

**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, 2019

OR

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

Commission File Number 001-03970

HARSCO CORPORATION

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

350 Poplar Church Road, Camp Hill, Pennsylvania

(Address of principal executive offices)

23-1483991

(I.R.S. employer identification number)

17011

(Zip Code)

Registrant's telephone number, including area code **717-763-7064**

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, par value \$1.25 per share	HSC	New York Stock Exchange

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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting 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	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>

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 is a shell company (as defined in Rule 12b-2 of the Act). Yes No

The aggregate market value of the Company's voting stock held by non-affiliates of the Company as of June 30, 2019 was \$2,202,849,000

Indicate the number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date:

Class	Outstanding at January 31, 2020
Common stock, par value \$1.25 per share	78,514,758

DOCUMENTS INCORPORATED BY REFERENCE

Selected portions of the 2020 Proxy Statement are incorporated by reference into Part III of this Report.

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PART I

Item 1. Business.

OUR COMPANY - OUR VISION

Harsco Corporation ("we," "our" or the "Company") is a market-leading, global provider of environmental solutions for industrial and specialty waste streams, and innovative equipment and technology for the rail sector. Our three reportable business segments are Harsco Environmental, Harsco Clean Earth, and Harsco Rail and we are working towards transforming the Company into a single-thesis environmental solutions company that is a global leader in the markets we serve.

We have worked in recent years to both transform our portfolio and strengthen our financial results, and we are now investing to grow the Company. While we are pleased with our performance and progress, we have further accelerated our business transformation through targeted internal investment as well as M&A. The purchase of Clean Earth and sale of our energy-linked business in 2019 were significant strategic steps for our Company. As a result, approximately 80% of our revenues today are generated from our two environmentally-focused segments. It also is important to note that these moves have reduced the Company's portfolio complexity and business cyclical.

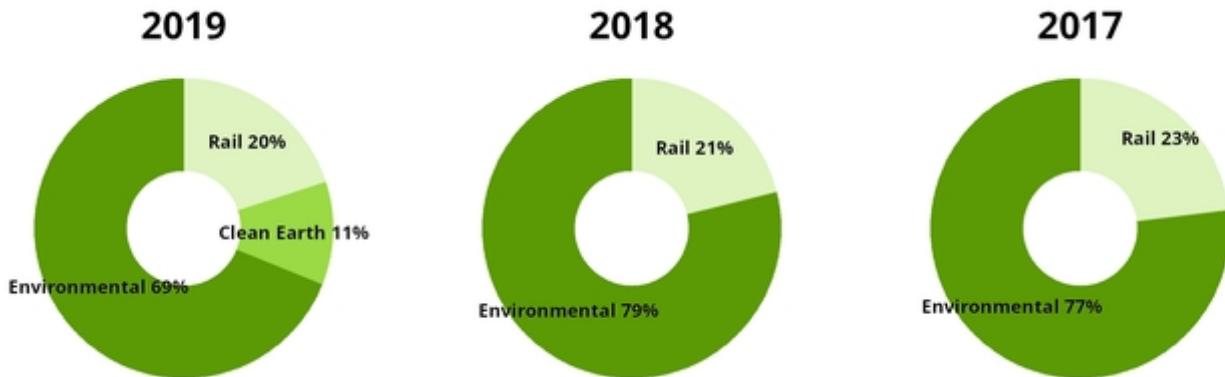
More broadly, we are committed to viewing every customer need through a sustainability lens. Our customers are increasingly expecting more customizable solutions that address environmental challenges within their industries. The Company is responding to this need by helping our customers build better businesses and, in a larger sense, a better environment. Our go-forward strategy is clear: to continue our transformation with the goal of becoming a leading, global environmental solutions company.

SEGMENT INFORMATION

The Company's current operations consist of three reportable business segments: Harsco Environmental, Harsco Clean Earth, and Harsco Rail. Until 2019, the Company also reported the Harsco Industrial Segment composed of three businesses, which were sold in 2019 and 2020. Historical results for these businesses are now accounted for as discontinued operations.

The Company reports segment information using the "management approach," based on the way management organizes and reports the segments within the enterprise for making operating decisions and assessing performance. The Company's reporting segments are identified based upon differences in products, services, and markets served. Financial information concerning segments and international and domestic operations is included in Note 15, Information by Segment and Geographic Area, in Part II, Item 8, "Financial Statements and Supplementary Data," which information is incorporated herein by reference.

Our revenues by business segment are as follows, and a description of the products and services offered through these business segments is further below.



HARSCO ENVIRONMENTAL

BUSINESS OVERVIEW

Our Harsco Environmental Segment (previously known as Metals & Minerals) can trace its heritage back to the earliest efforts in industrial recycling and environmental resource management. Where others only saw waste and expense, our predecessors saw opportunity and value nearly 100 years ago. Harsco Environmental ("HE") was founded upon market insights, grounded in respect for environments, efficient use of resources, and optimism for the future.

Today, HE is the premier, global provider of environmental services and material processing to the global steel and metals industries. HE partners with its global customer base to deliver production-critical on-site operational support and resource recovery services, through management of our customers' primary waste or byproduct streams. Our services support the metal manufacturing process, generating significant operational and financial efficiencies for our customers and allowing them to focus on their core steelmaking businesses.

HE serves 70 customers at over 145 sites in more than 30 countries. Our diversified customer base includes the largest steel producers in the regions where we operate, serving a mix of mini-mill and integrated operations. In recent years, HE has greatly extended its reach, signing major new services contracts in bellwether emerging markets like China and India, and further strengthening our footprint in Western economies. As a result, our global portfolio is balanced and diversified, and any foreign currency risk is partially mitigated by the fact that our operating costs and revenues are regularly denominated in local currencies.

In addition to providing critical services to our customers, we provide zero-waste solutions for relevant waste or byproduct streams - an important component of our value proposition. We repurpose processed material for alternative uses and / or convert this material into viable products to be sold in other markets via our applied products offerings and capabilities. Our applied products portfolio includes road and roofing materials, abrasives, agriculture products and aggregates. This expertise is increasingly important to our customers as environmental regulations increase and the marketplace grows more averse to landfilling waste.

2019 REBRANDING

In 2019, the Company rebranded its Metals & Minerals business as Harsco Environmental, further signaling our commitment to serving our customers by preserving the environment. The rebranding planted our stake in the ground as a go-to resource for environmental solutions. These solutions now account for approximately 70% of this segment's revenues. The new name reflects our role as a trusted business partner, as well as the services and products we offer. It also better positions the business to expand our reach into adjacent industries. We expect to continue to expand our environmental solutions portfolio and transfer and implement proven best practices across our customer base.

CUSTOMERS AND SERVICE CONTRACTS

We offer our customers a suite of more than 30 services, and our on-site work is performed under long-term contracts. These contracts typically include fixed fees or minimum billings, which de-risk our investment during periods of economic weakness, and variable fees often linked to the amount of metal produced or waste processed at a site. Our variable fees under contracts are, importantly, not linked to steel prices. Additionally, in recent years we have strengthened our contract terms and underwriting practices, in an effort to earn a sufficient and timely return on our investments, as well as achieve other objectives. These measures, along with various improvement initiatives, have boosted our site portfolio results and driven more consistent performance across our operations.

Our contract renewal rates are high, with many customer relationships that span decades. Our largest customers today include ArcelorMittal, Gerdau, Tata, Taiyuan Iron & Steel, and ThyssenKrupp. We serve most of our major customers at multiple sites, often under many more contracts. The length of our customer relationships reflects our value proposition. Customers choose the Company to (1) achieve operational and financial efficiencies; (2) concentrate their efforts of metal manufacturing and supporting end-market product demands; (3) gain access to process innovations and technologies developed by the Company; and (4) leverage our downstream product applications and know-how. Lastly, HE had one customer in the past three years that provided more than 10% of this segment's revenues, again under many long-term contracts at multiple sites.

On December 31, 2019, the Company's services contracts had estimated future revenues of \$3.2 billion at current production levels, compared with \$3.1 billion at December 31, 2018, with the increase primarily due to new and renewed contracts and the timing of contract expirations, partially offset by the impact of foreign currency translation. This provides the Company with a substantial base of anticipated long-term revenues. Approximately 21% of these revenues are expected to be recognized by December 31, 2020; approximately 40% of these revenues are expected to be recognized between January 1, 2021 and December 31, 2023; approximately 18% of these revenues are expected to be recognized between January 1, 2024 and

December 31, 2026; and the remaining revenues are expected to be recognized thereafter. Estimated future revenues are exclusive of anticipated contract renewals, projected volume increases and ad-hoc services as well as future revenues from roofing granules, abrasives products, roadmaking materials, additives and specialty recovery technology services.

ON-SITE SERVICES

HE provides a broad range of services, most of which address our customers' environmental challenges. In total, these services reduce both landfill waste and the carbon footprint of our customers' sites and in 2019, on-site services represented approximately 85% of HE's revenues. A summary of our most significant services is as follows:

Resource Recovery, Metal Recycling and Slag Optimization

Resource recovery, metal recycling and slag optimization is the core component of our service offerings. We capture liquid steel waste or byproduct (slag) and transport it for cooling, treatment and conditioning. We then recover valuable metal from the waste-stream, which is returned to our customer in a form suitable for recycling through the customers' manufacturing process. The residual non-metallic processed material is then finally transformed into environmental products that create new and additional revenue streams to other customers.

Scrap Management

We manage customer scrap inventories and upgrade scrap by making it cleaner and denser. Improved scrap characteristics reduce electricity usage which, combined with the usage of recycled material, provides sustainability benefits to our customers.

Materials Handling and Logistics

We transport materials, including semi-finished and finished products, safely and efficiently for our customers. Our tracking technology also provides real-time analysis of material location, quantities and product quality.

Meltshop and Furnace Services

Meltshop and furnace services allow the molten metal production process to run smoothly and efficiently. These services include under vessel cleaning and the removal of ladle slag (waste) and general melt shop debris.

APPLIED PRODUCTS

HE creates value-added downstream products from industrial waste-streams. Our experience in manufacturing these products and successfully penetrating relevant end-markets is an important differentiator for the Company. These zero-waste solutions preserve our natural resources and reduce or eliminate landfill disposal. Applied products in 2019 represented approximately 12% of HE's revenues, and our major applied products include the following:

Road Surfacing and Materials

Because of its natural shape and interlocking properties, steel slag holds many advantages when used in asphalt roadway surfaces, ranging from high skid resistance to better durability. The Company's slag-based asphalt product, developed and sold as SteelPhalt™, maintains positive surface characteristics throughout the life of the road, allowing longer replacement intervals and lower maintenance costs. The Company also sells a slag aggregate that is a sustainable and cost-effective alternative to natural stone. This aggregate is often used as unbound road base material for secondary roads and sub-base material elsewhere.

Abrasives and Roofing Materials

Our Reed Minerals business is among the largest roofing granule suppliers in the U.S., partnering with the country's leading shingle manufacturers. Nearly 100 years ago, we pioneered a process of recycling coal combustion waste from power plants. Through the Company's proprietary process, we create premium quality roofing granules that are a critical raw material in asphalt roofing shingles.

Reed is also one of the largest U.S. manufacturers of abrasives, using coal as well as copper slag and crushed glass, for the surface preparation market. Our BLACK BEAUTY® abrasives are well-recognized within the industry and are used as blast material to remove paint, rust, and other coatings from surfaces, prior to applying a new finish.

Metallurgical Additives

The Company's custom-designed steelmaking additives facilitate fluid slag formation in the steelmaking process, thus improving customer productivity and helping achieve the steel product specifications required for today's premium applications.

Agriculture and Turf Products

We produce soil conditioners and fertilizers, principally from stainless steel slag that optimize crop yields and turf performance. CrossOver® and AgrowSil products are our leading silicon, calcium and magnesium-based product brands, sold mainly in the Americas. These products are formulated to address nutrient deficiencies and toxicity issue in soil as well as help plants withstand outside pressures and disease.

Cement Additives

Steel slag is naturally cementitious and commonly blended with other materials to produce environmentally-friendly, high-performing cement products. Cement made with slag aggregate can achieve permeabilities and strengths that compare favorably to concrete made with conventional aggregates.

ALTEK GROUP

In 2018, the Company acquired Altek Europe Holdings Limited and its affiliated entities ("Altek"), a UK-based manufacturer of market-leading products that enable aluminum producers and recyclers to manage and extract value from critical waste streams, reduce waste generation, and improve operating productivity. The cost-efficient recovery of metal and other valuable materials is increasingly important to the aluminum industry. Altek's products and technologies address this challenge, and its latest innovation, AluSalt™, offers customers a breakthrough technology that converts salt slag waste into valuable products, addressing one of the largest environmental concerns within the aluminum market.

The Altek acquisition aligns with HE's core strategy of creating value from waste. Altek also represented an initial step in building a significant environmental solutions business within the aluminum industry, where we believe the growth potential is significant.

GROWTH STRATEGY

After a period of business improvement, we have started in recent years to invest growth capital in HE. We have identified attractive opportunities that meet our return thresholds to expand our service portfolio, and our pipeline of opportunities remains significant. Additionally, we have initiated efforts to expand our downstream products business and plan to continue investing in innovation - and our workforce that drives it - to support our business sustainability.

A summary of our key growth initiatives is as follows:

- **Further Penetrate Existing Sites.** Given our broad services capabilities, we see significant potential for add-on services contracts at existing sites.
- **New Sites.** We continue to pursue new services contracts in certain markets, particularly in emerging economies where out-sourcing opportunities are significant because of increased environmental awareness or where steel consumption (production) is set to grow.
- **Investment in Downstream Products.** We see ample opportunities to expand certain products businesses, and our investment in a second SteelPhalt™ (road materials) plant in Europe is a recent example.
- **Innovation.** We are at the forefront of innovation in our industry. Our Pure and Applied Innovation Programs are specifically focused on helping our customers solve their most pressing environmental challenges amid ever-increasing regulation. This initiative includes developing new customer or industry solutions, either in-house or externally, and expanding the usage of technologies that already exist within our business.

COMPETITORS

HE competes principally with a small number of privately-held businesses for services outsourced by customers on a global basis. We also compete with numerous smaller, privately-held businesses in each of our regional markets and, to some degree, customers that may decide to perform certain services themselves.

We believe that HE differentiates itself from its competition through innovative technologies that support our service offerings, and through the operating expertise developed by sharing best practices across our global portfolio. Our safety practices and performance also support our business, as do our long-standing relationships and our downstream product solutions.

HARSCO CLEAN EARTH

BUSINESS OVERVIEW

In June 2019, the Company acquired Clean Earth ("CE"), one of the largest specialty waste processing companies in the U.S. CE provides processing and beneficial reuse solutions for hazardous wastes, contaminated materials, and dredged volumes through its 27 facilities in 16 States. Ninety-nine percent of the waste handled by CE is beneficially reused, and it serves a widely-diversified base of over 1,700 customers, in essentially every industry that generates waste. It also holds a portfolio of more than 200 critically-important permits, that support its unique portfolio of services and technologies.

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With the acquisition of CE, the Company entered an adjacent, financially-attractive environmental services market with significant regulatory oversight. Specialty-waste permits have considerable value, and CE is positioned to take advantage of increasingly stringent regulation on the handling of this waste. These dynamics provide recurring revenues and support attractive underlying growth. CE also operates in a fragmented market where acquisition opportunities are likely to develop. As a result, we see CE as a platform for growth as we continue the transformation of the Company's business portfolio.

INTEGRATION

By the end of 2020, the Company expects to integrate and fully realize identified synergies, most of which are cost synergies related to support-function integration, from the acquisition of CE. Revenue synergies are also anticipated given the complementary nature of our environmental businesses in this time frame, and a longer-term opportunity is to leverage HE's global footprint to expand our specialty waste business outside of the U.S.

CUSTOMERS

CE provides low-cost, regulatory-compliant solutions to a diverse base of customers or suppliers (waste originators). These customers include waste generators in numerous industries, including chemicals, power, aerospace, medical, and metals, as well as integrated waste companies and brokers. CE also services federal, state and local governments as well as developers linked to large infrastructure and redevelopment projects, and it processes a variety of consumer goods, including electronics, cleaners, pesticides and aerosols, which must be handled in strict compliance with environmental regulation.

LINES OF BUSINESS

Hazardous Waste

CE provides testing, tracking, processing, recycling, and disposal services for hazardous waste and it operates 9 Resource Conservation and Recovery Act ("RCRA") Part B Permits. This includes 6 Treatment, Storage and Disposal Facility permits (TSDFs) that enable the Company to process a variety of complex hazardous wastes, consisting of toxic, reactive and flammable materials such as industrial wastewater, manufacturing sludge, oily-mixtures, asbestos and pharmaceutical waste. The remaining facilities handle a limited number of other wastes, including landfill leachate with per- and polyfluoroalkyl substances ("PFAS"), electronics, batteries and light bulbs. These operations possess unique and differentiated processing technologies, such as applications for aerosol can and medical waste recycling. In the second half of 2019, this line of business represented approximately 36% of CE's revenues.

Contaminated Materials

CE processes approximately four million tons per year of contaminated soil at thirteen locations. These soils are contaminated with heavy metals, PCBs, pesticides, PFAS or other chemicals, and the related clean-up work is often the result of infrastructure improvements, private redevelopment, industrial site remediation and/or underground storage tank removal. CE treats and recycles this soil through various processes, after which the material is suitable for beneficial reuse as construction fill material or landfill capping. In the second-half of 2019, this line of business represented approximately 54% of CE's revenues.

Dredged Materials

CE operates two facilities to treat dredged material, the sediment accumulated at the bottom of waterways that is removed for environmental (clean-up) or maintenance (maintain depth) purposes. After treatment, these materials are also beneficially reused as fill material. In the second half of 2019, dredged material processing represented approximately 10% of CE's revenues.

OPERATIONS AND PERMITS

CE maintains a full suite of regulation-compliant treatment capabilities that de-characterize waste and that can be tailored to meet customer-specific requirements. These solutions include: a) **Thermal Desorption** - a remediation technology that involves heating soil to remove or separate the contaminants; b.) **Bioremediation** - a treatment process that degrades contaminants by the application of microorganisms or engineered bacteria; c.) **Chemical fixation** - a remediation process using chemical additives; and d.) **Physical treatment** - a sizing and segregation process to remove unsuitable materials.

Additionally, CE holds a portfolio of more than 200 process, treatment and operating permits, including the ones mentioned above. This permit portfolio is difficult to duplicate, making these permits valuable and critically-important assets in this heavily-regulated industry. CE has achieved a 100% renewal-retention rate on desired permits in the past 20 years, and the number of permits held by CE has increased considerably over the past few years. CE's ability to secure new permits or permit modifications for new waste streams or processes in the future remains an important growth lever for the business.

BACKLOG

The dollar value of CE's backlog is excluded due to the short-cycle nature of services provided and variability in revenues due to the timing of receipt and composition of materials. CE had an estimated material backlog on December 31, 2019 of approximately 3 million tons, most of which can be attributed to its contaminated materials business. This backlog provides us significant visibility on future performance, given that this tonnage represents approximately two-thirds of a full-year processing volume for the business.

GROWTH

Favorable underlying market dynamics, driven by increased regulation and a growing list of contaminants and hazardous materials, and investment are anticipated to fuel CE's growth in the coming years. We also anticipate penetrating the market with new treatment solutions and expansion of existing technologies, including through permit modifications and applications in new geographic markets. Lastly, CE is well-positioned to benefit from an improved outlook for maintenance and environmental dredging, and we expect acquisitions to be an important growth lever for CE. CE operates in a very fragmented, regionally-driven market. As a result, we expect to pursue acquisition opportunities that may provide increased scale and/or new capabilities, along with synergies and attractive financial returns to the Company.

On February 7, 2020, the Company announced it had entered into a definitive agreement to acquire the Stericycle Environmental Solutions Business ("ESOL"), an established hazardous waste transportation and processing solutions provider from Stericycle, Inc. Under the terms of the agreement, the Company will acquire ESOL for \$462.5 million in cash, subject to post-closing adjustments. The transaction has been approved by the Company's Board of Directors and is expected to close by March 31, 2020 subject to customary closing conditions, including regulatory approvals.

COMPETITION

Given the fragmented nature of the specialty waste industry, CE competes with numerous companies. Our larger peers include Clean Harbors, Heritage Environmental Services, Stericycle, and U.S. Ecology within the hazardous materials line of business, and GFL Environmental (SoilSafe) and Impact Environmental within the contaminated materials market. CE differentiates itself from competitors through service reliability and responsiveness, its diverse operating capabilities and regulatory compliant solutions, and the value it provides through providing low-cost solutions relative to other disposal alternatives in the regions where it operates.

HARSCO RAIL

BUSINESS OVERVIEW

Harsco Rail is recognized for technical leadership and our worldwide experience in all aspects of railway track maintenance. We enable railroads to operate at peak efficiency over smooth, precisely aligned track, which improves safety performance and reduces fuel consumption. Our broad array of products and services helps every type of railway operator, from major national and international railway systems, to short lines and high-speed urban transit networks, achieve their productivity and sustainability objectives.

More specifically, Harsco Rail is a supplier of equipment, after-market parts and services for the construction and maintenance of railway track. We manufacture highly-engineered railway track maintenance equipment and support a large installed-base of the Company's equipment with a full suite of aftermarket parts. We are a leading supplier of collision avoidance and warning systems to enhance passenger, rail worker and pedestrian safety, and we pioneered a number of measurement and diagnostic technologies that further support railway maintenance programs.

RAIL EQUIPMENT

Manufacturing high-quality, cutting-edge technology equipment is core to Harsco Rail. These products are developed through an active research and development effort, often in conjunction with our customers. Our primary operating costs include product engineering, metal and electrical components. Rail equipment sales represented approximately 49% of segment revenues in 2019. Below is a sampling of our major equipment categories.

Surfacing Equipment

Harsco Rail's surfacing machines precisely align and stabilize railway track by raising the rail to the desired height and packing the supporting ballast foundation. This process increases rail productivity and limits maintenance downtime for our customers. The Company is also a leader in the development of automated tamping equipment through the integration of drone technology, which provides customers with incremental operating flexibility.

Utility Track Vehicles ("UTVs")

Our all-purpose UTVs are used to power work trains for a broad range of rail maintenance requirements, including snow removal, catenary maintenance, and other repairs. UTVs are engineered to order, providing highly versatile configurations equipped with cranes, generators and/or work platforms used by our customers. Harsco Rail has also recently developed and introduced a hybrid diesel-electric maintenance vehicle, a breakthrough technology, that supports customer ambitions to electrify their rails and lower their carbon footprint.

Production Grinders

Harsco Rail's suite of grinding products extend the life of track and enhance customer performance. Our grinders remove cracks and other surface defects and re-profile rail heads. The result is smoother and quieter track that enables our customers to operate at higher speeds and lower fuel consumption.

Tie Equipment

Harsco Rail provides a full line of tie equipment, with drone capabilities, to help customers maintain their linear assets. These products include spike puller, anchor spreader and tie replacement vehicles that support optimal track performance and safety.

New Track Construction Equipment

A new track construction machine produced by the Company can lay roughly a mile of track per day in continuous operation. The equipment constructs track three times faster than the stick-building alternative and works with all forms of ties.

AFTERMARKET PARTS AND SERVICE

Harsco Rail sells a full range of aftermarket parts and provides on-site technical assistance and training programs to our customers. These products include OEM genuine replacement parts and upgrade kits to ensure equipment achieves peak performance and to minimize operating costs. Our service representatives are deployed around the world, and our e-commerce website features over 15,000 parts. Aftermarket parts sales and services represented approximately 40% of segment revenues in 2019.

PROTRAN TECHNOLOGY

Protran is a leading technology provider to the rail and transit market. Its railway track worker and train operator safety systems help protect railway personnel from oncoming rail traffic and prevent vehicle-to-vehicle collisions. Protran's safety equipment is found on transit buses as well, providing turn alerts to pedestrians. Protran also sells track measurement and diagnostic solutions. This technology provides analytical data on track conditions, thereby helping railways plan the timing and location of preventive maintenance. Protran represented approximately 4% of segment revenues in 2019.

RAILWAY CONTRACTING SERVICES

Harsco Rail's contracting services provide customers with a quality service through work crews that operate the equipment and understand the customer's maintenance needs. With years of experience, Harsco Rail's contract service teams have covered more than 397,500 miles of track, helping customers achieve desired productivity goals. Railways contracting services represented approximately 7% of segment revenues in 2019.

CUSTOMERS

Over 125 major railways, including Class-1 railroads in North America, mass transit systems (authorities), equipment leasing companies and state-owned railroads around the world have chosen Harsco Rail to optimize the condition of their tracks. Harsco Rail's geographic and product mix is diversified. In 2019, approximately 26% of Harsco Rail's revenues were derived outside of North America. Harsco Rail had one customer in 2019, 2018 and 2017 that provided more than 10% of the segment's revenues.

BACKLOG

Harsco Rail had an order backlog on December 31, 2019 of \$446.9 million compared with \$297.2 million on December 31, 2018. Most of this backlog can be attributed to our Rail equipment business, and the year-on-year backlog increase is attributable to higher equipment bookings during the year. Equipment is often sold through long lead-time purchase orders or under large, multi-year supply contracts, while aftermarket and Protran sales have shorter-cycle characteristics.

Importantly, this backlog also provides us significant visibility for future quarters. As of December 31, 2019, \$225.9 million or 51% of the Harsco Rail segment's manufactured products order backlog is expected to be filled in 2020. The remainder of this backlog is expected to be filled through 2024.

MANUFACTURING AND WORKING CAPITAL

Our primary equipment manufacturing facility is in Columbia, South Carolina. We also maintain a manufacturing presence in Europe, mainly to support certain large, multi-year supply contracts in that region. In 2018, the Company decided to consolidate and centralize its principal North American manufacturing and distribution into one facility, allowing for improved efficiency and better service to customers. As a result, our operations in Ludington, Michigan were transferred to our expanded facility in Columbia, South Carolina. The capital investment to complete this program concluded in 2019.

Given the time required to manufacture certain equipment, Rail manages its inventories to meet forecasted demand and customer requirements. We will usually build inventories during the design and production phase for large or long-lead-time orders, and the opposite is true as equipment is delivered under these contracts. Further, the overall cash impact of these inventory changes is mitigated by the fact that Rail often receives advance or progress payments on large orders.

GROWTH

Developing new and differentiated technology is critical to our growth, and we see numerous potential growth levers for Harsco Rail throughout our product portfolio and expanding global presence. We expect to benefit in North America from the efficiency or productivity goals of our freight customers and investments by transit authorities to upgrade and improve asset performance. In the international market, we anticipate further share gains through our equipment innovations, and we are positioned to benefit as global spending for safety and measurement technologies increases.

COMPETITION

We have many competitors across our global product and services portfolio, including Plasser & Theurer, Nordco, Loram, and Matisa Matériel Industriel SA. We believe Harsco Rail differentiates itself from competitors through innovative technology solutions, as well as service and product quality. We create customized products designed to meet the specific needs of our customers' railway projects, while at the same time meeting their productivity, safety and environmental goals.

CORPORATE SUSTAINABILITY

We are committed to building a global, market-leading environmental solutions company that preserves our environment, adheres to ethical and responsible business practices, and supports our customers as they do the same. Sustainability is central to our business strategy - our employees are inspired to develop innovative products and services that positively impact the environment and support the Company's growth.

Our key sustainability focus areas include:

- **Serving Our Customers.** We help our customers solve their most pressing sustainability challenges by providing services and products that meet their environmental and business objectives.
- **Preserving Our Environment.** We strive to eliminate or reduce our global environmental impact by providing the highest-quality environmental management in our operations and improving our environmental footprint through continuous improvement efforts. Our Corporate Environmental Policy outlines our environmental stewardship commitments. We also expect all third parties that do business with the Company to share our environmental standards.
- **Protecting Our People.** Safety is of paramount importance in everything we do - our goal, each and every day, is that our people return home unharmed. We are building a best-in-class Safety culture, and our cross-functional / cross-divisional Safety Committee is responsible for implementing best practices with a goal of eliminating all incidents within our business activities.
- **Investing in Our People & Communities.** We invest in career development of our employees, knowing that diversity of perspective, backgrounds and talents strengthens our business. We are also committed to building strong, sustainable communities where we live and work.
- **Excellence in Corporate Governance.** Our Code of Conduct and Core Values lie at the center of all we do. Through these policies and guidelines, we have equipped every employee with the tools, training, and guidance to always do the right things, the right way. Additionally, Environmental, Social and Governance ("ESG") oversight is provided by the Nominating & Corporate Governance Committee of the Company's Board of Directors.

Further details on our sustainability initiatives and accomplishments can be found in our latest ESG Report. This report, published in the second-half of 2019, is our most comprehensive sustainability report to date and can be found on the Company's website (www.harsco.com/sustainability) along with other related policies.

HARSCO BUSINESS SYSTEM ("HBS")

Our HBS is a shared set of processes that reflect and support our corporate strategy. These repeatable and replicable standards and practices are the hallmark of a high-performing company. There is intrinsic value in a common language, and a defined business system does away, in large part, with ambiguity about what constitutes success. The elements of our HBS are: **Environmental, Health & Safety; Continuous Improvement; Talent Development; Strategic Planning; and Acquisitions & Divestitures.**

EMPLOYEES

On December 31, 2019, the Company had approximately 10,500 employees in more than 30 countries. The majority of our employees are represented by labor unions, through more than 100 collective bargaining agreements. Labor agreements with these unions expire periodically, and any work stoppages or strikes, which are uncommon, are not likely to have a meaningful impact on our operations given the variability of these agreements. The Company's management believes it has strong relations with its employees and unions, and the Company is committed to safe, appealing work environments as well as market-competitive benefits programs and investment in personal development.

ACQUISITIONS AND DIVESTITURES

Given the Company's evolution to a single-thesis environmental solutions company, acquisitions and divestitures have been - and are expected to continue being - an important element of our business strategy. These actions support the Company's growth ambitions, while reducing business cyclicity and portfolio complexity.

On February 7, 2020, the Company announced it had entered into a definitive agreement to acquire ESOL, an established hazardous waste transportation and processing solutions provider from Stericycle, Inc. Under the terms of the agreement, the Company will acquire ESOL for \$462.5 million in cash, subject to post-closing adjustments. The transaction has been approved by the Company's Board of Directors and is expected to close by March 31, 2020 subject to customary closing conditions, including regulatory approvals.

In June 2019, the Company acquired CE from Compass Diversified Holdings for approximately \$628 million in cash. This acquisition expands the Company's environmental service capabilities, while providing the Company entry into a market with attractive organic growth and recurring revenues characteristics. CE also provides the Company with a platform for future acquisition growth. It is a separately reported segment for the Company, and the acquisition was funded through a private placement of senior unsecured notes and borrowings under the Company's Revolving Credit Facility.

