on our undistributed foreign earnings from jurisdictions which impose such taxes to the extent these amounts were repatriated to the U.S. by way of intercompany loan.

Earnings per share ("EPS")**—**Basic EPS is computed using the weighted-average number of common shares outstanding during the year. We use the treasury stock method to compute diluted EPS which gives effect to the potential dilution of earnings that could have occurred if additional shares were issued for awards granted under our incentive compensation and stock plan. The treasury stock method assumes proceeds that would be obtained upon exercise of awards granted under our incentive compensation and stock plan are used to purchase outstanding common stock at the average market price during the period.

Investments in Affiliated Companies**—**Investments in companies in which ChampionX does not have a controlling financial interest, but over which it has significant influence, are accounted for using the equity method and reported within other non-current assets in our consolidated balance sheets. ChampionX's share of the after-tax earnings of equity method investees is included within interest and other income in our consolidated statements of income (loss).

Fair value measurements**—**We record our financial assets and financial liabilities at fair value. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the reporting date (an exit price). In the absence of active markets for the identical assets or liabilities, such measurements involve developing assumptions based on market observable data and, in the absence of such data, internal information that is consistent with what market participants would use in a hypothetical transaction that occurs at the measurement date. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect our market assumptions. Preference is given to observable inputs. These two types of inputs create the following fair value hierarchy:

- Level 1 — Unadjusted quoted prices in active markets for identical assets and liabilities.
- Level 2 — Observable inputs other than quoted prices included in Level 1. For example, quoted prices for similar assets or liabilities in active markets or quoted prices for identical assets or liabilities in inactive markets.
- Level 3 — Unobservable inputs reflecting management's own assumptions about the assumptions market participants would use in pricing the asset or liability.

Derivative financial instruments— The Company uses foreign currency forward contracts to manage risks associated with foreign currency exchange rates. The Company does not hold derivative financial instruments of a speculative nature or for trading purposes. See Note 17—Derivatives and Hedging Transactions for further information.

Foreign currency**—**Financial statements of operations for which the U.S. dollar is not the functional currency, and are located in non-highly inflationary countries, are translated into U.S. dollars prior to consolidation. Assets and liabilities are translated at the exchange rate in effect at the balance sheet date, while income statement accounts are translated at the weighted-average monthly exchange rates. For these operations, translation gains and losses are recorded as a component of accumulated other comprehensive income (loss) in stockholders' equity until the foreign entity is sold or liquidated. Assets and liabilities of an entity that are denominated in currencies other than an entity's functional currency are remeasured into the functional currency using end of period exchange rates or historical rates when applicable to certain balances. Gains and losses related to these re-measurements are recorded in our consolidated statements of income (loss) as a component of other expense, net.

Change in accounting estimate**—**During the second quarter of 2020, we entered into new commercial agreements which changed the economics of the leased asset program of our electrical submersible pump ("ESP") subsidiary in our Production & Automation Technologies segment. As such, we re-evaluated the estimated useful life and salvage value of our assets based on the combination of new commercial contracts and historical operating trends related to the aging of our lease fleet, including functioning assets beyond original expected life. Based on our analysis, effective April 1, 2020, we changed our estimate of useful life and salvage values for certain equipment to better reflect the useful life and estimated values of these assets at the end of their useful life. The estimated useful life, previously estimated at 12 months, was increased to 18 months. The estimated salvage value of the equipment, previously estimated at 50% of the original purchase price, was decreased to 0%. The effect of the changes in estimate for the year ended December 31, 2020, was an increase in depreciation expense of $37.6 million, a decrease in net income of $26.4 million, and a decrease in basic and diluted earnings per share of $0.18 per share, respectively. See Note 10—Leases for additional information related to our leased assets.

NOTE 2—NEW ACCOUNTING STANDARDS

Accounting Standards Adopted

Effective January 1, 2020, we adopted ASU 2016-13, "*Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*." This update amends the impairment model to utilize an expected credit loss methodology in place of the incurred credit loss methodology for financial instruments. We applied the provisions of this ASU to our financial instruments, mostly consisting of trade receivables, as of January 1, 2020. We utilized the modified retrospective method of adoption; therefore, prior period amounts have not been adjusted and continue to be reflected in accordance with our historical accounting policies. As of January 1, 2020, we recorded a cumulative adjustment to retained earnings of $1.6 million, net of $0.4 million of income tax benefit.

NOTE 3—MERGER TRANSACTION, ACQUISITIONS, AND DISPOSITIONS

Merger Transaction

On June 3, 2020, we completed the acquisition of the Chemical Technologies business. To complete the acquisition, we issued 122.2 million shares of common stock, at a share price of $10.34 per share, in exchange for 100% equity ownership of Chemical Technologies.

Purchase Price Allocation

The acquisition-date fair value of the consideration transferred consisted of the following:

(in thousands)		
Equity consideration	$	1,263,931
Replacement awards attributable to pre-combination services[(1)]		43,964
Unfavorable supply agreement[(2)]		46,000
Favorable supply agreement[(2)]		(59,000)
Fair value of consideration transferred	$	1,294,895

(1) Represents the fair value of the replacement equity awards to the extent services were provided by employees of Chemical Technologies prior to closing. See Note 13—Equity and Cash Incentive Programs for additional information about the replacement equity awards.

(2) As part of the Merger, the Company entered into a Cross Supply and Product Transfer Agreement with Ecolab in which over a period of approximately three years from the merger date, certain products will be manufactured by one party for the other. The cross selling prices in which each party will transfer their products, and include a take-or-pay element, have been set forth within this agreement and are not reflective of market terms. As a result, we recognized an intangible asset recorded at fair value for the favorable terms and a liability recorded at fair value for the unfavorable terms. The intangible asset will be amortized on a straight-line basis over a three-year period into cost of goods and services and the liability will be amortized as a component of product revenue.

The following table provides the final allocation of the purchase price as of the acquisition date.

(in thousands)		
Cash and cash equivalents	$	57,588
Receivables		394,432
Inventories		340,000
Prepaid expenses and other current assets		63,576
Property, plant, and equipment		687,085
Identifiable intangible assets[1]		290,000
Other non-current assets		156,427
Total identifiable assets acquired		1,989,108
Accounts payable		184,028
Other current liabilities[1]		172,997
Long-term debt [2]		537,000
Deferred tax liabilities		103,956
Other liabilities[1]		98,970
Total liabilities assumed		1,096,951
Net identifiable assets acquired		892,157
Add: Negative fair value of non-controlling interests		16,052
Goodwill		386,686
Total net assets acquired	$	1,294,895

(1) The fair value of the consideration transferred related to the favorable and unfavorable terms of the cross supply agreement has been excluded.
(2) In connection with the Merger, we assumed a term loan from Chemical Technologies, of which approximately $26.9 million has been classified as short-term representing the mandatory amortization payments due within the next twelve months. See Note 8—Debt for further information.

Pro forma financial information

The following unaudited pro forma results of operations have been prepared as though the Merger was completed on January 1, 2019. Pro forma amounts are based on the preliminary purchase price allocation of the acquisition and are not necessarily indicative of results that may be reported in the future. Non-recurring pro forma adjustments including acquisition-related costs directly attributable to the Merger are included within the reported pro forma revenue and net income (loss).

	Years Ended December 31,			
(in thousands)	2020		2019	
Revenues	$	2,775,027	$	3,456,354
Net income (loss) attributable to ChampionX		(777,553)		229,126

Included in the net income (loss) attributable to ChampionX on a pro forma basis were goodwill and long-lived asset impairment charges of $805.0 million during 2020.

Other Acquisitions

Tomson Technologies LLC and Group 2 LLC

On December 8, 2021, we acquired Tomson Technologies LLC and Group 2 Technologies LLC, leaders in nano technology platforms with proven commercial applications helping energy companies lower the carbon footprint and operating expenses of their oil and gas production operations. Under the terms of the agreement, we paid an initial amount of $10.1 million, net of cash acquired. We may also be required to make future payments of up to an additional $13.0 million, contingent on the future performance of the business. As part of our purchase price allocation, we recorded contingent consideration of $3.7 million, goodwill of $2.5 million, and intangible assets of $10.2 million. The pro forma effect of this acquisition on revenue and net income has been determined to be immaterial to our financial statements.

Scientific Aviation

On July 2, 2021, we acquired Scientific Aviation, Inc. (“Scientific”), a provider of site-specific and regional methane emissions monitoring solutions for continuous and periodic monitoring applications. Scientific has been included in our Production & Automation Technologies segment. Under the terms of the agreement, we paid an initial amount of $10.0 million, net of cash acquired. We may also be required to make future payments of up to an additional $10.0 million, contingent on the future performance of Scientific. As part of our purchase price allocation, we recorded contingent consideration of $5.5 million and goodwill of $13.9 million. The pro forma effect of this acquisition on revenue and net income has been determined to be immaterial to our financial statements.

Dispositions

The Corsicana Plant

On September 7, 2021, we sold the U.S.-based assets associated with our chemical manufacturing plant in Corsicana, Texas (the “Corsicana Plant”) for a total purchase price of $70.0 million, subject to certain closing costs, pursuant to an Asset Purchase Agreement. The sale constituted an asset sale for accounting purposes.

Upon closing of the transaction, we received $68.8 million in cash, including $3.5 million to be held in escrow for one year to cover post-closing indemnification obligations and is included in restricted cash on our consolidated balance sheet. Proceeds from the sale were used to pay down debt and make further progress toward our long-term leverage target.

Pursuant to the Asset Purchase Agreement, we sold all of our property, plant and equipment as well as all other assets necessary to operate the Corsicana Plant. Total assets sold primarily consisted of $23.6 million in property, plant and equipment, $2.2 million in inventory, and $1.8 million in spare parts. We recognized a net gain of $38.0 million, which is included in other (income) expense, net in our condensed consolidated statements of income (loss) for the year ended December 31, 2021. The transaction was reflected in our Reservoir Chemical Technologies segment.

Other

During March 2019, we classified our pressure vessel manufacturing business in our Production & Automated Technologies segment as held for sale. We recognized an impairment loss of $1.7 million, which was recorded in selling, general and administrative expense in the consolidated statements of income (loss), to adjust the carrying amount of the disposal group to fair value. In June 2019, we completed the sale of our pressure vessel manufacturing business and made a cash payment of $2.2 million, resulting in a loss on disposition of $2.5 million, which was recorded in other expense, net in the consolidated statements of income (loss) for the year ended December 31, 2019.

NOTE 4—SEGMENT INFORMATION

Our reporting segments are:

- Production Chemical Technologies—provides oil and natural gas production and midstream markets with solutions to manage and control corrosion, oil and water separation, flow assurance, sour gas treatment and a host of water-related issues.
- Production & Automation Technologies—designs, manufactures, markets and services a full range of artificial lift equipment, end-to-end digital automation solutions, as well as other production equipment and asset monitoring technologies. Production & Automation Technologies' products are sold under a collection of brands including Harbison-Fischer, Norris, Alberta Oil Tool, Oil Lift Technology, PCS Ferguson, Pro-Rod, Upco, Unbridled ESP, Scientific Aviation, Norriseal-Wellmark, Quartzdyne, Spirit, Theta, Timberline and Windrock.
- Drilling Technologies—designs, manufactures and markets polycrystalline diamond cutters and bearings primarily for use in oil and gas drill bits under the US Synthetic brand.
- Reservoir Chemical Technologies—manufactures specialty products that support well stimulation, construction (including drilling and cementing) and well intervention in the oil and natural gas industry.

We refer to our Production Chemical Technologies segment and our Reservoir Chemical Technologies segment collectively as our Chemical Technologies business. Business activities that do not meet the criteria of an operating segment have been combined into Corporate and other. Corporate and other includes (i) corporate and overhead expenses, and (ii) revenue and costs for activities that are not operating segments.