Also, in 2019, the Company completed the sale of the Harsco Industrial Air-X-Changers business for approximately \$600 million (July 2019) and the Harsco Industrial Patterson-Kelley business (November 2019) for approximately \$60 million in cash. Subsequent to the end of 2019, the Company sold its remaining Industrial business, IKG, for \$85 million in cash and notes. These divestitures accelerate the transformation of the Company's portfolio of businesses into a global leading provider of environmental solutions and services, and significantly reduce the Company's exposure to the cyclicity of the U.S. energy market.

In May 2018, the Company acquired Altek, a U.K.-based manufacturer of market leading products that enable aluminum producers and recyclers to manage critical waste streams and improve operating productivity. Altek has developed unique technologies that support the sustainability of its customers, which complements the Company's other industrial waste services. The Company acquired Altek for a purchase price of £45 million (approximately \$60 million), with the potential for additional contingent consideration through 2021 subject to the future financial performance of Altek. The acquisition was funded through increased borrowings. Altek's revenues and operating results are included in the results of the Harsco Environmental Segment.

SEASONALITY

Certain of the Company's businesses can be subject to seasonal fluctuations. Demand for services and solutions provided by HE are subject to seasonal changes related to weather conditions, inventory management through the steel-industry supply chain, and customer operating outages linked to regular holidays. The timing of these impacts varies by region, however, overall customer demand for HE across its global footprint tend to be strongest in the second quarter and third quarter of each year. CE, meanwhile, provides services that can also fluctuate seasonally with weather. As a result, demand for CE services tends to be weakest in the first quarter of each year due to cold weather and lower construction activity in the northern part of the U.S. Harsco Rail is not considered to be influenced by seasonal trends.

Due to these factors, the Company's revenues and earnings are usually higher during the second and third quarters of each year relative to the first and fourth quarter of the year. Additionally, the Company's cash flows are also influenced by seasonality. The Company's cash flow from operations has historically been higher in the second half of the year, compared with the first half, due to working capital management, increased receivable collections against higher first half revenues and the timing of certain cash payments, including for incentive compensation and pension contributions.

ENVIRONMENTAL COMPLIANCE

The Company is subject to various environmental regulations within its global operations and the scope of relevant environmental regulation is expanded following the Company's acquisition of CE in 2019. CE operates within an industry that is subject to stringent environmental regulation by federal, state and local authorities, which regulate the treatment and disposal of specialty waste. Facility and operating permits or approvals from these authorities are required to maintain operations. The nature of these permits varies by jurisdiction and are based on the activities at a particular site. These permits are generally difficult to obtain. This dynamic, along with increased regulation on the treatment and disposal of specialty waste, is beneficial to our CE business.

The most significant U.S. federal environmental regulation that impacts our business is the RCRA. RCRA created a cradle-to-grave system which governs the transportation, treatment, storage and disposal of hazardous waste. Under RCRA, each hazardous waste processing facility must maintain a RCRA permit and comply with defined operating practices. This legislation is administered by the U.S. Environmental Protection Agency (EPA), although its authority may be delegated to a State EPA with similar or more stringent environmental standards.

The Company is also subject to air and water quality control legislation in the U.S. and in foreign countries where the Company operates. The Clean Water Act regulates the discharge of pollutants into waterways and sewers in the U.S., and where necessary, we obtain and must comply with permits to discharge wastewater from our facilities. Similarly, the Clean Air Act in the U.S. controls emissions of pollutants into the air and requires permits for certain emissions.

The Company regards compliance with all applicable environmental regulation as critical to its business. Historically, the Company has been able to renew and retain all required permits to maintain its operations and it has not experienced substantial difficulty complying with relevant environmental regulations. The Company also does not anticipate making any material capital expenditures to comply with or improve environmental performance in the future, and while environmental regulations may increase or expand, it cannot predict the extent of this future environmental regulation, its related costs and the overall effect on the Company's business.

For additional information regarding environmental matters see Note 11, Commitment and Contingencies, in Part II, Item 8, "Financial Statements and Supplementary Data."

CORPORATE INFORMATION

The Company was incorporated in 1956. The Company's global headquarters and executive offices are located at 350 Poplar Church Road, Camp Hill, Pennsylvania 17011, and its main telephone number is 717.763.7064.

The Company's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to such reports filed with or furnished to the Securities and Exchange Commission (the "SEC") under Sections 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, are available on the Company's website at www.harsco.com as soon as reasonably practicable after such reports are electronically filed with the SEC. Additionally, the SEC maintains a website that contains reports, proxy and other information regarding issuers that electronically file with the SEC at www.sec.gov.

AVAILABLE INFORMATION

Our website address is www.harsco.com. Copies of our key Corporate governance documents, such as our Code of Business Conduct and Internal Controls Framework, as well as our Board of Directors composition and structure can be viewed on our website under the "Corporate Governance" subheading of the "Our Company" page. Additionally, further information on our Corporate Sustainability initiatives also can be accessed through the "Our Company" page. The information posted on the Company's website is not incorporated into the Company's SEC filings.

Item 1A. Risk Factors.

Set forth below are risks and uncertainties that could materially and adversely affect the Company's results of operations, financial condition, liquidity and cash flows. The risks set forth below are not the only risks faced by the Company. The Company's business operations could also be affected by other factors not presently known to the Company or factors that the Company currently does not consider to be material.

Negative economic conditions may adversely impact demand for the Company's products and services, as well as the ability of the Company's customers to meet their obligations to the Company on a timely basis.

Negative economic conditions, including the tightening of credit in financial markets, can lead businesses to postpone spending, which may impact the Company's customers, causing them to cancel, decrease or delay their existing and future orders with the Company. In addition, economic conditions may impact the Company's customers by either causing them to close locations serviced by the Harsco Environmental Segment or causing their financial condition to deteriorate to a point where they are unable to meet their obligations to the Company on a timely basis. One or more of these events could adversely impact the Company's operating results and ability to collect its receivables.

Cyclical industry and economic conditions may adversely affect the Company's businesses.

The Company's businesses are subject to general economic slowdowns and cyclical conditions in each of the industries served. Examples are:

- The Harsco Environmental Segment may be adversely impacted by prolonged slowdowns in steel mill production, excess production capacity, bankruptcy or receivership of steel producers and changes in outsourcing practices;
- The resource recovery and slag optimization technologies business of the Harsco Environmental Segment can also be adversely impacted by prolonged slowdowns in customer production or a reduction in the selling prices of its materials, which are in some cases market-based and vary based upon the current fair value of the components being sold. Therefore, the revenue generated from the sale of such recycled materials varies based upon the fair value of the commodity components being sold;
- The abrasives and roofing materials business of the Harsco Environmental Segment may be adversely impacted by economic conditions that slow the rate of residential roof replacement, or by slowdowns in the industrial and infrastructure refurbishment industries;
- The Harsco Rail Segment may be adversely impacted by developments in the railroad industry that lead to lower capital spending or reduced track maintenance spending; and
- Capital constraints and increased borrowing costs may also adversely impact the financial position and operations of the Company's customers across all business segments.

Furthermore, utilization of deferred tax assets is ultimately dependent on generating sufficient income in future periods to ensure recovery of those assets. The cyclical nature of the Company's end markets and adverse economic conditions may negatively impact the future income levels that are necessary for the utilization of deferred tax assets.

The seasonality of the Company's business may cause quarterly results to fluctuate.

The majority of the Company's cash flows provided by operations has historically been generated in the second half of the year. This is a result of normally higher income during the second half of the year, as the Company's business tends to follow seasonal patterns. If the Company is unable to successfully manage the cash flow and other effects of seasonality on the business, its results of operations may suffer.

Customer concentration and related credit and commercial risks may adversely impact the Company's results of operations, financial condition and cash flows.

For the year ended December 31, 2019, the Company's top five customers in the Harsco Environmental Segment accounted for approximately 32% of revenues in that Segment and 22% of the Company's consolidated revenues. The Company routinely enters into multiple contracts with its top customers, and many vary in contract length and scope. Disagreements between the parties can arise as a result of the scope, nature and varying degree of relationship between the Company and these customers.

The Harsco Environmental Segment has several large customers and, if a large customer were to experience financial difficulty or file for bankruptcy or receivership protection, it could adversely impact the Company's results of operations, cash flows and asset valuations.

Disputes with customers with long-term contracts could adversely affect the Company's financial condition.

The Company routinely enters into multiple contracts with customers, many of which can be long-term contracts. Under long-term contracts, the Company may incur capital expenditures or other costs at the beginning of the contract that it expects to recoup through the life of the contract. Some of these contracts provide for advance payments to assist the Company in covering these costs and expenses. A dispute with a customer during the life of a long-term contract could impact the ability of the Company to receive payments or otherwise recoup incurred costs and expenses.

The Company's global presence subjects it to a variety of risks arising from doing business internationally.

The Company operates in approximately 30 countries, generating 57% of its revenues outside of the U.S. (based on location of the facility generating the revenue) for the year ended December 31, 2019. In addition, as of December 31, 2019, approximately 66% of the Company's property, plant and equipment is located outside of the U.S. The Company's global footprint exposes it to a variety of risks that may adversely affect the Company's results of operations, financial condition, liquidity and cash flows. These include, but may not be limited to, the following:

- periodic economic downturns in the countries in which the Company does business;
- imposition of or increases in currency exchange controls and hard currency shortages;
- customs matters and changes in trade policy or tariff regulations;
- changes in regulatory requirements in the countries in which the Company does business;
- changes in tax regulations, higher tax rates in certain jurisdictions and potentially adverse tax consequences including restrictions on repatriating earnings, adverse tax withholding requirements and "double taxation;"
- longer payment cycles and difficulty in collecting accounts receivable;
- complexities in complying with a variety of U.S. and foreign government laws, controls and regulations;
- political, economic and social instability, civil and political unrest, terrorist actions and armed hostilities in the regions or countries in which, or adjacent to which, the Company does business;
- increasingly complex laws and regulations concerning privacy and data security, including the European Union's ("EU") General Data Protection Regulation ("GDPR");
- inflation rates in the countries in which the Company does business;
- complying with complex labor laws in foreign jurisdictions;
- laws in various international jurisdictions that limit the right and ability of subsidiaries to pay dividends and remit earnings to affiliated companies unless specified conditions are met;
- sovereign risk related to international governments, including, but not limited to, governments stopping interest payments or repudiating their debt, nationalizing private businesses or altering foreign exchange regulations;
- uncertainties arising from local business practices, cultural considerations and international political and trade tensions; and
- public health issues or other calamities impacting regions or countries in which the Company operates, including travel to and/or imports or exports to or from such regions or countries.

If the Company is unable to successfully manage the risks associated with its global business, the Company's results of operations, financial condition, liquidity and cash flows may be negatively impacted.

Due to the international nature of the Company's business, the Company could be adversely affected by violations of certain laws.

The U.S. Foreign Corrupt Practices Act ("FCPA") and similar anti-bribery laws in non-U.S. jurisdictions generally prohibit companies and their intermediaries from making improper payments to officials for the purpose of obtaining or retaining business. The FCPA also imposes accounting standards and requirements on publicly traded U.S. corporations and their foreign affiliates, which, among other things, are intended to prevent the diversion of corporate funds to the payment of bribes and other improper payments, and to prevent the establishment of "off the books" slush funds from which improper payments can be made. The Company may be unsuccessful in its efforts to prevent reckless or criminal acts by employees or agents and may be exposed to liability due to pre-acquisition conduct of employees or agents of businesses or operations the Company may acquire. Violations of these laws, or allegations of such violations, could disrupt the Company's operations, require significant management involvement and have a material adverse effect on the Company's results of operations, financial condition and cash flows. If the Company is found to be liable for violations of these laws (either due to its own acts, out of inadvertence or due to the acts or inadvertence of others), the Company could also be subject to severe criminal or civil penalties or other sanctions; disgorgement; further changes or enhancements to its procedures, policies and controls; personnel changes and other remedial actions.

Furthermore, the Company is subject to the export controls and economic embargo rules and regulations of the U.S., including the Export Administration Regulations and trade sanctions against embargoed countries, which are administered by the Office of Foreign Asset Control within the Department of Treasury, as well as other laws and regulations administered by the Department of Commerce. These regulations limit the Company's ability to market, sell, distribute or otherwise transfer its products to prohibited countries or persons. Failure to comply with these rules and regulations may result in substantial civil and criminal penalties, including fines and disgorgement of profits, the imposition of a court-appointed monitor, the denial of export privileges and debarment from participation in U.S. Government contracts.

Exchange rate fluctuations may adversely impact the Company's business.

Fluctuations in foreign exchange rates between the U.S. dollar and the approximately 25 other currencies in which the Company currently conducts business may adversely impact the Company's results of operations in any given fiscal period. The Company's principal foreign currency exposures are in the EU, the U.K., China and Brazil. Given the structure of the Company's operations, an increase in the value of the U.S. dollar relative to the foreign currencies in which the Company earns its revenues generally has a negative impact on the translated amounts of the assets and liabilities, results of operations and cash flows. The Company's foreign currency exposures increase the risk of volatility in its financial position, results of operations and cash flows. If currencies in the below regions change materially in relation to the U.S. dollar, the Company's financial position, results of operations, or cash flows may be materially affected.

Compared with the corresponding full-year period in 2018, the average value of major currencies changed as follows in relation to the U.S. dollar during the full-year 2019, impacting the Company's revenues and income:

- British pound sterling weakened by 4%;
- Euro weakened by 5%;
- Chinese yuan weakened by 4%; and
- Brazilian real weakened by 7%

Compared with exchange rates at December 31, 2018, the value of major currencies at December 31, 2019 changed as follows:

- British pound sterling strengthened by 4%;
- Euro weakened by 2%;
- Chinese yuan weakened by 1%; and
- Brazilian real weakened by 3%

To illustrate the effect of foreign exchange rate changes in certain key markets of the Company, in 2019 revenues would have been approximately 3% or \$41 million higher and operating income would have been approximately 3% or \$3 million higher if the average exchange rates for 2018 were utilized. In a similar comparison for 2018 revenues would have been less than 1% or approximately \$3 million higher and operating income would have been less than 1% or approximately \$1 million higher if the average exchange rates for 2017 were utilized.

Currency changes also result in assets and liabilities denominated in local currencies being translated into U.S. dollars at different amounts than at the prior period end. Generally, if the U.S. dollar weakens in relation to currencies in countries in which the Company does business, the translated amounts of the related assets, liabilities, and therefore stockholders' equity, would increase. Conversely, if the U.S. dollar strengthens in relation to currencies in countries in which the Company does business, the translated amounts of the related assets, liabilities, and therefore stockholders' equity, would decrease.

Although the Company engages in foreign currency exchange forward contracts and other hedging strategies to mitigate foreign exchange transactional risks, hedging strategies may not be successful or may fail to completely offset these risks. In addition, competitive conditions in the Company's manufacturing businesses may limit the Company's ability to increase product prices in the face of adverse currency movement. Sales of products manufactured in the U.S. for the domestic and export markets may be affected by the value of the U.S. dollar relative to other currencies. Any long-term strengthening of the U.S. dollar could depress demand for these products and reduce sales. Conversely, any long-term weakening of the U.S. dollar could improve demand for these products and increase sales.

Economic conditions and regulatory changes following the U.K.'s referendum on withdrawal from the EU could impact the Company's business and results of operations.

In June 2016, a majority of voters in the U.K. approved a withdrawal from the EU in a national referendum (often referred to as Brexit). In March 2017 the U.K. invoked Article 50 of the Lisbon Treaty, initiating the withdrawal process, and the U.K. departed from the EU on January 31, 2020. The U.K. and the EU are continuing to negotiate their future relationship, including whether there will be a transition period. The withdrawal of the U.K. from the EU, as well as the manner of withdrawal, has created significant uncertainty about the future relationship between the U.K. and the EU, including with respect to the laws and regulations that will apply as the U.K. determines which EU laws to replace or replicate following its withdrawal from the UK.

The Company's business, particularly the Harsco Environmental Segment, whose headquarters is in the U.K., could be impacted by the exit of the U.K. from the EU. Adverse consequences such as deterioration in economic conditions and volatility in currency exchange rates could have a negative impact on the Company's operations, financial condition and results of operations. In addition, incremental regulatory controls and regulations governing trade between the U.K. and the rest of the EU could have adverse consequences on the steel industry in the U.K. and/or the EU and could negatively impact the Company's operations and financial condition.

The Company may lose customers or be required to reduce prices as a result of competition.

The industries in which the Company operates are highly competitive. Some examples are as follows:

- The Harsco Environmental Segment is sustained mainly through contract renewals and new contract signings. The Company may be unable to renew contracts at historical price levels or to obtain additional contracts at historical rates as a result of competition. If the Company is unable to renew its contracts at the historical rates or renewals are made at reduced prices, or if its customers terminate their contracts, revenue and results of operations may decline.
- The Harsco Rail Segment competes with companies that manufacture similar products both internationally and domestically. Certain international competitors export their products into the U.S. and sell them at lower prices, which can be the result of lower labor costs and government subsidies for exports. In addition, certain competitors may from time to time sell their products below their cost of production in an attempt to increase their market share. Such practices may limit the prices the Company can charge for its products and services. Unfavorable foreign exchange rates can also adversely impact the Company's ability to match the prices charged by international competitors. If the Company is unable to match the prices charged by competitors, it may lose customers.

Restrictions imposed by the Company's Senior Secured Credit Facilities and other financing arrangements may limit the Company's operating and financial flexibility.

The agreements governing the Company's outstanding financing arrangements impose a number of restrictions. Under the Company's Senior Secured Credit Facilities, the Company must comply with certain financial covenants on a quarterly basis. The covenants also place limitations on dividends, acquisitions, investments in joint ventures, unrestricted subsidiaries, indebtedness and the imposition of liens on the Company's assets. In the event of a default, the Company's lenders and the counterparties to the Company's other financing arrangements could terminate their commitments to the Company and declare all amounts borrowed, together with accrued interests and fees, immediately due and payable. If this were to occur, the Company might not be able to pay these amounts, or the Company might be forced to seek an amendment to the Company's financing arrangements which could make the terms of these arrangements more onerous for the Company. In addition, this could also trigger an event of default under the cross-default provisions of the Company's other obligations. As a result, a default under one or more of the existing or future financing arrangements could have significant consequences for the Company.

The Company is exposed to counterparty risk in its derivative financial arrangements.

The Company uses derivative financial instruments, such as interest rate swaps and foreign currency exchange forward contracts, for a variety of purposes. The Company uses interest rate swaps in conjunction with certain debt issuances in order to secure either a fixed or floating interest rate. The Company uses foreign currency exchange forward contracts as part of a worldwide program to minimize foreign currency operating income and balance sheet exposure. In particular, the Company uses foreign currency exchange forward contracts to hedge commitments, such as foreign currency debt, firm purchase commitments and foreign currency cash flows for certain export sales transactions. The unsecured contracts for foreign currency exchange forward contracts outstanding at December 31, 2019 mature at various times through 2021 and are with major financial institutions. The Company may also enter into derivative contracts to hedge commodity exposures. The failure of one or more counterparties to the Company's derivative financial instruments to fulfill their obligations could adversely affect the Company's results of operations, financial condition, liquidity and cash flows.

The Company's variable rate indebtedness subjects it to interest rate risk, which could cause the Company's debt service obligations to increase significantly.

The Company's total debt at December 31, 2019 was \$781.8 million. Of this amount, approximately 36% had variable rates of interest and approximately 64% had fixed interest rates. The weighted average interest rate of total debt was approximately 5.4%. At debt levels as of December 31, 2019, a one percentage point increase/decrease in variable interest rates would increase/decrease interest expense by \$2.9 million per year. If the Company is unable to successfully manage its exposure to variable interest rates, including through interest rate swaps that the Company has put into place, its debt service obligations may increase even though the amount borrowed remains the same and, in turn, its results of operations and financial condition may be negatively impacted.

The Company is subject to taxes in numerous jurisdictions and could be subject to additional tax liabilities, which could materially adversely affect the Company's results of operations and cash flows and impact the Company's ability to compete abroad.

The Company is subject to U.S. federal, U.S. state and international income, payroll, property, sales and use, value-added, fuel and other types of taxes in numerous jurisdictions. Changes in tax rates, enactments of new tax laws, revisions of tax regulations, and claims or litigation with taxing authorities could result in substantially higher taxes, and therefore could have a significant adverse effect on the Company's results of operations, financial condition and liquidity.

The Company's tax expense and liabilities may also be affected by other factors, such as changes in business operations, acquisitions, investments, entry into new geographies, intercompany transactions, the relative amount of foreign earnings, losses incurred in jurisdictions for which the related tax benefits may not be realized, and changes in deferred tax assets and their valuation. Significant judgment is required in evaluating and estimating the Company's tax expense and liabilities. The ultimate tax determination for many transactions and calculations is uncertain. For example, the legislation known as the U.S. Tax Cuts and Jobs Act of 2017 (the "Tax Act") requires complex computations to be performed that were not historically required, significant judgments to be made in interpretations of the provisions of the Tax Act, estimates in calculations, and the preparation and analysis of information not previously relevant or regularly produced. The U.S. Treasury Department, the IRS, and other standard-setting bodies will continue to interpret or issue guidance on how provisions of the Tax Act will be applied or administered. As future guidance is issued, the Company may need to make adjustments to amounts previously recorded, and those adjustments could materially impact the Company's consolidated financial statements in the period in which the adjustments are made.

The Company's defined benefit net periodic pension cost ("NPPC") is directly affected by equity and bond markets. A downward trend in those markets could adversely impact the Company's results of operations, financial condition and cash flows.

In addition to the economic issues that directly affect the Company's businesses, changes in the performance of equity and bond markets, particularly in the U.K. and the U.S., impact actuarial assumptions used in determining annual NPPC, pension liabilities and the valuation of the assets in the Company's defined benefit pension plans. Financial market deterioration would most likely have a negative impact on the Company's NPPC and the pension assets and liabilities. This could result in a decrease to stockholders' equity and an increase in the Company's statutory funding requirements.

In addition to the Company's defined benefit pension plans, the Company also participates in several multiemployer pension plans ("MEPPPs") throughout the world. Within the U.S., the Pension Protection Act of 2006 may require additional funding for MEPPPs that could cause the Company to be subject to higher cash contributions in the future. Additionally, market conditions and the number of participating employers remaining in each plan may affect the funded status of MEPPPs and consequently any Company withdrawal liability, if applicable.

If the Harsco Clean Earth Segment is unable to obtain or renew its operating permits or license agreements with regulatory bodies, its business would be adversely affected.

The Harsco Clean Earth Segment's facilities operate using permits and licenses issued by various regulatory bodies at various local, state and federal government levels. Failure to obtain permits and licenses necessary to operate these facilities on a timely basis or failure to renew or maintain compliance with its permits, licenses and site lease agreements on a timely basis could prevent or restrict the Company's ability to provide certain services, resulting in a material adverse effect on its business. There can be no assurance that the Company will continue to be successful in obtaining timely permit or license applications approval, maintaining compliance with its permits, licenses and lease agreements and obtaining timely license renewals.

A negative outcome on personal injury claims against the Company may adversely impact results of operations and financial condition.

The Company has been named as one of many defendants (approximately 90 or more in most cases) in legal actions alleging personal injury from exposure to airborne asbestos over the past several decades. In their suits, the plaintiffs have named as defendants, among others, many manufacturers, distributors and installers of numerous types of equipment or products that allegedly contained asbestos. The majority of the asbestos complaints pending against the Company have been filed in New York. Almost all of the New York complaints contain a standard claim for damages of \$20 million or \$25 million against the approximately 90 defendants, regardless of the individual plaintiff's alleged medical condition and without specifically identifying any of the Company's products as the source of plaintiff's asbestos exposure. If the Company is found to be liable in any of these actions and the liability exceeds the Company's insurance coverage, results of operations, cash flows and financial condition could be adversely affected.

The nature of the Company's products creates the possibility of significant product liability and warranty claims, which could harm its business.

The Company's customers use some of its products in potentially hazardous applications that can cause injury or loss of life and damage to property, equipment or the environment. In addition, the Company's products are integral to the production process for some end-users and any failure of the Company's products could result in a suspension of operations. Accidents may occur at a location where the Company's equipment and services have been or are being used. Investigations into such accidents, even if the Company and its products are ultimately found not to be the cause of such accidents, require the Company to expend significant time, effort and resources. The Company cannot be certain that its products will be completely free from defects. The Company may be named as a defendant in product liability or other lawsuits asserting potentially large claims. In addition, the Company cannot guarantee that insurance will be available or adequate to cover any or all liabilities incurred. The Company also may not be able to maintain insurance in the future at levels it believes are necessary and at rates it considers reasonable.

Higher than expected claims under insurance policies, under which the Company retains a portion of the risk, could adversely impact results of operations and cash flows.

The Company retains a significant portion of the risk for property, workers' compensation, U.K. employers' liability, automobile and general and product liability losses. Reserves have been recorded that reflect the undiscounted estimated liabilities for ultimate losses, including claims incurred but not reported. Inherent in these estimates are assumptions that are based on the Company's history of claims and losses, a detailed analysis of existing claims with respect to potential value, and current legal and legislative trends. If actual claims are higher than those projected by management, an increase to the Company's insurance reserves may be required and would be recorded as a charge to income in the period the need for the change was determined.

The Harsco Clean Earth Segment's insurance policies do not cover all losses, costs, or liabilities that it may experience.

The Harsco Clean Earth Segment maintains insurance coverage, but these policies do not cover all of its potential losses, costs, or liabilities. The Company could suffer losses for uninsurable or uninsured risks or in amounts in excess of its existing insurance coverage which would significantly affect its financial performance. For example, the Company's pollution legal liability insurance excludes costs related to fines, penalties, or assessments. The Company's insurance policies also have deductibles and self-retention limits that could expose it to significant financial expense. The Company's ability to obtain and maintain adequate insurance may be affected by conditions in the insurance market over which it has no control. The occurrence of an event that is not fully covered by insurance could have a material adverse effect on the Company's business, financial condition, and results of operations. In addition, the Harsco Clean Earth Segment's business requires that it maintain various types of insurance. If such insurance is not available or not available on economically acceptable terms, the Clean Earth Segment's and our businesses could be materially and adversely affected.

The waste management industry, in which the Harsco Clean Earth Segment is a participant, is subject to various economic, business, and regulatory risks.

The future operating results of the Harsco Clean Earth Segment may be affected by such factors as its ability to utilize its facilities and workforce profitably in the face of intense price competition, maintain or increase market share during periods of economic contraction or industry consolidation, realize benefits from cost reduction programs, invest in new technologies for treatment of various waste streams, generate incremental volumes of waste to be handled through the Harsco Clean Earth Segment's facilities from existing and acquired sales offices and service centers, obtain sufficient volumes of waste at prices which produce revenue sufficient to offset the operating costs of its facilities and minimize downtime and disruptions of operations.

Outdoor construction, which may be limited due to colder weather, and dredging, which may be limited due to environmental restrictions in certain waterways in the Northeastern United States, can be cyclical in nature. If those cyclical industries slow significantly, the business that the Harsco Clean Earth Segment receives from them would likely decrease.

Increases or decreases in purchase prices (or selling prices) or availability of steel or other materials and commodities may affect the Company's profitability.

The profitability of the Company's manufactured products may be affected by changing purchase prices of raw material, including steel and other materials and commodities. If raw material costs associated with the Company's manufactured products increase and the costs cannot be transferred to the Company's customers, results of operations would be adversely affected. Additionally, decreased availability of steel or other materials could affect the Company's ability to produce manufactured products in a timely manner. If the Company cannot obtain the necessary raw materials for its manufactured products, then revenues, results of operations and cash flows could be adversely affected.

Certain services performed by the Harsco Environmental Segment result in the recovery, processing and sale of recovered metals and minerals and other high-value metal byproducts to its customers. The selling price of the byproducts material is market-based and varies based upon the current fair value of its components. Therefore, the revenue amounts generated from the sale of such byproducts material vary based upon the fair value of the commodity components being sold.

The success of the Company's strategic ventures depends on the satisfactory performance by strategic venture partners of their strategic venture obligations.

The Company enters into various strategic ventures as part of its strategic growth initiatives as well as to comply with local laws. Differences in opinions or views between strategic venture partners can result in delayed decision-making or failure to agree on material issues which could adversely affect the business and operations of the venture. From time to time, in order to establish or preserve a relationship, or to better ensure venture success, the Company may accept risks or responsibilities for the strategic venture that are not necessarily proportionate with the reward it expects to receive. The success of these and other strategic ventures also depends, in large part, on the satisfactory performance by the Company's strategic venture partners of their strategic venture obligations, including their obligation to commit working capital, equity or credit support as required by the strategic venture and to support their indemnification and other contractual obligations.

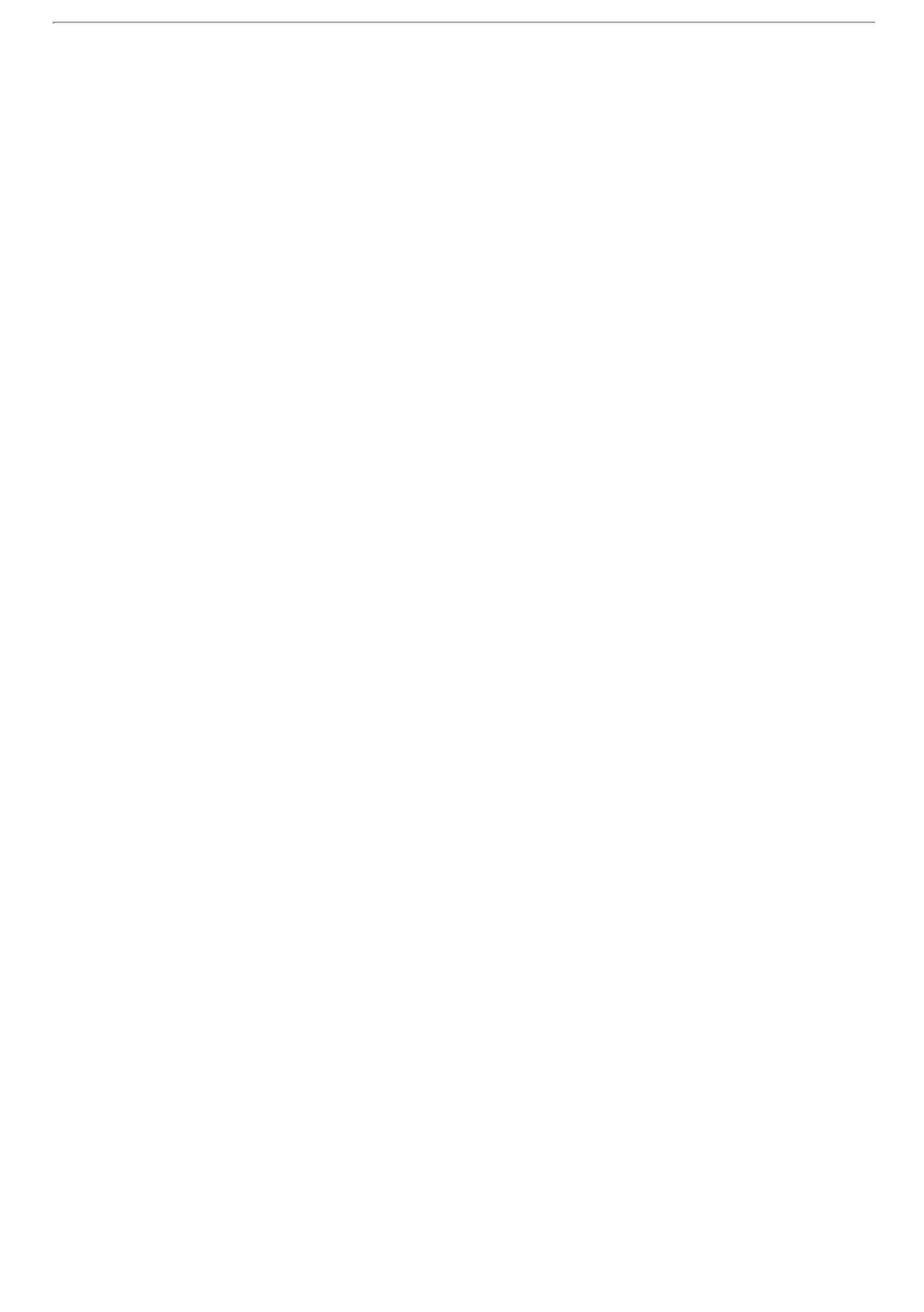
If the Company's strategic venture partners fail to satisfactorily perform their strategic venture obligations as a result of financial or other difficulties, the strategic venture may be unable to adequately perform or deliver its contracted services. Under these circumstances, the Company may be required to make additional investments and provide additional services to ensure the adequate performance and delivery of the contracted services. These additional obligations could result in reduced profits or, in some cases, increased liabilities or significant losses for the Company with respect to the strategic venture. In addition, although the Company generally performs due diligence with regard to potential strategic partners or ventures, a failure by a strategic venture partner to comply with applicable laws, rules or regulations could negatively impact its business and, in the case of government contracts, could result in fines, penalties, suspension or even debarment. Unexpected strategic venture developments could have a material adverse effect on results of operations, financial condition and cash flows.