Segment revenue and segment operating profit

	Years Ended December 31,		
(in thousands)	**2021**	**2020**	**2019**
Segment revenue:			
Production Chemical Technologies	$ 1,842,400	$ 992,805	$ —
Production & Automation Technologies	762,371	615,918	884,364
Drilling Technologies	172,066	116,186	246,887
Reservoir Chemical Technologies	141,095	61,507	—
Corporate and other [(1)]	157,058	113,580	—
Total revenue	$ 3,074,990	$ 1,899,996	$ 1,131,251
Income (loss) before income taxes:			
Segment operating profit (loss):			
Production Chemical Technologies	$ 165,463	$ 94,294	$ —
Production & Automation Technologies	45,635	(697,937)	54,024
Drilling Technologies	30,409	2,574	73,497
Reservoir Chemical Technologies	30,311	(6,198)	—
Total segment operating profit (loss)	271,818	(607,267)	127,521
Corporate and other [(1)]	67,212	103,751	29,034
Interest expense, net	51,921	51,731	39,301
Income (loss) before income taxes	$ 152,685	$ (762,749)	$ 59,186

(1) Corporate and other includes costs not directly attributable or allocated to our reportable segments such as corporate executive management and other administrative functions, and the results attributable to our noncontrolling interest. Additionally, the sales and expenses related to the Cross Supply Agreement with Ecolab are included within Corporate and other. See Note 3—Merger Transaction, Acquisitions, and Dispositions for further information.

Geographic information

(in thousands)	December 31, 2021	2020
Property, plant, and equipment, net:		
United States	$ 492,766	$ 547,662
Singapore	100,259	111,184
Canada	77,501	85,487
Other Countries	106,287	110,203
Total property, plant, and equipment, net	$ 776,813	$ 854,536

See Note 5—Revenue for information related to revenue by geography and end markets.

Other business segment information

(in thousands)	Capital Expenditures Years Ended December 31, 2021	2020	2019
Chemical Technologies [1]	$ 38,915	$ 10,498	$ —
Production & Automation Technologies	40,137	32,100	30,291
Drilling Technologies	2,826	1,736	9,061
Corporate and other	2,586	829	428
Total	$ 84,464	$ 45,163	$ 39,780

(1) Our Chemical Technologies business has an integrated supply chain function that serves the Production Chemical Technologies and Reservoir Chemical Technologies reportable segments. As such, capital expenditure information by each reportable segment has not been provided and is not available, since the Company does not produce or utilize such information.

(in thousands)	Depreciation & Amortization Years Ended December 31, 2021	2020	2019
Production Chemical Technologies	$ 98,049	$ 58,328	$ —
Production & Automation Technologies	101,575	130,725	110,131
Drilling Technologies	7,295	7,940	9,263
Reservoir Chemical Technologies	10,295	5,741	—
Corporate and other	20,071	11,628	544
Total	$ 237,285	$ 214,362	$ 119,938

NOTE 5—REVENUE

Our revenue is generated primarily from product sales. Service revenue is generated from providing services to our customers. These services include installation, repair and maintenance, laboratory and logistics services, chemical management services, troubleshooting, reporting, water treatment services, technical advisory assistance and other field services. Lease revenue is derived from rental income of leased production equipment. As our costs are shared across the various revenue categories, cost of goods sold is not tracked separately and is not discretely identifiable.

In certain geographical areas, the Company utilizes joint ventures and independent third-party distributors and sales agents to sell and market products and services. Amounts payable to independent third-party distributors and sales agents may fluctuate based on sales and timing of distributor fee payments. For services rendered by such independent third-party distributors and sales agents, the Company records the consideration received on a net basis within product revenue in our consolidated statements of income (loss). Additionally, amounts owed to distributors and sales agents is reported within accrued distributor fees within our consolidated balance sheets.

Revenue disaggregated by geography was as follows:

	Year Ended December 31, 2021					
(in thousands)	Production Chemical Technologies	Production & Automation Technologies	Drilling Technologies	Reservoir Chemical Technologies	Corporate and other (1)	Total
United States	$ 653,826	$ 583,010	$ 136,351	$ 88,313	$ 105,855	$ 1,567,355
Latin America	364,386	18,454	—	15,220	4,741	402,801
Middle East & Africa	268,096	53,995	5,408	22,140	8,896	358,535
Canada	263,887	58,927	13,474	2,739	342	339,369
Europe	180,269	6,088	11,810	4,315	11,617	214,099
Asia-Pacific	43,593	7,229	3,358	4,585	25,607	84,372
Australia	28,388	34,451	130	135	—	63,104
Other	39,955	217	1,535	3,648	—	45,355
Total revenue	$ 1,842,400	$ 762,371	$ 172,066	$ 141,095	$ 157,058	$ 3,074,990

	Year Ended December 31, 2020					
(in thousands)	Production Chemical Technologies	Production & Automation Technologies	Drilling Technologies	Reservoir Chemical Technologies	Corporate and other (1)	Total
United States	$ 318,460	$ 458,690	$ 82,812	$ 31,907	$ 72,948	$ 964,817
Latin America	202,177	21,679	22	4,283	3,650	231,811
Middle East & Africa	164,480	45,026	1,146	14,292	15,254	240,198
Canada	129,210	32,709	9,029	1,414	640	173,002
Europe	116,192	10,521	11,840	1,990	12,052	152,595
Asia-Pacific	28,023	5,549	9,141	2,267	9,041	54,021
Australia	13,225	41,233	110	274	—	54,842
Other	21,038	511	2,086	5,080	(5)	28,710
Total revenue	$ 992,805	$ 615,918	$ 116,186	$ 61,507	$ 113,580	$ 1,899,996

	Year Ended December 31, 2019					
(in thousands)	Production Chemical Technologies	Production & Automation Technologies	Drilling Technologies	Reservoir Chemical Technologies	Corporate and other	Total
United States	$ —	$ 679,280	$ 181,721	$ —	$ —	$ 861,001
Latin America	—	32,389	19	—	—	32,408
Middle East & Africa	—	59,051	1,013	—	—	60,064
Canada	—	52,647	17,667	—	—	70,314
Europe	—	19,752	32,213	—	—	51,965
Asia-Pacific	—	9,727	12,975	—	—	22,702
Australia	—	30,702	139	—	—	30,841
Other	—	816	1,140	—	—	1,956
Total revenue	$ —	$ 884,364	$ 246,887	$ —	$ —	$ 1,131,251

(1) Revenues associated with sales under the Cross Supply Agreement with Ecolab are included within Corporate and other. See Note 3—Merger Transaction, Acquisitions, and Dispositions for further information.

Revenue is attributed to regions based on the location of our direct customer, which in some instances is an intermediary and not necessarily the end user.

Performance Obligations

Some of our contracts have a single performance obligation which represents, in most cases, the equipment or product sold to the customer. Some contracts include multiple performance obligations, often satisfied at or near the same time, such as a product and the related installation and/or maintenance services. For contracts with multiple performance obligations, we allocate the transaction price to each performance obligation based on the estimated relative standalone selling prices of the promised goods or services underlying each performance obligation. We typically use observable prices to determine the stand-alone selling price of a performance obligation.

Within our Production & Automation Technologies and Drilling Technologies reportable segments, substantially all of our performance obligations are recognized at a point in time and are primarily related to our product revenue derived from the sale of drilling and production equipment. Revenue is recognized when control transfers to the customer upon shipment or completion of installation, testing, or certification as required under the contract. Within our Production Chemical Technologies and Reservoir Chemical Technologies segments, revenue recognized from the sale of products is recognized at the point in time when the obligations in the contract with the customer are satisfied, which generally occurs with the delivery of the product. Within our ESP leased asset program, when stipulated in the contract, equipment damaged in operation is charged to the customer and recognized as product revenue. Service and lease revenue are recognized over time when the services are provided to the customer or when the customer receives the benefit of the leased equipment.

Remaining performance obligations

As of December 31, 2021, we did not have any contracts with an original length of greater than a year from which revenue is expected to be recognized in the future related to performance obligations that are unsatisfied (or partially unsatisfied).

Contract Balances

The beginning and ending contract asset and contract liability balances from contracts with customers were as follows:

	December 31,	
(in thousands)	**2021**	**2020**
Contract assets	$ —	$ —
Contract liabilities	15,246	16,668

Contract assets primarily relate to work completed for performance obligations that are satisfied over time and are recorded in prepaid expenses and other current assets on our consolidated balance sheets. Contract assets are transferred to receivables when the right to consideration becomes unconditional. Contract liabilities relate to billings or consideration received in advance of performance (obligation to transfer goods or services to a customer) under the contract. Contract liabilities are recognized as revenue when the performance obligation has been performed, which primarily occurs during the subsequent quarter. Current contract liabilities are recorded in accrued expenses and other current liabilities on our consolidated balance sheets.

NOTE 6—PROPERTY, PLANT, AND EQUIPMENT

Property, plant and equipment consisted of the following:

	December 31,	
(in thousands)	**2021**	**2020**
Land and land improvements	$ 134,913	$ 140,209
Buildings and improvements	309,821	316,529
Software	44,295	37,638
Machinery, equipment and other	906,651	854,650
	1,395,680	1,349,026
Accumulated depreciation	(618,867)	(494,490)
Property, plant and equipment, net	$ 776,813	$ 854,536

Depreciation expense was $149.8 million, $142.6 million, and $68.6 million for the years ended December 31, 2021, 2020, and 2019, respectively.

NOTE 7—GOODWILL AND INTANGIBLE ASSETS

Goodwill

The carrying amount of goodwill, including changes therein, by reportable segment is below:

(in thousands)	Production Chemical Technologies	Production & Automation Technologies	Drilling Technologies	Reservoir Chemical Technologies	Total
December 31, 2019	$ —	$ 809,977	$ 101,136	$ —	$ 911,113
Acquisition [1]	349,821	—	—	36,865	386,686
Impairment [2]	—	(616,271)	—	—	(616,271)
Foreign currency translation	1,236	(2,169)	—	(1)	(934)
December 31, 2020	351,057	191,537	101,136	36,864	680,594
Acquisition [1]	2,500	13,893	—	—	16,393
Foreign currency translation	3,081	37	—	2,762	5,880
December 31, 2021	$ 356,638	$ 205,467	$ 101,136	$ 39,626	$ 702,867

(1) See Note 3—Merger Transaction, Acquisitions, and Dispositions for additional information related to the acquisitions completed during June 2020, July 2021, and December 2021.

(2) Due to industry conditions resulting from the COVID-19 pandemic, we performed a quantitative impairment assessment of our goodwill as of March 31, 2020. Based on the results of our impairment test, we recognized impairment charges of $616.3 million.

We completed our annual impairment test as of October 1, 2021 for all reporting units and concluded that the goodwill related to our reporting units was not impaired.

Intangible Assets

During 2021, we recorded $10.2 million of acquired intangible assets as part of the Tomson Technologies LLC and Group 2 Technologies LLC acquisition. During 2020, we recorded $349.0 million of acquired intangible assets, including $59.0 million for favorable supply agreements as part of the Merger. See Note 3—Merger Transaction, Acquisitions, and Dispositions, for additional information.

The components of our definite- and indefinite-lived intangible assets were as follows:

	December 31, 2021			December 31, 2020		
(in thousands)	**Gross Carrying Amount**	**Accumulated Amortization**	**Net Carrying Amount**	**Gross Carrying Amount**	**Accumulated Amortization**	**Net Carrying Amount**
Definite-lived intangible assets:						
Customer relationships (1)	$ 593,242	$ 365,773	$ 227,469	$ 593,068	$ 321,298	$ 271,770
Unpatented technologies	142,540	37,264	105,276	133,700	19,958	113,742
Favorable supply agreements (2)	59,000	30,546	28,454	59,000	11,308	47,692
Trademarks (1)	59,873	32,270	27,603	59,881	27,565	32,316
Patents	38,735	31,080	7,655	38,635	29,289	9,346
Other	5,390	5,177	213	5,374	4,831	543
	898,780	502,110	396,670	889,658	414,249	475,409
Indefinite-lived intangible assets:						
Trademarks	3,600	—	3,600	3,600	—	3,600
In-process research and development (3)	1,200	—	1,200	—	—	—
	4,800	—	4,800	3,600	—	3,600
Total	$ 903,580	$ 502,110	$ 401,470	$ 893,258	$ 414,249	$ 479,009

(1) During 2020, we recorded a long-lived asset impairment charge of $41.0 million, consisting of $40.4 million to customer relationships and $0.6 million to trademarks within Production & Automation Technologies.
(2) Favorable supply agreements were entered into as part of the Merger transaction. See Note 3—Merger Transaction, Acquisitions, and Dispositions for further information.
(3) In-process research and development was acquired as part of the Tomson Technologies LLC and Group 2 Technologies LLC acquisitions. See Note 3—Merger Transaction, Acquisitions, and Dispositions for further information.