If the Harsco Clean Earth Segment fails to comply with applicable environmental laws and regulations, its business could be adversely affected.

The regulatory framework governing the Harsco Clean Earth Segment's business is extensive. The Company could be held liable if its operations cause contamination of air, groundwater or soil or expose its employees or the public to contamination. The Company may be held liable for damage caused by conditions that existed before it acquired the assets, business or operations involved. Also, it may be liable if it generates, transports or arranges for the transportation, disposal or treatment of hazardous substances that cause environmental contamination at facilities operated by others, or if a predecessor generated, transported, or made such arrangements and the Company is a successor. Liability for environmental damage could have a material adverse effect on the Company's financial condition, results of operations and cash flows. The Company may also be held liable for the mishandling of waste streams resulting from the misrepresentations by a customer as to the nature of such waste streams.

Stringent regulations of federal, state or local governments have a substantial impact on the Harsco Clean Earth Segment's contaminated soil, dredge material and solid and hazardous waste treatment, storage, disposal and beneficial use activities. Many complex laws, rules, orders and regulatory interpretations govern environmental protection, health, safety, noise, visual impact, odor, land use, zoning, transportation and related matters. The Company also may be subject to laws concerning the protection of certain marine and bird species, their habitats, and wetlands. It may incur substantial costs in order to conduct its operations in compliance with these environmental laws and regulations. Changes in environmental laws or regulations or changes in the enforcement or interpretation of existing laws, regulations or permitted activities may require the Company to make significant capital or other expenditures, to modify existing operating licenses or permits, or obtain additional approvals or limit operations. New environmental laws or regulations that raise compliance standards or require changes in operating practices or technology may impose significant costs and/or limit the Company's operations.

The Harsco Clean Earth Segment's revenue is primarily generated as a result of requirements imposed on its customers under federal, state and local laws and regulations to protect public health and the environment. If requirements to comply with laws and regulations governing management of contaminated soils, dredge material, and hazardous wastes were relaxed or less vigorously enforced at the federal, state and local levels, demand for the Harsco Clean Earth Segment's services could materially decrease and the Company's revenues and earnings could be reduced.



If the Harsco Clean Earth Segment fails to maintain safe worksites, it may be subject to significant operating risks and hazards.

The Harsco Clean Earth Segment operates facilities that accept, process and/or treat materials provided by its customers. These facilities may be inherently dangerous workplaces. If serious accidents or fatalities occur or its safety record was to deteriorate, it may be ineligible to bid on certain work, and existing service arrangements could be terminated. Further, regulatory changes implemented by the Occupational Safety and Health Administration could impose additional costs on the Company. Adverse experience with hazards and claims could result in liabilities caused by, among other things, injury or death to persons, which could have a negative effect on the Company's reputation with its existing or potential new customers and its prospects for future business.

The Company is subject to various environmental laws, and the success of existing or future environmental claims against it could adversely impact the Company's results of operations and cash flows.

In addition to the environmental and safety considerations discussed above with respect to the Harsco Clean Earth Segment, the Company's operations generally are subject to various federal, state, local and international laws, regulations and ordinances relating to the protection of health, safety and the environment, including those governing discharges to air and water, handling and disposal practices for solid and hazardous byproducts, the remediation of contaminated sites and the maintenance of a safe workplace. These laws impose penalties, fines and other sanctions for non-compliance and liability for response costs, property damages and personal injury resulting from past and current spills, disposals or other releases of, or exposure to, hazardous materials. The Company could incur substantial costs as a result of non-compliance with or liability for remediation or other costs or damages under these laws. The Company may be subject to more stringent environmental laws in the future, and compliance with more stringent environmental requirements may require the Company to make material expenditures or subject it to liabilities that the Company currently does not anticipate.

The Company is currently involved in a number of environmental remediation investigations and cleanups and, along with other companies, has been identified as a "potentially responsible party" for certain byproduct disposal sites under the federal "Superfund" law. At several sites, the Company is currently conducting environmental remediation, and it is probable that the Company will agree to make payments toward funding certain other of these remediation activities. It also is possible that some of these matters will be decided unfavorably to the Company and that other sites requiring remediation will be identified. Each of these matters is subject to various uncertainties, and financial exposure is dependent upon the following factors:

- the continuing evolution of environmental laws and regulatory requirements;
- the availability and application of technology;
- the allocation of cost among potentially responsible parties;
- the years of remedial activity required; and
- the remediation methods selected.

The Company's ongoing operations are subject to extensive laws, regulations, rules and ordinances relating to safety, health and environmental matters that impose significant costs and liabilities on the Company, and future laws and governmental standards could increase these costs and liabilities.

The Company is subject to a variety of international, federal, state and local laws and governmental regulations, rules and ordinances regulating the use of certain materials contained in its products and/or used in its manufacturing processes. Many of these laws and governmental standards provide for extensive obligations that require the Company to incur significant compliance costs and impose substantial monetary fines and/or criminal sanctions for violations.

Furthermore, such laws and standards are subject to change and may become more stringent. Although it is not possible to predict changes in laws or other governmental standards, the development, proposal or adoption of more stringent laws or governmental standards may require the Company to change its manufacturing processes, for example, by reducing or eliminating use of the regulated component or material in its manufacturing process. The Company may not be able to develop a new manufacturing process to comply with such legal and regulatory changes without investing significant time and resources, if at all. In addition, such legal and regulatory changes may also affect buying decisions by the users of the Company's products that contain regulated materials or that involve the use of such materials in the manufacturing process. If applicable laws and governmental standards become more stringent, the Company's results of operations, liquidity and financial condition could be materially adversely affected.

The Company maintains a workforce based upon current and anticipated workload. If the Company does not receive future contract awards or if these awards are delayed, significant cost may result that could have a material adverse effect on results of operations, financial condition, liquidity and cash flows.

The Company's estimates of future performance depend on, among other matters, whether and when the Company will receive certain new contract awards, including the extent to which the Company utilizes its workforce. The rate at which the Company utilizes its workforce is impacted by a variety of factors, including:

- the ability to manage attrition;
- the ability to forecast the need for services, which allows the Company to maintain an appropriately sized workforce;
- the ability to transition employees from completed projects to new projects or between segments; and
- the need to devote resources to non-revenue generating activities such as training or business development.

While the Company's estimates are based upon good faith judgment, these estimates can be unreliable and may frequently change based on newly available information. In the case of large-scale domestic and international projects where timing is often uncertain, it is particularly difficult to predict whether and when the Company will receive a contract award. The uncertainty of contract award timing can present difficulties in matching the Company's workforce size with contract needs. If an expected contract award is delayed or not received, the Company could incur cost resulting from reductions in staff or redundancy of facilities or equipment that could have a material adverse effect on results of operations, financial condition, liquidity and cash flows.

Increased information technology security threats and more sophisticated computer crime pose a risk to the Company's systems, networks, products and services.

The Company relies upon information technology systems and networks in connection with a variety of business activities, some of which are managed by third parties. Additionally, the Company collects and stores data that is of a sensitive nature. The secure operation of these information technology systems and networks, and the processing and maintenance of this data is critical to the Company's business operations and strategy. Information technology security threats - from user error to attacks designed to gain unauthorized access to the Company's systems, networks and data - are increasing in frequency and sophistication. These threats pose a risk to the security of the Company's systems and networks and the confidentiality, availability and integrity of the Company's data. Should an attack on the Company's information technology systems and networks succeed, it could expose the Company and the Company's employees, customers, dealers and suppliers to misuse of information or systems, the compromising of confidential information, manipulation and destruction of data, production downtimes and operations disruptions. The occurrence of any of these events could adversely affect the Company's reputation, competitive position, business, results of operations and cash flows. In addition, various privacy and security laws govern the protection of this information and breaches in security could result in litigation, regulatory action, potential liability and the costs and operational consequences of implementing further data protection measures. For example, the EU's GDPR extends the scope of the EU data protection laws to all companies processing data of EU residents, regardless of the company's location.

The Company's intellectual property portfolio may not prevent competitors from independently developing similar or duplicative products and services.

The Company's patents and other intellectual property may not prevent competitors from independently developing or selling similar or duplicative products and services, and there can be no assurance that the resources invested by the Company to protect the Company's intellectual property will be sufficient or that the Company's intellectual property portfolio will adequately deter misappropriation or improper use of the Company's technology. The Company could also face competition in some countries where the Company has not protected its intellectual property portfolio. The Company may also face attempts to gain unauthorized access to the Company's information technology systems or products for the purpose of improperly acquiring trade secrets or confidential business information. The theft or unauthorized use or publication of the Company's trade secrets and other confidential business information as a result of such an incident could adversely affect the Company's competitive position and the value of the Company's investment in research and development. The Company may be unable to secure or retain ownership or rights to use data in certain software analytics or services offerings. In addition, the Company may be the target of aggressive and opportunistic enforcement of patents by third parties, including non-practicing entities. Regardless of the merit of such claims, responding to infringement claims can be expensive and time-consuming. If the Company is found to infringe any third-party rights, the Company could be required to pay substantial damages or could be enjoined from offering some of the Company's products and services. Also, there can be no assurances that the Company will be able to obtain or renew from third parties the licenses needed in the future, and there is no assurance that such licenses can be obtained on reasonable terms.

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Union disputes or other labor matters could adversely affect the Company's operations and financial results.

A significant portion of the Company's employees are represented by labor unions in a number of countries under various collective bargaining agreements with varying durations and expiration dates. There can be no assurance that any current or future issues with the Company's employees will be resolved or that the Company will not encounter future strikes, work stoppages or other types of conflicts with labor unions or the Company's employees. The Company may not be able to satisfactorily renegotiate collective bargaining agreements in the U.S. and other countries when they expire. If the Company fails to renegotiate existing collective bargaining agreements, the Company could encounter strikes or work stoppages or other types of conflicts with labor unions. In addition, existing collective bargaining agreements may not prevent a strike or work stoppage at the Company's facilities in the future. The Company may also be subject to general country strikes or work stoppages unrelated to the Company's business or collective bargaining agreements. A work stoppage or other limitations on production at the Company's facilities for any reason could have an adverse effect on the Company's business, results of operations, financial condition and cash flows. In addition, many of the Company's customers and suppliers have unionized work forces. Strikes or work stoppages experienced by the Company's customers or suppliers could have an adverse effect on the Company's business, results of operations and financial condition.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

Operations of the Company and its subsidiaries are conducted at both owned and leased properties in domestic and international locations. The Company's executive offices are located at 350 Poplar Church Road, Camp Hill, Pennsylvania 17011 and are owned. The following table describes the location and principal use of the Company's more significant properties.

Location	Principal Products \ Services	Interest
Harsco Environmental Segment		
Taiyuan City, China	Environmental Services	Leased
Tangshan, China	Environmental Services	Leased
Rotherham, U.K.	Environmental Services	Owned
Drakesboro, Kentucky, U.S.	Applied Products - Roofing Granules/Abrasives	Owned
Sarver, Pennsylvania, U.S.	Environmental Services	Owned
Chesterfield, U.K.	Aluminum Dross and Scrap Processing Systems	Owned
Harsco Clean Earth Segment		
Middlesex, New Jersey, U.S.	Contaminated Materials Processing	Leased
Hudson, New Jersey, U.S.	Hazardous Waste Processing	Owned/Leased
New Castle, Delaware, U.S.	Contaminated Materials Processing	Leased
Prince Georges, Maryland, U.S.	Contaminated Materials Processing	Owned
Marshall, Kentucky, U.S.	Hazardous Waste Processing	Owned
Wayne, Michigan, U.S.	Hazardous Waste Processing	Owned
Harsco Rail Segment		
Columbia, South Carolina, U.S.	Rail Maintenance-of-way Equipment	Owned

The Harsco Environmental Segment principally operates on customer-owned sites and has administrative offices throughout the world, including Camp Hill, Pennsylvania and Leatherhead, U.K. The above table includes the principal properties owned or leased by the Company. The Company also operates from a number of other smaller plants, warehouses and offices in addition to the above. The Company considers all of its properties at which operations are currently performed to be in satisfactory condition and suitable for their intended use.

Item 3. Legal Proceedings.

Information regarding legal proceedings is included in Note 11, Commitments and Contingencies, in Part II, Item 8, "Financial Statements and Supplementary Data."

Item 4. Mine Safety Disclosures.

Not applicable.

Supplementary Item. Information About Our Executive Officers.

Set forth below, at February 21, 2020, are the executive officers of the Company and certain information with respect to each of them. There are no family relationships among any of the executive officers.

Name	Age	Position with the Company
Executive Officers:		
F. Nicholas Grasberger III	56	Chairman, President and Chief Executive Officer
Peter F. Minan	58	Senior Vice President and Chief Financial Officer
Samuel C. Fenice	45	Vice President and Corporate Controller
Jeswant Gill	57	Senior Vice President and Group President - Harsco Rail
Russell C. Hochman	55	Senior Vice President and General Counsel, Chief Compliance Officer & Corporate Secretary
Tracey L. McKenzie	52	Senior Vice President and Chief Human Resources Officer

F. Nicholas Grasberger III - Chairman, President and Chief Executive Officer since October 22, 2018. President and Chief Executive Officer from August 1, 2014 to October 22, 2018. Mr. Grasberger served as Senior Vice President and Chief Financial Officer from April 2013 to November 2014, and as President and Chief Operating Officer from April 2014 to August 2014. Prior to joining Harsco in 2013, Mr. Grasberger served as the Managing Director of the multinational Precision Polymers division of Fenner Plc from March 2011 to April 2013. From April 2009 to November 2009 he served as Executive Vice President and Chief Executive Officer of Armstrong Building Products. From January 2005 to March 2009 he served as Senior Vice President and Chief Financial Officer of Armstrong World Industries, Inc. Prior to his employment with Armstrong, Mr. Grasberger served as Vice President and Chief Financial Officer of Kennametal Inc. and before that as Corporate Treasurer and Director of the corporate planning process at H.J. Heinz Company. He started his career with USX Corporation. In June 2019, Mr. Grasberger joined the Board of Directors of Louisiana-Pacific Corporation.

Peter F. Minan - Senior Vice President and Chief Financial Officer since November 11, 2014. Mr. Minan has an extensive background in global financial management acquired through a nearly 30-year career with KPMG from 1983 to 2012. He became a partner at KPMG in 1993 and served as global lead partner for several multi-national Fortune 500 industrial and consumer audits. His roles included National Managing Partner, U.S. Audit practice, and Partner in Charge, Washington/Baltimore Audit practice. His most recent role was with Computer Sciences Corporation, where he served as Vice President of Enterprise Risk Management and Internal Audit from 2012 to 2013.

Samuel C. Fenice - Vice President and Corporate Controller since August 16, 2016. Mr. Fenice oversees the administration of all corporate accounting policies and procedures, including internal and external corporate reporting. Mr. Fenice joined Harsco's Internal Audit team in 2002 and has since held progressively responsible roles in Finance, including two terms as Interim Corporate Controller. Mr. Fenice is a graduate of Penn State University and a Certified Public Accountant.

Jeswant Gill - Senior Vice President and Group President - Harsco Rail since November 2016. Prior to joining the Company, Mr. Gill served as Senior Executive/Managing Director, Global Solutions of The Arcadia Group International, LLC from October 2015 to November 2016. From June 2014 to September 2015 Mr. Gill served as Vice President and Executive Vice President, Industrial Segment of Kennametal, Inc. From January 2008 to May 2014 Mr. Gill worked for Ingersoll Rand Company Limited, acting as Vice President of Global Services, Industrial Technologies from January 2011 to May 2014, and as President of Security Technologies, Asia Pacific from January 2008 until December 2010. Prior to his employment with Ingersoll Rand Company Limited, Mr. Gill worked for Invensys, Johnson Controls Inc. and Schlumberger. Mr. Gill holds a B.S. in engineering physics and an MBA, both from Queen's University in Ontario, Canada.

Russell C. Hochman - Senior Vice President and General Counsel, Chief Compliance Officer and Corporate Secretary since May 2015. Served as Vice President, Interim General Counsel, Chief Compliance Officer and Corporate Secretary from March 2015 to May 2015. Served as Deputy General Counsel from July 2013 to March 2015. Prior to joining Harsco in 2013, Mr. Hochman served in senior legal roles with Pitney Bowes Inc. and leading law firms based in New York. Mr. Hochman holds a J.D. from Albany Law School of Union University and a B.A. from Cornell University.

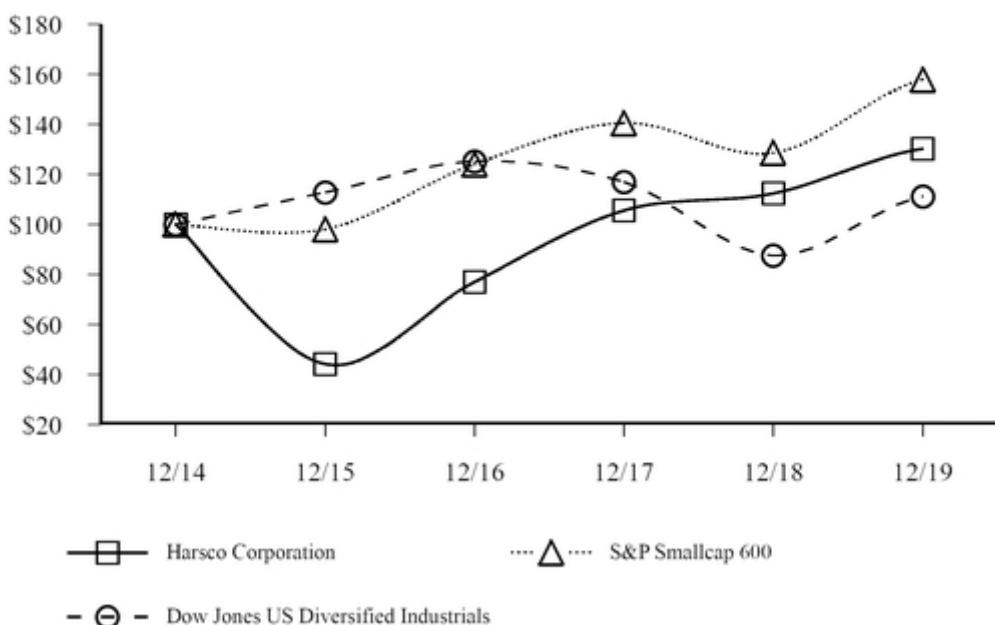
Tracey L. McKenzie - Senior Vice President and Chief Human Resources Officer since September 2014. Prior to joining the Company, Ms. McKenzie served as Global HR Vice President for JLG Industries, a leader in the manufacturing sector for advanced aerial lift systems. Ms. McKenzie previously held executive level HR positions in her native Australia and worked at Pacific Scientific Aerospace (a division of Danaher). She moved to the U.S. in 2003 and holds an MBA from the University of New England and a bachelor's in business administration from Royal Melbourne Institute of Technology (RMIT).

PART II**Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.**

Harsco Corporation common stock is listed on the New York Stock Exchange under the trading symbol HSC. At December 31, 2019, there were 78,514,758 shares outstanding. In 2019, the Company's common stock traded in a range of \$16.33 to \$27.97 and closed at \$23.07 at year-end. At December 31, 2019, there were approximately 27,742 stockholders. For additional information regarding the Company's equity compensation plans see Note 13, Stock-Based Compensation, in Part II, Item 8, "Financial Statements and Supplementary Data," Part III, Item 11, "Executive Compensation," and Part III, Item 12 "Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters."

Stock Performance Graph

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*
Among Harsco Corporation, the S&P Smallcap 600 Index and the Dow
Jones US Diversified Industrials Index



*\$100 invested on 12/31/14 in stock or index, including reinvestment of dividends.
Fiscal year ending December 31.

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	December 2014	December 2015	December 2016	December 2017	December 2018	December 2019
Harsco Corporation	100.00	44.23	76.96	105.54	112.39	130.21
S&P Smallcap 600	100.00	98.03	124.06	140.48	128.56	157.85
Dow Jones US Diversified Industrials	100.00	112.84	125.21	116.95	87.62	111.19

Issuer Purchases of Equity Securities

On May 2, 2018, the Company announced that the Board of Directors adopted a share repurchase program authorizing the Company to repurchase up to \$75,000,000 of outstanding shares of the Company's common stock through April 24, 2021. Below is a table showing the share repurchase activity during the fourth quarter of 2019:

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number (or Approximate Dollar Value) of Shares that May Yet Be Purchased Under the Plans or Programs
October 1, 2019 - October 31, 2019	349,270	\$ 17.42	349,270	\$ 13,151,485

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Item 6. Selected Financial Data.

Five-Year Statistical Summary

(In thousands, except per share, employee information and percentages)	2019 (b) (c)	2018 (c)	2017	2016	2015
Statement of operations information					
Revenues from continuing operations (a)	\$ 1,503,742	\$ 1,347,672	\$ 1,307,470	\$ 1,203,681	\$ 1,365,836
Amounts attributable to Harsco Corporation common stockholders (a)					
Income (loss) from continuing operations, net of tax (d)	\$ 28,231	\$ 100,578	\$ (6,810)	\$ (102,550)	\$ (33,824)
Income from discontinued operations (d)	475,688	36,479	14,632	16,883	40,012
Net income (loss) attributable to Harsco Corporation	503,919	137,057	7,822	(85,667)	6,188
Financial position and cash flow information					
Working capital (e)	\$ 187,918	\$ 188,038	\$ 117,964	\$ 122,602	\$ 120,267
Total assets (f) (g)	2,367,467	1,632,867	1,578,685	1,581,338	2,051,887
Long-term debt (g)	775,498	585,662	566,794	629,239	845,621
Total debt (g)	781,811	602,229	586,623	659,072	900,934
Depreciation and amortization (h)	138,395	132,785	129,937	141,486	156,475
Capital expenditures (h)	(184,973)	(132,168)	(98,314)	(69,340)	(123,552)
Cash provided (used) by operating activities (h)(i)	(163)	192,022	176,892	159,876	121,772
Cash provided (used) by investing activities (h)	(132,192)	(161,143)	(103,325)	122,887	(130,373)
Cash provided (used) by financing activities (h)(i)	125,734	(25,538)	(83,715)	(292,364)	22,189
Ratios					
Return on average equity (j)	100.2%	50.7%	4.1%	(29.5)%	2.3%
Current ratio (f) (k)	1.4:1	1.5:1	1.2:1	1.3:1	1.2:1
Per share information attributable to Harsco Corporation common stockholders (d)					
Basic—Income (loss) from continuing operations	\$ 0.35	\$ 1.25	\$ (0.08)	\$ (1.28)	\$ (0.42)
Income (loss) from discontinued operations	5.97	0.45	0.18	0.21	0.50
Net income (loss)	\$ 6.33 (m)	\$ 1.70	\$ 0.10	\$ (1.07)	\$ 0.08
Diluted—Income (loss) from continuing operations	\$ 0.35	\$ 1.20	\$ (0.08)	\$ (1.28)	\$ 0.42
Income (loss) from discontinued operations	5.85	0.44	0.18	0.21	0.50
Net income (loss)	\$ 6.19 (m)	\$ 1.64	\$ 0.10	\$ (1.07)	\$ 0.08
Other information					
Book value per share (l)	\$ 10.06	\$ 3.94	\$ 2.67	\$ 1.72	\$ 3.88
Cash dividends declared per share	—	—	—	—	0.666
Diluted weighted-average number of shares outstanding	81,375	83,595	80,553	80,333	80,234
Number of employees	10,500	9,900	9,400	9,400	10,800

- (a) On January 1, 2018, the Company adopted the new revenue recognition standard utilizing the modified retrospective transition method, including the use of practical expedients. Prior period comparative information has not been restated and continues to be reported under accounting principles generally accepted in the U.S. in effect for those periods.
- (b) Includes the effects of the acquisition of CEHI Acquisition Corporation and subsidiaries. See Note 3, Acquisitions and Dispositions, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.
- (c) Includes the effects of the acquisition of Altek Europe Holdings Limited and its affiliated entities. See Note 3, Acquisitions and Dispositions, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.
- (d) During 2019, the Company announced the sale of the businesses that comprised its former Industrial Segment. As a result, the operating results of the Harsco Industrial Segment, costs directly related to the disposals, an allocation of interest expense associated with mandatory debt repayments required as a result of the disposals and the write-off of deferred financing costs resulting from the mandatory repayment have been reflected in the Consolidated Statements of Operations as discontinued operations for all periods presented. See Note 3, Acquisitions and Dispositions, for additional information.
- (e) On January 1, 2017, the Company adopted changes issued by the Financial Accounting Standards Board ("FASB") related to the reclassification of current deferred tax assets and liabilities to non-current. As a result of these changes, the Company reclassified its net current deferred tax assets and liabilities to non-current, which reduced Net working capital by \$27.1 million and \$38.1 million at December 31, 2016 and 2015, respectively.
- (f) On January 1, 2019, the Company adopted changes issued by the FASB related to the accounting for leases which introduced a lessee model that brought most leases onto the balance sheet. The Company elected to apply the transition requirements at the January 1, 2019 effective date and therefore, comparative information has not been restated and continues to be reported under U.S. GAAP in effect for those periods. See Note 2, Recently Adopted and Recently Issued Accounting Standards, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.
- (g) On January 1, 2016, the Company adopted changes issued by the FASB related to simplifying the presentation of debt issuance costs. The changes required that debt issuance costs related to a recognized debt liability be presented in the balance sheet as a direct reduction from the carrying amount of that debt liability. The Company reclassified debt issuance costs in the amount of \$10.1 million at December 31, 2015.
- (h) Includes the Harsco Industrial Segment.
- (i) On January 1, 2017, the Company adopted changes issued by the FASB to the accounting for stock-based compensation. The Company reclassified employee taxes paid on stock compensation in the amount of \$0.1 million and \$0.3 million for the year ended December 31, 2016 and 2015, respectively, from Cash

provided by operating activities to Cash provided (used) by financing activities on its Consolidated Statement of Cash Flows.

- (j) Return on average equity is calculated by dividing net income attributable to Harsco Corporation by average Harsco Corporation stockholders' equity throughout the year. The 2019 calculation includes the after-tax gains on the sale of AXC and PK of \$453.6 million.
- (k) Current ratio is calculated by dividing total current assets by total current liabilities.
- (l) Book value per share is calculated by dividing total equity by shares outstanding.
- (m) Does not total due to rounding.

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

The following discussion should be read in conjunction with the Consolidated Financial Statements of Harsco Corporation ("we" or the "Company") provided under Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K.

Amounts included in this Item 7 of this Annual Report on Form 10-K are rounded in millions and all percentages are calculated based on actual amounts. As a result, minor differences may exist due to rounding.

Forward-Looking Statements

The nature of the Company's business, together with the number of countries in which it operates, subject it to changing economic, competitive, regulatory and technological conditions, risks and uncertainties. In accordance with the "safe harbor" provisions of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, the Company provides the following cautionary remarks regarding important factors that, among others, could cause future results to differ materially from the results contemplated by forward-looking statements, including the expectations and assumptions expressed or implied herein. Forward-looking statements contained herein could include, among other things, statements about management's confidence in and strategies for performance; expectations for new and existing products, technologies and opportunities; and expectations regarding growth, sales, cash flows, and earnings. Forward-looking statements can be identified by the use of such terms as "may," "could," "expect," "anticipate," "intend," "believe," "likely," "estimate," "outlook," "plan" or other comparable terms.

Factors that could cause actual results to differ, perhaps materially, from those implied by forward-looking statements include, but are not limited to: (1) changes in the worldwide business environment in which the Company operates, including general economic conditions; (2) changes in currency exchange rates, interest rates, commodity and fuel costs and capital costs; (3) changes in the performance of equity and bond markets that could affect, among other things, the valuation of the assets in the Company's pension plans and the accounting for pension assets, liabilities and expenses; (4) changes in governmental laws and regulations, including environmental, occupational health and safety, tax and import tariff standards and amounts; (5) market and competitive changes, including pricing pressures, market demand and acceptance for new products, services and technologies; (6) the Company's inability or failure to protect its intellectual property rights from infringement in one or more of the many countries in which the Company operates; (7) failure to effectively prevent, detect or recover from breaches in the Company's cybersecurity infrastructure; (8) unforeseen business disruptions in one or more of the many countries in which the Company operates due to political instability, civil disobedience, armed hostilities, public health issues or other calamities; (9) disruptions associated with labor disputes and increased operating costs associated with union organization; (10) the seasonal nature of the Company's business; (11) the Company's ability to successfully enter into new contracts and complete new acquisitions or strategic ventures in the time-frame contemplated, or at all; (12) the integration of the Company's strategic acquisitions; (13) potential severe volatility in the capital markets; (14) failure to retain key management and employees; (15) the amount and timing of repurchases of the Company's common stock, if any; (16) the outcome of any disputes with customers, contractors and subcontractors; (17) the financial condition of the Company's customers, including the ability of customers (especially those that may be highly leveraged and those with inadequate liquidity) to maintain their credit availability; (18) implementation of environmental remediation matters; (19) risk and uncertainty associated with intangible assets; and (20) other risk factors listed from time to time in the Company's SEC reports. A further discussion of these, along with other potential risk factors, can be found in Part I, Item 1A, "Risk Factors," of this Annual Report on Form 10-K. The Company cautions that these factors may not be exhaustive and that many of these factors are beyond the Company's ability to control or predict. Accordingly, forward-looking statements should not be relied upon as a prediction of actual results. The Company undertakes no duty to update forward-looking statements except as may be required by law.