Amortization expense related to our intangible assets was $87.4 million, $70.9 million, and $51.4 million for the years ended December 31, 2021, 2020, and 2019, respectively. Estimated future amortization expense related to intangible assets held as of December 31, 2021, is as follows:

(in thousands)	**Estimated Amortization**
2022	$ 87,476
2023	62,150
2024	48,800
2025	37,674
2026	37,316

NOTE 8—DEBT

Long-term debt consisted of the following:

	December 31,	
(in thousands)	**2021**	**2020**
2018 Credit Facility	$ —	$ —
2018 Term Loan Facility	140,000	140,000
2020 Term Loan Facility	496,725	523,575
6.375% Senior Notes due 2026	92,041	277,041
Total	728,766	940,616
Net unamortized discounts and issuance costs	(4,259)	(8,002)
Total long-term debt	724,507	932,614
Current portion of long-term debt [1]	(26,850)	(26,850)
Long-term debt, less current portion	$ 697,657	$ 905,764

(1) Includes the mandatory amortization payments due within twelve months related to the 2020 Term Loan Facility.

2018 Credit Facility

On May 9, 2018, we entered into a credit agreement ("credit agreement") governing the terms of our senior secured credit facilities, consisting of (i) a 7-year senior secured term loan B facility ("term loan facility") and (ii) a 5-year senior secured revolving credit facility ("revolving credit facility," and together with the term loan facility, the "senior secured credit facilities"), with JPMorgan Chase Bank, N.A. as administrative agent. The net proceeds of the senior secured credit facilities were used (i) to pay fees and expenses in connection with our spin-off ("Separation") from Dover Corporation ("Dover"), (ii) partially fund the cash payment to Dover and (iii) provide for working capital and other general corporate purposes. The senior secured credit facilities are jointly and severally guaranteed by ChampionX and certain of ChampionX's wholly owned U.S. subsidiaries, including, upon the consummation of the Merger, certain wholly owned U.S. subsidiaries within the Chemical Technologies business, ("guarantors"), on a senior secured basis, and are secured by substantially all tangible and intangible assets of ChampionX and the guarantors, except for certain excluded assets.

Outstanding borrowings under the senior secured credit facilities will accrue interest at a base per annum rate plus a margin. Interest on borrowings in which interest is accrued at a base rate plus an applicable margin is payable on the last business day of each quarter. The senior secured credit facilities contain a number of customary covenants that, among other things, limit or restrict the ability of ChampionX and the restricted subsidiaries to, subject to certain qualifications and exceptions, perform certain activities which include, but are not limited to (i) incur additional indebtedness, (ii) make acquisitions and (iii) pay dividends or other payments in respect of our capital stock. Additionally, ChampionX is required to maintain (a) a minimum interest coverage ratio, as defined in the credit agreement, of 2.50 to 1.00 and (b) a maximum total leverage ratio, as defined in the credit agreement, of 3.75 to 1.00.

On February 14, 2020, the Company entered into an amendment to the credit agreement (as amended, the "2018 Credit Facility"), which (i) provided for the incurrence of an additional $150.0 million of revolving commitments under the 2018 Credit Facility upon consummation of the Merger, (ii) permitted the consummation of the Merger and the incurrence of a senior secured term loan facility ("2020 Term Loan Facility") in an aggregate amount up to $537.0 million, and (iii) continued to provide that all obligations under the 2018 Credit Facility are guaranteed by the guarantors.

The revolving credit facility consists of a 5-year senior secured facility with aggregate commitments in an amount equal to $400.0 million, of which up to $100.0 million is available for the issuance of letters of credit. Amounts repaid under the revolving credit facility may be re-borrowed. The revolving credit facility matures in May 2023. We had no borrowings on the credit facility during the year ended December 31, 2021.

2018 Term Loan Facility

The term loan facility had an initial commitment of $415.0 million. The full amount of the term loan facility was funded on May 9, 2018. Amounts borrowed under the term loan facility that are repaid or prepaid may not be re-borrowed. The term loan facility matures in May 2025. Net proceeds of $408.7 million from the term loan facility were utilized to partially fund the cash payment to Dover at the Separation and to pay fees and expenses incurred in connection with the Separation.

The term loan is subject to mandatory amortization payments of 1% per annum of the initial commitment of $415.0 million paid quarterly. Additionally, subject to certain exceptions, the term loan facility is subject to mandatory prepayments, including the amount equal to: 100% of the net cash proceeds of all non-ordinary course asset sales subject to (i) reinvestment periods and (ii) step-downs to 75% and 50% based on certain leverage targets; and 50% of excess cash flow, as defined in the credit agreement, with step-downs to 25% and 0% based on certain leverage targets. ChampionX may voluntarily prepay amounts outstanding under the term loan facility in whole or in part at any time without premium or penalty, as defined in the credit agreement. The weighted average interest rate on borrowings during the period was 2.63%.

2020 Term Loan Facility

On June 3, 2020, ChampionX Holdings Inc. ("legacy ChampionX") entered into a term loan facility for $537.0 million ("2020 Term Loan Facility"). Proceeds from the 2020 Term Loan Facility were utilized to fund a cash payment of $527.4 million from legacy ChampionX to Ecolab upon the completion of the Merger. We assumed the 2020 Term Loan Facility upon completion of the Merger, which is fully and unconditionally guaranteed by the Company and the guarantors, which also guarantee the obligations under the 2018 Credit Facility. The 2020 Term Loan Facility matures at the earlier of (i) June 3, 2027 or (ii) January 30, 2026 in the event the Company's senior unsecured notes due May 1, 2026 remain outstanding. Amounts outstanding under the 2020 Term Loan Facility bear interest at a rate equal to (a) LIBOR plus 5.0% for eurocurrency rate loans (to the extent LIBOR is less than 1%, the LIBOR rate will be deemed to be 1%) or (b) the highest of (i) the Federal Funds Rate plus 1/2 of 1%, (ii) the "prime rate" quoted by Bank of America, N.A., (iii) LIBOR plus 1.00%, and (iv) 1.00%, plus 4.0%. The 2020 Term Loan Facility contains customary representations and warranties, covenants, and events of default for loan facilities of this type. The weighted average interest rate on borrowings during the period was 6.00%.

The term loan is subject to mandatory amortization payments of $6.7 million paid quarterly, which began on September 30, 2020. Any voluntary prepayment of the 2020 Term Loan Facility which occurs prior to June 3, 2022, is subject to a make-whole prepayment premium on the aggregate prepaid principal amount of the 2020 Term Loan Facility.

Senior Notes

On May 3, 2018, and in connection with the Separation, we completed the offering of $300.0 million in aggregate principal amount of 6.375% senior notes due May 2026 ("Senior Notes"). Interest on the Senior Notes is payable semi-annually in arrears on May 1 and November 1 of each year and commenced on November 1, 2018. Net proceeds of $293.8 million from the offering were utilized to partially fund the $700.0 million cash payment to Dover at the Separation and to pay fees and expenses incurred in connection with the Separation.

Payment obligations of the Senior Notes are fully and unconditionally guaranteed by the guarantors on a joint and several basis. On June 18, 2020, the wholly owned subsidiaries of legacy ChampionX that guarantee the 2018 Credit Facility and the 2020 Term Loan Facility, delivered a Supplemental Indenture to join as guarantors of the Senior Notes.

The terms of the Senior Notes are governed by the indenture dated as of May 3, 2018, between the Company and Wells Fargo Bank, N.A., as trustee, and are guaranteed, on a senior unsecured basis, by the guarantors. We may redeem the Senior Notes, in whole or in part, at certain tiered redemption prices as defined in the indenture, plus accrued and unpaid interest. The Senior Notes are our senior unsecured obligations. The Senior Notes rank equally in right of payment with our future and existing senior debt but are effectively subordinated to our future and existing debt to the extent of the assets securing such senior debt. The Senior Notes rank senior in right of payment to all of our future subordinated debt.

Redemptions and Repurchase

During 2021, the Company completed the redemption of certain of the Company's 6.375% Senior Notes at 104.781% of the principal amount thereof. We repurchased $185.0 million in aggregate principal amount of the Senior Notes for $196.6 million in cash, including $2.7 million in accrued interest. At December 31, 2021, $92.0 million in aggregate principal amount of Senior Notes was outstanding.

In connection with these redemptions, we recognized a net loss of approximately $11.1 million for the year ended December 31, 2021, inclusive of the write off of unamortized debt financing costs related to the extinguished portion of the Senior Notes, which is included in other expense, net in our consolidated statements of income (loss).

During 2020, the Company repurchased $23.0 million in aggregate principal amount of the Senior Notes in cash upon completion of a tender offer for the Senior Notes. The total amount paid was $23.4 million, including principal and $0.2 million in accrued interest. In connection with the repurchase, we recognized a net loss of approximately $0.9 million for the year ended December 31, 2020 and is included in other expense, net in our consolidated statement of income (loss).

As of December 31, 2021, aggregate contractual future principal payments on long-term debt are as follows:

(in thousands)	**Principal Payments**[(1)]
2022	$ 26,850
2023	26,850
2024	26,850
2025	166,850
2026	118,891
Thereafter	362,475
Total	$ 728,766

(1) Principal payments included relate to our 2020 Term Loan Facility and Senior Notes. See Note 10—Leases for future payments related to finance lease obligations.

NOTE 9—COMMITMENTS AND CONTINGENCIES

The Company is subject to various claims and contingencies related to, among other things, workers' compensation, general liability (including product liability), automobile claims, health care claims, environmental matters, and lawsuits. We record liabilities where a contingent loss is probable and can be reasonably estimated. If the reasonable estimate of a probable loss is a range, the Company records the most probable estimate of the loss or the minimum amount when no amount within the range is a better estimate than any other amount. In accordance with applicable GAAP, the Company discloses a contingent liability even if the liability is not probable or the amount is not estimable, or both, if there is a reasonable possibility that a material loss may have been incurred.

Lease Commitments

See Note 10—Leases for a schedule of future minimum payments on our operating and finance lease arrangements.

Guarantees and Indemnifications

We have provided indemnities in connection with sales of certain businesses and assets, including representations and warranties, covenants and related indemnities for environmental health and safety, tax, and employment matters. We do not have any material liabilities recorded for these indemnifications and are not aware of any claims or other information that would give rise to material payments under such indemnities.

In connection with the Company's Separation from Dover in 2018, we entered into agreements with Dover that govern the treatment between Dover and us for certain indemnification matters and litigation responsibility. Generally, the separation and distribution agreement provides for cross-indemnities principally designed to place financial responsibility for the obligations and liabilities of our business with us and to place financial responsibility for the obligations and liabilities of Dover's business with Dover. The separation and distribution agreement also establishes procedures for handling claims subject to indemnification and related matters.

In connection with the Merger, we entered into agreements with Ecolab that govern the treatment between Ecolab and us for certain indemnification matters and litigation responsibility. Generally, the separation and distribution agreement provides for cross-indemnities principally designed to place financial responsibility for the obligations and liabilities of our business with us and to place financial responsibility for the obligations and liabilities of Ecolab's business with Ecolab. The separation and distribution agreement also establishes procedures for handling claims subject to indemnification and related matters. In addition, pursuant to the Tax Matters Agreement, we have agreed to indemnify Ecolab and its affiliates for (i) all taxes for which ChampionX is responsible as defined within the Tax Matters Agreement, (ii) all taxes resulting from a breach by ChampionX of any of its representations (but only to the extent relating to a breach occurring after the consummation of the Merger) or any of its covenants under the Tax Matters Agreement, (iii) all taxes resulting from an acquisition after the Merger of any of the stock or assets of ChampionX, other than as a result of the Merger or a repayment of the ChampionX Credit Facilities and (iv) reasonable costs and expenses (including reasonable attorneys' fees and expenses) related to the foregoing.

As of December 31, 2021 and December 31, 2020, we had $80.2 million and $88.8 million, respectively, of outstanding letters of credit, surety bonds and guarantees, which expire at various dates through 2039. These financial instruments are primarily maintained as security for insurance, warranty, and other performance obligations. Generally, we would only be liable for the amount of these letters of credit and surety bonds in the event of default in the performance of our obligations, the probability of which we believe is remote.

Supply Agreements

Cross Supply and Product Transfer Agreement

As discussed in Note 3—Merger Transaction, Acquisitions, and Dispositions, certain agreements were entered into between the Company and Ecolab, including, among others, a Cross Supply and Product Transfer Agreement. The Cross Supply and Product Transfer Agreement includes a take-or-pay element which requires the Company to purchase a minimum of 13.7 million kilograms of product over a ten-year period, approximately $23.3 million. The Company has the option to terminate early beginning in the fifth year upon a two-year's notice, subject to a termination fee which declines over the contract term.

Vendor Supply Agreement

We also acquired a Vendor Supply Agreement from Ecolab as part of the Merger discussed in Note 3—Merger Transaction, Acquisitions, and Dispositions. Ecolab made payments in the aggregate of $25.0 million and the Company assumed the receivable for the repayment of this loan. The loan is required to be repaid with 4% interest on the unapplied discount, totaling $30.0 million to be paid back in discounts. The fair value of the expected future cash flows as of December 31, 2021 and December 31, 2020, was $14.1 million and $14.9 million, respectively.

Litigation and Environmental Matters

We are involved in various pending or potential lawsuits, claims and environmental actions that have arisen in the ordinary course of our business. These proceedings primarily involve claims by private parties alleging injury arising out of use of our products, patent infringement, employment matters, and commercial disputes, as well as possible obligations to investigate and mitigate the effects on the environment of the disposal or release of certain chemical substances at various sites, such as Superfund sites and either operating or owned facilities. We review the probable outcome of such proceedings, the costs and expenses reasonably expected to be incurred and accrued to date, and the availability and extent of insurance coverage. We accrue a liability for legal matters that are probable and can be reasonably estimated. If the reasonable estimate of a probable loss is a range, the Company records the most probable estimate of the loss or the minimum amount when no amount within the range is a better estimate than any other amount. We are unable to predict the ultimate outcome of these actions because of the inherent uncertainty of litigation and unfavorable rulings or developments could occur, and there can be no certainty that the Company may not ultimately incur changes in excess of recorded liabilities. However, we believe the most probable, ultimate resolution of these matters will not have a material adverse effect on our consolidated financial position, results of operations or cash flows.

Environmental Matters

The Company is currently participating in environmental assessments and remediation at approximately 11 locations, the majority of which are in the U.S., and environmental liabilities have been accrued reflecting our best estimate of future costs. Potential insurance reimbursements are not anticipated in the Company's accruals for environmental liabilities. As of December 31, 2021 and December 31, 2020, environmental liability accruals related to these locations were $6.8 million and $9.2 million, respectively.

Prior to the separation from Dover in 2018, groundwater contamination was discovered at the Norris Sucker Rods plant site located in Tulsa, Oklahoma ("Norris"). Initial remedial efforts were undertaken at the time of discovery of the contamination and Norris has since coordinated monitoring and remediation with the Oklahoma Department of Environmental Quality ("ODEQ"). As part of the ongoing long-term remediation process, Norris contracted an engineering and consulting firm to develop a range of possible additional remedial alternatives in order to accelerate the remediation process and associated cost estimates for the work. In October 2019, we received the firm's preliminary remedial alternatives for consideration. We have submitted our long-term remediation plan and it was approved by ODEQ. We are now in discussion with ODEQ to finalize a consent order. Because we have not yet finalized the consent order for further remediation at the site and discussions with ODEQ remain ongoing, we cannot fully anticipate the timing, outcome or possible impact of such further remedial activities, financial or otherwise. As a result of the recommendations in the report, we accrued liabilities for these remediation efforts of approximately $2.0 million as of December 31, 2019. Liabilities could increase in the future at such time as we ultimately reach agreement with ODEQ on our remediation plan and such liabilities become probable and can be reasonably estimated, however, there have been no changes to our estimated liability as of December 31, 2021.

Matters Related to Deepwater Horizon Incident Response

On April 22, 2010, the deepwater drilling platform, the Deepwater Horizon, operated by a subsidiary of BP plc, sank in the Gulf of Mexico after an explosion and fire, resulting in a massive oil spill. Certain entities that are now subsidiaries of ChampionX as a result of the Merger (collectively the "COREXIT Defendants") supplied COREXIT™ 9500, an oil dispersant product listed on the U.S. EPA National Contingency Plan Product Schedule, which was used in the response to the spill. In connection with the provision of COREXIT™, the COREXIT Defendants were named in several lawsuits. Cases arising out of the Deepwater Horizon accident were administratively transferred and consolidated for pre-trial purposes under In Re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010, Case No. 10-md-02179 in the United States District Court in the Eastern District of Louisiana (E.D. La.) ("MDL 2179"). Claims related to the response to the oil spill were consolidated in a master complaint captioned the "B3 Master Complaint." In 2011, Transocean Deepwater Drilling, Inc. and its affiliates (the "Transocean Entities") named the COREXIT Defendants and other unaffiliated companies as first party defendants (In re the Complaint and Petition of Triton Asset Leasing GmbH, et al, MDL No. 2179, Civil Action 10-2771). In April and May 2011, the Transocean Entities, Cameron International Corporation, Halliburton Energy Services, Inc., M-I L.L.C., Weatherford U.S., L.P. and Weatherford International, Inc. (collectively, the "Cross Claimants") filed cross claims in MDL 2179 against the COREXIT Defendants and other unaffiliated cross defendants. In April and June 2011, in support of its defense of the claims against it, the COREXIT Defendants filed counterclaims against the Cross Claimants. On May 18, 2012, the COREXIT Defendants filed a motion for summary judgment as to the claims in the B3 Master Complaint. On November 28, 2012, the Court granted the COREXIT Defendants' motion and dismissed with prejudice the claims in the B3 Master Complaint asserted against the COREXIT Defendants. There currently remain three "B3" cases that had asserted claims against the COREXIT Defendants and that remain pending against other defendants. Because the Court's decision was not a "final judgment" for purposes of appeal with respect to those claims, under Federal Rule of Appellate Procedure 4(a), plaintiffs will have 30 days after entry of final judgment in each case to appeal the Court's summary judgment decision.

The Company believes the claims asserted against the COREXIT Defendants are without merit and intends to defend these lawsuits vigorously. The Company also believes that it has rights to contribution and/or indemnification (including legal expenses) from third parties. However, we cannot predict the outcome of these lawsuits, the involvement it might have in these matters in the future, or the potential for future litigation.

NOTE 10—LEASES

Lessee Accounting

We have operating and finance leases for real estate, vehicles and equipment. Certain of our vehicle leases include residual value guarantees, which have been excluded from the measurement of our lease liabilities as we do not believe it is probable the residual value guarantees will be paid at the end of the lease. Our real estate and vehicle leases generally include options to renew or extend the lease term at our discretion. These options are included in the measurement of our lease liabilities only when it is reasonably certain that we will exercise these rights.

Balance sheet presentation—Leases are presented in our consolidated balance sheet as follows:

(in thousands)	Balance Sheet Classification	December 31, 2021	December 31, 2020
Right-of Use Assets:			
Finance leases	Property, plant, and equipment, net	$ 8,048	$ 7,337
Operating leases	Operating lease right-of-use assets	115,458	122,481
Total lease right-of-use assets		123,506	129,818
Lease Liabilities:			
Finance leases - current	Accrued expenses and other current liabilities	$ 4,006	$ 4,326
Finance leases	Other long-term liabilities	4,498	4,188
Operating leases - current	Current portion of operating lease liabilities	36,389	33,234
Operating leases	Operating lease liabilities	73,521	83,553
Total lease liabilities		$ 118,414	$ 125,301

Components of total lease cost—Components of total lease cost were as follows:

(in thousands)	Years Ended December 31, 2021	Years Ended December 31, 2020
Finance lease cost:		
Amortization of right-of-use assets	$ 5,855	$ 5,266
Interest on lease liabilities	510	567
Operating lease cost	41,113	31,850
Short-term and variable lease cost	21,756	12,917
Sublease income	(18)	(3,584)
Total lease cost	$ 69,216	$ 47,016

Lease term and discount rate—Our weighted-average remaining lease term and weighted-average discount rate for operating and finance leases are as follows:

	December 31, 2021	December 31, 2020
Weighted-average remaining lease term (years):		
Operating lease	6.9	6.3
Finance lease	2.7	2.7
Weighted-average discount rate:		
Operating lease	5.3 %	6.7 %
Finance lease	5.0 %	6.0 %

Maturity Analysis—Future minimum payments, as determined in accordance with ASC 842, on our operating and finance leases as of December 31, 2021 are as follows:

(in thousands)		Operating		Finance
2022	$	41,991	$	4,327
2023		30,621		2,429
2024		20,894		1,475
2025		11,488		659
2026		3,799		198
Thereafter		25,131		31
Total future minimum lease payments		133,924		9,119
Interest included within lease payments		(24,014)		(615)
Total lease liabilities	$	109,910	$	8,504

Lessor Accounting

Lease revenue is primarily generated from our ESP leased asset program within our Production & Automation Technologies segment. An ESP rental unit has components consisting of surface, downhole and cable equipment. The average length of these arrangements generally range from 12 months to 14 months. Lease revenue for our leased asset programs was $65.4 million and $54.0 million for the years ended December 31, 2021 and 2020, respectively.

Leased assets—Components of our leased asset program, all of which are included within Property, plant, and equipment, net on our consolidated balance sheet, are as follows:

(in thousands)	Useful life		December 31, 2021
Cable equipment	18 months	$	33,498
Downhole equipment	18 months		43,206
Surface equipment	5 years		73,633
Other lease equipment	3 - 5 years		14,344
			164,681
Accumulated depreciation			(112,610)
Leased assets, net		$	52,071

Depreciation expense on our leased assets was $43.7 million and $67.6 million for the year ended December 31, 2021 and 2020, respectively.

NOTE 11—RESTRUCTURING

During the current and prior periods, we approved various restructuring plans related to the consolidation of product lines and associated facility closures and workforce reductions. As a result, we recognized charges of $13.3 million during 2021, consisting of employee severance and related benefits. During 2020 and 2019, we recorded restructuring and other charges of $23.3 million and $5.2 million, respectively.

The following table presents the restructuring and other related charges by segment as classified in our condensed consolidated statements of income (loss).

	Years Ended December 31,		
(in thousands)	**2021**	**2020**	**2019**
Segment restructuring charges:			
Production Chemical Technologies	$ 6,508	$ 5,241	$ —
Production & Automation Technologies	5,441	11,814	4,467
Drilling Technologies	—	5,521	710
Reservoir Chemical Technologies	415	348	—
Corporate and other	910	367	—
Total	$ 13,274	$ 23,291	$ 5,177
Statements of Income (Loss) classification:			
Cost of goods and services	$ 6,554	$ 13,955	$ 3,592
Selling, general and administrative expense	6,720	9,336	1,585
Total	$ 13,274	$ 23,291	$ 5,177

Our liability balance for restructuring and other related charges at December 31, 2021 reflects employee severance and related benefits initiated during the period. Additional programs may be initiated during 2021 with related restructuring charges.

The following table details our restructuring accrual activities during the year ended December 31, 2021:

(in thousands)	**Restructuring Accrual Balance**
December 31, 2020	$ 2,951
Restructuring charges	9,419
Payments	(8,613)
Other, including foreign currency translation	(14)
December 31, 2021	$ 3,743

NOTE 12—EMPLOYEE BENEFIT PLANS

The Company sponsors several pension and post-employment benefit plans in the U.S. and internationally, of which, approximately half of such plans are frozen to new participants.