Executive Overview

The Company is a market-leading, global provider of environmental solutions for industrial and specialty waste streams, and innovative equipment and technology for the rail sector. The Company's operations consist of three reportable segments: Harsco Environmental, Harsco Clean Earth and Harsco Rail and we are working towards transforming Harsco into a single-thesis environmental solutions company that is a global leader in the markets we serve. The Harsco Environmental Segment operates primarily under long-term contracts, providing critical environmental services and material processing to the global steel and metals industries including zero waste solutions for manufacturing byproducts within the metals industry. The Harsco Clean Earth Segment provides specialty waste processing and beneficial reuse solutions for hazardous wastes, contaminated materials and dredged volumes. The Harsco Rail Segment is a provider of highly engineered maintenance equipment, after-market parts and safety and diagnostic systems which support railroad and transit customers worldwide. The Company has locations in approximately 30 countries, including the U.S. The Company was incorporated in 1956.

In June 2019, the Company completed the previously announced acquisition of Clean Earth from Compass Diversified Holdings for approximately \$628 million in cash. Clean Earth operates 27 permitted facilities in the U.S. and maintains a portfolio of more than 200 permits with a 100% permit renewal success rate to date. In addition, Clean Earth owns 9 Resource Conservation and Recovery Act (RCRA) Part B Permits which include 6 Treatment, Storage and Disposal Facility (TSDF) permits that enable the Company to process complex and highly recurring hazardous waste streams. The results of Clean Earth will be reflected in the Harsco Clean Earth Segment, which is a new reportable segment of the Company.

Also, in June 2019, the Company completed a private placement of \$500 million principal amount of senior unsecured notes (the "Notes"). The Notes are due July 31, 2027 and bear interest, which is payable on January 31 and July 31 of each year, at a fixed rate of 5.75%. The bonds were issued at par and the proceeds were used, together with borrowings under the Company's Revolving Credit Facility, to fund the acquisition of Clean Earth. The Company also amended the existing Senior Secured Credit Facilities to increase the borrowing capacity of the Revolving Credit Facility by \$200 million to a total of \$700 million, extend the maturity date of the Revolving Credit Facility until June 2024 and increase the net debt to consolidated adjusted earnings before interest, tax, depreciation and amortization ("EBITDA") ratio covenant from 3.5 to 4.5, which decreases to 4.0 for the second quarter of 2020 and periods thereafter. Refer to Liquidity and Capital Resources for additional information pertaining to the Notes and amendment of the Senior Secured Credit Facilities.

In May 2019, the Company announced its intent to divest the businesses that comprised the Harsco Industrial Segment: Harsco Industrial Air-X-Changers ("AXC"), Harsco Industrial IKG ("IKG") and Harsco Industrial Patterson-Kelley ("PK"). These disposals represent a strategic shift and accelerate the transformation of the Company's portfolio of businesses into a leading provider of environmental solutions and services. As a result of these disposals (i) the carrying value of the remaining assets and liabilities of the Harsco Industrial Segment have been classified as Assets held-for-sale and Liabilities of assets held-for-sale on the Consolidated Balance Sheets; (ii) the operating results of the Harsco Industrial Segment, costs directly related to the disposals and an allocation of interest expense associated with mandatory debt repayments required as a result of the disposals have been reflected in the Consolidated Statements of Operations as discontinued operations for all periods presented; and (iii) all disclosures have been updated to reflect these changes. In July 2019, the Company sold AXC for \$600 million in cash and recognized a gain on sale of \$527.9 million pre-tax (or approximately \$421 million after-tax). In November 2019, the Company sold PK for approximately \$60 million in cash and recognized a gain on sale of \$41.2 million pre-tax (or approximately \$33 million after-tax). These gains have been recorded in the Consolidated Statements of Operations as discontinued operations for the year ended December 31, 2019. In January 2020, the Company sold IKG for \$85 million in cash and notes.

Utilizing a portion of the proceeds from the AXC transaction, the Company made a required prepayment and further reduced amounts outstanding under the Term Loan Facility in the amount of \$320.9 million. The remainder of the proceeds from the sale were used to pay down the Company's Revolving Credit Facility. As a result of this prepayment, the Company recorded a charge of \$5.3 million, related to the write-off of previously recorded deferred financing costs associated with the Term Loan Facility, in the Company's Condensed Consolidated Statements of Operations as discontinued operations for the year ended December 31, 2019.

Highlights for 2019 include (refer to the discussion of segment and consolidated results included within Results of Operations below, as well as Liquidity and Capital Resources, for additional information pertaining to the key drivers impacting these highlights):

- Revenues for the year ended December 31, 2019 increased approximately 12% compared with the year ended December 31, 2018. The primary drivers for this increase were the acquisition of Clean Earth; strong maintenance-of-way equipment sales in the Harsco Rail Segment; and new contract starts and the Altek acquisition in the Harsco Environmental Segment; partially offset by the impact of foreign currency translation.
- Operating income from continuing operations for the year ended December 31, 2019 decreased approximately 20% compared with the year ended December 31, 2018. The primary drivers for this decrease were approximately \$25 million of strategic costs primarily related to the acquisition of Clean Earth and the recently announced acquisition of Stericycle's Environmental Solutions Business ("ESOL"); lower operating results in the Harsco Rail Segment due to operational challenges and higher manufacturing costs resulting from the consolidation of North American manufacturing operations into a single facility; lower operating results in the Harsco Environmental Segment resulting from lower services demand and weak customer production levels, a \$6.2 million provision for doubtful accounts related to a customer in the U.K. entering administration during the second quarter of 2019, site exits and the impact of foreign currency translation. These decreases were partially offset by the inclusion of Clean Earth operating results for the second half of 2019.
- Diluted earnings per common share from continuing operations attributable to Harsco Corporation for the year ended December 31, 2019 were \$0.35, a decrease of approximately 71% compared with the year ended December 31, 2018. In addition to the factors noted above for revenue and operating income from continuing operations, the primary drivers of these decreases were finance related costs associated with the Clean Earth acquisition and Term Loan Facility amendment, increased interest expense and increased defined benefit pension expense.
- Cash flows used by operating activities for the year ended December 31, 2019 were \$0.2 million, a decrease of \$192.2 million compared with cash flows provided by operating activities the year ended December 31, 2018. The primary drivers for this decrease were lower net income (excluding the impacts of the AXC and PK sales), including approximately \$29 million of strategic costs principally associated with the Clean Earth acquisition and sale of the Industrial businesses, a \$103 million income tax payment related to the gain on the sale of AXC (the proceeds of the sale are reflected in cash flows from investing activities) as well as unfavorable changes in working capital.

Looking forward, the Company maintains a positive outlook across all businesses. The Company's view for 2020 and beyond is supported by the below factors, which should be considered in the context of other risks, trends and strategies:

- The Harsco Environmental Segment experienced lower services demand and customer steel output during 2019, primarily in North America and Europe, resulting from supply-chain rebalancing and lower customer profitability. A number of internal actions are underway to support near-term financial performance. While this current weakness is expected to persist, Harsco Environmental expects modest improvements in operating results during 2020, primarily during the second-half of the year, driven by the positive affect of growth investments and contracts as well as improved services demand, partially offset by the impact of lost contracts.
- As previously noted, a U.K.-based customer in the Harsco Environmental Segment entered administration, resulting in the Company recording a \$6.2 million provision for doubtful accounts, related to pre-administration receivables, primarily during the second quarter of 2019. The Company continues to provide services to the customer and continues to collect on post-administration invoices timely while the customer seeks a buyer for its operations. Depending on the outcome of any potential transactions, there could be an impact on the Company's results of operations, cash flows and asset valuations in the future, which may be material in any one period.
- The Harsco Clean Earth Segment has performed well since the acquisition. Operating results for 2020, exclusive of corporate allocations of administrative expenses, are expected to improve due to permit modifications and increased volumes for all lines of business. These improved operating results will be partially offset by a less favorable business mix during 2020.
- The Harsco Rail Segment experienced commercial shipment delays and operating challenges related to consolidation of North American manufacturing operations during the latter part of 2019. A portion of the delayed shipments will be recognized during 2020 and actions are being taken to improve efficiency and increase productivity of the manufacturing operations. Overall, the Harsco Rail Segment expects improved operating results during 2020 resulting from strong maintenance-of-way equipment sales as well as growth in technology-safety products and contracting sales, partially offset by higher selling, general and administrative costs as well as increased research and development spending which are necessary to support anticipated volume increases. Backlog for the Harsco Rail Segment remains at record levels and the long-term outlook for this business remains strong.
- Interest expense for 2020 is expected to increase due to higher average debt balances during 2020 and the impact of a higher weighted average interest rate resulting from the issuance of the Notes in 2019.

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- Net periodic pension cost ("NPPC") will decrease by approximately \$13 million during 2020, which will primarily be reflected in the caption Defined benefit pension (income) expense on the consolidated statement of operations. The decrease is primarily the result of higher plan asset values at December 31, 2019.

Results of Operations

Revenues by Segment

(Dollars in millions)	2019	2018	Change	%
Harsco Environmental	\$ 1,034.8	\$ 1,068.3	\$ (33.5)	(3.1)%
Harsco Clean Earth	169.5	—	169.5	—
Harsco Rail	299.4	279.3	20.1	7.2
Corporate	—	0.1	(0.1)	(100.0)
Total Revenues	\$ 1,503.7	\$ 1,347.7	\$ 156.1	11.6 %

Revenues by Region

(Dollars in millions)	2019	2018	Change	%
North America	\$ 685.6	\$ 507.5	\$ 178.1	35.1
Western Europe	431.2	438.9	(7.7)	(1.8)
Latin America (a)	148.6	155.9	(7.2)	(4.6)
Asia-Pacific	159.4	167.9	(8.4)	(5.0)
Middle East and Africa	60.4	50.0	10.4	20.8
Eastern Europe	18.5	27.6	(9.1)	(32.9)
Total Revenues	\$ 1,503.7	\$ 1,347.7	\$ 156.1	11.6 %

(a) Includes Mexico.

Operating Income (Loss) and Operating Margins by Segment

(Dollars in millions)	2019	2018	Change	%
Harsco Environmental	\$ 112.3	\$ 121.2	\$ (8.9)	(7.3)%
Harsco Clean Earth	20.0	—	20.0	—
Harsco Rail	23.7	37.3	(13.6)	(36.5)
Corporate	(51.7)	(27.8)	(23.9)	(85.8)
Total Operating Income	\$ 104.3	\$ 130.7	\$ (26.4)	(20.2)%

	2019	2018
Harsco Environmental	10.9%	11.3%
Harsco Clean Earth	11.8	—
Harsco Rail	7.9	13.4
Consolidated Operating Margin	6.9%	9.7%

Harsco Environmental Segment:

Significant Effects on Revenues (In millions)

Revenues—2018	\$ 1,068.3
Foreign currency translation.	(37.6)
Net impact of new contracts and lost contracts.	(10.0)
Effect of Altek acquisition.	7.4
Net effects of price/volume changes, primarily attributable to volume changes.	6.4
Other.	0.3
Revenues—2019	\$ 1,034.8

Factors Positively Affecting Operating Income:

- New contract starts increased operating income during 2019 compared with prior year.
- Lower selling, general and administrative expenses improved operating income by \$3.0 million during 2019 when compared with prior year.
- Operating results for 2019 were positively affected by contingent consideration adjustments related to the Altek acquisition of \$8.5 million. The fair value adjustment resulted from the decreased probability of Altek achieving cumulative financial and non-financial performance goals within the required time frame. The Company currently expects that the future cash flows of the Altek business will be sufficient to recover the net book value of its long-lived assets. An impairment charge may be required in future periods should the performance of this business not meet current expectations.
- Operating results for 2019 were positively affected by a \$2.3 million gain during the first quarter of 2019 related to the recognition of a foreign currency cumulative translation adjustment resulting from the substantial liquidation of a subsidiary.
- One-time costs associated with the Altek acquisition of approximately \$1 million during 2018 which did not repeat during 2019.

Factors Negatively Impacting Operating Income:

- The Company recorded a provision for doubtful accounts of \$6.2 million related to a customer in the U.K. that entered administration during the second quarter of 2019 which represents a full write-off of pre-administration receivables.
- Overall steel production by customers under services contracts for 2019 decreased by 2% compared with prior year.
- Operating results for 2019 were negatively impacted by decreased stainless steel and ferrous scrap prices as well as the impact of contract exits.
- Operating results for 2019 were also negatively impacted by costs associated with the continued integration and scaling of the Altek business acquired during 2018 including amortization expenses associated with intangible assets recognized as part of the acquisition.
- Foreign currency translation decreased operating income by \$3.9 million during 2019 compared with prior year.
- Operating results for 2018 were positively affected by a \$3.2 million adjustment to previously accrued amounts related to the disposal of certain slag material in Latin America due to obtaining the necessary permits.

Harsco Clean Earth Segment:

The Company acquired Clean Earth on June 28, 2019 and the operating results are reflected in the Harsco Clean Earth Segment, which is a new reportable segment of the Company. Revenues and operating income for the six months ended December 31, 2019 were \$169.5 million and \$20.0 million, respectively.

Harsco Rail Segment:**Significant Effects on Revenues (In millions)**

Revenues—2018	\$ 279.3
Net effects of price/volume changes, primarily attributable to volume changes.	23.4
Foreign currency translation.	(3.3)
Revenues—2019	<u><u>\$ 299.4</u></u>

Factors Positively Affecting Operating Income:

- Improved demand for machine sales improved operating income during 2019 compared with prior year.
- Results for 2018 included an additional forward contract loss provision related to the Company's first of two contracts with the federal railway system of Switzerland of \$1.8 million, for which costs to complete exceeded original estimated costs.

Factors Negatively Impacting Operating Income:

- Lower after-market parts, Protran safety equipment and contract service volumes decreased operating income during 2019 compared with prior year.
- Operating income was negatively impacted by one-time costs associated with the initiative to improve manufacturing efficiency, including the consolidation of U.S. manufacturing and distribution into a single facility. These costs decreased operating income by \$4.8 million during 2019 compared with prior year. Additionally, operational challenges and higher manufacturing costs resulting from this initiative negatively impacted operating income during 2019 compared with prior year.
- Increased selling, general and administrative costs and research and development costs of \$3.8 million during 2019 to support and execute the Company's growth strategy compared with prior year.

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Consolidated Results

(In millions, except per share information and percentages)	2019	2018	2017
Total revenues	\$ 1,503.7	\$ 1,347.7	\$ 1,307.5
Cost of services and products sold	1,144.3	1,012.5	997.8
Selling, general and administrative expenses	253.0	202.7	194.9
Research and development expenses	4.8	3.9	2.7
Other (income) expenses, net	(2.6)	(2.2)	7.3
Operating income from continuing operations	104.3	130.7	104.7
Interest income	2.0	2.2	2.5
Interest expense	(36.6)	(21.5)	(26.9)
Unused debt commitment and amendment fees	(7.7)	(1.1)	(2.3)
Defined benefit pension income (expense)	(5.5)	3.5	(2.6)
Income tax expense from continuing operations	(20.2)	(5.5)	(78.2)
Equity in income of unconsolidated entities, net	0.3	0.4	—
Income (loss) from continuing operations	36.5	108.5	(2.8)
Gain on sale of discontinued businesses	569.1	—	—
Income from discontinued businesses	27.5	43.9	20.4
Income tax expense from discontinued businesses	(121.0)	(7.5)	(5.7)
Income from discontinued operations, net of tax	475.7	36.5	14.6
Net income	512.2	145.0	11.8
Total other comprehensive income (loss)	(0.1)	(21.5)	63.2
Total comprehensive income (loss)	512.2	123.5	75.0
Diluted income (loss) per common share from continuing operations attributable to Harsco Corporation common stockholders	0.35	1.20	(0.08)
Effective income tax rate from continuing operations	35.8%	4.8%	103.7%

Comparative Analysis of Consolidated Results

Total Revenues

Revenues for 2019 increased \$156.1 million or 12% from 2018. Revenues for 2018 increased \$40.2 million or 3% from 2017. These increases were attributable to the following significant items:

Changes in Revenues (In millions)	2019 vs. 2018	2018 vs. 2017
Effect of the Clean Earth acquisition.	\$ 169.5	\$ —
Net effect of price/volume changes, primarily attributable to volume changes in the Harsco Rail Segment.	23.4	(15.7)
Effect of Altek acquisition in the Harsco Environmental Segment.	7.4	11.8
Net effect of price/volume changes in the Harsco Environmental Segment, primarily attributable to volume changes.	6.4	48.6
Foreign currency translation.	(40.9)	(3.1)
Net impact of new contracts and lost contracts (including exited underperforming contracts) in the Harsco Environmental Segment.	(10.0)	(2.3)
Other.	0.3	0.9
Total change in revenues	\$ 156.1	\$ 40.2

Cost of Services and Products Sold

Cost of services and products sold for 2019 increased \$131.8 million or 13% from 2018. Cost of services and products sold for 2018 increased \$14.7 million or 1% from 2017. These increases were attributable to the following significant items:

Change in Cost of Services and Products Sold (In millions)	2019 vs. 2018	2018 vs. 2017
Impact of Clean Earth acquisition.	\$ 124.2	\$ —
Increased costs due to changes in revenues; and product and service mix (exclusive of foreign currency translation and fluctuations in commodity costs included in selling prices).	47.2	14.4
Foreign currency translation.	(35.1)	(1.3)
Other.	(4.5)	1.6

Total change in cost of services and products sold

\$ 131.8 \$ 14.7

Selling, General and Administrative Expenses

Selling, general and administrative expenses for 2019 increased \$50.3 million or 25% from 2018. This increase was primarily related to approximately \$25 million of strategic costs primarily related to the acquisition of Clean Earth and recently announced acquisition of ESOL, the provision for doubtful accounts related to the Harsco Environmental Segment customer in the U.K. entering administration and the inclusion of selling, general and administrative expenses associated with the Altek acquisition which occurred in May 2018 and the Clean Earth acquisition which occurred in June 2019.

Selling, general and administrative expenses for 2018 increased \$7.8 million or 4% from 2017. This increase was primarily related to the Altek acquisition and increased compensation expense; partially offset by a decrease in bad debt expense in the Harsco Environmental Segment.

Other (Income) Expenses, Net

The major components of this Statement of operations caption are detailed below. See Note 17, Other (Income) Expenses, Net, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

(In thousands)	Other Expenses		
	2019	2018	2017
Contingent consideration adjustments	\$ (7,681)	\$ (2,939)	\$ —
Net gains	(6,303)	(3,868)	(1,354)
Employee termination benefits costs	6,619	4,763	6,733
Other costs to exit activities	4,208	170	1,262
Impaired asset write-downs	773	104	874
Other income	(237)	(431)	(188)
Total other (income) expenses, net	<u>\$ (2,621)</u>	<u>\$ (2,201)</u>	<u>\$ 7,327</u>

Interest Expense

Interest expense in 2019 was \$36.6 million, an increase of \$15.1 million or 70% compared with 2018. The increase primarily relates to higher outstanding borrowings and weighted average interest rates. The higher outstanding borrowings are a result of cash paid for the Clean Earth acquisition, net of the after-tax AXC sale proceeds, higher capital expenditures and share repurchases. The higher interest rates are a result of the June 2019 issuance of the Notes.

Interest expense in 2018 was \$21.5 million, a decrease of \$5.3 million or 20% compared with 2017. The decrease primarily relates to reduced interest rates for the Senior Secured Credit Facilities, which was amended in December 2017 and June 2018.

See Note 7, Debt and Credit Agreements, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Unused Debt Commitment and Amendment Fees

During 2019, the Company recognized \$6.7 million of expenses for fees and other costs related to the unused bridge financing commitment that the Company arranged in the event that the Notes were not issued prior to the acquisition of Clean Earth. Additionally, the Company recognized \$1.0 million of expenses related to the amendment of the Term Loan Facility.

In June 2018, the Company amended the Senior Secured Credit Facilities in order to, among other things, reduce the interest rate applicable to the Company's Term Loan Facility and to increase the limit of the Company's Revolving Credit Facility. As a result, charges of \$1.1 million were recorded during 2018 consisting principally of fees associated with the transaction and the write-off of unamortized deferred financing costs.

See Note 7, Debt and Credit Agreements, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Defined Benefit Pension Income (Expense)

Defined benefit pension expense in 2019 was \$5.5 million compared to defined benefit pension income of \$3.5 million in 2018. This change is primarily the result of lower plan asset values at December 31, 2018.

Defined benefit pension income in 2018 was \$3.5 million compared to defined benefit pension expense of \$2.6 million in 2017. This change is primarily the result of higher plan asset values at December 31, 2017.

Income Tax Expense from Continuing Operations

Income tax expense from continuing operations in 2019 was \$20.2 million, an increase of \$14.7 million compared with 2018. The effective income tax rate relating to continued operations for 2019 was 35.8% versus 4.8% for 2018. The increase in income tax expense and the effective income tax rate related to continuing operations was primarily due to a \$11.7 million tax benefit as a result of the Tax Act and an \$8.3 million tax benefit as a result of the Altek acquisition in 2018 not recurring in 2019, a change in the mix of international income and withholding taxes on remitted earnings, partially offset by decreased income from U.S. continuing operations.

Income tax expense from continuing operations in 2018 was \$5.5 million, a decrease of \$72.7 million compared with 2017. The effective income tax rate relating to continued operations for 2018 was 4.8% versus 103.7% for 2017. The decrease in income tax expense and the effective income tax rate related to continuing operations was primarily due to the impact of the Tax Act. The Company recognized a provisional \$49.8 million income tax charge as a result of revaluing the U.S. ending net deferred tax assets and liabilities for the year ended December 31, 2017 and made a favorable adjustment of a \$11.7 million to the provisional amount during the fourth quarter 2018. Additionally, as a result of the Altek acquisition, an \$8.3 million income tax benefit arising from the adjustment to certain existing deferred tax asset valuation allowances was realized.

See Note 10, Income Taxes, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Gain on Sale of Discontinued Businesses

In July 2019, the Company completed the previously announced sale of AXC for \$600 million in cash and recognized a gain on sale of \$527.9 million pre-tax (approximately \$421 million after tax). In November 2019, the Company completed the previously announced sale of PK for \$60 million cash and recognized a gain on sale of \$41.2 million pre-tax (or approximately \$33 million after-tax). These transactions have been recorded in the Consolidated Statements of Operations as discontinued operations for the year ended December 31, 2019.

Income from Discontinued Businesses

The operating results of the former Harsco Industrial Segment, costs directly related to these disposals, an allocation of interest expense associated with mandatory debt repayments required as a result of the disposals and the write-off of deferred financing costs resulting from the mandatory repayment have been reflected as discontinued operations in the Consolidated Statement of Operations for all periods presented. See Note 3, Acquisitions and Dispositions, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Liquidity and Capital Resources

Cash Flow Summary

The Company has sufficient financial liquidity and borrowing capacity to support the strategies within each of its businesses. The Company currently expects operational and business needs to be met by cash provided by operations supplemented with borrowings from time to time due to historical patterns of seasonal cash flow and for the funding of various projects. The Company regularly assesses capital needs in the context of operational trends and strategic initiatives.

The Company's cash flows from operating, investing and financing activities, as reflected on the Consolidated Statements of Cash Flows, are summarized in the following table:

(In millions)	2019	2018	2017
Net cash provided (used) by:			
Operating activities	\$ (0.2)	\$ 192.0	\$ 176.9
Investing activities	(132.2)	(161.1)	(103.3)
Financing activities	125.7	(25.5)	(83.7)
Impact of exchange rate changes on cash	(0.8)	(4.4)	4.5
Net change in cash and cash equivalents	\$ (7.4)	\$ 0.9	\$ (5.7)

Cash provided (used) by operating activities — Net cash used by operating activities in 2019 was \$0.2 million, a decrease of \$192.2 million from 2018. The primary drivers for this decrease were a \$103 million tax payment related to the gain on the sale of AXC, the proceeds for which are reflected in investing activities, approximately \$29 million of transaction related costs principally associated with the Clean Earth acquisition and sale of the Harsco Industrial Segment businesses and increases in working capital principally due to higher inventory balances in the Harsco Rail Segment.

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Also included in the Cash flows from operating activities section of the Consolidated Statements of Cash Flows is the caption, Other assets and liabilities. A summary of the major components of this caption for the periods presented is as follows:

(In millions)	2019	2018	2017
Net cash provided (used) by:			
Change in income taxes	\$ 5.3	\$ (15.3)	\$ 0.9
Change in prepaid expenses	(13.0)	2.1	(3.7)
Change in contingent consideration liabilities	(8.2)	(2.9)	—
Other (a)	(8.7)	(17.4)	6.2
Total change in other assets and liabilities	\$ (24.6)	\$ (33.5)	\$ 3.4

(a) Other relates primarily to other accruals that are individually not significant.

Cash used by investing activities — Net cash used by investing activities in 2019 was \$132.2 million, a decrease of \$29.0 million from 2018. The decrease was primarily due to proceeds from the sale of AXC and PK; partially offset by the purchase of Clean Earth and an increase in purchases of property, plant and equipment.

Cash provided (used) by financing activities — Net cash provided by financing activities in 2019 was \$125.7 million, an increase of \$151.3 million from 2018. The change was primarily due to net cash borrowings of \$181.3 million in 2019 compared with net cash borrowings of \$13.8 million in 2018, partially offset by payment of deferred financing costs and employee taxes paid on stock-based compensation. The increase in net cash borrowings was primarily related to proceeds from the Notes offering, which were used to acquire Clean Earth and pay related transaction costs, and borrowings for additional capital expenditures; partially offset by the repayment of debt using proceeds from the sale of AXC and PK.

Cash Requirements

The following summarizes the Company's expected future payments related to contractual obligations and commercial commitments at December 31, 2019:

Contractual Obligations and Commercial Commitments at December 31, 2019 (b)

(In millions)	Total	Payments Due by Period			
		Less than 1 year	1-3 years	3-5 years	After 5 years
Short-term borrowings	\$ 3.6	\$ 3.6	\$ —	\$ —	\$ —
Long-term debt (including current maturities and finance leases)	795.0	2.7	4.1	288.2	500.0
Projected interest payments on long-term debt (c)	271.2	39.7	77.6	79.6	74.3
Purchase obligations (d)	127.2	88.5	37.7	1.0	—
Operating lease liabilities	73.3	15.0	18.3	8.1	31.9
Pension obligations (e)	33.6	33.6	—	—	—
Foreign currency exchange forward contracts (f)	0.9	0.9	—	—	—
Contingent consideration (g)	12.2	3.9	7.2	0.6	0.5
Total contractual obligations (h)	\$ 1,317.0	\$ 187.9	\$ 144.9	\$ 377.5	\$ 606.7

(b) See Note 3, Acquisitions and Dispositions; Note 7, Debt and Credit Agreements; Note 8, Leases; Note 9, Employee Benefit Plans; Note 10, Income Taxes; and Note 14, Financial Instruments, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information on short-term borrowings and long-term debt (including finance leases); operating leases; employee benefit plans; income taxes; interest rate swaps and foreign currency exchange forward contracts, respectively.

(c) The total projected interest payments on long-term debt are based upon borrowings, interest rates and foreign currency exchange rates at December 31, 2019, including interest rate swaps currently in effect. The interest rates on variable-rate debt and the foreign currency exchange rates are subject to changes beyond the Company's control and may result in actual interest expense and payments differing from the amounts projected above.

(d) Purchase obligations represent legally binding obligations to purchase property, plant and equipment, inventory and other commitments made in the normal course of business to meet operations requirements.

(e) Amounts represent expected employer contributions to defined benefit pension plans for the next year.

(f) Amounts represent the fair value of the foreign currency exchange contracts outstanding at December 31, 2019. Due to the nature of these contracts, based on fair values at December 31, 2019 there will be a net cash payable of \$0.9 million comprised of cash receipts of \$495.4 million and cash payments of \$496.3 million. The foreign currency exchange contracts are recorded on the Consolidated Balance Sheets at fair value.

(g) The Company acquired Clean Earth on June 28, 2019 and included in the liabilities acquired was a contingent consideration liability resulting from a prior Clean Earth acquisition. Also, included is a liability payable to Compass Diversified Holdings related to reimbursements related to future utilization of net operating losses by the Company.

(h) At December 31, 2019, in addition to the above contractual obligations, the Company had \$4.3 million of potential long-term tax liabilities, including interest and penalties, related to uncertain tax positions. Because of the high degree of uncertainty regarding the future cash flows associated with these potential long-term tax liabilities, the Company is unable to estimate the years in which settlement will occur with the respective taxing authorities.

Off-Balance Sheet Arrangements

The following table summarizes the Company's contingent commercial commitments at December 31, 2019. These amounts are not included on the Consolidated Balance Sheets since there are no current circumstances known to management indicating that the Company will be required to make payments on these contingent commercial commitments.

Commercial Commitments at December 31, 2019

(In millions)	Total	Amount of Commercial Commitment Expiration Per Period						Indefinite Expiration
		Less than 1 Year	1-3 Years	3-5 Years	Over 5 Years	—	—	
Performance bonds	\$ 196.0	\$ 153.5	\$ 40.7	\$ 0.1	\$ —	\$ —	\$ —	1.7
Standby letters of credit	46.4	32.3	7.3	2.1	4.7	—	—	—
Guarantees	41.3	4.4	—	4.1	18.9	—	—	13.9
Total commercial commitments	<u>\$ 283.7</u>	<u>\$ 190.2</u>	<u>\$ 48.0</u>	<u>\$ 6.3</u>	<u>\$ 23.6</u>	<u>\$ —</u>	<u>\$ —</u>	<u>15.6</u>

Certain commercial commitments that are of a continuous nature do not have an expiration date and are therefore considered to be indefinite in nature. See Note 14, Financial Instruments, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Sources and Uses of Cash

The Company's principal sources of liquidity are cash provided by operations and borrowings under the Senior Secured Credit Facilities, augmented by cash proceeds from asset sales. In addition, the Company has other bank credit facilities available throughout the world. The Company expects to continue to utilize all of these sources to meet future cash requirements for operations and growth initiatives.