We recognized net actuarial gains in the amount of $8.5 million during the year ended December 31, 2021 and net actuarial losses of $5.5 million and $2.5 million during the years ended December 31, 2020 and 2019, respectively. The actuarial gains and losses are reflected in our consolidated statements of comprehensive income (loss). The unfunded liability of the plans as of December 31, 2021 and 2020 was approximately $13.9 million and $24.9 million, respectively, and is included in other long-term liabilities within our consolidated balance sheets. The net periodic benefit expense was $2.5 million, $3.2 million, and $2.0 million for the years ended December 31, 2021, 2020, and 2019, respectively.

NOTE 13—EQUITY AND CASH INCENTIVE PROGRAMS

Our Board of Directors adopted the 2018 Equity and Cash Incentive Plan ("2018 Plan"). The 2018 Plan was amended and restated in 2020 to increase the shares of common stock reserved for issuance under the 2018 Plan to 18.2 million, and in 2021 to increase the shares of common stock reserved for issuance to 31.4 million, in each case subject to customary adjustments arising from stock splits and other similar changes, along with other amendments.

The 2018 Plan authorizes the grant of stock options, stock-settled stock appreciation rights ("SARs"), restricted stock awards, restricted stock units, performance share awards, cash performance awards, directors' shares and deferred stock units. The ChampionX Compensation Committee determines the exercise price for options and the base price of SARs, which may not be less than the fair value of ChampionX common stock on the date of grant. Generally, stock options or SARs vest after 3 years of service and expire at the end of 10 years. Performance share awards vest if ChampionX achieves certain pre-established performance targets based on specified performance criteria over a performance period of not less than 3 years.

In connection with the Merger, the Company entered into the Employee Matters Agreement dated December 18, 2019, which provided the terms in which certain Ecolab share-based awards held by legacy ChampionX employees were replaced with share-based awards of the Company on the merger date. The fair value of the replacement awards has been allocated between each employee's pre-combination and post-combination services. Amounts allocated to pre-combination services have been included as consideration transferred as part of the Merger. See Note 3—Merger Transaction, Acquisitions, and Dispositions for a summary of consideration transferred. Compensation costs of $15.8 million allocated to post-combination services will be recorded as stock-based compensation expense over each employees' remaining service period of approximately two years.

Stock-based compensation expense is reported within selling, general and administrative expense in the consolidated statements of income (loss). Stock-based compensation expense relating to all stock-based incentive plans was as follows:

	Years Ended December 31,		
	2021	2020	2019
Stock-based compensation expense	$ 23,178	$ 19,536	$ 10,250
Tax benefit	(5,257)	(4,478)	(2,153)
Stock-based compensation expense, net of tax	$ 17,921	$ 15,058	$ 8,097

SARs

We did not issue SARs during 2021, 2020 or 2019. A summary of activity relating to SARs outstanding for the year ended December 31, 2021, is as follows:

	SARs			
	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding at January 1, 2021	415,331	$ 29.67		
Forfeited / expired	(2,134)	25.27		
Exercised	(19,674)	24.73		
Outstanding at December 31, 2021	393,523	$ 29.94	4.2	$ —
Exercisable at December 31, 2021	393,523	$ 29.94	4.2	$ —

There is no unrecognized compensation expense related to SARs, as all SARs are exercisable as of December 31, 2021.

Other information regarding the exercise of SARs is presented below:

(in thousands)	2021	2020	2019
SARs:			
Fair value of SARs that became exercisable	$ —	$ 878	$ 662
Aggregate intrinsic value of SARs exercised	71	—	629

Performance Share Awards - ChampionX

Market Vesting Conditions

We granted 166,519, 121,261, and 46,459 performance share awards subject to market vesting conditions during 2021, 2020, and 2019, respectively, under the 2018 Plan. These awards vest if ChampionX achieves certain pre-established performance targets based on specified performance criteria over a performance period of not less than 3 years. The performance targets for these awards are classified as a market vesting condition, therefore the compensation cost was calculated using the grant date fair value, as estimated using a Monte Carlo simulation, and is not subject to change based on future events. The fair value used in determining stock-based compensation expense of the performance share awards issued in 2021, 2020, and 2019, is as follows:

Performance shares:	**2021**	**2020**	**2019**
Fair value per share at date of grant	$ 26.32	$ 14.55	$ 57.43

Performance Vesting Conditions

We granted 166,519 and 46,460 performance share awards subject to performance vesting conditions during 2021 and 2019, respectively, under the 2018 Plan. We did not grant any of this type of award in 2020. These awards are considered performance condition awards as attainment is based on ChampionX's performance relative to established internal metrics. The fair value of these awards was determined using ChampionX's closing stock price on the date of grant.

The fair value and average attainment used in determining stock-based compensation expense of the performance shares issued in 2021 and 2020 are as follows:

Performance shares:	**2021**	**2020**
Fair value per share at date of grant	$ 17.61	$ —
Average attainment rate reflected in expense	100 %	— %

A summary of activity for ChampionX's performance share awards under the 2018 Plan for the year ended December 31, 2021, is as follows:

	Shares	**Weighted-Average Grant-Date Fair Value**
Unvested at January 1, 2021	278,763	$ 35.95
Granted	333,037	21.97
Forfeited	(5,678)	21.97
Vested	(148,341)	50.50
Performance adjustment [1]	47,728	56.32
Unvested at December 31, 2021	505,509	$ 24.26

(1) Represents the additional shares that were issued to participants upon vesting of the awards due to the performance factor being exceeded for the three-year performance period.

Unrecognized compensation expense related to unvested performance share awards as of December 31, 2021, was $6.0 million, which will be recognized over a weighted average period of 2.0 years.

Restricted Stock Units

Restricted stock units may be granted at no cost to certain officers and key employees. Restricted stock units generally vest over a three- or four-year period.

A summary of activity for restricted stock units for the year ended December 31, 2021, is as follows:

	Shares	Weighted-Average Grant-Date Fair Value
Unvested at January 1, 2021	2,669,779	$ 14.04
Granted	901,485	18.10
Forfeited	(126,077)	13.70
Vested	(1,103,080)	15.28
Unvested at December 31, 2021	2,342,107	$ 14.49

Unrecognized compensation expense relating to unvested restricted stock units as of December 31, 2021, was $16.8 million, which will be recognized over a weighted average period of 0.9 years.

Non-Qualified Stock Options

We did not grant non-qualified stock options in 2021. All outstanding non-qualified stock options were issued to legacy ChampionX employees upon the closing of the Merger as replacement awards for options originally granted to them by Ecolab. A summary of activity for non-qualified stock options for the year ended December 31, 2021 is as follows:

	Non-Qualified Stock Options			
	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding at January 1, 2021	7,175,040	$ 6.01		
Granted	—	—		
Forfeited / expired	(39,990)	7.54		
Exercised	(1,646,397)	5.38		
Outstanding at December 31, 2021	5,488,653	$ 6.18	5.0	$ 75,984
Exercisable at December 31, 2021	5,487,875	$ 6.18	5.0	$ 75,975

We had no unrecognized compensation expense relating to unvested stock options as of December 31, 2021.

During the year ended December 31, 2021, the total intrinsic value of stock options exercised was approximately $29.6 million and cash received from stock options exercised was approximately $8.8 million. The cash tax benefit from stock options exercised during the year ended December 31, 2021 was approximately $1.9 million.

NOTE 14—STOCKHOLDERS' EQUITY

On February 4, 2022, our Board of Directors ("Board") approved a plan to initiate a regular quarterly cash dividend of $0.075 per share on the Company's common stock. The first declared dividend is payable on April 29, 2022 to shareholders of record on April 8, 2022. Subsequent dividend declarations, if any, including the amounts and timing of future dividends, are subject to approval by the Board and will depend on future business conditions, financial conditions, results of operations and other factors.

Accumulated other comprehensive loss—Accumulated other comprehensive loss consisted of the following:

(in thousands)	Foreign Currency Translation	Defined Pension and Other Post-Retirement Benefits	Cash Flow Hedges	Accumulated Other Comprehensive Income (Loss)
December 31, 2019	$ (35,210)	$ (8,827)	$ —	$ (44,037)
Other comprehensive income (loss) before reclassifications, net of tax	20,245	(5,504)	(2,320)	12,421
Reclassification adjustment for net losses included in net income, net of tax	—	861	—	861
Other comprehensive income (loss), net of tax	20,245	(4,643)	(2,320)	13,282
December 31, 2020	(14,965)	(13,470)	(2,320)	(30,755)
Other comprehensive income (loss) before reclassifications, net of tax	(4,465)	8,712	3,601	7,848
Reclassification adjustment for net losses included in net income, net of tax	—	1,282	—	1,282
Other comprehensive income (loss), net of tax	(4,465)	9,994	3,601	9,130
December 31, 2021	$ (19,430)	$ (3,476)	$ 1,281	$ (21,625)

Reclassifications from accumulated comprehensive loss—Reclassification adjustments from accumulated other comprehensive loss to net income related to defined pension and other post-retirement benefits consisted of the following:

(in thousands)	Years Ended December 31, 2021	2020	2019	Affected line items on the consolidated statements of income
Amortization of actuarial loss and net transition obligation[1]	$ 1,532	$ 492	$ 364	Other expense, net
Amortization of prior service cost [1]	77	—	2	Other expense, net
Settlement loss [1]	—	698	508	Other expense, net
	1,609	1,190	874	Income before income taxes
	(327)	(329)	(230)	Provision for (benefit from) income taxes
	$ 1,282	$ 861	$ 644	Net income

(1) These accumulated comprehensive loss components are included in the computation of net periodic benefit cost (See Note 12—Employee Benefit Plans for additional information).

NOTE 15—EARNINGS PER SHARE

On June 3, 2020, 122.2 million shares of our common stock were issued in conjunction with the acquisition of the legacy ChampionX business. See Note 3—Merger Transaction, Acquisitions, and Dispositions for additional information.

A reconciliation of the number of shares used for the basic and diluted earnings (loss) per share calculation was as follows:

	Years Ended December 31,		
(in thousands, except per share data)	**2021**	**2020**	**2019**
Net income (loss) attributable to ChampionX	$ 113,299	$ (743,930)	$ 52,164
Weighted-average number of shares outstanding	201,579	148,370	77,427
Dilutive effect of stock-based compensation	6,746	—	197
Total shares and dilutive securities	208,325	148,370	77,624
Basic earnings per share attributable to ChampionX	$ 0.56	$ (5.01)	$ 0.67
Diluted earnings per share attributable to ChampionX	$ 0.54	$ (5.01)	$ 0.67

For all periods presented, the computation of diluted earnings (losses) per share excludes awards with an anti-dilutive impact. For the years ended December 31, 2021 and December 31, 2019, the diluted shares include the dilutive impact of equity awards except for approximately 0.4 million shares and 0.4 million shares that were excluded because their inclusion would be anti-dilutive. For the year ended December 31, 2020, we excluded all outstanding equity awards from the calculation of weighted-average shares outstanding, because their inclusion would be anti-dilutive as we were in a loss position.

NOTE 16—FAIR VALUE MEASUREMENTS

The carrying amount and the estimated fair value for assets and liabilities measured on a recurring basis are as follows:

	Carrying Amount	
	December 31,	
(in thousands)	2021	2020
Assets		
Foreign currency forward contracts	$ 4,081	$ 4,576
Liabilities		
Foreign currency forward contracts	$ 3,773	$ 6,561

The carrying value of foreign currency forward contracts is at fair value, which is determined based on foreign currency exchange rates as of the balance sheet date and is classified within Level 2. For purposes of fair value disclosure above, derivative values are presented gross. See Note 17—Derivatives and Hedging Transactions for further discussion of gross versus net presentation of the Company's derivatives.

The carrying amounts of cash and cash equivalents, trade receivables, and accounts payable approximate their fair value due to their short-term nature.