Summary of Senior Secured Credit Facilities and Notes:

(In millions)	December 31 2019	December 31 2018
By type:		
Revolving Credit Facility	\$ 67.0	\$ 62.0
Term Loan Facility	218.2	541.8
5.75% Notes	500.0	—
Total	\$ 785.2	\$ 603.8
By classification:		
Current	\$ —	\$ 5.4
Long-term	785.2	598.3
Total	\$ 785.2	\$ 603.8

(In thousands)	December 31, 2019			
	Facility Limit	Outstanding Balance	Outstanding Letters of Credit	Available Credit
Revolving Credit Facility (a U.S.-based program)	\$ 700,000	\$ 67,000	\$ 25,352	\$ 607,648

In July 2019, the Company made a prepayment of \$320.9 million on the \$550 million Term Loan Facility, using proceeds from the sale of AXC. The remainder of the proceeds from the sale were used to pay down the Revolving Credit Facility. As a result of this prepayment, the Company wrote off \$5.3 million of previously recorded deferred financing costs on the Condensed Consolidated Statement of Operations as discontinued operations for the year ended December 31, 2019. The prepayment satisfied all future quarterly principal payment requirements under the Term Loan Facility; the remaining principal is due at maturity.

During June 2019, the Company completed the Notes offering. The Notes are due July 31, 2027 and bear interest at a fixed rate of 5.75%, which is payable on January 31 and July 31 of each year, beginning on January 31, 2020. The Notes are fully and unconditionally guaranteed, jointly and severally, by all of the wholly owned domestic subsidiaries of the Company that guarantee the Senior Secured Credit Facilities. The indenture governing the Notes contains provisions that (i) allow the Company to redeem some or all of the Notes prior to maturity; (ii) require the Company to offer to repurchase all of the Notes upon a change in control; and (iii) require adherence to certain covenants which are generally less restrictive than those included in the Company's Credit Agreement governing the Senior Secured Credit Facilities (the "Credit Agreement"). The Notes were used, together with borrowings under the Company's Revolving Credit Facility, to fund the acquisition of Clean Earth.



Additionally, during June 2019, the Company amended the Credit Agreement to, among other things, increase the borrowing capacity of the Revolving Credit Facility by \$200 million to a total of \$700 million, extend the maturity date of the Revolving Credit Facility until June 2024 and increase the maximum net debt to consolidated adjusted EBITDA ratio from 3.5 to 4.5, which decreases to 4.0 for the second quarter of 2020 and periods thereafter. As of December 31, 2019, \$1.0 million of expenses were recognized related to the amended Credit Agreement.

The Company has capitalized \$11.6 million of fees related to the issuance of the Notes and the amendment of the Revolving Credit Facility.

In addition, during the second quarter of 2019, the Company recognized \$6.7 million of expenses for fees and other costs related to bridge financing commitments that the Company arranged in the event that the Notes were not issued prior to the acquisition of Clean Earth. Because the Notes were issued prior to completion of the Clean Earth acquisition, the bridge financing commitments were not utilized.

On May 2, 2018 the Company announced that the Board authorized a share repurchase program pursuant to which the Company could repurchase shares in an amount up to \$75 million. The extent to which the Company repurchases shares, and the timing of such repurchases, will depend upon a variety of factors including market conditions and other corporate considerations as determined by the Company's management. The repurchase program may be suspended or discontinued at any time. During 2019, the Company purchased 1.8 million shares of common stock under this program at an average price of \$18.02 per share or a total of approximately \$32 million. During 2018, the Company purchased 1.3 million shares of common stock under this program at an average price of \$22.72 per share or a total of approximately \$30 million.

Certainty of Cash Flows

The majority of the Company's cash flows provided by operations has historically been generated in the second half of the year. The certainty of the Company's future cash flows is underpinned by the long-term nature of the Company's metals services contracts, the order backlog for the Company's railway track maintenance services and equipment and overall discretionary cash flows (operating cash flows plus cash from asset sales in excess of the amounts necessary for capital expenditures to maintain current revenue levels) generated by the Company. Historically, the Company has utilized these discretionary cash flows for growth-related capital expenditures, strategic acquisitions, debt repayment and dividend payments.

The types of products and services that the Company provides are not subject to rapid technological change, which increases the stability of related cash flows. Additionally, the Company believes each business in its portfolio is a leader in the industries and major markets the Company serves. Due to these factors, the Company is confident in the Company's future ability to generate positive cash flows from operations.

Debt Covenants

The Credit Agreement contains a consolidated net debt to consolidated adjusted EBITDA ratio covenant, which is not to exceed 4.5 to 1.0, as of December 31, 2019, and a minimum consolidated adjusted EBITDA to consolidated interest charges ratio covenant, which is not to be less than 3.0 to 1.0. At December 31, 2019, the Company was in compliance with these covenants as the net leverage ratio was 2.4 to 1.0 and interest coverage ratio was 6.8 to 1.0. Based on balances and covenants in effect at December 31, 2019, the Company could increase net debt by \$644.9 million and still be in compliance with these debt covenants. The Company expects to continue to be in compliance with these debt covenants for at least the next twelve months.

Cash Management

The Company has various cash management systems throughout the world that centralize cash in various bank accounts where it is economically justifiable and legally permissible to do so. These centralized cash balances are then redeployed to other operations to reduce short-term borrowings and to finance working capital needs or capital expenditures. Due to the transitory nature of cash balances, they are normally invested in bank deposits that can be withdrawn at will or in very liquid short-term bank time deposits and government obligations. The Company's policy is to use the largest banks in the various countries in which the Company operates. The Company monitors the creditworthiness of banks and, when appropriate, will adjust banking operations to reduce or eliminate exposure to less creditworthy banks.

At December 31, 2019, the Company's consolidated cash and cash equivalents included \$53.8 million held by non-U.S. subsidiaries. At December 31, 2019, less than 2% of the Company's consolidated cash and cash equivalents had regulatory restrictions that would preclude the transfer of funds with and among subsidiaries. Non-U.S. subsidiaries also held \$19.9 million of cash and cash equivalents in consolidated strategic ventures. The strategic venture agreements may require strategic venture partner approval to transfer funds with and among subsidiaries. While the Company's remaining non-U.S. cash and cash equivalents can be transferred with and among subsidiaries, the majority of these non-U.S. cash balances will be used to support the ongoing working capital needs and continued growth of the Company's non-U.S. operations.

Application of Critical Accounting Policies

The Company's discussion and analysis of its financial condition and results of operations are based upon the consolidated financial statements, which have been prepared in accordance with generally accepted accounting principles in the U.S. ("U.S. GAAP"). The preparation of these consolidated financial statements requires the Company to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses. On an ongoing basis, the Company evaluates the estimates, including those related to defined benefit pension benefits, notes and accounts receivable, goodwill, long-lived asset impairment, inventories, revenue recognition - cost-to-cost method, insurance reserves and income taxes. The impact of changes in these estimates, as necessary, is reflected in the respective segment's results of operations in the period of the change. The Company bases estimates on historical experience and various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different outcomes, assumptions or conditions.

The Company believes the following critical accounting policies are affected by the Company's more significant judgments and estimates used in the preparation of the consolidated financial statements. Management has discussed the development and selection of the critical accounting estimates described below with the Audit Committee of the Board and they have reviewed the Company's disclosures relating to these estimates in this Management's Discussion and Analysis of Financial Condition. These items should be read in conjunction with Note 1, Summary of Significant Accounting Policies, in Part II, Item 8, "Financial Statements and Supplementary Data."

Defined Benefit Pension Benefits

The Company has defined benefit pension plans in several countries. The largest of these plans are in the U.K. and the U.S. The Company's funding policy for these plans is to contribute amounts sufficient to meet the minimum funding pursuant to U.K. and U.S. statutory requirements, plus any additional amounts that the Company may determine to be appropriate.

Changes in the discount rate assumption and the actual performance of plan assets compared with the expected long-term rate of return on plan assets are the primary drivers in the change in funded status of the Company's defined benefit pension plans. These factors are components of actuarial loss (gain) and impact the amount recognized in Other comprehensive income (loss), as such actuarial changes are not reflected directly on the Consolidated Statements of Operations but amortized over time in accordance with U.S. GAAP.

Critical Estimate—Defined Benefit Pension Benefits

Accounting for defined benefit pension plans requires the use of actuarial assumptions. The principal assumptions used include the discount rate and the expected long-term rate of return on plan assets. Each assumption is reviewed annually and represents management's best estimate at that time. The assumptions are selected to represent the average expected experience over time and may differ, in any one year, from actual experience due to changes in capital markets and the overall economy. These differences will impact the amount of unfunded benefit obligation and the expense recognized.

The discount rates used in calculating the Company's projected benefit obligations at the December 31, 2019 measurement date for the U.K. and U.S. defined benefit pension plans were 2.0% and 3.2%, respectively, and the global weighted-average discount rate was 2.4%. The discount rates selected represent level-equivalent rates using the yield curve spot rates on a year-by-year expected cash flow basis, using yield curves of high-quality corporate bonds. Annual NPPC is determined using the discount rates at the beginning of the year. The discount rates for 2019 expense were 2.9% for the U.K. plan, 4.2% for the U.S. plans and 3.2% for the global weighted-average of plans.

The expected long-term rate of return on plan assets is determined by evaluating the asset return expectations with the Company's advisors as well as actual, long-term, historical results of asset returns for the pension plans. Generally, the NPPC increases as the expected long-term rate of return on assets decreases. For 2020 and 2019, the global weighted-average expected long-term rate of return on asset assumption is 5.6% and 5.9%, respectively. This rate was determined based on a model of expected asset returns for an actively managed portfolio.

Changes in NPPC may occur in the future due to changes in actuarial assumptions and due to changes in returns on plan assets resulting from financial market conditions. Holding all other assumptions constant, using December 31, 2019 plan data, a one-quarter percent increase or decrease in the discount rate and the expected long-term rate of return on plan assets would increase or decrease annual 2019 pre-tax defined benefit NPPC as follows:

	U.S. Plans	U.K. Plan
Discount rate		
One-quarter percent increase	Increase of \$0.1 million	Decrease of \$0.1 million
One-quarter percent decrease	Decrease of \$0.1 million	-
Expected long-term rate of return on plan assets		
One-quarter percent increase	Decrease of \$0.5 million	Decrease of \$2.0 million
One-quarter percent decrease	Increase of \$0.5 million	Increase of \$2.0 million

Increases or decreases to the net pension obligations may be required should circumstances that affect these estimates change. Additionally, certain events could result in the pension obligation changing at a time other than the annual measurement date. This would occur when a benefit plan is amended or when plan curtailments or settlements occur.

See Note 9, Employee Benefit Plans, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Notes and Accounts Receivable

Notes and accounts receivable are stated at net realizable value through the use of an allowance for doubtful accounts. The allowance for doubtful accounts is maintained for estimated losses resulting from the inability or unwillingness of customers to make required payments. The Company has policies and procedures in place requiring customers to be evaluated for creditworthiness prior to the execution of new service contracts or shipments of products. These reviews are structured to minimize the Company's risk related to realizability of receivables. Despite these policies and procedures, the Company may at times still experience collection problems and potential bad debts due to economic conditions within certain industries (e.g., steel industry), countries or regions in which the Company operates. At December 31, 2019 and 2018, trade accounts receivable of \$310.0 million and \$246.4 million, respectively, were net of reserves of \$13.5 million and \$4.6 million, respectively.

Critical Estimate—Notes and Accounts Receivable

A considerable amount of judgment is required to assess the realizability of receivables, including the current creditworthiness of each customer, related aging of past due balances and the facts and circumstances surrounding any non-payment. The Company's provisions for bad debts during 2019, 2018 and 2017 were \$7.5 million, \$0.4 million and \$5.2 million, respectively.

On a monthly basis, customer accounts are analyzed for collectability. Reserves are established based upon a specific-identification method as well as historical collection experience, as appropriate. The Company also evaluates specific accounts when it becomes aware of a situation in which a customer may not be able to meet its financial obligations due to a deterioration in financial condition, credit ratings, bankruptcy or receivership. The reserves are based on the facts available to the Company and are re-evaluated and adjusted as additional information becomes available. Reserves are also determined by using percentages (based upon experience) applied to certain aged receivable categories. Specific issues are discussed with corporate management and any significant changes in reserve amounts or the write-off of balances must be approved by specifically designated corporate personnel. All approved items are monitored to ensure they are recorded in the proper period. Additionally, any significant changes in reserve balances are reviewed to ensure the proper corporate approval has occurred.

If the financial condition of the Company's customers were to deteriorate, resulting in their inability to make payments, additional allowances may be required. Conversely, an improvement in a customer's ability to make payments could result in a decrease of the allowance for doubtful accounts. Changes in the allowance for doubtful accounts related to both of these situations would be recorded through Operating income from continuing operations in the period the change was determined. For the year ended 2019, the Company recorded a provision for doubtful accounts in the Harsco Environmental Segment related to a customer in the U.K. entering administration. The Company continues to provide services to the customer and continues to collect on post-administration invoices timely while the customer seeks a buyer for their operations. Depending on the outcome of any potential transactions, there could be an impact on the Company's results of operations, cash flows and asset valuations in the future, which may be material in any one period.

The Company has not materially changed the methodology for calculating allowances for doubtful accounts for the years presented. See Note 4, Accounts Receivable and Inventories, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Business Combinations and Goodwill

The Company accounts for business combinations using the acquisition method of accounting, which requires that once control is obtained, all assets acquired and liabilities assumed, including amounts attributable to noncontrolling interests, be recorded at their respective fair values at the date of acquisition. During 2019, the Company acquired 100% of the outstanding stock of Clean Earth, one of the largest U.S. providers of specialty waste processing and benefit reuse solutions for hazardous wastes, contaminated materials and dredged volumes. See Note 3, Acquisitions and Dispositions, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

The Company's goodwill balances were \$738.4 million and \$404.7 million at December 31, 2019 and 2018, respectively. The Company performs the annual goodwill impairment test as of October 1. The Company has three reporting units consisting of the Harsco Environmental Segment, the Harsco Clean Earth Segment and the Harsco Rail Segment. Almost all of the Company's goodwill is allocated to the Harsco Environmental Segment and the Harsco Clean Earth Segment.

Critical Estimate—Business Combinations and Goodwill

The acquisition method of accounting requires the excess of purchase price over the fair values of identifiable assets and liabilities to be recorded as goodwill. The determination of fair value of assets acquired and liabilities assumed requires numerous estimates and assumptions with respect to the timing and amounts of cash flow projections, revenue growth rates, customer attrition rates, discount rates and useful lives. Such estimates are based upon assumptions believed to be reasonable, and when appropriate, include assistance from independent third-party valuation firms. During the measurement period, which is up to one year from the acquisition date, the Company may record adjustments to the assets acquired and liabilities assumed, with corresponding offsets to goodwill. See Note 3, Acquisitions and Dispositions, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information regarding the purchase price allocation related to acquisitions.

In accordance with U.S. GAAP, goodwill is not amortized and is tested for impairment at least annually or more frequently if indicators of impairment exist or if a decision is made to dispose of a business. Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment for which discrete financial information is available. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include declining cash flows or operating losses at the reporting unit level, a significant adverse change in legal factors or in the business climate, an adverse action or assessment by a regulator, unanticipated competition, a loss of key personnel or a more likely than not expectation that a reporting unit or a significant portion of a reporting unit will be sold or otherwise disposed of, among others.

In applying the goodwill impairment test, the Company has the option to perform a qualitative test ("Step 0") or a quantitative test ("Step 1"). Under Step 0, the Company assesses qualitative factors to determine whether it is more likely than not that the fair value of the reporting units is less than its carrying value. Qualitative factors may include, but are not limited to, economic conditions, industry and market considerations, cost factors, overall financial performance of the reporting unit, and other entity and reporting unit specific events. If after assessing these qualitative factors, the Company determines it is "more-likely-than-not" that the fair value of the reporting unit is less than the carrying value, the Company would perform Step 1.

The Step 1 approach of testing for goodwill impairment involves comparing the current fair value of each reporting unit to the net book value, including goodwill. The Company uses a discounted cash flow model ("DCF model") to estimate the current fair value of reporting units, as management believes forecasted operating cash flows are the best indicator of current fair value. A number of significant assumptions and estimates are involved in the preparation of DCF models including future revenues and operating margin growth, the weighted-average cost of capital ("WACC"), tax rates, capital spending, pension funding, the impact of business initiatives and working capital projections. These assumptions and estimates may vary significantly among reporting units. DCF models are based on approved long-range plans for the early years and historical relationships and projections for later years. WACC rates are derived from internal and external factors including, but not limited to, the average market price of the Company's stock, shares outstanding, book value of the Company's debt, the long-term risk-free interest rate, and both market and size-specific risk premiums. Due to the many variables noted above and the relative size of the Company's goodwill, differences in assumptions may have a material impact on the results of the Company's annual goodwill impairment testing. If the net book value of a reporting unit were to exceed the current fair value, the second step of the goodwill impairment test ("Step 2") would currently be required to determine if an impairment existed and the amount of goodwill impairment to record, if any.

Step 2 compares the net book value of a reporting unit's goodwill with the implied fair value of that goodwill. The implied fair value of goodwill represents the excess of fair value of the reporting unit over the fair value amounts assigned to all of the assets and liabilities of the reporting unit if it were to be acquired in a hypothetical business combination and the current fair value of the reporting unit represented the purchase price. As necessary, the Company may use independent third-party valuation firms to assist with the Step 2 assessment.

The performance of the Company's 2019 annual impairment tests did not result in any impairment of the Company's goodwill.

See Note 1, Summary of Significant Accounting Policies and Note 6, Goodwill and Other Intangible Assets, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Long-lived Asset Impairment (Other than Goodwill)

Long-lived assets (or asset groups) are reviewed for impairment when events and circumstances indicate that the book value of an asset (or asset group) may be impaired. The amounts charged against pre-tax income from continuing operations related to impaired long-lived assets (or asset groups) included in Other (income) expenses, net on the Consolidated Statements of Operations were \$0.8 million, \$0.1 million and \$0.9 million in 2019, 2018 and 2017, respectively.

Critical Estimate—Asset Impairment

The determination of a long-lived asset (or asset group) impairment involves significant judgments based upon short-term and long-term projections of future asset (or asset group) performance. If the undiscounted cash flows associated with an asset (or asset group) do not exceed the asset's book value, impairment loss estimates would be based upon the difference between the book value and fair value of the asset (or asset group). The fair value is generally based upon the Company's estimate of the amount that the assets (or asset group) could be bought or sold for in a transaction between willing parties. If quoted market prices for the asset (or asset group) or similar assets are unavailable, the fair value estimate is generally calculated using a DCF model. Should circumstances change that affect these estimates, additional impairment charges may be required and would be recorded through income in the period the change was determined.

The Company has not materially changed the methodology for calculating long-lived asset impairments for the years presented. U.S. GAAP requires consideration of all valuation techniques for which market participant inputs can be obtained without undue cost and effort. The use of a DCF model continues to be an appropriate method for determining fair value; however, methodologies such as quoted market prices must also be evaluated. See Note 17, Other (Income) Expenses, Net in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Inventories

Inventory balances are adjusted for estimated obsolete or unmarketable inventory equal to the difference between the cost of inventory and its net realizable value or estimated market value, as applicable. At December 31, 2019 and 2018, inventories of \$157.0 million and \$116.2 million, respectively, are net of reserves of \$12.5 million and \$9.5 million, respectively.

Critical Estimate—Inventories

In assessing the realization of inventory balances, the Company is required to make judgments as to future demand and compare these with current or committed inventory levels. If actual market conditions are determined to be less favorable than those projected by management, additional inventory write-downs may be required and would be recorded through Operating income from continuing operations in the period the determination is made. Additionally, the Company records reserves to adjust a substantial portion of its U.S. inventory balances to the LIFO method of inventory valuation. In adjusting these reserves throughout the year, the Company estimates its year-end inventory costs and quantities. At December 31 of each year, the reserves are adjusted to reflect actual year-end inventory costs and quantities. During periods of inflation, LIFO expense usually increases and during periods of deflation it decreases. These year-end adjustments resulted in pre-tax income of \$1.6 million in 2019, pre-tax expense of \$0.6 million in 2018 and pre-tax income of \$1.7 million in 2017.

The Company has not materially changed the methodology for calculating inventory reserves for the years presented. See Note 4, Accounts Receivable and Inventories, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Revenue Recognition - Cost-to-cost Method

For certain contracts with customers, which meet specific criteria established in U.S. GAAP, the Company recognizes revenue on an over time basis utilizing an input method based on costs incurred ("cost-to-cost method") to measure progress, which requires the Company to make estimates regarding the revenues and costs associated with design, manufacturing and delivery of products.

Critical Estimate—Revenue Recognition - Cost-to-cost Method

The Company uses the cost-to-cost method to measure progress because it is the measure that best depicts the transfer of control to the customer, which occurs as the Company incurs costs under the contracts. Under the cost-to-cost method, the extent of progress towards completion is based on the ratio of costs incurred to total estimated costs at completion which includes both actual costs already incurred and the estimated costs to complete. Accounting for contracts with customers using the cost-to-cost method requires significant judgment relative to assessing risks, estimating contract revenues (including estimates of variable consideration, if applicable), estimating contract costs (including estimating any liquidating damages or penalties related to performance, engineering costs to design the machine and the material, labor and overhead manufacturing

costs to build the machine); making assumptions for schedule and technical items; properly executing the engineering and design phases consistent with customer expectations; the availability and costs of labor and material resources; productivity; and evaluating whether a significant financing component is present. Due to the number of years it may take to complete certain contracts and the scope and nature of the work required to be performed on those contracts, primarily in the Harsco Rail Segment, estimating total revenues and costs at completion is inherently complicated and subject to many variables. Accordingly, estimates are subject to change as experience is gained and as more information is obtained, even though the scope of the work under the contract may not have changed. When adjustments in estimated total contract sales or estimated total costs are required, any changes from prior estimates are recognized in current period earnings for the inception-to-date effect of such changes. When estimates of total costs to be incurred on a contract using the cost-to-cost method exceed estimates of total sales to be earned, a provision for the entire loss on the contract is recorded in current period earnings when the loss is determined.

The Company recognized an estimated forward loss provision related to the contracts with the federal railway system of Switzerland. At December 31, 2019, the entire remaining estimated forward loss provision of \$6.4 million is included in the caption Other current liabilities on the Consolidated Balance Sheets. The estimated forward loss provision represents the Company's best estimate based on currently available information. It is possible that the Company's overall estimate of costs to complete these contracts may increase, which would result in an additional estimated forward loss provision at such time. As of December 31, 2019, the Company has substantially completed the first SBB contract and the second SBB contract is approximately 42% complete. Based on all information currently available, the Company is unable to estimate any further possible loss or range of loss at this time. There are a number of key events now expected to occur in 2020, including the finalization of the manufacturing designs for certain of the vehicles, and which could affect the cost estimates. Any adjustment to the cost estimates would be recorded when new information becomes available and could have a material impact on the Company's results of operations in that period.

Insurance Reserves

The Company retains a significant portion of the risk for U.S. workers' compensation, U.K. employers' liability, automobile, general and product liability losses. At December 31, 2019 and 2018, the Company recorded liabilities of \$28.7 million and \$60.3 million, respectively, related to both asserted and unasserted insurance claims. At December 31, 2019 and 2018, \$3.7 million and \$34.2 million, respectively, was included in insurance liabilities related to claims covered by insurance carriers for which a corresponding receivable has been recorded. The balance at December 31, 2018 includes an insurance receivable and related insurance liability associated with the Lima Refining Company litigation. See Note 11, Commitments and Contingencies, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Critical Estimate—Insurance Reserves

Insurance reserves have been recorded based upon actuarial calculations that reflect the undiscounted estimated liabilities for ultimate losses, including claims incurred but not reported. Inherent in these estimates are assumptions that are based on the Company's history of claims and losses, a detailed analysis of existing claims with respect to potential value, and current legal and legislative trends. If actual claims differ from those projected by management, changes (either increases or decreases) to insurance reserves may be required and would be recorded through Operating income from continuing operations in the period the change was determined. During 2019, 2018 and 2017, the Company recorded insurance reserve adjustments that decreased pre-tax insurance expense from continuing operations for self-insured programs by \$1.5 million, \$2.0 million and \$1.5 million, respectively. The Company has programs in place to improve claims experience, such as disciplined claim and insurance litigation management and a focused approach to workplace safety.

The Company has not materially changed the methodology for calculating insurance reserves for the years presented. There are currently no known trends, demands, commitments, events or uncertainties that are reasonably likely to occur that would materially affect the methodology or assumptions described above. See Note 1, Summary of Significant Accounting Policies, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Income Taxes

The Company's income tax expense, deferred tax assets and liabilities and reserves for uncertain tax positions reflect management's best estimate of taxes to be paid. The Company is subject to various international, federal, state and local income taxes in jurisdictions where the Company operates. In determining income tax expense, the Company makes its best estimate of the annual effective income tax rate at the end of each quarter and applies that rate to year-to-date income (loss) before income taxes to arrive at the year-to-date income tax provision (exclusive of loss jurisdictions for which no tax benefit is realizable with any discrete tax items recorded separately). At December 31, 2019, 2018 and 2017, the Company's annual effective income tax rate on income from continuing operations was 35.8%, 4.8% and 103.7%, respectively.

Critical Estimate—Income Taxes

Annual effective income tax rates are estimated by giving recognition to currently enacted tax rates, tax holidays, tax credits, capital losses and tax deductions as well as certain exempt income and non-deductible expenses for all jurisdictions where the Company operates. Quarterly income tax provisions incorporate any change in the year-to-date provision from the previous quarterly periods.

The Company records deferred tax assets to the extent the Company believes these assets will more likely than not be realized. In making such determinations, the Company considers all available evidence, including future reversals of existing deferred tax liabilities, projected future taxable income, feasible and prudent tax planning strategies and recent financial operating results. In the event the Company was to determine that it would be able to realize deferred tax assets in the future in excess of their net recorded amount, an adjustment to the valuation allowance would be made that would reduce the provision for income taxes.

Valuation allowances of \$127.1 million and \$137.5 million at December 31, 2019 and 2018, respectively, related principally to deferred tax assets for pension liabilities, NOLs, foreign tax credit carryforwards, capital loss carryforwards and foreign currency translation that are uncertain as to realizability. In 2019, the Company recorded a valuation allowance reduction of \$12.5 million related to capital loss carryforwards, foreign tax credit carryforwards and state NOLs due to the losses and foreign tax credit carryforwards being utilized to reduce the tax liabilities on the capital gain realized as a result of the sale of AXC and PK. In addition, the Company recorded a valuation allowance reduction (and corresponding reduction to deferred tax assets) of \$5.6 million due to the merger and liquidation of certain foreign dormant entities resulting in the loss of certain tax attributes, offset by a net increase of \$7.9 million related to losses in certain jurisdictions where the Company determined it is more likely than not that these assets will not be realized. In 2018, the Company finalized the impact of the Tax Act and reduced the provisional valuation allowance by \$15.2 million because of the expected realization of foreign tax credit and state net operating loss carryforward. In addition, the U.K. valuation allowance was reduced by \$13.6 million as a result of the Altek acquisition and change in estimates of interest deductions. The Company recorded a valuation allowance reduction of \$8.7 million from the effects of foreign currency translation adjustments, partially offset by the net increase related to losses in certain jurisdictions where the Company determined that it is more likely than not that these assets will not be realized.

An income tax benefit from an uncertain tax position may be recognized when it is more likely than not that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, based on its technical merits. The unrecognized tax benefits at December 31, 2019 and 2018 were \$3.1 million and \$2.4 million, respectively, excluding accrued interest and penalties. The unrecognized income tax benefit may decrease as a result of the lapse of statute of limitations or as a result of final settlement and resolution of outstanding tax matters in various state and international jurisdictions.

On December 22, 2017, the Tax Act was signed into law. The Tax Act significantly changed U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system and imposing a repatriation tax on deemed repatriated earnings of foreign subsidiaries. The Tax Act permanently reduced the U.S. corporate income tax rate from a maximum of 35% to a 21% rate, effective January 1, 2018. The SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations when a registrant did not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Act. The Company recognized provisional tax impacts related to the deemed repatriated earnings and the revaluation of deferred tax assets and liabilities in its consolidated financial statements for the year ended December 31, 2017. Based on an analysis of the earnings and profits ("E&P") for the Company's foreign subsidiaries, no toll charge was recorded in 2017 related to the Tax Act. The Company finalized its E&P analysis in 2018 and confirmed there is no toll charge related to the Tax Act. Adjustments made to the provisional amounts allowed under SAB 118 were identified and recorded as discrete adjustments during the year ended December 31, 2018. The accounting was completed in the fourth quarter of 2018.

The Company has not materially changed the methodology for calculating income tax expense, deferred tax assets and liabilities and reserves for uncertain tax positions for the years presented or for quarterly periods. See Note 10, Income Taxes, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Research and Development

Internal funding for research and development was as follows:

(In millions)	Research and Development Expenses		
	2019	2018	2017
Harsco Environmental	\$ 0.9	\$ 1.6	\$ 1.3
Harsco Rail	3.9	2.3	1.4
Total research and development expenses	<u><u>\$ 4.8</u></u>	<u><u>\$ 3.9</u></u>	<u><u>\$ 2.7</u></u>

The amounts shown exclude technology development and engineering costs classified in cost of services sold; cost of products sold; or selling, general and administrative expenses.

Recently Adopted and Recently Issued Accounting Standards

Information on recently adopted and recently issued accounting standards is included in Note 2, Recently Adopted and Recently Issued Accounting Standards, in Part II, Item 8, "Financial Statements and Supplementary Data."

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

See the Risk Factors captioned "Exchange rate fluctuations may adversely impact the Company's business," "The Company is exposed to counterparty risk in its derivative financial arrangements" and "The Company's variable rate indebtedness subjects it to interest rate risk, which could cause the Company's debt service obligations to increase significantly" in Part I, Item 1A, "Risk Factors," for quantitative and qualitative disclosures about market risk.

Item 8. Financial Statements and Supplementary Data.

Index to Consolidated Financial Statements and Supplementary Data

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Management's Report on Internal Control Over Financial Reporting

Management of Harsco Corporation, together with its consolidated subsidiaries (the "Company"), is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Securities Exchange Act Rule 13a-15(f) or 15d-15(e). The Company's internal control over financial reporting is a process designed under the supervision of the Company's principal executive and principal financial officers to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the Company's consolidated financial statements for external reporting purposes in accordance with accounting principles generally accepted in the United States of America.

The Company's internal control over financial reporting includes policies and procedures that:

- Pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect transactions and dispositions of assets of the Company;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with accounting principles generally accepted in the United States of America, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and the directors of the Company; and
- 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 Company's consolidated 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 and procedures may deteriorate.

Management has assessed the effectiveness of its internal control over financial reporting at December 31, 2019 based on the framework established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Management has excluded CEHI Acquisition Corporation ("Clean Earth"), which we acquired in 2019, from the scope of our assessment of internal control over financial reporting as permitted under SEC rules. The total assets and operating revenues of Clean Earth, excluded from assessment, represent approximately 7% and 11%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2019. Based on this assessment, management has determined that the Company's internal control over financial reporting was effective at December 31, 2019.

The effectiveness of the Company's internal control over financial reporting at December 31, 2019 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report appearing in this Annual Report on Form 10-K, which expresses an unqualified opinion on the effectiveness of the Company's internal control over financial reporting at December 31, 2019.

/s/ NICHOLAS GRASBERGER III

F. Nicholas Grasberger III

Chairman, President and Chief Executive Officer

February 21, 2020

/s/ PETER F. MINAN

Peter F. Minan

Senior Vice President and Chief Financial Officer

February 21, 2020

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors of Harsco Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Harsco Corporation and its subsidiaries (the “Company”) as of December 31, 2019 and 2018 and the related consolidated statements of operations, comprehensive income, changes in equity, and cash flows for each of the three years in the period ended December 31, 2019, including the related notes and financial statement schedule listed in the index appearing under Item 15(a)(2) (collectively referred to as the “consolidated financial statements”). We also have audited the Company’s internal control over financial reporting as of December 31, 2019, 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, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 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, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Changes in Accounting Principles

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019 and, as discussed in Note 1 to the consolidated financial statements, the Company changed the manner in which it accounts for revenue from contracts with customers in 2018.

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 the accompanying Management’s Report on Internal Control Over Financial Reporting. 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.

As described in Management's Report on Internal Control Over Financial Reporting, management has excluded Clean Earth, Inc. from its assessment of internal control over financial reporting as of December 31, 2019, because it was acquired by the Company in a purchase business combination during 2019. We have also excluded Clean Earth, Inc. from our audit of internal control over financial reporting. Clean Earth, Inc. is a wholly-owned subsidiary whose total assets and total revenues excluded from management's assessment and our audit of internal control over financial reporting represent approximately 7% and 11%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2019.

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 matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate 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 matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Goodwill Impairment Assessment - Environmental Reporting Unit

As described in Notes 1 and 6 to the consolidated financial statements, the Company's consolidated goodwill balance was \$738.4 million as of December 31, 2019, and the goodwill associated with the Environmental reporting unit was \$395.1 million. As disclosed by management, the Company performs the annual goodwill impairment test as of October 1, or more frequently, if indicators of impairment exist, or if a decision is made to dispose of a business. The Company uses a discounted cash flow model to estimate the current fair value of reporting units. A number of significant assumptions and estimates are involved in the preparation of the discounted cash flow model, including future revenues and operating margin growth, the weighted-average cost of capital, tax rates, capital spending, pension funding, the impact of business initiatives and working capital projections.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment of the Environmental reporting unit is a critical audit matter are there was significant judgment by management when developing the fair value measurement of the reporting unit. This in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's cash flow projections and significant assumptions, including future revenues and operating margin growth and the weighted-average cost of capital. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained.

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 assessment, including controls over the valuation of the Company's Environmental reporting unit. These procedures also included, among others (i) testing management's process for developing the fair value estimate, (ii) evaluating the appropriateness of the discounted cash flow model, (iii) testing the completeness, accuracy, and relevance of underlying data used in the model, and (iv) evaluating the significant assumptions used by management, including future revenues and operating margin growth and the weighted-average cost of capital. Evaluating management's assumptions related to future revenues and operating margin growth involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the reporting unit, (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 model, including the weighted-average cost of capital.

Revenue Recognition using the Cost-to-Cost Method - Rail Segment

As described in Notes 1 and 16 to the consolidated financial statements, a portion of the Company's total railway track maintenance equipment sales revenue of \$146 million for the year ended December 31, 2019 was generated from contracts with customers using the cost-to-cost method. As disclosed by management, the Company uses the cost-to-cost method to measure progress for its contracts because management believes that the measure best depicts the transfer of control to the customer, which occurs as the Company incurs cost on the contracts. Accounting for contracts with customers using the cost-to-cost method requires significant judgment relative to assessing risks, estimating contract revenues (including estimates of variable consideration, if applicable), estimating contract costs (including estimating any liquidating damages or penalties related to performance, engineering costs to design the machine and material, labor, and overhead manufacturing costs to build the machine), making assumptions for schedule and technical items, properly executing the engineering and design phases consistent with customer expectations, the availability and costs of labor and material resources, productivity, and evaluating whether a significant financing component is present.

The principal considerations for our determination that performing procedures relating to revenue recognition using the cost-to-cost method in the Rail segment is a critical audit matter are there was significant judgment by management when developing the estimated costs to complete contracts. This in turn led to significant auditor judgment, subjectivity, and effort in performing procedures and evaluating audit evidence related to the estimates of the costs to complete, such as the engineering costs to design the machine and the material, labor, and overhead manufacturing costs to build the machines.

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 the revenue recognition process, including controls over the determination of estimated contract revenues and costs. The procedures also included, among others, evaluating and testing management's process for determining the estimate of costs at completion for a sample of contracts, which included evaluating the reasonableness of significant assumptions used by management, including the engineering costs to design the machine and the material, labor, and overhead manufacturing costs to build the machine and considering the factors that can affect the accuracy of those estimates. Evaluating the reasonableness of significant assumptions used involved assessing management's ability to reasonably estimate costs to complete contracts by testing management's process for evaluating the Company's ability to properly develop an estimate for costs to complete a contract, including reviewing similar completed contracts actual costs incurred and observing the progress of open contracts.

Clean Earth Acquisition - Fair Value of Intangible Assets

As described in Notes 1 and 3 to the consolidated financial statements, the Company completed the acquisition of Clean Earth for \$628 million of cash consideration in 2019, which resulted in \$242.2 million of intangible assets being recorded. As disclosed by management, the determination of fair value of assets acquired and liabilities assumed requires numerous estimates and assumptions with respect to the timing and amounts of cash flow projections, revenue growth rates, customer attrition rates, discount rates, and useful lives.

The principal considerations for our determination that performing procedures relating to the Clean Earth acquisition - fair value of intangible assets is a critical audit matter are (i) there was a high degree of auditor judgment and subjectivity in applying procedures relating to the fair value measurement of intangible assets acquired due to the significant judgment by management when developing the estimate, (ii) significant audit effort was required in evaluating the significant assumptions relating to the estimate, such as the timing and amounts of cash flow projections, revenue growth rates, customer attrition rates, discount rates, and useful lives, 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 the acquisition accounting, including controls over management's valuation of the intangible assets and controls over development of the assumptions related to the valuation of the intangible assets, including the estimates of the timing and amounts of cash flow projections, revenue growth rates, customer attrition rates, discount rates, and useful lives. These procedures also included, among others, (i) reading the purchase agreement, (ii) testing management's process for estimating the fair value of intangible assets, (iii) testing the completeness, accuracy, and relevance of underlying data used in the determination of the fair value of intangible assets, and (iv) testing management's cash flow projections used to estimate the fair value of the intangible assets. Testing management's process included evaluating the appropriateness of the valuation method and the reasonableness of significant assumptions, including the timing and amounts of cash flow projections, revenue growth rates, customer attrition rates, discount rates, and useful lives. Evaluating the reasonableness of the timing and amounts of cash flow projections, revenue growth rates, customer attrition rates, and useful lives involved considering the past performance of the acquired business, as well as economic and industry forecasts. The discount rate was evaluated by considering the cost of capital of comparable businesses and other industry factors. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's valuation method, including the discount rate.

/s/PricewaterhouseCoopers LLP
Philadelphia, Pennsylvania
February 21, 2020

We have served as the Company's auditor since at least 1933. We have not been able to determine the specific year we began serving as auditor of the Company.

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**HARSCO CORPORATION
CONSOLIDATED BALANCE SHEETS**

(In thousands, except share amounts)	December 31 2019	December 31 2018
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 57,259	\$ 64,260
Restricted cash	2,473	2,886
Trade accounts receivable, net	309,990	246,427
Insurance claim receivable	—	30,000
Other receivables	21,265	23,770
Inventories	156,991	116,185
Current portion of contract assets	31,166	12,130
Current portion of assets held-for-sale	22,093	75,232
Other current assets	51,575	34,144
Total current assets	652,812	605,034
Property, plant and equipment, net	561,786	432,793
Right-of-use assets, net	52,065	—
Goodwill	738,369	404,713
Intangible assets, net	299,082	69,207
Deferred income tax assets	14,288	48,551
Assets held-for-sale	32,029	55,331
Other assets	17,036	17,238
Total assets	\$ 2,367,467	\$ 1,632,867
LIABILITIES		
Current liabilities:		
Short-term borrowings	\$ 3,647	\$ 10,078
Current maturities of long-term debt	2,666	6,489
Accounts payable	176,755	124,984
Accrued compensation	37,992	50,201
Income taxes payable	18,692	2,634
Insurance liabilities	10,140	40,774
Current portion of advances on contracts	53,906	29,407
Current portion of operating lease liabilities	12,544	—
Current portion of liabilities of assets held-for-sale	11,344	39,410
Other current liabilities	137,208	113,019
Total current liabilities	464,894	416,996
Long-term debt	775,498	585,662
Insurance liabilities	18,515	19,575
Retirement plan liabilities	189,954	213,578
Advances on contracts	6,408	37,675
Operating lease liabilities	36,974	—
Liabilities of assets held-for-sale	12,152	555
Other liabilities	73,413	45,450
Total liabilities	1,577,808	1,319,491
COMMITMENTS AND CONTINGENCIES		
HARSCO CORPORATION STOCKHOLDERS' EQUITY		
Preferred stock, Series A junior participating cumulative preferred stock	—	—
Common stock, par value \$1.25 (issued 114,720,347 and 113,473,951 shares at December 31, 2019 and 2018, respectively)	143,400	141,842

Additional paid-in capital	200,595	190,597
Accumulated other comprehensive loss	(587,622)	(567,107)
Retained earnings	1,824,100	1,298,752
Treasury stock, at cost (36,205,589 and 33,928,928 shares at December 31, 2019 and 2018, respectively)	(838,893)	(795,821)
Total Harsco Corporation stockholders' equity	741,580	268,263
Noncontrolling interests	48,079	45,113
Total equity	789,659	313,376
Total liabilities and equity	\$ 2,367,467	\$ 1,632,867

See accompanying notes to consolidated financial statements.

HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS

	Years ended December 31		
(In thousands, except per share amounts)	2019	2018	2017
Revenues from continuing operations:			
Service revenues	\$ 1,081,473	\$ 955,464	\$ 934,282
Product revenues	<u>422,269</u>	392,208	373,188
Total revenues	<u>1,503,742</u>	1,347,672	1,307,470
Costs and expenses from continuing operations:			
Cost of services sold	839,156	745,748	737,499
Cost of products sold	<u>305,134</u>	266,792	260,347
Selling, general and administrative expenses	252,970	202,713	194,906
Research and development expenses	<u>4,824</u>	3,925	2,736
Other (income) expenses, net	<u>(2,621)</u>	(2,201)	7,327
Total costs and expenses	<u>1,399,463</u>	1,216,977	1,202,815
Operating income from continuing operations			
Interest income	1,975	2,155	2,469
Interest expense	<u>(36,586)</u>	(21,531)	(26,862)
Unused debt commitment and amendment fees	<u>(7,704)</u>	(1,127)	(2,265)
Defined benefit pension income (expense)	<u>(5,493)</u>	3,457	(2,595)
Income from continuing operations before income taxes and equity income	<u>56,471</u>	113,649	75,402
Income tax expense from continuing operations	<u>(20,214)</u>	(5,499)	(78,190)
Equity in income of unconsolidated entities, net	<u>273</u>	384	—
Income (loss) from continuing operations	<u>36,530</u>	108,534	(2,788)
Discontinued operations:			
Gain on sale of discontinued businesses	569,135	—	—
Income from discontinued businesses	<u>27,531</u>	43,942	20,379
Income tax expense from discontinued businesses	<u>(120,978)</u>	(7,463)	(5,747)
Income from discontinued operations, net of tax	<u>475,688</u>	36,479	14,632
Net income	<u>512,218</u>	145,013	11,844
Less: Net income attributable to noncontrolling interests	<u>(8,299)</u>	(7,956)	(4,022)
Net income attributable to Harsco Corporation	<u>\$ 503,919</u>	\$ 137,057	\$ 7,822
Amounts attributable to Harsco Corporation common stockholders:			
Income (loss) from continuing operations, net of tax	\$ 28,231	\$ 100,578	\$ (6,810)
Income from discontinued operations, net of tax	<u>475,688</u>	36,479	14,632
Net income attributable to Harsco Corporation common stockholders	<u>\$ 503,919</u>	\$ 137,057	\$ 7,822
Weighted average shares of common stock outstanding	79,632	80,716	80,553
Basic earnings (loss) per share attributable to Harsco Corporation common stockholders:			
Continuing operations	\$ 0.35	\$ 1.25	\$ (0.08)
Discontinued operations	<u>5.97</u>	0.45	0.18
Basic earnings per share attributable to Harsco Corporation common stockholders	<u>\$ 6.33</u> (a)	\$ 1.70	\$ 0.10
Diluted weighted average shares of common stock outstanding	81,375	83,595	80,553
Diluted earnings (loss) per share attributable to Harsco Corporation common stockholders:			
Continuing operations	\$ 0.35	\$ 1.20	\$ (0.08)
Discontinued operations	<u>5.85</u>	0.44	0.18
Diluted earnings per share attributable to Harsco Corporation common stockholders	<u>\$ 6.19</u> (a)	\$ 1.64	\$ 0.10

(a) Does not total due to rounding.

See accompanying notes to consolidated financial statements.

HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(In thousands)	Years ended December 31		
	2019	2018	2017
Net income	\$ 512,218	\$ 145,013	\$ 11,844
Other comprehensive income (loss):			
Foreign currency translation adjustments, net of deferred income taxes of \$2,507, \$(2,167) and \$3,471 in 2019, 2018 and 2017, respectively	15,498	(50,743)	36,011
Net gain (loss) on cash flow hedging instruments, net of deferred income taxes of \$1,438, \$(1,130) and \$(759) in 2019, 2018 and 2017, respectively	(5,106)	2,101	1,897
Pension liability adjustments, net of deferred income taxes of \$(3,244), \$854 and \$(4,084) in 2019, 2018 and 2017, respectively	(10,478)	27,185	25,254
Unrealized gain (loss) on marketable securities, net of deferred income taxes of \$(11), \$16 and \$(12) in 2019, 2018 and 2017, respectively	28	(48)	22
Total other comprehensive income (loss)	(58)	(21,505)	63,184
Total comprehensive income	512,160	123,508	75,028
Less: Comprehensive income attributable to noncontrolling interests	(7,327)	(5,454)	(7,068)
Comprehensive income attributable to Harsco Corporation	\$ 504,833	\$ 118,054	\$ 67,960

See accompanying notes to consolidated financial statements.

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HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)	Years ended December 31		
	2019	2018	2017
Cash flows from operating activities:			
Net income	\$ 512,218	\$ 145,013	\$ 11,844
Adjustments to reconcile net income to net cash provided (used) by operating activities:			
Depreciation	119,803	122,135	121,839
Amortization	18,592	10,650	8,098
Loss on early extinguishment of debt	5,314	—	—
Deferred income tax expense (benefit)	6,815	(6,522)	57,349
Equity income of unconsolidated entities, net	(273)	(384)	—
Dividends from unconsolidated entities	125	88	93
Gain on Sale from discontinued business	(569,135)	—	—
Other, net	1,764	2,666	749
Changes in assets and liabilities, net of acquisitions and dispositions of businesses:			
Accounts receivable	(3,464)	(16,881)	(32,012)
Insurance receivable	195,000	—	—
Inventories	(42,484)	(14,706)	19,557
Contract assets	(21,795)	(3,312)	—
Right-of-use-assets	15,164	—	—
Accounts payable	13,407	18,347	12,554
Accrued interest payable	14,723	(154)	438
Accrued compensation	(15,759)	(1,127)	11,126
Advances on contracts and other customer advances	(4,172)	3,057	(16,811)
Operating lease liabilities	(14,740)	—	—
Insurance liability	(195,000)	—	—
Income taxes payable - gain on sale of discontinued businesses	12,373	—	—
Retirement plan liabilities, net	(24,022)	(33,321)	(21,300)
Other assets and liabilities	(24,617)	(33,527)	3,368
Net cash provided (used) by operating activities	(163)	192,022	176,892
Cash flows from investing activities:			
Purchases of property, plant and equipment	(184,973)	(132,168)	(98,314)
Proceeds from sale of businesses	658,414	—	—
Purchase of businesses, net of cash acquired*	(623,495)	(56,389)	—
Proceeds from sales of assets	17,022	11,887	13,418
Expenditures for intangible assets	(1,311)	—	—
Purchase of equity method investment	(2,364)	—	—
Payments for interest rate swap terminations	(2,758)	—	—
Net proceeds (payments) from settlement of foreign currency forward exchange contracts	7,273	15,527	(18,429)
Net cash used by investing activities	(132,192)	(161,143)	(103,325)
Cash flows from financing activities:			
Short-term borrowings, net	(5,398)	1,932	5,061
Current maturities and long-term debt:			
Additions	848,314	128,858	27,985
Reductions	(661,620)	(116,988)	(108,280)
Dividends paid to noncontrolling interests	(4,712)	(5,480)	(2,445)
Sale (purchase) of noncontrolling interests	4,026	477	(3,412)
Stock-based compensation - Employee taxes paid	(11,234)	(3,730)	(1,688)

Common stock acquired for treasury	(31,838)	(30,011)	—
Deferred financing costs	(11,272)	(596)	(42)
Other investing activities, net	(532)	—	(894)
Net cash provided (used) by financing activities	125,734	(25,538)	(83,715)
Effect of exchange rate changes on cash, including restricted cash	(793)	(4,404)	4,478
Net increase (decrease) in cash and cash equivalents, including restricted cash	(7,414)	937	(5,670)
Cash and cash equivalents, including restricted cash, at beginning of period	67,146	66,209	71,879
Cash and cash equivalents, including restricted cash, at end of period	\$ 59,732	\$ 67,146	\$ 66,209

HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS (Continued)

(In thousands)	Years ended December 31		
	2019	2018	2017
Supplementary cash flow information:			
Change in accrual for purchases of property, plant and equipment included in accounts payable	\$ <u>5,164</u>	\$ <u>7,567</u>	\$ <u>(666)</u>
*Purchase of businesses, net of cash acquired			
Working capital	\$ <u>(26,663)</u>	\$ <u>1,295</u>	\$ <u>—</u>
Property, plant and equipment	(77,295)	(3,327)	—
Goodwill	(330,230)	(22,518)	—
Long-term debt acquired	605	335	—
Other noncurrent assets and liabilities, net	(189,912)	(32,174)	—
Net cash used to acquire businesses	\$ <u>(623,495)</u>	\$ <u>(56,389)</u>	\$ <u>—</u>

See accompanying notes to consolidated financial statements.

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HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

(In thousands, except share and per share amounts)	Common Stock		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Noncontrolling Interests	Total
	Issued	Treasury					
Balances, January 1, 2017	\$ 140,625	\$ (760,391)	\$ 172,101	\$ 1,150,688	\$ (606,722)	\$ 41,262	\$ 137,563
Adoption of new accounting standard			1,106	(709)			397
Net income				7,822		4,022	11,844
Cash dividends declared:							
Noncontrolling interests						(2,445)	(2,445)
Total other comprehensive income, net of deferred income taxes of \$(1,384)					60,140	3,044	63,184
Purchase of subsidiary shares from noncontrolling interest			(2,242)			(1,194)	(3,436)
Sale of investment in consolidated subsidiary						25	25
Stock appreciation rights exercised, net 8,965 shares	16	(63)	(16)				(63)
Vesting of restricted stock units and other stock grants, net 269,924 shares	469	(1,625)	(469)				(1,625)
Amortization of unearned stock-based compensation, net of forfeitures			9,721				9,721
Balances, December 31, 2017	141,110	(762,079)	180,201	1,157,801	(546,582)	44,714	215,165
Adoption of new accounting standard				3,894	(1,520)		2,374
Net income				137,057		7,956	145,013
Cash dividends declared:							
Noncontrolling interests						(5,534)	(5,534)
Total other comprehensive loss, net of deferred income taxes of \$(2,427)					(19,005)	(2,500)	(21,505)
Purchase of subsidiary shares from noncontrolling interest						477	477
Stock appreciation rights exercised, net 28,109 shares	50	(282)	(50)				(282)
Vesting of restricted stock units and other stock grants, net 384,134 shares	682	(3,449)	(682)				(3,449)
Treasury shares repurchased, 1,321,072 shares		(30,011)					(30,011)
Amortization of unearned stock-based compensation, net of forfeitures			11,128				11,128
Balances, December 31, 2018	141,842	(795,821)	190,597	1,298,752	(567,107)	45,113	313,376
Adoption of new accounting standard (See Note 2)				21,429	(21,429)		—
Net income				503,919		8,299	512,218
Cash dividends declared:							
Noncontrolling interests						(4,693)	(4,693)
Total other comprehensive income (loss), net of deferred income taxes of \$690					914	(972)	(58)
Sale of noncontrolling interest						4,026	4,026
Strategic venture exit						(3,694)	(3,694)
Stock appreciation rights exercised, net 11,246 shares	20	(117)	(20)				(117)
Vesting of restricted stock units and other stock grants, net 196,102 shares	402	(2,882)	(402)				(2,882)
Vesting of performance share units, net 529,213 shares	1,136	(8,235)	(1,149)				(8,248)
Treasury shares repurchased, 1,766,826 shares		(31,838)					(31,838)
Amortization of unearned stock-based compensation, net of forfeitures			11,569				11,569
Balances, December 31, 2019	<u>\$ 143,400</u>	<u>\$ (838,893)</u>	<u>\$ 200,595</u>	<u>\$ 1,824,100</u>	<u>\$ (587,622)</u>	<u>\$ 48,079</u>	<u>\$ 789,659</u>

See accompanying notes to consolidated financial statements.

HARSCO CORPORATION

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Summary of Significant Accounting Policies

Consolidation

The consolidated financial statements include all accounts of Harsco Corporation (the "Company"), all entities in which the Company has a controlling voting interest and variable interest entities required to be consolidated in accordance with generally accepted accounting principles in the U.S. ("U.S. GAAP"). Intercompany accounts and transactions have been eliminated among consolidated entities. The Company's management has evaluated all activity of the Company and concluded that subsequent events are properly reflected in the Company's consolidated financial statements and notes as required by U.S. GAAP.

Reclassifications

Certain reclassifications have been made to prior year amounts to conform with current year classifications.

Cash and Cash Equivalents

Cash and cash equivalents include cash on hand, demand deposits and short-term investments that are highly liquid in nature and have an original maturity of three months or less.

Restricted Cash

The Company had restricted cash of \$2.5 million and \$2.9 million at December 31, 2019 and December 31, 2018, respectively, and the restrictions are primarily related to collateral provided for certain guarantees of the Company's performance.

Inventories

Inventories in the U.S. are principally accounted for using the last-in, first-out ("LIFO") method and are stated at the lower of cost or market. The Company's remaining inventories are accounted for using the first-in, first-out ("FIFO") or average cost methods and are stated at the lower of cost or net realizable value. See Note 4, Accounts Receivable and Inventories, for additional information.

Depreciation

Property, plant and equipment is recorded at cost and depreciated over the estimated useful lives of the assets using, principally, the straight-line method. When property, plant and equipment is retired from service, the cost of the retirement is charged to the allowance for depreciation to the extent of the accumulated depreciation and the balance is charged to income. Long-lived assets to be disposed of by sale are not depreciated while they are classified as held-for-sale.

Leases

The Company leases certain property and equipment under noncancelable lease agreements. The Company determines if a contract or arrangement contains a lease at inception. All leases are evaluated and classified as either an operating or finance lease. A lease is classified as a finance lease if any of the following criteria are met: (i) ownership of the underlying asset transfers to the Company by the end of the lease term; (ii) the lease contains an option to purchase the underlying asset that the Company is reasonably expected to exercise; (iii) the lease term is for a major part of the remaining economic life of the underlying asset; (iv) the present value of the sum of lease payments and any residual value guaranteed by the Company equals or exceeds substantially all of the fair value of the underlying asset; or (v) the underlying asset is of a specialized nature that it is expected to have no alternative use to the lessor at the end of the lease term. A lease that does not meet any of the criteria to be classified as a finance lease is classified as an operating lease.

Operating leases are included as Right-of-use assets, net, Current portion of operating lease liabilities, and Operating lease liabilities on the Company's Condensed Consolidated Balance Sheets. Right-of-use ("ROU") assets and operating lease liabilities are recognized based on the present value of the future lease payments over the lease term at the commencement date. As most of the Company's leases do not provide an implicit rate for use in determining the present value of future payments, the Company uses an incremental borrowing rate. This incremental borrowing rate reflects the creditworthiness of the Company for a lending period commensurate to the term of the lease and the standard lending practices related to such loans in the respective jurisdiction where the underlying assets are located. ROU assets also include any lease payments made and exclude any lease incentives and initial direct costs incurred. Lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. Lease expense for minimum lease payments is recognized on a straight-line basis over the lease term, including rent abatement periods and rent holidays. Certain of the Company's leases are subject to annual changes in an index or are subject to adjustments for which the amounts are not readily

determinable at lease inception. While lease liabilities are not remeasured as a result of changes to these costs, changes are treated as variable lease payments and recognized in the period in which the obligation for those payments was incurred.

Finance leases are included as Property, plant and equipment, net; Current maturities of long-term debt and Long-term debt on the Company's Condensed Consolidated Balance Sheets. Finance lease costs are split between depreciation expense related to the asset and interest expense on the lease liability, using the effective rate charged by the lessor.

The Company has lease agreements with both lease and non-lease components, which the Company has elected to account for as a single lease component. Additionally, the Company has elected not to record short-term leases, those with expected terms of twelve months or less, on the Company's Condensed Consolidated Balance Sheets. Certain lease agreements include fixed escalations, while others include rental payments adjusted periodically for inflation. See Note 2, Recently Adopted and Recently Issued Accounting Standards; Note 7, Debt and Credit Agreements; and Note 8, Leases, for additional information on leases.

Business Combinations and Goodwill

The Company accounts for business combinations using the acquisition method of accounting, which requires that once control is obtained, all assets acquired and liabilities assumed, including amounts attributable to noncontrolling interests, be recorded at their respective fair values at the date of acquisition. The excess of purchase price over the fair values of identifiable assets and liabilities is recorded as goodwill. The determination of fair value of assets acquired and liabilities assumed requires numerous estimates and assumptions with respect to the timing and amounts of cash flow projections, revenue growth rates, customer attrition rates, discount rates and useful lives. Such estimates are based upon assumptions believed to be reasonable, and when appropriate, include assistance from independent third-party valuation firms. During the measurement period, which is up to one year from the acquisition date, the Company may record adjustments to the assets acquired and liabilities assumed, with corresponding offsets to goodwill.

In accordance with U.S. GAAP, goodwill is not amortized and is tested for impairment at least annually or more frequently if indicators of impairment exist or if a decision is made to dispose of a business. Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment for which discrete financial information is available. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include declining cash flows or operating losses at the reporting unit level, a significant adverse change in legal factors or in the business climate, an adverse action or assessment by a regulator, unanticipated competition, a loss of key personnel or a more likely than not expectation that a reporting unit or a significant portion of a reporting unit will be sold or otherwise disposed of, among others.

In applying the goodwill impairment test, the Company has the option to perform a qualitative test ("Step 0") or a quantitative test ("Step 1"). Under Step 0, the Company assesses qualitative factors to determine whether it is more likely than not that the fair value of the reporting units is less than its carrying value. Qualitative factors may include, but are not limited to, economic conditions, industry and market considerations, cost factors, overall financial performance of the reporting unit, and other entity and reporting unit specific events. If after assessing these qualitative factors, the Company determines it is "more-likely-than-not" that the fair value of the reporting unit is less than the carrying value, the Company would perform Step 1.

The Step 1 approach of testing for goodwill impairment involves comparing the current fair value of each reporting unit to the net book value, including goodwill. The Company uses a discounted cash flow model ("DCF model") to estimate the current fair value of reporting units, as management believes forecasted operating cash flows are the best indicator of current fair value. A number of significant assumptions and estimates are involved in the preparation of DCF models including future revenues and operating margin growth, the weighted-average cost of capital ("WACC"), tax rates, capital spending, pension funding, the impact of business initiatives and working capital projections. These assumptions and estimates may vary significantly among reporting units. DCF models are based on approved long-range plans for the early years and historical relationships and projections for later years. WACC rates are derived from internal and external factors including, but not limited to, the average market price of the Company's stock, shares outstanding, book value of the Company's debt, the long-term risk-free interest rate, and both market and size-specific risk premiums. Due to the many variables noted above and the relative size of the Company's goodwill, differences in assumptions may have a material impact on the results of the Company's annual goodwill impairment testing. If the net book value of a reporting unit were to exceed the current fair value, the second step of the goodwill impairment test ("Step 2") would currently be required to determine if an impairment existed and the amount of goodwill impairment to record, if any.

Step 2 compares the net book value of a reporting unit's goodwill with the implied fair value of that goodwill. The implied fair value of goodwill represents the excess of fair value of the reporting unit over the fair value amounts assigned to all of the assets and liabilities of the reporting unit if it were to be acquired in a hypothetical business combination and the current fair

value of the reporting unit represented the purchase price. As necessary, the Company may use independent third-party valuation firms to assist with the Step 2 assessment. See Note 6, Goodwill and Other Intangible Assets, for additional information.

Long-Lived Assets Impairments (Other than Goodwill)

Long-lived assets (or asset groups) are reviewed for impairment when events and circumstances indicate that the carrying amount of an asset (or asset group) may not be recoverable. Long-lived assets (or asset groups) are reviewed for impairment when events and circumstances indicate the book value of an asset (or asset group) may be impaired. The Company's policy is to determine if an impairment loss exists when it is determined that the carrying amount of the asset (or asset group) exceeds the sum of the expected undiscounted future cash flows resulting from use of the asset (or asset group) and its eventual disposition. Impairment losses are measured as the amount by which the carrying amount of the asset (or asset group) exceeds its fair value, normally as determined in either open market transactions or through the use of a DCF model. Long-lived assets (or asset groups) to be disposed of are reported at the lower of the carrying amount or fair value less cost to sell. See Note 17, Other (Income) Expenses, Net for additional information.

Deferred Financing Costs

The Company has incurred debt issuance costs which are recognized as a reduction of Long-term debt on the Consolidated Balance Sheets. Debt issuance costs are amortized and recognized as interest expense over the contractual term of the related indebtedness or shorter period if appropriate based upon contractual terms. Whenever indebtedness is modified from its original terms, an evaluation is made whether an accounting modification or extinguishment has occurred in order to determine the accounting treatment for debt issuance costs related to the debt modification.