The fair value of our Senior Notes is based on Level 1 quoted market prices. The fair value of our term loan facilities are based on Level 2 quoted market prices for the same or similar debt instruments. The carrying amount and the estimated fair value of long-term debt, including current maturities, held by the Company were:

	December 31, 2021		December 31, 2020	
(in thousands)	Carrying Amount	Fair Value	Carrying Amount	Fair Value
2018 Term Loan Facility	$ 140,000	$ 138,950	$ 140,000	$ 137,200
2020 Term Loan Facility	$ 496,725	$ 502,313	$ 523,575	$ 530,120
6.375% Senior Notes due 2026	$ 92,041	$ 95,805	$ 277,041	$ 277,054

Impairment of Goodwill and Long-lived Assets

During 2020, we recorded a $616.3 million impairment charge to goodwill in our Artificial Lift and Automation reporting units. Additionally, we recorded a long-lived asset impairment charge of $41.0 million in our Production & Automation Technologies reporting segment. We consider the inputs for our long-lived asset and goodwill impairment calculations to be Level 3 inputs in the fair value hierarchy. See Note 7—Goodwill and Intangible Assets for additional information.

Merger Transaction

On June 3, 2020 we completed the acquisition of the legacy ChampionX business through the merger of one of our wholly owned subsidiaries with legacy ChampionX. The measurements of assets acquired and liabilities assumed, other than debt which was measured using Level 2 measurements, are based on inputs that are not observable in the market and thus represent Level 3 inputs. See Note 3—Merger Transaction, Acquisitions, and Dispositions for additional information.

Credit Risk

By their nature, financial instruments involve risk, including credit risk, for non-performance by counterparties. Financial instruments that potentially subject us to credit risk primarily consist of trade receivables. See Note 1—Basis of Presentation and Summary of Significant Accounting Policies for additional information on the mitigation of credit risk.

NOTE 17—DERIVATIVES AND HEDGING TRANSACTIONS

The Company uses foreign currency forward contracts to manage risks associated with foreign currency exchange rates. The Company does not hold derivative financial instruments of a speculative nature or for trading purposes. Derivative contracts are recorded as assets and liabilities on the balance sheet at fair value. We evaluate hedge effectiveness at contract inception and thereafter on a quarterly basis. If a derivative is no longer expected to be effective, hedge accounting is discontinued. Changes in fair value are recognized immediately in earnings unless the derivative qualifies and is designated as a hedge. Changes in fair value attributable to changes in spot exchange rates for derivative contracts that have been designated as cash flow hedges are recognized in accumulated other comprehensive income (loss) ("AOCI") and reclassified into earnings in the same period the hedged transaction affects earnings and are presented in the same income statement line as the earnings effect of the hedged item. Cash flows from derivatives are classified in the statement of cash flows in the same category as the cash flows from the items subject to designated hedge or undesignated (economic) hedge relationships.

The Company is exposed to credit risk in the event of nonperformance of counterparties for foreign currency forward exchange contracts. We monitor our exposure to credit risk by using major global banks and financial institutions as counterparties and monitoring their financial condition and credit profile. The Company does not anticipate nonperformance by any of these counterparties, and therefore, recording a valuation allowance against the Company's derivative balance is not considered necessary.

Derivative Positions Summary

Certain of the Company's derivative transactions are subject to master netting arrangements that allow the Company to settle with the same counterparties. These arrangements generally do not call for collateral and as of the applicable dates presented in the following table, no cash collateral had been received or pledged related to the underlying derivatives. We have elected to present our derivative balances on a gross basis on the condensed consolidated balance sheet.

The following table summarizes the gross fair value of the Company's outstanding derivatives and the lines in which they are presented on the condensed consolidated balance sheet.

	Derivative Assets		Derivative Liabilities	
	December 31,		December 31,	
(in thousands)	2021	2020	2021	2020
Prepaid expenses and other current assets	$ 4,081	$ 4,576	$ —	$ —
Accrued expenses and other current liabilities	—	—	3,773	6,561
	$ 4,081	$ 4,576	$ 3,773	$ 6,561

The following table summarizes the notional values of the Company's outstanding derivatives:

	December 31,	
(in thousands)	2021	2020
Notional value of foreign currency forward contracts	$ 704,190	$ 483,377

Cash Flow Hedges

The Company utilizes foreign currency forward contracts to hedge the effect of foreign currency exchange rate fluctuations on forecasted foreign currency transactions, primarily related to inventory purchases. These forward contracts are designated as cash flow hedges. The changes in fair value of these contracts attributable to changes in spot exchange rates are recorded in AOCI until the hedged items affect earnings, at which time the gain or loss is reclassified into the same line item in the consolidated statements of income (loss) as the underlying exposure being hedged. The forward points are marked-to-market monthly and recognized in the same line item in the consolidated statements of income (loss) as the underlying exposure being hedged.

Derivatives Not Designated as Hedging Instruments

The Company also uses foreign currency forward contracts to offset its exposure to the change in value of certain foreign currency denominated assets and liabilities, primarily receivables and payables, which are remeasured at the end of each period. Although the contracts are effective economic hedges, they are not designated as accounting hedges. Therefore, changes in the value of these derivatives are recognized immediately in earnings, thereby offsetting the current earnings effect of the related foreign currency denominated assets and liabilities.

Effect of Derivative Instruments on Income

The loss of all derivative instruments recognized is summarized below:

	Years Ended December 31,	
(in thousands)	**2021**	**2020**
Loss reclassified from AOCI to income on cash flow hedges:		
Cost of goods and services	$ 3,717	$ 171
Loss on derivatives not designated as hedging instruments:		
Other (income) expense, net	3,589	692
Total loss of derivative instruments	$ 7,306	$ 863

NOTE 18—INCOME TAXES

Components of income (loss) before income taxes—Domestic and foreign components of income before income taxes were as follows:

	Years Ended December 31,		
(in thousands)	**2021**	**2020**	**2019**
Domestic	$ (2,099)	$ (811,995)	$ 51,073
Foreign	154,784	49,246	8,113
Income (loss) before income taxes	$ 152,685	$ (762,749)	$ 59,186

Provision for (benefit from) income taxes—The provision for (benefit from) income taxes consisted of:

	Years Ended December 31,		
(in thousands)	**2021**	**2020**	**2019**
Current:			
U.S. federal	$ 14,895	$ 1,578	$ 15,327
State and local	4,867	1,579	1,196
Foreign	40,149	20,264	4,264
Total current	59,911	23,421	20,787
Deferred:			
U.S. federal	(24,962)	(32,454)	(12,815)
State and local	(862)	(6,738)	(1,156)
Foreign	4,358	(4,625)	(590)
Total deferred	(21,466)	(43,817)	(14,561)
Provision for (benefit from) income taxes	$ 38,445	$ (20,396)	$ 6,226

Effective income tax rate reconciliation—The effective income tax rate was different from the statutory U.S. federal income tax rate due to the following:

	Years Ended December 31,		
	2021	2020	2019
Statutory U.S. federal income tax rate	21.0 %	21.0 %	21.0 %
Net difference resulting from:			
State and local taxes, net of federal income tax benefit	2.1	0.5	3.2
Foreign withholding tax	8.5	(1.2)	1.8
Foreign derived intangible income	(0.7)	—	(0.8)
Foreign operations tax effect	(1.3)	(0.4)	—
Research and experimentation tax credits	(2.5)	0.4	(1.2)
Foreign tax credit	(9.9)	—	(8.0)
Nondeductible expenses	1.6	(0.6)	2.5
Branch income	7.6	(0.7)	0.6
Tax return to accrual adjustments	(7.3)	0.1	(9.4)
State deferred taxes	—	0.2	(7.9)
Goodwill impairment	—	(15.5)	—
Foreign inclusions (including global intangible low-taxed income)	6.6	(0.7)	—
Transaction costs	—	(0.6)	—
Change in valuation allowance	1.8	(0.5)	9.0
Stock compensation	(3.7)	—	—
Nondeductible officer compensation	2.1	—	—
Other	(0.7)	0.7	(0.3)
Effective income tax rate	25.2 %	2.7 %	10.5 %

Deferred tax assets and liabilities—Significant components of deferred tax assets and liabilities were as follows:

	December 31,			
(in thousands)	**2021**		**2020**	
Deferred tax assets attributable to:				
Accrued compensation	$	12,395	$	13,437
Accrued expenses		8,020		3,950
Inventories		830		—
Net operating loss and other carryforwards		32,420		25,879
Accounts receivable		18,301		19,930
Lease liability		16,573		17,180
Long-term liabilities		—		1,470
Other assets		7,687		2,110
Deferred tax assets		96,226		83,956
Valuation allowance		(38,716)		(26,786)
Deferred tax assets, net of valuation allowance	$	57,510	$	57,170
Deferred tax liabilities attributable to:				
Inventories	$	—	$	(2,124)
Intangible assets, including goodwill		(70,799)		(80,634)
Property, plant and equipment		(69,971)		(73,507)
Foreign withholding taxes		(20,239)		(15,673)
Lease asset		(18,346)		(18,293)
Investment in subsidiary		(2,014)		(10,189)
Long-term liabilities		(1,100)		—
Deferred tax liabilities		(182,469)		(200,420)
Net deferred tax liabilities	$	(124,959)	$	(143,250)
Classified as follows in the consolidated balance sheets:				
Other non-current assets	$	13,012	$	13,033
Deferred income taxes		(137,971)		(156,283)
Net deferred tax liabilities	$	(124,959)	$	(143,250)

Effective Tax Rate. Our effective tax rate was 25.2% for 2021 compared to 2.7% for 2020. The effective tax rate for 2021 was primarily impacted by the effects of foreign earnings and withholding taxes.

Net operating loss carryforwards. As of December 31, 2021, our deferred tax asset balance included non-U.S. net operating loss carryforwards of $18.7 million. This entire balance is available to be carried forward; non-U.S. carryforwards will expire during the years 2025 through 2041.

Foreign tax credit carryforwards. As of December 31, 2021, our deferred tax asset balance included U.S. foreign tax credit carryforwards of $14.3 million. This entire balance is available to be carried forward and will expire during 2029.

Valuation allowance. Management assesses the available positive and negative evidence to estimate whether sufficient future taxable income will be generated to permit use of the existing deferred tax assets. With respect to foreign net operating losses, a significant piece of objective negative evidence evaluated was the cumulative loss incurred in various international jurisdictions over the three-year period ended December 31, 2021. Such objective evidence limits the ability to consider other subjective evidence, such as our projections for future growth. In addition, we analyzed our foreign income classification and determined we would not generate sufficient general limitation income to utilize our general limitation foreign tax credits. Based on this evaluation, as of December 31, 2021, we recorded a valuation allowance of $28.5 million relating to net operating losses and $10.2 million relating to foreign tax credits to recognize only the portion of the deferred tax asset that is more likely than not to be realized. The amount of the deferred tax asset considered realizable, however, could be adjusted if estimates of future taxable income during the carryforward period are reduced or increased if objective negative evidence in the form of cumulative losses are no longer present and additional weight is given to subjective evidence such as our projections of future growth. In addition, if we increase our general limitation income, we could utilize and thus recognize additional foreign tax credit deferred tax assets.

Unrecognized tax benefits. We file federal, state, and local tax returns in the United States as well as foreign tax returns. We are routinely audited by the tax authorities in these jurisdictions, and a number of audits are currently underway. We believe all income tax uncertainties have been properly accounted for and, accordingly, the Company has no unrecognized tax benefits as of December 31, 2021.

The Company accounts for uncertain tax positions in accordance with guidance in ASC 740, "*Income Taxes (Topic 740)*", which prescribes the minimum recognition threshold a tax position taken or expected to be taken in a tax return is required to meet before being recognized in the financial statements. The Company does not have any material uncertain tax positions, individually or in totality.

The Company is subject to U.S. federal income tax as well as income tax in multiple state jurisdictions. The earliest period the Company is subject to examination of federal income tax returns by the Internal Revenue Service is 2018. The state income tax returns and other state tax filings of the Company are subject to examination by the state taxing authorities for various periods, generally up to four years after they are filed.

Undistributed Earnings. As of December 31, 2021, the Company has $20.2 million of deferred tax liabilities primarily associated with withholding taxes on undistributed earnings generated by foreign subsidiaries. The Company continues to assert permanent reinvestment of the remaining undistributed earnings for which deferred taxes have not been provided for as of December 31, 2021. If there are policy changes, the Company would record the applicable taxes in the period of change. No deferred taxes have been provided for withholding taxes and other taxes on the remaining earnings as of December 31, 2021 as computation of the potential deferred tax liability associated with these undistributed earnings and any other basis differences is not practicable.

Tax Holidays. The Company has a tax incentive awarded by the Singapore Economic Development Board. This incentive provides 0% tax rate on manufacturing profits generated at the Company's facility located on Jurong Island which expires in December 2024.

NOTE 19—RELATED PARTY TRANSACTIONS

Noncontrolling Interest and Unconsolidated Affiliates

For the years ended December 31, 2021, 2020, and 2019, we declared and paid $1.6 million, $2.2 million, and none, respectively, of distributions to the noncontrolling interest holders in Apergy Middle East Services LLC. We also declared and paid $1.6 million and $0.5 million to the noncontrolling interest holders in Champion Arabia Co. Ltd. and Petrochem Performance Products LLC, respectively, during the year ended December 31, 2021.

In the ordinary course of business, we enter into certain transactions with our unconsolidated affiliates at market prices. These transactions primarily related to inventory sales and amounted to approximately $9.6 million for the year ended December 31, 2021.

NOTE 20—CASH FLOW INFORMATION

Cash payments for income taxes and cash payments for interest incurred related to our debt are as follows:

	Years Ended December 31,		
(in thousands)	**2021**	**2020**	**2019**
Cash information:			
Cash paid for income taxes	$ 50,097	$ 18,179	$ 26,464
Cash paid for interest	$ 51,995	$ 39,746	$ 36,085
Net increase (decrease) in accounts payable for capital expenditures	$ 8,686	$ 9,549	$ 1,943

Supplemental cash flow information related to our lease liabilities is as follows:

(in thousands)	Statement of Cash Flows Classification	December 31, 2021	December 31, 2020
Cash paid for amounts included in measurement of lease liabilities:			
Operating leases [1]	Operating	$ 45,583	$ 30,256
Finance leases - interest	Operating	$ 510	$ 550
Finance leases - principal	Financing	$ 6,258	$ 5,139
Supplemental non-cash information on lease liabilities arising from obtaining right-of-use assets:			
Operating leases	Non-cash	$ 27,390	$ 37,631
Finance leases	Non-cash	$ 5,971	$ 4,017

(1) Cash required by operating leases is reported net of operating lease expense in the operating section of our consolidated statements of cash flows in accrued expenses and other liabilities.

Leased Asset Program

Our ESP leased asset program is reported in our Production & Automation Technologies segment. At the time of purchase, assets are recorded to inventory and are transferred to property, plant, and equipment when a customer contracts for an asset under our leased asset program. During the years ended December 31, 2021, 2020, and 2019, we transferred $48.7 million, $15.3 million, and $75.7 million, respectively, of inventory into property, plant, and equipment as a result of assets entering our lease program.

Expenditures for assets that are placed into our leased asset program expected to be recovered through sale are reported in leased assets in the operating section of our consolidated statements of cash flows. All other capitalizable expenditures for assets that are placed into our leased asset program are classified as capital expenditures in the investing section of our consolidated statements of cash flows. During the years ended December 31, 2021, 2020, and 2019, we made cash payments of $37.1 million, $20.8 million, and $16.0 million, respectively, for leased asset program equipment.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Disclosure Controls and Processes

We maintain a set of disclosure controls and procedures (as defined in Rule 15d-15(e) under the Exchange Act) designed to provide reasonable assurance that information required to be disclosed in our reports filed or submitted under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to management as appropriate to allow timely decisions regarding required disclosure.

Our management, with the participation of our principal executive officer and principal financial officer, carried out an evaluation of the effectiveness of our disclosure controls and procedures as of the end of the period covered by this annual report. Based upon that evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of December 31, 2021.

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 Exchange Act Rule 13a-15(f). Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we carried out an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2021, based on the framework in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our management has concluded that our internal control over financial reporting was effective as of December 31, 2021.

The effectiveness of our internal control over financial reporting as of December 31, 2021 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

Changes in Internal Control

There have been no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2021, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

Iran Threat Reduction and Syria Human Rights Act of 2012

Under the Iran Threat Reduction and Syria Human Rights Act of 2012, which added Section 13(r) of the Exchange Act, the Company is required to disclose in its periodic reports if it or any of its affiliates knowingly engaged in certain activities, transactions or dealings relating to Iran or with entities or individuals designated pursuant to certain Executive Orders. Disclosure is required even where the activities are conducted outside the U.S. by non-U.S. affiliates in compliance with applicable law, and even if the activities are not covered or prohibited by U.S. law.

As authorized by the U.S. Treasury's Office of Foreign Assets Control ("OFAC"), a non-U.S. subsidiary of the Company which is part of our Chemical Technologies business completed sales of products used for process and water treatment applications in upstream oil and gas production related to the operation of and production from the Rhum gas field off the Scottish coast ("Rhum") totaling $781,516 for the year ended December 31, 2021. The net profit before taxes associated with these sales for each period were nominal. Rhum is jointly owned by Serica Energy plc and Iranian Oil Company (U.K.) Limited. Our non-U.S. subsidiary intends to continue the Rhum-related activities, consistent with a specific license obtained from OFAC by its customers, and such activities may require additional disclosure pursuant to the above mentioned statute.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Information about our executive officers is presented under the caption “Information about our Executive Officers” in Part I, Item 1 of this Annual Report on Form 10-K.

The remaining information required in response to this Item will be included in the definitive proxy statement for our 2022 Annual Meeting of Shareholders to be filed with the SEC and is incorporated herein by reference.

ITEM 11. EXECUTIVE COMPENSATION

The information required in response to this Item will be included in the definitive proxy statement for our 2022 Annual Meeting of Shareholders to be filed with the SEC and is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required in response to this Item will be included in the definitive proxy statement for our 2022 Annual Meeting of Shareholders to be filed with the SEC and is incorporated herein by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required in response to this Item will be included in the definitive proxy statement for our 2022 Annual Meeting of Shareholders to be filed with the SEC and is incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required in response to this Item will be included in the definitive proxy statement for our 2022 Annual Meeting of Shareholders to be filed with the SEC and is incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) The following documents are filed as part of this Annual Report on Form 10-K:

1. Financial Statements:

Our consolidated financial statements are included under Part II, Item 8, "Financial Statements and Supplementary Data" of this Annual Report on Form 10-K.

2. Financial Statement Schedule and related Report of Independent Registered Public Accounting Firm:

See "Schedule II—Valuation and Qualifying Accounts" and the related Report of Independent Registered Public Accounting Firm included herein. All other financial statement schedules are omitted because of the absence of conditions under which they are required or because information required is shown in the consolidated financial statements and notes thereto in Part II, Item 8 of this Annual Report on Form 10-K.

3. Index of Exhibits:

		Incorporated by Reference		
Exhibit No	**Exhibit Description**	**Form**	**Exhibit No.**	**Filing Date**
2.1	Separation and Distribution Agreement, dated May 9, 2018, by and between Dover Corporation and ChampionX Corporation.	8-K	2.1	May 11, 2018
2.2	Agreement and Plan of Merger and Reorganization, dated as of December 18, 2019, by and among Ecolab Inc., ChampionX Holding Inc., ChampionX Corporation, and Athena Merger Sub, Inc.	8-K	2.1	December 20, 2019
2.3	Separation and Distribution Agreements, dated as of December 18, 2019, by and among Ecolab Inc., ChampionX Holding Inc., and ChampionX Corporation.	8-K	2.2	December 20, 2019
3.1	Amended and Restated Certificate of Incorporation of the Company.	8-K	3.1	May 11, 2018
3.2	Certificate of Amendment to Amended and Restated Certificate of Incorporation of the Company.	8-K	3.1	June 4, 2020
3.3	Amended and Restated By-Laws of the Company.	8-K	3.2	June 4, 2020
4.1	Indenture, dated as of May 3, 2018, between Apergy Corporation, as Issuer, and Wells Fargo Bank, National Association, as Trustee.	8-K	4.1	May 7, 2018
4.2	Form of 6.375% Senior Notes due 2026 (included as Exhibit 1 to the Indenture filed as Exhibit 4.1).	8-K	4.2	May 7, 2018
4.3	Effective Date Supplemental Indenture, dated as of May 9, 2018, among the Guarantors named therein and Wells Fargo Bank, National Association, as Trustee.	8-K	4.1	May 11, 2018
4.4	Supplemental Indenture, dated as of November 5, 2019, among Apergy Corporation, the Guarantor named therein and Wells Fargo Bank, National Association, as Trustee.	10-K	4.5	March 2, 2020
4.5	Supplemental Indenture, dated as of June 18, 2020, among the Guarantors named therein and Wells Fargo Bank, National Association, as Trustee.	10-Q	4.1	August 7, 2020
4.6	Description of ChampionX Corporation Common Stock	10-K	4.6	March 1, 2021
10.1	Credit Agreement, dated May 9, 2018, among the Company, as borrower, the lenders and issuing banks party thereto and JPMorgan Chase Bank, N.A., as administrative agent.	8-K	10.4	May 11, 2018

10.2	Amendment No. 1, dated February 14, 2020, amending that certain Credit Agreement dated as of May 9, 2018, by and among the Company, as borrower, the lenders party thereto and JPMorgan Chase Bank, N.A., as administrative agent.	8-K	10.1	February 18, 2020
10.3	Amendment No. 2, dated June 24, 2020, amending that certain Credit Agreement dated as of May 9, 2018, by and among the Company, as borrower, the lenders party thereto and JPMorgan Chase Bank, N.A., as administrative agent.	10-Q	10.2	August 7, 2020
10.4	Credit Agreement, dated June 3, 2020, among ChampionX Holding Inc., as borrower, the lenders party thereto and Bank of America, N.A., as administrative agent	8-K	10.2	June 4, 2020
10.5+	ChampionX Corporation Amended and Restated 2018 Equity and Cash Incentive Plan.	10-Q	10.1	May 13,2021
10.6+	ChampionX Corporation Executive Officer Annual Incentive Plan.	8-K	10.6	May 11, 2018
10.7+	Apergy USA, Inc. Executive Deferred Compensation Plan.	8-K	10.7	May 11, 2018
10.8+	ChampionX Corporation Executive Severance Plan.	8-K	10.8	May 11, 2018
10.9+	ChampionX Corporation Senior Executive Change-in-Control Severance Plan.	8-K	10.9	May 11, 2018
10.10+	Form of award grant letter for restricted stock unit awards made under the ChampionX Corporation 2018 Equity and Cash Incentive Plan.	8-K	10.10	May 11, 2018
10.11+	Form of award grant letter for performance share awards made under the ChampionX Corporation 2018 Equity and Cash Incentive Plan.	8-K	10.11	May 11, 2018
10.12+	ChampionX Mirror Savings Plan	10-K	10.13	March 1, 2021
10.13+*	ChampionX Mirror Savings Plan First Amendment			
10.14+	Offer Letter, dated January 15, 2021 by and between the Company and Kenneth M. Fisher	8-K	10.1	January 21, 2021
10.15+	Release and Separation Agreement, dated January 19, 2021 by and between the Company and Jay A. Nutt	8-K	10.2	January 21, 2021
10.16+	Transition Letter, dated January 15, 2021, by and between the Company and Jay A. Nutt	8-K	10.3	January 21, 2021
10.17	Tax Matters Agreement, dated as of June 3, 2020, by and among Ecolab Inc., ChampionX Holding Inc. and ChampionX Corporation.	8-K	2.4	June 4, 2020
10.18	Intellectual Property Matters Agreement, dated as of June 3, 2020, by and among Ecolab Inc. and ChampionX Holding Inc.	8-K	2.6	June 4, 2020
10.19	Master Cross Supply and Product Transfer Agreement, dated as of June 3, 2020, by and among Ecolab Inc. and ChampionX LLC.	8-K	2.7	June 4, 2020
21.1*	Subsidiaries of ChampionX Corporation.			
23.1*	Consent of PricewaterhouseCoopers LLP, an independent registered public accounting firm.			
31.1*	Certification of Chief Executive Officer Pursuant to Rule 13a-14(a) and Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended.			
31.2*	Certification of Chief Financial Officer Pursuant to Rule 13a-14(a) and Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended.			
32.1**	Certification of Chief Executive Officer Under Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. 1350.			
32.2**	Certification of Chief Financial Officer Under Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. 1350.			
101.INS*	XBRL Instance Document			
101.SCH*	XBRL Taxonomy Extension Schema Document			
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document			
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document			

101.LAB*	XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document
104*	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)

*Filed herewith
**Furnished herewith
+ Denotes management contract or compensatory plan or arrangement

ITEM 16. FORM 10-K SUMMARY

None.