Revenue Recognition

The Company recognizes revenues to depict the transfer of promised services and products to customers in an amount that reflects the consideration the Company expects to receive in exchange for those services or products. Service revenues include the Harsco Clean Earth Segment and the service components of the Harsco Environmental and Harsco Rail Segments. Product revenues include portions of Harsco Environmental and Harsco Rail Segments.

Harsco Environmental - This Segment provides on-site services, under long-term contracts, for material logistics; product quality improvement and resource recovery from iron, steel and metals manufacturing; manufactures and sells industrial abrasives and roofing granule products; and manufactures aluminum dross and scrap processing systems.

- Service revenues are recognized over time as the customer simultaneously receives the benefits provided by the Company's performance. The Company utilizes an output method based on work performed (liquid steel tons processed, weight of material handled, etc.) to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contractual terms, which may include both fixed and variable portions. The fixed portion is recognized as earned (normally monthly) over the contractual period. The variable portion is recognized as services are performed and differs based on the volume of services performed. Given the long-term nature of these arrangements, most contracts permit periodic adjustment of either the variable or both the fixed and variable portions based on the changes in macroeconomic indicators, including changes in commodity prices. Transaction prices, when the standalone selling price is not directly observable, are allocated to performance obligations utilizing an expected cost plus a margin approach. Amounts are typically billed and payable on a monthly basis as services are performed.
- Product revenues are recognized at the point when control transfers to the customer. Control generally transfers at the point of shipment for domestic orders and in accordance with the international commercial terms included in contracts for export sales. Transaction prices are based on contractual terms, which are generally fixed and when the standalone selling price is not directly observable, allocated to performance obligations utilizing an adjusted market assessment approach. Amounts are billed and payable upon completion of each transaction.
- Product revenues in the aluminum dross and scrap process systems business are generally recognized over time as control is transferred to the customer. Control transfers over time because aluminum dross and scrap systems are customized, have no alternate use and the Company has an enforceable right to payment. The Company utilizes an input method based on costs incurred ("cost-to-cost method") to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contractual terms, which are generally fixed, and when the standalone selling price is not directly observable, allocated to performance obligations utilizing an adjusted market assessment approach. The Company may receive periodic payments associated with key milestones with any remaining consideration billed and payable upon completion of the transaction.

Harsco Clean Earth - This Segment provides specialty waste processing and beneficial reuse solutions for hazardous wastes, contaminated materials and dredged volumes.

- Revenues are recognized over time as the customer simultaneously receives the benefits provided by the Company's performance. The Company utilizes an output method based on the amount of materials received for processing to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contractual terms which are generally fixed for hazardous waste and contaminated materials and which is variable (based on volumes) for dredged material. Fixed amounts are recognized as earned over the contractual period and variable amounts are recognized as services are performed and differ based on the volume of services performed. Transaction prices, when the standalone selling price is not directly observable, are allocated to performance obligations utilizing an expected cost plus a margin approach. Amounts are typically billed and payable on a monthly basis.

Harsco Rail - This Segment sells railway track maintenance equipment, after-market parts, Protran/safety equipment and provides railway track maintenance services.

- For the majority of railway track maintenance equipment sales, revenue is recognized at the point when control transfers to the customer. Control generally transfers at the point of shipment for domestic orders and in accordance with the international commercial terms included in contracts for export sales. In certain railway track maintenance equipment sales, revenue is recognized over time because such equipment is highly customized, has no alternate use and the Company has an enforceable right to payment. The Harsco Rail Segment uses the cost-to-cost method to measure progress because it is the measure that best depicts the transfer of control to the customer, which occurs as the Harsco Rail Segment incurs costs under the contracts. Under the cost-to-cost method, the extent of progress towards completion is based on the ratio of costs incurred to total estimated costs at completion which includes both actual costs already incurred and the estimated costs to complete. Accounting for contracts with customers using the cost-to-cost method requires significant judgment relative to assessing risks, estimating contract revenues (including estimates of variable consideration, if applicable), estimating contract costs (including estimating any liquidating damages or penalties related to performance, engineering costs to design the machine and the material, labor and overhead manufacturing costs to build the machine); making assumptions for schedule and technical items; properly executing the engineering and design phases consistent with customer expectations; the availability and costs of labor and material resources; productivity; and evaluating whether a significant financing component is present. Due to the number of years it may take to complete certain contracts and the scope and nature of the work required to be performed on those contracts, primarily in the Harsco Rail Segment, estimating total revenues and costs at completion is inherently complicated and subject to many variables. Transaction prices are based on contracted terms, which are generally fixed, and when the standalone selling price is not directly observable, allocated to performance obligations utilizing either the adjusted market assessment or expected cost plus a margin approach. For certain transactions, the Company receives periodic payments associated with key milestones. In limited instances, those payments are intended to provide financing with such transactions being treated as including a significant financing component. Any remaining consideration is billed and payable upon completion of the transaction.
- For after-market parts sales and safety equipment, revenue is recognized at the point when control transfers to the customer. Control generally transfer to the customer at the point of shipment for domestic orders and in accordance with the international commercial terms included in contracts for export sales. Transaction prices are based on contracted terms, which are generally fixed, and when the standalone selling price is not directly observable, allocated to performance obligations utilizing an adjusted market assessment approach. Amounts are billed and payable upon completion of each contract.
- For railway track maintenance services, revenue is recognized over time as the customer simultaneously receives the benefits provided by the Company's performance. The Company utilizes an appropriate output method based on work performed (feet, miles, shifts worked, etc.) to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contracted terms, which are generally variable. The variable portion is recognized as services are performed and differs based on the value of services. Given the long-term nature of these arrangements, most contracts permit periodic adjustment based on the changes in macroeconomic indicators. Transaction prices, when the standalone selling price is not directly observable, are allocated to performance obligations utilizing an expected cost plus a margin approach. Amounts are typically billed and payable on a monthly basis as services are performed.

The Company has elected to utilize the following practical expedients on an ongoing basis:

- The Company has not adjusted the promised amount of consideration for the effects of a significant financing component if the Company expects, at contract inception, that the period between when the Company transfers the promised good or services to the customer and when the customer pays for that good or service would be one year or less; and
- The Company has elected to exclude disclosures related to unsatisfied performance obligations where the related contract has a duration of one year or less; or where the consideration is entirely variable. Accordingly, the Company's disclosure related to unsatisfied performance obligations is limited to the railway track maintenance equipment in the Harsco Rail Segment and the fixed portion of fees related to metals services in the Harsco Environmental Segment.

Taxes assessed by governmental authorities that are both imposed on and concurrent with a specific revenue-producing transaction, that are collected by the Company from a customer, are excluded from revenue. Additionally, in certain contracts, the Company facilitates shipping and handling activities after control has transferred to the customer. The Company has elected to record all shipping and handling activities as costs to fulfill a contract. In situations where the shipping and handling costs have not been incurred at the time revenue is recognized, the respective shipping and handling costs are accrued.

On January 1, 2018, the Company adopted changes, with subsequent amendments, issued by the Financial Accounting Standards Board ("FASB") related to the recognition of revenue from contracts with customers. The Company chose to implement the impact of the FASB changes utilizing the modified retrospective method. Comparative information has not been restated and continues to be reported under U.S. GAAP in effect for those periods (2017).

Income Taxes

The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of the events that have been included in the consolidated financial statements. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial statements and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period that includes the enactment date.

The Company records deferred tax assets to the extent that the Company believes that these assets will more likely than not be realized. In making such determinations, the Company considers all available positive and negative evidence, including future reversals of existing deferred tax liabilities, projected future taxable income, tax planning strategies and recent financial results. In the event the Company was to determine that it would be able to realize deferred income tax assets in the future in excess of their net recorded amount, an adjustment to the valuation allowance would be made that would reduce the provision for income taxes.

The Company prepares and files tax returns based on interpretation of tax laws and regulations and records its provision for income taxes based on these interpretations. Uncertainties may exist in estimating the Company's tax provisions and in filing tax returns in the many jurisdictions in which the Company operates, and as a result these interpretations may give rise to an uncertain tax position. The tax benefit from an uncertain tax position is recognized when it is more likely than not that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, based on its technical merits. Each subsequent period the Company determines if existing or new uncertain tax positions meet a more likely than not recognition threshold and adjust accordingly.

The Company recognizes interest and penalties related to unrecognized tax benefits within Income tax expense in the accompanying Consolidated Statements of Operations. Accrued interest and penalties are included in Other liabilities on the Consolidated Balance Sheets.

The significant assumptions and estimates described in the preceding paragraphs are important contributors to the effective tax rate each year.

See Note 10, Income Taxes, for additional information.

Accrued Insurance and Loss Reserves

The Company retains a significant portion of the risk for U.S. workers' compensation, U.K. employers' liability, automobile, general and product liability losses. During 2019, 2018 and 2017, the Company recorded insurance expense from continuing operations related to these lines of coverage of \$15.4 million, \$13.5 million and \$16.0 million, respectively. Reserves have been recorded that reflect the undiscounted estimated liabilities including claims incurred but not reported. When a recognized liability is covered by third-party insurance, the Company records an insurance claim receivable to reflect the covered liability. Changes in the estimates of the reserves are included in net income (loss) in the period determined. During 2019, 2018 and 2017, the Company recorded insurance reserve adjustments that decreased pre-tax insurance expense from continuing operations for self-insured programs by \$1.5 million, \$2.0 million and \$1.5 million, respectively. At December 31, 2019 and 2018, the Company has recorded liabilities of \$28.7 million and \$60.3 million, respectively, related to both asserted as well as unasserted insurance claims. Included in the balances at December 31, 2019 and 2018 were \$3.7 million and \$34.2 million, respectively, of recognized liabilities covered by insurance carriers. Amounts estimated to be paid within one year have been included in current caption, Insurance liabilities, with the remainder included in non-current caption, Insurance liabilities, on the Consolidated Balance Sheets.

Warranties

The Company provides for warranties of certain products as they are sold. The following table summarizes the warranty activity for 2019, 2018 and 2017:

(In thousands)	2019	2018	2017
Warranty reserves, beginning of the year	\$ 5,243	\$ 5,486	\$ 6,001
Accruals for warranties issued during the year	4,134	3,837	4,533
Reductions related to pre-existing warranties	(2,748)	(3,320)	(3,428)
Acquisitions (See Note 3)	—	249	—
Warranties paid	(649)	(942)	(1,637)
Other (principally foreign currency translation)	(60)	(67)	17
Warranty reserves, end of the year	<u>\$ 5,920</u>	<u>\$ 5,243</u>	<u>\$ 5,486</u>

Warranty expense and payments are incurred principally in the Harsco Rail Segment. Warranty activity may vary from year to year depending upon the mix of revenues and contractual terms related to product warranties.

Foreign Currency Translation

The financial statements of the Company's subsidiaries outside the U.S., except for those subsidiaries located in highly inflationary economies and those entities for which the U.S. dollar is the currency of the primary economic environment in which the entity operates, are measured using the local currency as the functional currency. Assets and liabilities of these subsidiaries are translated at the exchange rates at the balance sheet date. Resulting translation adjustments are recorded in the cumulative translation adjustment account, a separate component of Accumulated other comprehensive loss on the Consolidated Balance Sheets. Income and expense items are translated at average monthly exchange rates. Gains and losses from foreign currency transactions are included in Operating income from continuing operations. For subsidiaries operating in highly inflationary economies, and those entities for which the U.S. dollar is the currency of the primary economic environment in which the entity operates, gains and losses on foreign currency transactions and balance sheet translation adjustments are included in Operating income from continuing operations.

Financial Instruments and Hedging

The Company has operations throughout the world that are exposed to fluctuations in related foreign currencies in the normal course of business. The Company seeks to reduce exposure to foreign currency fluctuations through the use of forward exchange contracts. The Company does not hold or issue financial instruments for trading purposes and it is the Company's policy to prohibit the use of derivatives for speculative purposes. The Company has a Foreign Currency Risk Management Committee that meets periodically to monitor foreign currency risks.

The Company executes foreign currency exchange forward contracts to hedge transactions for firm purchase commitments, to hedge variable cash flows of forecasted transactions and for export sales denominated in foreign currencies. These contracts are generally for 90 days or less; however, where appropriate, longer-term contracts may be utilized. For those contracts that are designated as qualified cash flow hedges, gains or losses are recorded in Accumulated other comprehensive loss on the Consolidated Balance Sheets.

The Company uses interest rate swaps in conjunction with certain debt issuances in order to secure a fixed interest rate. The interest rate swaps are recorded on the Consolidated Balance Sheets at fair value, with changes in value attributed to the effect of the swaps' interest spread and changes in the credit worthiness of the counter-parties recorded in Accumulated other comprehensive loss.

Amounts recorded in Accumulated other comprehensive loss on the Consolidated Balance Sheets are reclassified into operations in the same period or periods during which the hedged forecasted transaction affects income. The cash flows from these contracts are classified consistent with the cash flows from the transaction being hedged (e.g., the cash flows related to contracts to hedge the purchase of fixed assets are included in cash flows from investing activities, etc.). The Company also enters into certain forward exchange contracts that are not designated as hedges. Gains and losses on these contracts are recognized in operations based on changes in fair market value. For fair value hedges of a firm commitment, the gain or loss on the derivative and the offsetting gain or loss on the hedged firm commitment are recognized currently in operations.

See Note 14, Financial Instruments, for additional information.

Earnings Per Share

Basic earnings per share are calculated using the weighted-average shares of common stock outstanding, while diluted earnings per share reflect the dilutive effects of stock-based compensation. Dilutive securities are not included in the computation of loss per share when the Company reports a net loss from continuing operations as the impact would be anti-dilutive. All share and per share amounts are restated for any stock splits and stock dividends that occur prior to the issuance of the financial statements. See Note 12, Capital Stock, for additional information.

Use of Estimates in the Preparation of Financial Statements

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses. Actual results could differ from those estimates.

2. Recently Adopted and Recently Issued Accounting Standards

The following accounting standards have been adopted in 2019:

On January 1, 2019, the Company adopted changes issued by the FASB related to accounting for leases. The changes introduce a lessee model that brings most leases onto the balance sheet. The changes also align many of the underlying principles of the new lessor model with those in the FASB's new revenue recognition standard. Furthermore, the changes address other concerns related to the current lease model such as eliminating the requirement in current guidance for an entity to use bright-line tests in determining lease classification. The changes also require lessors to increase the transparency of their exposure to changes in value of their residual assets and how they manage that exposure. The Company elected the package of practical expedients permitted under the transition, which among other items, allowed the carry forward of the historical lease classification. The Company has elected to apply the transition requirements at the January 1, 2019 effective date and therefore, comparative information has not been restated and continues to be reported under U.S. GAAP in effect for those periods. The changes had a significant impact on the Consolidated Balance Sheets upon adoption and the Company recorded ROU assets and lease liabilities of \$34.0 million and \$34.2 million, respectively. The difference between the ROU assets and lease liabilities was recorded primarily as adjustments to other assets and liabilities where prepaid rent and deferred expenses were previously recorded. Additionally, the Company's accounting for finance leases remained consistent. The changes did not have an impact on the Company's Consolidated Statements of Operations or Consolidated Statements of Cash Flows. The discount rates used to calculate the ROU assets and lease liabilities as of the effective date were based on the remaining lease terms as of the effective date. See Note 8, Leases, for additional information.

On January 1, 2019, the Company adopted changes issued by the FASB which expand and refine hedge accounting for both financial and non-financial risk components, aligns the recognition and presentation of the effects of hedging instruments and hedged items in the financial statements and includes certain targeted improvements to ease the application of current guidance related to the assessment of hedge effectiveness. Upon adoption, the Company's recognition model for the excluded component was modified from a mark-to-market approach to an amortization approach for hedging relationships. Hedging relationships entered into on or after January 1, 2019 will be under the amortization approach while those entered into before January 1, 2019 will continue to be recognized under the mark-to-market approach. As such, there was no effect of applying this election reflected as an adjustment to Accumulated other comprehensive loss with a corresponding adjustment to the

opening balance of Retained earnings. Presentation and disclosure amendments are required to be applied prospectively. Other than required expanded disclosures, the adoption of these changes did not have a material impact on the Company's consolidated financial statements.

On January 1, 2019, the Company adopted changes issued by the FASB which allow entities to reclassify stranded income tax effects resulting from the Tax Cuts and Jobs Act (the "Tax Act") from accumulated other comprehensive income to retained earnings in the consolidated financial statements. Under the Tax Act, deferred taxes were adjusted to reflect the reduction of the historical corporate income tax rate to the newly enacted corporate income tax rate, which left the tax effects on items within accumulated other comprehensive income stranded at historical tax rates. The adoption of these changes resulted in the Company reclassifying approximately \$21 million of stranded income tax effects into Retained earnings.

The following accounting standards have been issued and become effective for the Company at a future date:

In June 2016, the FASB issued changes, as amended, which update the impairment model by requiring entities to use a forward-looking approach based on expected losses rather than incurred losses to estimate credit losses on certain types of financial instruments, including trade receivables. This may result in the earlier recognition of allowances for losses. The changes become effective for the Company on January 1, 2020. Other than required expanded disclosures, the adoption of these changes will not have a material impact on the Company's consolidated financial statements.

In January 2017, the FASB issued changes that remove Step 2 of the annual goodwill impairment test, which requires a hypothetical purchase price allocation. The changes provide that the amount of goodwill impairment will be equal to the amount by which a reporting unit's carrying value exceeds its fair value, not to exceed the carrying amount of goodwill. All other goodwill impairment guidance remains largely unchanged. The same one-step impairment test will be applied to goodwill at all reporting units, even those with zero or negative carrying amounts. Entities will be required to disclose the amount of goodwill at reporting units with zero or negative carrying amounts. The changes become effective for the Company on January 1, 2020. Management has determined that these changes will not have a material impact on the Company's consolidated financial statements. However, should the Company be required to record a goodwill impairment charge in future periods, the amount recorded may differ compared to any amounts that might be recorded under current practice.

In August 2018, the FASB issued changes which modify the disclosure requirements for fair value measurements. The amendments in this update remove the requirement to disclose the amount of, and reasons for, transfers between Level 1 and Level 2 of the fair value hierarchy; the policy for timing of transfers between levels; and the valuation processes for Level 3 fair value measurements. The changes require disclosure of changes in unrealized gains and losses for the period included in other comprehensive income (loss) for recurring Level 3 fair value measurements held at the end of the reporting period and the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements. The changes become effective for the Company on January 1, 2020. Other than required expanded disclosures, the adoption of these changes will not have a material impact on the Company's consolidated financial statements.

In August 2018, the FASB issued changes which modify the disclosure requirements for employers that sponsor defined benefit pension or other post-retirement plans. The changes remove the requirements to disclose: amounts in accumulated other comprehensive income (loss) expected to be recognized as components of net periodic benefit cost over the next fiscal year; the amount and timing of plan assets expected to be returned to the employer and the effects of a one-percentage point change in assumed health care cost trend rates. The update also requires disclosure of an explanation of the reasons for significant gains and losses related to changes in the benefit obligation for the period. The changes become effective for the Company on January 1, 2021. Management does not believe these changes will have a material impact on its consolidated financial statements.

In December 2019, the FASB issued changes which are intended to reduce complexity and simplify the accounting for income taxes in accordance with U.S. GAAP by removing certain exceptions related to investments, intraperiod allocations and interim calculations and clarifying existing guidance to improve consistent application. The changes become effective for the Company on January 1, 2021, with early adoption permitted. Management is currently evaluating the impact of these changes on its consolidated financial statements.

3. Acquisitions and Dispositions

Clean Earth

On June 28, 2019, the Company acquired 100% of the outstanding stock of Clean Earth, one of the largest U.S. providers of specialty waste processing and beneficial reuse solutions for hazardous wastes, contaminated materials and dredged volumes, for an enterprise valuation of approximately \$625 million on a cash free, debt free basis, subject to normal working capital adjustments. The Company transferred approximately \$628 million of cash consideration and agreed to reimburse the sellers for any usage of assumed net operating losses in a post-closing period for up to five years, the present value of which is estimated at approximately \$8 million. Clean Earth provides solutions that analyze, treat, document and recycle waste streams generated by multiple end-markets such as infrastructure, chemicals, aerospace and defense, non-public/private development, medical, industrial and dredging. Clean Earth treatment processes include thermal desorption, dredged material stabilization, bioremediation, physical treatment/screen and chemical fixation. Clean Earth operates 27 permitted facilities in the U.S. and maintains a portfolio of more than 200 permits with a 100% permit renewal success rate to date. In addition, Clean Earth owns 9 Resource Conservation and Recovery Act (RCRA) Part B Permits which include 6 Treatment, Storage and Disposal Facility (TSDF) permits that enable the Company to process complex and highly recurring hazardous waste streams.

The fair value recorded for the assets acquired and liabilities assumed for Clean Earth is as follows:

(In millions)	Preliminary Valuation		
	June 28, 2019	Measurement Period Adjustments (a)	December 31 2019
Cash and cash equivalents (b)	\$ 42.8	\$ (39.2)	\$ 3.6
Trade accounts receivable, net	63.7	(1.2)	62.5
Other receivables	0.8	1.3	2.1
Other current assets	8.7	(1.4)	7.3
Property, plant and equipment	75.6	1.7	77.3
Right-of-use assets	14.4	11.4	25.8
Goodwill	313.8	16.4	330.2
Intangible assets	261.1	(18.9)	242.2
Other assets	4.0	(3.0)	1.0
Accounts payable	(23.0)	(0.1)	(23.1)
Acquisition consideration payable (b)	(39.2)	39.2	—
Other current liabilities	(18.0)	(1.3)	(19.3)
Net deferred taxes liabilities	(51.2)	5.4	(45.8)
Operating lease liabilities	(11.1)	(8.4)	(19.5)
Other liabilities	(6.5)	(2.1)	(8.6)
Total identifiable net assets of Clean Earth	\$ 635.9	\$ (0.2)	\$ 635.7

(a) The measurement period adjustments did not have a material impact on the Company's previously reported operating results.

(b) Acquisition consideration payable represents a portion of the cash consideration not paid out until July 2019.

The goodwill is attributable to strategic benefits, including enhanced operational and financial scale, as well as product and market diversification that the Company expects to realize. The Company expects \$16.3 million of goodwill to be deductible for income tax purposes through 2033.

The following table details the preliminary valuation of identifiable intangible assets and amortization periods for Clean Earth:

(Dollars in millions)	Weighted-Average Amortization Period	Preliminary Valuation		
		Preliminary Valuation June 28, 2019	Measurement Period Adjustments (c)	December 31 2019
Permits	18 years	\$ 176.1	\$ (6.0)	\$ 170.1
Customer relationships and backlog	7.5 years	33.4	(12.9)	20.5
Air rights	Usage based (d)	25.6	—	25.6
Trade names	11.5 years	26.0	—	26.0
Total identifiable intangible assets of Clean Earth		\$ 261.1	\$ (18.9)	\$ 242.2

(c) The measurement period adjustments did not have a material impact on the Company's previously reported operating results.

(d) The Company estimates that based on current usage that the expected useful life would be 26.5 years.

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The Company valued the identifiable intangible assets using an income-based approach that utilized either the multi-period excess earnings method or the relief from royalty method. The purchase price allocation for Clean Earth is not final, primarily due to certain tax related matters, and the fair value of intangible assets and goodwill may vary from those reflected in the Company's consolidated financial statements at December 31, 2019.

The year ended December 31, 2019 include Clean Earth direct acquisition costs of \$15.2 million which are included in Selling, general and administrative expenses in the Company's Consolidated Statements of Operations. In addition to the acquisition costs reflected in the Company's Consolidated Statements of Operations, the debt issuance costs associated with the issuance of debt to fund the acquisition are reflected, net of amortization subsequent to the acquisition date, as Long-term debt on the Company's Consolidated Balance Sheets. See Note 7, Debt and Credit Agreements, for additional information.

Included in the liabilities acquired was a contingent consideration liability resulting from a prior Clean Earth acquisition. Any changes in the fair value of contingent consideration related to updated assumptions and estimates will be recognized on the Consolidated Statements of Operations during the period in which the change occurs. The following table reflects the changes in the fair value of contingent consideration which occurred since acquisition:

(In thousands)	2019
Balance at June 28, 2019	\$ 3,100
Payment	(525)
Fair value adjustment	825
Balance at end of year	\$ 3,400

The pro forma information below gives effect to the Clean Earth acquisition as if it had been completed on January 1, 2018. The pro forma information is not necessarily indicative of the Company's results of operations had the acquisition been completed on the above date, nor is it necessarily indicative of future results. The pro forma information does not reflect any cost savings from operating efficiencies or synergies that could result from the acquisition and does not reflect the additional revenue opportunities following the acquisition. The pro forma information below includes adjustments to reflect additional depreciation and amortization expense based on the estimated fair value and useful lives of intangible assets and fixed assets acquired; includes additional interest expense of approximately \$18 million for the year ended December 31, 2019 and approximately \$36 million for the year ended December 31, 2018 on the acquisition related borrowings used to finance the Clean Earth acquisition and excludes certain directly attributable transaction costs and historic Clean Earth interest expense. The values assigned to the assets acquired and liabilities assumed are based on preliminary valuations and are subject to change as the Company obtains additional information during the measurement period.

(In millions)	Year Ended December 31	
	2019	2018
Pro forma revenues	\$ 1,635.9	\$ 1,614.6
Pro forma net income (including discontinued operations) (e)	517.6	116.1

(e) Pro forma net income for 2019 includes a \$453.6 million after-tax gain on the sale of AXC and PK.

Altek

In May 2018, the Company acquired Altek Europe Holdings Limited and its affiliated entities (collectively, "Altek"), a U.K.-based manufacturer of market-leading products that enable aluminum producers and recyclers to manage and efficiently extract value from critical byproduct streams, reduce byproduct generation and improve operating productivity. The Company acquired Altek, on a debt and cash free basis, for a purchase price of £45 million (approximately \$60 million) in cash, with the potential for up to £25 million (approximately \$33 million) in additional contingent consideration through 2021 subject to the future financial performance of Altek. The cash consideration transferred included payments of \$57.4 million, inclusive of normal working capital adjustments. In addition, the Company recognized contingent consideration with an initial fair value of \$12.1 million as of the acquisition date. Altek's revenues and operating results have been included in the results of the Harsco Environmental Segment. Inclusion of pro forma financial information for this transaction is not necessary as the acquisition is immaterial to the Company's results of operations.

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The fair value recorded for the assets acquired and liabilities assumed for Altek is as follows:

(In millions)	Final Valuation		
	June 30 2018	Measurement Period Adjustments (f)	March 31 2019
Cash and cash equivalents	\$ 1.7	\$ —	\$ 1.7
Net working capital	(1.5)	0.2	(1.3)
Property, plant and equipment	3.3	—	3.3
Intangible assets	52.5	0.2	52.7
Goodwill	20.9	1.6	22.5
Net deferred tax liabilities	(8.5)	—	(8.5)
Other liabilities	(0.3)	—	(0.3)
Total identifiable net assets of Altek	\$ 68.1	\$ 2.0	\$ 70.1

(f) The measurement period adjustments did not have a material impact on the Company's previously reported operating results.

The initial fair value of contingent consideration was estimated using a probability simulation model which uses assumptions and estimates to forecast a range of outcomes for the contingent consideration. Key inputs to the model include projected earnings before interest, tax, depreciation and amortization; the discount rate; the projection risk neutralization rate; and volatility, which are Level 3 data. The Company will continue to assess these assumptions and estimates on a quarterly basis as additional data impacting the assumptions is obtained. Any changes in the fair value of contingent consideration related to updated assumptions and estimates will be recognized on the Consolidated Statements of Operations during the period in which the change occurs. The following table reflects the changes in the fair value of contingent consideration:

(In thousands)	2019	2018
Balance at beginning of year	\$ 8,420	\$ —
Recognition of contingent consideration	—	10,097
Measurement period adjustment (g)	—	1,958
Fair value adjustment (h)	(8,506)	(2,939)
Foreign currency translation	86	(696)
Balance at end of year	\$ —	\$ 8,420

(g) Measurement period adjustment was recorded to goodwill on the Consolidated Balance Sheet.

(h) The fair value adjustment resulted from the decreased probability of Altek achieving cumulative financial and non-financial performance goals within the required time frame. This amount is recorded in Other expenses, net on the Consolidated Statements of Operations.

Harsco Industrial Segment

In May 2019, the Company announced the intent to divest the businesses that comprised the Harsco Industrial Segment; Harsco Industrial Air-X-Changers ("AXC"), Harsco Industrial IKG ("IKG") and Harsco Industrial Patterson-Kelley ("PK"). These disposals represent a strategic shift and accelerate the transformation of the Company's portfolio of businesses into a leading provider of environmental solutions and services. In July 2019, the Company sold AXC for \$600 million in cash and recognized a gain on sale of \$527.9 million pre-tax (or approximately \$421 million after-tax). In November 2019, the Company sold PK for approximately \$60 million in cash and recognized a gain on sale of \$41.2 million pre-tax (or approximately \$33 million after-tax). These gains have been recorded in the Consolidated Statements of Operations as discontinued operations for the year ended December 31, 2019. In January 2020, the Company sold IKG for \$85 million in cash and notes, subject to post-closing adjustments.

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The former Harsco Industrial Segment's balance sheet positions as of December 31, 2019 and December 31, 2018 are presented as Assets held-for-sale and Liabilities of assets held-for-sale in the Company's Consolidated Balance Sheets and are summarized as follows:

(in thousands)	December 31, 2019(i)	December 31 2018
Trade accounts receivable, net	\$ 10,982	\$ 44,786
Other receivables	78	412
Inventories	9,838	16,926
Current portion of contract assets	—	12,124
Other current assets	655	984
Property, plant and equipment, net	20,703	37,107
Right-of-use assets, net	11,230	—
Goodwill	—	6,839
Intangible assets, net	—	10,618
Deferred income tax assets	—	563
Other assets	96	204
Total assets	\$ 53,582	\$ 130,563
Accounts payable	\$ 5,060	\$ 24,426
Accrued compensation	2,324	7,385
Current portion of advances on contracts	1,168	1,910
Current portion of operating lease liabilities	1,575	—
Other current liabilities	1,218	5,689
Operating lease liabilities	9,837	—
Other liabilities	2,314	555
Total liabilities	\$ 23,496	\$ 39,965

(i) The decrease from December 31, 2018 is primarily related to the sale of AXC and PK.