Schedule II—Valuation and Qualifying Accounts

Allowance for Doubtful Accounts	Balance at Beginning of Year	Charged to Cost and Expense[1]	Accounts Written Off	Other	Balance at End of Year
Year Ended December 31, 2021	$ 10,192	4,418	(7,002)	54	$ 7,662
Year Ended December 31, 2020	$ 8,072	3,644	(3,230)	1,706	$ 10,192
Year Ended December 31, 2019	$ 4,745	4,955	(1,447)	(181)	$ 8,072

(1) Net of recoveries on previously reserved or written-off balances.

Deferred Tax Valuation Allowance	Balance at Beginning of Year	Additions	Reductions	Other	Balance at End of Year
Year Ended December 31, 2021	$ 26,786	14,696	(2,766)	—	$ 38,716
Year Ended December 31, 2020	$ 6,027	21,101	(342)	—	$ 26,786
Year Ended December 31, 2019	$ 722	5,556	(251)	—	$ 6,027

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.

CHAMPIONX CORPORATION
(Registrant)

Date: February 10, 2022	By:	/s/ KENNETH M. FISHER
		Kenneth M. Fisher
		Executive Vice President and Chief Financial 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.

Date	Signature
February 10, 2022	/s/ SIVASANKARAN SOMASUNDARAM Sivasankaran Somasundaram President and Chief Executive Officer Director (Principal Executive Officer)
February 10, 2022	/s/ KENNETH M. FISHER Kenneth M. Fisher Executive Vice President and Chief Financial Officer (Principal Financial Officer)
February 10, 2022	/s/ ANTOINE MARCOS Antoine Marcos Vice President, Corporate Controller and Chief Accounting Officer (Principal Accounting Officer)
February 10, 2022	/s/ HEIDI S. ALDERMAN Heidi S. Alderman Director
February 10, 2022	/s/ MAMATHA CHAMARTHI Mamatha Chamarthi Director
February 10, 2022	/s/ GARY P. LUQUETTE Gary P. Luquette Director
February 10, 2022	/s/ STUART PORTER Stuart Porter Director
February 10, 2022	/s/ DANIEL W. RABUN Daniel W. Rabun Chairman of the Board of Directors
February 10, 2022	/s/ STEPHEN M. TODD Stephen M. Todd Director
February 10, 2022	/s/ STEPHEN K. WAGNER Stephen K. Wagner Director

Exhibit 10.13

CHAMPIONX MIRROR SAVINGS PLAN
FIRST AMENDMENT

This First Amendment of the ChampionX Mirror Savings Plan is adopted by ChampionX LLC.

1. Effective as of January 1, 2022, a new subsection (3) is added to Section 3.3 as follows:

   Effective January 1, 2022, notwithstanding any provision of the Plan to the contrary, no Matching Contributions shall be credited to the Account of any Executive with respect to any Executive Deferrals made in any Plan Year beginning on or after January 1, 2022, and Section 3.3 shall have no further force or effect with respect to Executive Deferrals made after December 31, 2021.

2. Effective as of January 1, 2022, Section 3.4 is amended by the addition of the following sentence at the conclusion of the section:

   Effective January 1, 2022, notwithstanding any provision of the Plan to the contrary, no Non-Elective Contributions shall be credited to the Account of any Executive for any Plan Year beginning on or after January 1, 2022, and Section 3.4 shall have no further force or effect with respect to Plan Years beginning after December 31, 2021.

By: __/s/ Jordan Zweig____________________________
Its: SVP and Chief Human Resources Officer
Dated: October 14, 2021

Exhibit 21.1

Subsidiaries of ChampionX Corporation

Subsidiary	Jurisdiction of Formation
Accelerated Production Systems Limited	England and Wales
Ace Downhole, LLC	Delaware
Apergy (Delaware) Formation, Inc.	Delaware
Apergy Artificial Lift de México, S. A. de C.V.	Mexico
Apergy Artificial Lift International, LLC	Delaware
Apergy Artificial Lift Pty. Ltd	Queensland
Apergy Artificial Lift S.A.	Argentina
Apergy Artificial Lift, LLC	Delaware
Apergy BMCS Acquisition Corp.	Delaware
Apergy Canada ULC	British Columbia
Apergy Egypt LLC	Egypt
Apergy Energy (Kenya) Limited	Kenya
Apergy Energy Automation, LLC	Delaware
Apergy Energy India Private Limited	India
Apergy ESP Systems, LLC	Oklahoma
Apergy for Petroleum Services LLC	Egypt
Apergy Luxembourg S.à r.l.	Luxembourg
Apergy Minority Luxembourg S.à r.l.	Luxembourg
Apergy PCS Holding LLC	Delaware
Apergy Process Companies, LLC	Delaware
Apergy Process Systems, Inc.	Texas
Apergy Rods UK Limited	England and Wales
Apergy S.A.	Argentina
Apergy UK Limited	England and Wales
Apergy USA, Inc.	Delaware
Champion Arabia Co. Ltd.	Saudi Arabia
Champion ES Holdings Inc.	Texas
Champion Technologies (Nig) Limited	Nigeria
Champion Technologies B.V.	Netherlands
Champion Technologies Del Ecuador CIA LTDA. CHAMPIONTECH	Ecuador
Champion Technologies do Brasil Servicos e Produtos Quimicos Ltda.	Brazil
Champion Technologies Limited	Mauritius
Champion Technologies Limited	Scotland
Champion Technologies Middle East FZCO	United Arab Emirates
Champion Technologies Russia & Caspian B.V.	Netherlands
ChampionX (RO) Energy Services S.R.L.	Romania
ChampionX Argentina S.R.L.	Argentina
ChampionX Associate Investment Company Limited	Nigeria
ChampionX Australia Pty Ltd	New South Wales
ChampionX Azerbaijan LLC	Azerbaijan
ChampionX Canada ULC	Alberta
ChampionX de Colombia Ltda	Colombia
ChampionX EG Holdings LLC	Delaware

ChampionX Egypt Holdings Ltd.	England and Wales
ChampionX Egypt Ltd.	England and Wales
ChampionX Energy Services Limited	Ghana
ChampionX Equatorial Guinea, S.A.R.L.	Equatorial Guinea
ChampionX Europe B.V.	Netherlands
ChampionX Europe GmbH	Switzerland
ChampionX Gabon SARL	Gabon
ChampionX Gulf Limited	Jersey
ChampionX Guyana Inc.	Guyana
ChampionX Holding Inc.	Delaware
ChampionX Holdings 1 ULC	British Columbia
ChampionX International Operations, Inc.	Delaware
ChampionX LA Holding B.V.	Netherlands
ChampionX LA S.C.A.	Venezuela
ChampionX LLC	Delaware
ChampionX Mauritania SARL	Mauritania
ChampionX Middle East Holdings, Inc.	Delaware
ChampionX Middle East LLC	Oman
ChampionX Middle East Services LLC	Oman
ChampionX New Zealand	New Zealand
ChampionX NL 1 B.V.	Netherlands
ChampionX Norge AS	Norway
ChampionX Oilfield Solutions Ghana Limited	Ghana
ChampionX PNG Ltd	Papua New Guinea
ChampionX Russia Holding B.V.	Netherlands
ChampionX Services LLC	Russian Federation
ChampionX SG 2 Pte. Ltd.	Singapore
ChampionX SG 3 Pte. Ltd.	Singapore
ChampionX SG 4 Pte. Ltd.	Singapore
ChampionX SG Service Pte. Ltd.	Singapore
ChampionX Texas Leasing LLC	Delaware
ChampionX U.S. 3 Inc.	Delaware
ChampionX U.S. 4 LLC	Delaware
ChampionX U.S. 5 LLC	Delaware
ChampionX U.S. 6 LLC	Delaware
ChampionX Ultrafab ULC	Alberta
ChampionX USA Inc.	Delaware
ChampionX-Element JSC	Russian Federation
Chemical Innovations NL B.V.	Netherlands
Corexit Environmental Solutions LLC	Delaware
CTI Chemicals Asia Pacific Pte. Ltd.	Singapore
Ener Tools S.A.	Argentina
Group 2 Technologies LLC	Texas
Harbison-Fischer, Inc.	Delaware
Honetreat Company	California
Houseman Limited	England and Wales
International Legacy Fabrication L.L.C.	Oman
Legacy Fabrication (Oman) Holdings, LLC	Delaware

Legacy Fabrication Ghana Ltd.	Ghana
Legacy Fabrication LLC	Delaware
Master Chemicals LLC	Russian Federation
Norris Rods, Inc.	Delaware
Norriseal-WellMark, Inc.	Delaware
NPS Services, Inc.	Delaware
Oil Lift Technology Inc.	British Columbia
Oil Lift Technology S.A.S.	Colombia
Oil Lift Technology, Inc.	New Mexico
ONES West Africa LLC	Delaware
P.T. Champion Kurnia Djaja Technologies	Indonesia
PCS Ferguson Canada Inc.	Alberta
PCS Ferguson, Inc.	Delaware
Pro Rod USA, Inc.	Delaware
Products Flange and Supply, Inc.	Texas
Promchimservice Limited Liability Company	Russian Federation
Pro-Rod Inc.	Alberta
PT Nalco Champion Indonesia	Indonesia
Quartzdyne, Inc.	Delaware
Scientific Aviation, Inc.	California
Spirit Global Energy Solutions Canada Ltd.	Alberta
Spirit Global Energy Solutions, Inc.	Delaware
Theta Oilfield Services, Inc.	Delaware
Tomson Technologies LLC	Texas
UAC Corporation	Delaware
UPCO, Inc.	Oklahoma
US Synthetic Corporation	Delaware
WellMark Holdings, Inc.	Delaware
Windrock, Inc.	Tennessee

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-224926 and 333-238904) of ChampionX Corporation of our report dated February 10, 2022 relating to the financial statements and financial statement schedule and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP
Houston, TX
February 10, 2022

Exhibit 31.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO RULE 13A-14(A) AND RULE 15D-14(A)
OF THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

I, Sivasankaran Somasundaram, certify that:

1. I have reviewed this Annual Report on Form 10-K of ChampionX Corporation (the “registrant”);

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 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 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: February 10, 2022

/s/ SIVASANKARAN SOMASUNDARAM

Sivasankaran Somasundaram

President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO RULE 13A-14(A) AND RULE 15D-14(A)
OF THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

I, Kenneth M. Fisher, certify that:

1. I have reviewed this Annual Report on Form 10-K of ChampionX Corporation (the "registrant");

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 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 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: February 10, 2022

/s/ KENNETH M. FISHER

Kenneth M. Fisher

Executive Vice President and
Chief Financial Officer
(Principal Financial Officer)

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER
UNDER SECTION 906 OF THE SARBANES-OXLEY
ACT OF 2002, 18 U.S.C. SECTION 1350**

I, Sivasankaran Somasundaram, President and Chief Executive Officer of ChampionX Corporation (the “Company”), do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(a) The Annual Report on Form 10-K of the Company for the year ended December 31, 2021, as filed with the Securities and Exchange Commission (the “Report”) fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(b) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 10, 2022

/s/ SIVASANKARAN SOMASUNDARAM

Sivasankaran Somasundaram

President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 32.2

**CERTIFICATION OF CHIEF FINANCIAL OFFICER
UNDER SECTION 906 OF THE SARBANES-OXLEY
ACT OF 2002, 18 U.S.C. SECTION 1350**

I, Kenneth M. Fisher, Executive Vice President and Chief Financial Officer of ChampionX Corporation (the “Company”), do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(a) The Annual Report on Form 10-K of the Company for the year ended December 31, 2021, as filed with the Securities and Exchange Commission (the “Report”) fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(b) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 10, 2022

/s/ KENNETH M. FISHER

Kenneth M. Fisher

Executive Vice President and
Chief Financial Officer
(Principal Financial Officer)