The Harsco Industrial Segment has historically been a separate reportable segment with primary operations in North America and Latin America. In accordance with U.S. GAAP, the results of the former Harsco Industrial Segment are presented as discontinued operations and, as such, have been excluded from both continuing operations and segment results for the years ended December 31, 2019, 2018, and 2017. Certain key selected financial information included in net income from discontinued operations for the former Harsco Industrial Segment is as follows:

(In millions)	Years ended December 31		
	2019	2018	2017
Amounts directly attributable to the former Harsco Industrial Segment:			
Total revenues	\$ 306,972	\$ 374,707	\$ 299,592
Cost of products sold	224,811	276,198	225,163
Gain on sale from discontinued businesses	569,135	—	—
Income from discontinued business	27,823	43,593	20,049
Additional amounts allocated to the former Harsco Industrial Segment:			
Selling, general and administrative expenses (j)	\$ 8,429	\$ —	\$ —
Interest expense (k)	11,237	16,613	20,689
Loss on early extinguishment of debt (l)	5,314	—	—

(j) The Company has allocated directly attributable transaction costs to discontinued operations.

(k) The Company has allocated interest expense, including a portion of the amount reclassified into income for the Company's interest rate swaps, amortization of deferred financing costs, and \$2.7 million related to interest rate swap terminations which occurred during the year ended December 31, 2019, all of which were directly attributed with the mandatory repayment of the Company's Term Loan Facility, resulting from the AXC disposal, as part of discontinued operations.

(l) The Company has allocated the \$5.3 million write-off of deferred financing costs to discontinued operations as it is directly attributed to the mandatory repayment of the Term Loan Facility that resulted from the AXC disposal.

The Company has retained corporate overhead expenses previously allocated to the Harsco Industrial Segment of \$4.0 million, \$5.6 million and \$5.6 million in 2019, 2018, and 2017, respectively, as part of Selling, general and administrative expenses on the Consolidated Statements of Operations.

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The following is selected financial information included on the Consolidated Statements of Cash Flows attributable to the former Harsco Industrial Segment:

(In millions)	Years Ended December 31		
	2019	2018	2017
Non-cash operating items			
Depreciation and amortization	\$ 3,301	\$ 7,729	\$ 7,360
Cash flows from investing activities			
Purchases of property, plant and equipment	8,372	7,561	6,895

4. Accounts Receivable and Inventories

Accounts receivable consist of the following:

(In thousands)	December 31	
	2019	2018
Trade accounts receivable	\$ 323,502	\$ 251,013
Less: Allowance for doubtful accounts	(13,512)	(4,586)
Trade accounts receivable, net	\$ 309,990	\$ 246,427
Insurance claim receivable (a)	\$ —	\$ 30,000
Other receivables (b)	\$ 21,265	\$ 23,770

(a) Relates to the Lima Refinery litigation. See Note 11, Commitments and Contingencies, for additional information.

(b) Other receivables include employee receivables, tax claim receivables and other miscellaneous receivables not included in Trade accounts receivable, net.

The provision for doubtful accounts related to trade accounts receivable was as follows:

(In thousands)	Years Ended December 31		
	2019	2018	2017
Provision for doubtful accounts related to trade accounts receivable	\$ 7,507	\$ 380	\$ 5,211

The increase in the provision for doubtful accounts for the year ended 2019 primarily resulted from a provision for doubtful accounts in the Harsco Environmental Segment related to a customer in the U.K. entering administration. The Company continues to provide services to the customer and continues to collect on post-administration invoices timely while the customer seeks a buyer for their operations. Depending on the outcome of any potential transactions, there could be an impact on the Company's results of operations, cash flows and asset valuations in the future, which may be material in any one period. The provision for doubtful accounts for the year ended 2017 relates principally to the write-off of certain pre-administration receivable balances for one of the Company's customers in Australia in the Harsco Environmental Segment.

Inventories consist of the following:

(In thousands)	December 31	
	2019	2018
Finished goods	\$ 14,550	\$ 11,892
Work-in-process	13,088	20,839
Raw materials and purchased parts	104,488	61,547
Stores and supplies	24,865	21,907
Total inventories	\$ 156,991	\$ 116,185
Valued at lower of cost or market:		
LIFO basis	\$ 101,465	\$ 66,650
FIFO basis	7,473	5,719
Average cost basis	48,053	43,816
Total inventories	\$ 156,991	\$ 116,185

Inventories valued on the LIFO basis at both December 31, 2019 and 2018 were approximately \$23 million less than the amounts of such inventories valued at current costs. During 2018 and 2017 as a result of reducing certain inventory quantities valued on a

LIFO basis, net income (loss) was favorably impacted compared to that which would have been recorded under the FIFO basis of valuation by \$0.6 million and \$0.4 million, respectively. There was no impact during 2019.

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The Company recognized an initial estimated forward loss provision related to the contracts with the federal railway system of Switzerland ("SBB") of \$45.1 million for the year ended December 31, 2016. The Company recorded an additional forward loss provision of \$1.8 million for the year ended December 31, 2018. At December 31, 2019, the entire remaining estimated forward loss provision of \$6.4 million is included in the caption Other current liabilities on the Consolidated Balance Sheets. The estimated forward loss provision represents the Company's best estimate based on currently available information. It is possible that the Company's overall estimate of costs to complete these contracts may increase, which would result in an additional estimated forward loss provision at such time.

The Company recognized \$23.4 million and \$24.2 million of revenues for the contracts with SBB, on an over time basis, utilizing a cost-to-cost method for the years ended December 31, 2019 and 2018, respectively. In addition, for the year ended December 31, 2017 \$42.5 million of revenue based on the percentage-of-completion (units-of-delivery) method of accounting, whereby revenues and estimated average costs of the units to be produced under the contracts are recognized as deliveries are made or accepted. The Company has substantially completed the first contract and is approximately 42% complete on the second contract with SBB as of December 31, 2019.

5. Property, Plant and Equipment

Property, plant and equipment consist of the following:

(In thousands)	Estimated Useful Lives	December 31 2019	December 31 2018
Land	—	\$ 30,409	\$ 10,143
Land improvements	5-20 years	19,155	15,961
Buildings and improvements (a)	5-40 years	182,795	163,037
Machinery and equipment	3-20 years	1,518,652	1,470,620
Uncompleted construction	—	55,592	36,968
Gross property, plant and equipment		1,806,603	1,696,729
Less: Accumulated depreciation		(1,244,817)	(1,263,936)
Property, plant and equipment, net		\$ 561,786	\$ 432,793

(a) Buildings and improvements include leasehold improvements that are amortized over the shorter of their useful lives or the initial term of the lease.

6. Goodwill and Other Intangible Assets

Goodwill by Segment

The following table reflects the changes in carrying amounts of goodwill by segment for the years ended December 31, 2019 and 2018:

(In thousands)	Harsco Environmental Segment	Harsco Clean Earth Segment	Harsco Rail Segment	Consolidated Totals
Balance at December 31, 2017	\$ 381,893	\$ —	\$ 13,026	\$ 394,919
Changes to goodwill (a)	22,518	—	—	22,518
Foreign currency translation	(12,724)	—	—	(12,724)
Balance at December 31, 2018	391,687	—	13,026	404,713
Changes to goodwill (b)	—	330,230	—	330,230
Foreign currency translation	3,426	—	—	3,426
Balance at December 31, 2019	\$ 395,113	\$ 330,230	\$ 13,026	\$ 738,369

(a) Changes to goodwill in the Harsco Environmental Segment relate to the acquisition of Altek. See Note 3, Acquisitions and Dispositions.

(b) The changes to goodwill related to the acquisition of Clean Earth. See Note 3, Acquisitions and Dispositions.

The Company's methodology for determining reporting unit fair value is described in Note 1, Summary of Significant Accounting Policies. Performance of the Company's 2019 annual impairment test did not result in impairment of any of the Company's reporting units.

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Intangible Assets

Intangible assets totaled \$299.1 million, net of accumulated amortization of \$113.6 million at December 31, 2019 and \$69.2 million, net of accumulated amortization of \$101.4 million at December 31, 2018. The following table reflects these intangible assets by major category:

(In thousands)	December 31, 2019		December 31, 2018	
	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Customer related	\$ 143,996	\$ 99,327	\$ 122,378	\$ 93,577
Permits	170,322	4,694	—	—
Technology related	36,467	5,635	35,831	2,681
Trade names	31,719	2,182	5,565	682
Air rights	26,139	411	—	—
Patents	249	168	2,598	2,503
Other	3,765	1,158	4,214	1,936
Total	<u>\$ 412,657</u>	<u>\$ 113,575</u>	<u>\$ 170,586</u>	<u>\$ 101,379</u>

Amortization expense for intangible assets was \$15.5 million, \$5.9 million and \$3.3 million for 2019, 2018 and 2017, respectively. The following table shows the estimated amortization expense for the next five fiscal years based on current intangible assets.

(In thousands)	2020	2021	2022	2023	2024
Estimated amortization expense (a)	\$ 23,500	\$ 22,400	\$ 22,000	\$ 22,000	\$ 22,000

(a) These estimated amortization expense amounts do not reflect the potential effect of future foreign currency exchange rate fluctuations.

7. Debt and Credit Agreements

The Company's long-term debt consists of the following:

(In thousands)	December 31		December 31 2018
	2019	2020	
Senior Secured Credit Facilities (a):			
Term Loan Facility with an interest rate of 4.1% and 4.8% at December 31, 2019 and 2018, respectively	\$ 218,188	\$ 541,788	
Revolving Credit Facility with an average interest rate of 5.0% and 4.6% at December 31, 2019 and 2018, respectively	67,000	62,000	
5.75% notes due July 31, 2027	500,000	—	
Other financing payable (including capital leases) in varying amounts due principally through 2020 with a weighted-average interest rate of 3.9% at December 31, 2019 and 2018.	9,827	1,606	
Total debt obligations	795,015	605,394	
Less: deferred financing costs	(16,851)	(13,243)	
Total debt obligations, net of deferred financing costs	778,164	592,151	
Less: current maturities of long-term debt	(2,666)	(6,489)	
Long-term debt	\$ 775,498	\$ 585,662	

(a) All amounts related to the Senior Secured Credit Facilities were reflected as Long-term debt at December 31, 2019. The current portion of long-term debt related to the Senior Secured Credit Facilities was \$5.4 million with the remainder reflected as Long-term debt at December 31, 2018.

The maturities of long-term debt for the four years following December 31, 2020 are as follows:

(In thousands)	
2021	\$ 2,191
2022	1,956
2023	1,846
2024	286,354

Cash payments for interest on debt were \$27.6 million, \$34.2 million and \$44.3 million in 2019, 2018 and 2017, respectively.

Senior Secured Credit Facilities

The Company's Senior Secured Credit Facilities are comprised of a Term Loan Facility and a Revolving Credit Facility.

In December 2017, the Company amended the Credit Agreement governing the Senior Secured Credit Facilities (the "Credit Agreement") to, among other things, reduce the interest rate applicable to the Term Loan Facility, improve certain covenants and extend the maturity date by a year until December 2024. As a result of this amendment, a charge of \$2.3 million was recorded during the fourth quarter of 2017 consisting principally of fees associated with the transaction and the write-off of unamortized deferred financing costs and is reflected in the operating activities section of the Consolidated Statements of Cash Flows as part of Net income.

In June 2018, the Company amended the Credit Agreement to, among other things, reduce the interest rate applicable to the Term Loan Facility and to increase the limit of the Revolving Credit Facility. A charge of \$1.1 million was recorded during 2018 consisting principally of fees associated with the transaction and the write-off of unamortized deferred financing costs.

In June 2019, the Company amended the Credit Agreement to, among other things, increase the borrowing capacity of the Revolving Credit Facility by \$200 million to a total of \$700 million, extend the maturity date of the Revolving Credit Facility until June 2024 and increase the maximum net debt to consolidated adjusted earnings before interest, tax, depreciation and amortization ratio from 3.5 to 4.5, which decreases to 4.0 for the second quarter of 2020 and periods thereafter. As of December 31, 2019, \$1.0 million of expenses were recognized related to the amended Credit Agreement. The Company has capitalized \$2.6 million of fees related to the amendment of the Revolving Credit Facility.

The Credit Agreement imposes certain restrictions including, but not limited to, restrictions as to types and amounts of debt or liens that may be incurred by the Company; limitations on increases in dividend payments; limitations on repurchases of the Company's stock and limitations on certain acquisitions by the Company.

The Credit Agreement contains a consolidated net debt to consolidated adjusted earnings before interest, tax, depreciation and amortization ("EBITDA") ratio covenant, which is not to exceed 4.5 to 1.0, as of December 31, 2019, and a minimum consolidated adjusted EBITDA to consolidated interest charges ratio covenant, which is not to be less than 3.0 to 1.0. At December 31, 2019, the Company was in compliance with these and all other covenants.

With respect to the Senior Secured Credit Facilities, the obligations of the Company are guaranteed by substantially all of the Company's current and future wholly-owned domestic subsidiaries ("Guarantors"). All obligations under the Senior Credit Facility, and the guarantees of those obligations, are secured, subject to certain exceptions, by substantially all of the Company's assets and the assets of the Guarantors.

Term Loan Facility

Borrowings under the Term Loan Facility bear interest at a rate per annum of 225 basis points over the adjusted LIBOR rate, subject to a 1% floor, as defined in the Credit Agreement. The Term Loan Facility matures on December 8, 2024.

The Credit Agreement requires certain mandatory prepayments of the Term Loan Facility, subject to certain exceptions, based on net cash proceeds of certain sales or distributions of assets, as well as certain casualty and condemnation events, in some cases subject to reinvestment rights and certain other exceptions; net cash proceeds of any issuance of debt, excluded permitted debt issuances; and a percentage of excess cash flow, as defined by the Credit Agreement, during a fiscal year.

In July 2019, the Company made a prepayment of \$320.9 million on the \$550 million Term Loan Facility, using proceeds from the sale of AXC. The remainder of the proceeds from the sale were used to pay down the Revolving Credit Facility. As a result of this prepayment, the Company wrote off \$5.3 million of previously recorded deferred financing costs on the Condensed Consolidated Statement of Operations as discontinued operations for the year ended December 31, 2019. The prepayment satisfied all future quarterly principal payment requirements under the Term Loan Facility; the remaining principal is due at maturity.

Revolving Credit Facility

Borrowings under the \$700 million Revolving Credit Facility bear interest at a rate per annum ranging from 50 to 125 basis points over the base rate or 150 to 225 basis points over the adjusted London Interbank Offered Rate ("LIBOR") as defined in the Credit Agreement, subject to a 0% floor. Any principal amount outstanding under the Revolving Credit Facility is due and payable on the maturity of the Revolving Credit Facility. The Revolving Credit Facility matures on June 28, 2024.

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The following table illustrates the amount outstanding under the Revolving Credit Facility and available credit at December 31, 2019.

(In thousands)	December 31, 2019			
	Facility Limit	Outstanding Balance	Outstanding Letters of Credit	Available Credit
Revolving Credit Facility (a U.S.-based program)	\$ 700,000	\$ 67,000	\$ 25,352	\$ 607,648

5.75% Notes due July 31, 2027

During June 2019, the Company completed a private placement of \$500.0 million principal amount of senior unsecured notes (the "Notes"). The Notes are due July 31, 2027 and bear interest at a fixed rate of 5.75%, which is payable on January 31 and July 31 of each year, beginning on January 31, 2020. The Notes are fully and unconditionally guaranteed, jointly and severally, by all of the wholly owned domestic subsidiaries of the Company that guarantee the Senior Secured Credit Facilities. The indenture governing the Notes contains provisions that (i) allow the Company to redeem some or all of the Notes prior to maturity; (ii) require the Company to offer to repurchase all of the Notes upon a change in control; and (iii) require adherence to certain covenants which are generally less restrictive than those included in the Company's Credit Agreement. The Notes were used, together with borrowings under the Company's Revolving Credit Facility, to fund the acquisition of Clean Earth. See Note 3, Acquisitions and Dispositions, for additional information. The Company has capitalized \$9.0 million of fees related to the issuance of the Notes.

Other

In addition, during the second quarter of 2019, the Company recognized \$6.7 million of expenses for fees and other costs related to bridge financing commitments that the Company arranged in the event that the Notes were not issued prior to the acquisition of Clean Earth. Because the Notes were issued prior to completion of the Clean Earth acquisition, the bridge financing commitments were not utilized.

Short-term borrowings amounted to \$3.6 million and \$10.1 million at December 31, 2019 and 2018, respectively. At December 31, 2019 and 2018, Short-term borrowings consist primarily of bank overdrafts and other third-party debt. The weighted-average interest rate for short-term borrowings at December 31, 2019 and 2018 was 5.6% and 3.0%, respectively.

8. Leases

The components of lease expense were as follows:

(In thousands)	Year Ended December 31 2019	
	Amortization expense	Interest on lease liabilities
Finance leases:		
Amortization expense	\$ 1,234	
Interest on lease liabilities		50
Operating leases		16,083
Short-term leases		22,281
Variable lease expense		1,189
Sublease income		(198)
Total lease expense from continuing operations		\$ 40,639

Supplemental cash flow information related to leases was as follows:

(In thousands)	Year Ended December 31 2019	
	Cash paid for amounts included in the measurement of lease liabilities:	Right-of-use assets obtained in exchange for lease obligations:
Cash flows from operating activities - Operating leases	\$ 15,143	
Cash flows from financing activities - Finance leases		1,317
Operating leases (a)	\$ 65,525	
Finance leases		2,658

- (a) Includes ROU assets of approximately \$34 million that were recorded upon adoption at January 1, 2019 and \$25.8 million that were recorded upon the acquisition of Clean Earth. See Note 2, Recently Adopted and Recently Issued Accounting Standards, and Note 3, Acquisitions and Dispositions, for additional information.

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Supplemental balance sheet information related to leases was as follows:

(In thousands)	December 31 2019	
Operating Leases:		
Operating lease right-of-use assets	\$	52,065
Current portion of operating lease liabilities		12,544
Operating lease liabilities		36,974
Finance Leases:		
Property, plant and equipment, net	\$	3,519
Current maturities of long-term debt		1,237
Long-term debt		2,218

Supplemental additional information related to leases is as follows:

(In thousands)	December 31 2019	
Other information:		
Weighted average remaining lease term - Operating leases (in years)	11.57	
Weighted average remaining lease term - Finance leases (in years)	4.01	
Weighted average discount rate - Operating leases	6.3%	
Weighted average discount rate - Finance leases	4.2%	

Maturities of lease liabilities were as follows:

(In thousand)	Operating Leases	Finance Leases
Year Ending December 31st:		
2020	\$ 15,045	\$ 1,360
2021	11,159	908
2022	7,166	655
2023	5,044	477
2024	2,991	312
After 2024	31,932	3
Total lease payments	73,337	3,715
Less: Imputed interest	(23,819)	(260)
Total	\$ 49,518	\$ 3,455

As previously disclosed, under then in effect lease accounting in accordance with U.S. GAAP, future minimum payments under operating leases with noncancelable terms were as follows as of December 31, 2018:

(In thousands)	2019	\$ 10,761
	2020	8,938
	2021	6,235
	2022	4,602
	2023	3,083
After 2023		17,170

The Company's leases, excluding short-term leases, have remaining terms of less than one year to 30.8 years, some of which include options to extend for up to 10 years, and some of which include options to terminate within one year. As of December 31, 2019, the Company had no material operating leases that had not yet commenced. There are no material residual value guarantees or material restrictive covenants in any of the Company's leases.

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9. Employee Benefit Plans

Pension Benefits

The Company has defined benefit pension plans covering a substantial number of employees. The defined benefits for salaried employees generally are based on years of service and the employee's level of compensation during specified periods of employment. Defined benefit pension plans covering hourly employees generally provide benefits of stated amounts for each year of service. The multiemployer pension plans ("MEPPs"), in which the Company participates, provide benefits to certain unionized employees. The Company's funding policy for qualified plans is consistent with statutory regulations and customarily equals the amount deducted for income tax purposes. Periodic voluntary contributions are made, as recommended, by the Company's Pension Committee.

For most U.S. defined benefit pension plans and a majority of international defined benefit pension plans, accrued service is no longer granted. In place of these plans, the Company has established defined contribution plans providing for the Company to contribute a specified matching amount for participating employees' contributions to the plan. For U.S. employees, this match is made on employee contributions up to 4% of eligible compensation. Additionally, the Company may provide a discretionary contribution for eligible employees. There have been no discretionary contributions provided for the years 2019, 2018 and 2017. For non-U.S. employees, this match is up to 6% of eligible compensation with an additional 2% going towards insurance and administrative costs.

NPPC for U.S. and international plans for 2019, 2018 and 2017 is as follows:

(In thousands)	U.S. Plans			International Plans		
	2019	2018	2017	2019	2018	2017
Defined benefit pension plans:						
Service cost	\$ 39	\$ 42	\$ 43	\$ 1,447	\$ 1,669	\$ 1,724
Interest cost	10,551	9,562	9,878	22,280	21,589	21,459
Expected return on plan assets	(10,297)	(12,068)	(10,485)	(37,430)	(42,685)	(40,469)
Recognized prior service costs	—	1	33	326	(140)	186
Recognized losses	5,585	5,207	5,701	14,345	14,807	16,283
Settlement/curtailment loss (gain)	129	285	—	19	(36)	(20)
Defined benefit pension plan cost (income)	6,007	3,029	5,170	987	(4,796)	(837)
Multiemployer pension plans	727	686	650	1,167	1,313	1,306
Defined contribution plans	4,178	3,466	3,021	6,031	5,608	5,905
Net periodic pension cost	\$ 10,912	\$ 7,181	\$ 8,841	\$ 8,185	\$ 2,125	\$ 6,374

The change in the financial status of the defined benefit pension plans and amounts recognized on the Consolidated Balance Sheets at December 31, 2019 and 2018 are as follows:

(In thousands)	U.S. Plans		International Plans	
	2019	2018	2019	2018
Change in benefit obligation:				
Benefit obligation at beginning of year	\$ 286,027	\$ 314,861	\$ 874,679	\$ 1,015,586
Service cost	39	42	1,447	1,669
Interest cost	10,551	9,562	22,280	21,589
Plan participants' contributions	—	—	36	49
Amendments	—	—	1,254	11,238
Actuarial (gain) loss	20,064	(21,474)	93,330	(78,658)
Settlements/curtailments	—	—	(343)	(313)
Benefits paid	(15,842)	(16,964)	(37,396)	(37,721)
Effect of foreign currency	—	—	33,010	(58,760)

Acquisitions/divestitures	(6,146)	—	(9)	—
Benefit obligation at end of year	\$ 294,693	\$ 286,027	\$ 988,288	\$ 874,679

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(In thousands)	U.S. Plans		International Plans	
	2019	2018	2019	2018
Change in plan assets:				
Fair value of plan assets at beginning of year	\$ 205,388	\$ 229,941	\$ 744,538	\$ 842,717
Actual return on plan assets	37,665	(17,883)	108,235	(30,004)
Employer contributions	8,306	10,294	21,121	18,415
Plan participants' contributions	—	—	36	49
Settlements/curtailments	—	—	(343)	(313)
Benefits paid	(15,842)	(16,964)	(37,217)	(37,570)
Effect of foreign currency	—	—	28,275	(48,756)
Acquisitions/divestitures	(9,249)	—	(9)	—
Fair value of plan assets at end of year	\$ 226,268	\$ 205,388	\$ 864,636	\$ 744,538
Funded status at end of year	\$ (68,425)	\$ (80,639)	\$ (123,652)	\$ (130,141)

Amounts recognized on the Consolidated Balance Sheets for defined benefit pension plans consist of the following at December 31, 2019 and 2018:

(In thousands)	U.S. Plans		International Plans			
	December 31	2019	2018	December 31	2019	2018
Noncurrent assets	\$ —	\$ 1,953	\$ 987	\$ 2,379		
Current liabilities	1,980	1,954	697	643		
Noncurrent liabilities	64,465	80,638	123,942	131,876		
Liabilities of assets held-for-sale	1,980	—	—	—		
Accumulated other comprehensive loss	133,806	149,326	415,781	391,849		

Amounts recognized in Accumulated other comprehensive loss, for defined benefit pension plans consist of the following at December 31, 2019 and 2018:

(In thousands)	U.S. Plans		International Plans	
	2019	2018	2019	2018
Net actuarial loss	\$ 133,806	\$ 149,326	\$ 408,709	\$ 384,666
Prior service cost	—	—	7,072	7,183
Total	\$ 133,806	\$ 149,326	\$ 415,781	\$ 391,849

The estimated amounts that will be amortized from Accumulated other comprehensive loss into defined benefit pension plan NPPC in 2020 are as follows:

(In thousands)	U.S. Plans		International Plans	
	2019	2018	2019	2018
Net actuarial loss	\$ 5,085	\$ 15,137		
Prior service cost	—	392		
Total	\$ 5,085	\$ 15,529		

The Company's estimate of expected contributions to be paid in 2020 for the U.S. and international defined benefit plans are \$11.2 million and \$22.4 million, respectively.

Future Benefit Payments

The expected benefit payments for defined benefit pension plans over the next ten years are as follows:

(In millions)	2020	2021	2022	2023	2024	2025-2029
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U.S. Plans	\$ 25.7	\$ 17.5	\$ 17.6	\$ 17.5	\$ 17.4	\$ 84.7
International Plans	38.9	39.8	40.2	41.3	42.1	224.8

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Net Periodic Pension Cost and Defined Benefit Pension Obligation Assumptions

The weighted-average actuarial assumptions used to determine the defined benefit pension plan NPPC for 2019, 2018 and 2017 were as follows:

	U.S. Plans December 31			International Plans December 31			Global Weighted-Average December 31		
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Discount rates	4.2%	3.5%	4.0%	2.9%	2.6%	2.8%	3.2%	2.8%	3.1%
Expected long-term rates of return on plan assets	7.3%	7.3%	7.3%	5.5%	5.6%	5.9%	5.9%	6.0%	6.2%

The expected long-term rates of return on defined benefit pension plan assets for the 2020 NPPC are 7.0% for the U.S. plans and 5.2% for the international plans. The expected global long-term rate of return on assets for 2020 is 5.6%.

The weighted-average actuarial assumptions used to determine the defined benefit pension plan obligations at December 31, 2019 and 2018 were as follows:

	U.S. Plans December 31		International Plans December 31		Global Weighted-Average December 31	
	2019	2018	2019	2018	2019	2018
Discount rates	3.2%	4.2%	2.1%	2.9%	2.4%	3.2%

Since accrued service is no longer granted to the U.S. defined benefit plans and the majority of the international defined benefit pension plans, the rate of compensation increase did not have a significant impact on the defined benefit pension obligation at December 31, 2019 and 2018 or the defined benefit pension plan NPPC for the years ended 2019, 2018 and 2017.

The U.S. discount rate was determined using a yield curve that was produced from a universe containing approximately 1,100 U.S. dollar-denominated, AA-graded corporate bonds, all of which were noncallable (or callable with make-whole provisions) and excluding the 10% of the bonds with the highest deviation from the expected yield and the 10% with the lowest deviation from the expected yield within each duration group. The discount rate was then developed as the level-equivalent rate that would produce the same present value as that using spot rates to discount the projected benefit payments. For international plans, the discount rate is aligned to corporate bond yields in the local markets, normally AA-rated corporations. The process and selection seek to approximate the cash inflows with the timing and amounts of the expected benefit payments.

Accumulated Benefit Obligation

The accumulated benefit obligation for all defined benefit pension plans at December 31, 2019 and 2018 was as follows:

(In millions)	U.S. Plans December 31		International Plans December 31	
	2019	2018	2019	2018
Accumulated benefit obligation	\$ 294.7	\$ 286.0	\$ 982.7	\$ 869.4

Defined Benefit Pension Plans with Accumulated Benefit Obligation in Excess of Plan Assets

The projected benefit obligation, accumulated benefit obligation and fair value of plan assets for defined benefit pension plans with accumulated benefit obligations in excess of plan assets at December 31, 2019 and 2018 were as follows:

(In millions)	U.S. Plans December 31		International Plans December 31	
	2019	2018	2019	2018
Projected benefit obligation	\$ 294.7	\$ 279.2	\$ 966.3	\$ 831.7
Accumulated benefit obligation	294.7	279.2	961.1	828.9
Fair value of plan assets	226.3	196.6	841.9	701.4

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The asset allocations attributable to the Company's U.S. defined benefit pension plans at December 31, 2019 and 2018, and the long-term target allocation of plan assets, by asset category, are as follows:

U.S. Plans Asset Category	Target Long-Term Allocation	Percentage of Plan Assets December 31	
		2019	2018
Domestic equity securities	26%-36%	30.8%	30.6%
International equity securities	20%-30%	25.3%	22.0%
Fixed income securities	31%-41%	34.8%	42.9%
Cash and cash equivalents	Less than 5%	0.8%	0.7%
Other (a)	4%-14%	8.3%	3.8%

(a) Investments within this caption include diversified global asset allocation funds and credit collection fund.

Defined benefit pension plan assets are allocated among various categories of equities, fixed income securities and cash and cash equivalents with professional investment managers whose performance is actively monitored. The primary investment objective is long-term growth of assets in order to meet present and future benefit obligations. The Company periodically conducts an asset/liability modeling study and accordingly adjusts investments among and within asset categories to ensure the long-term investment strategy is aligned with the profile of benefit obligations.

The Company reviews the long-term expected return on asset assumption on a periodic basis taking considering variety of factors including the historical investment returns achieved over a long-term period, the targeted allocation of plan assets and future expectations based on a model of asset returns for an actively managed portfolio. The model simulates 1,000 different capital market results over 20 years. The expected return-on-asset assumption for U.S. defined benefit pension plans for 2020 and 2019 are 7.0% and 7.3%, respectively.

The U.S. defined benefit pension plans' assets include 360,000 shares at December 31, 2019 and 450,000 shares at December 31, 2018 of the Company's common stock, valued at \$8.3 million and \$8.9 million, respectively. These shares represented 3.7% and 4.4% of total U.S. plan assets at December 31, 2019 and 2018, respectively.

The asset allocations attributable to the Company's international defined benefit pension plans at December 31, 2019 and 2018 and the long-term target allocation of plan assets, by asset category, are as follows:

International Plans Asset Category	Target Long-Term Allocation	Percentage of Plan Assets December 31	
		2019	2018
Equity securities	29.0%	31.6%	29.2%
Fixed income securities	50.0%	48.5%	50.7%
Cash and cash equivalents	—	0.3%	0.3%
Other (b)	21.0%	19.6%	19.8%

(b) Investments within this caption include diversified growth funds and real estate funds.

International defined benefit pension plan assets at December 31, 2019 in the U.K. defined benefit pension plan amounted to approximately 95% of the international defined benefit pension plan assets. The U.K. plan assets are allocated among various categories of equities, fixed income securities and cash and cash equivalents with professional investment managers whose performance is actively monitored. The primary investment objective is long-term growth of assets in order to meet present and future benefit obligations. The Company periodically conducts asset/liability modeling studies and accordingly adjusts investment amounts within asset categories to ensure the long-term investment strategy is aligned with the profile of benefit obligations.

For the international long-term rate of return assumption, the Company considered the current level of expected returns in risk-free investments (primarily government bonds); the historical level of the risk premium associated with other asset classes in which the portfolio is invested; and the expectations for future returns of each asset class and plan expenses. The expected return for each asset class was then weighted based on the target asset allocation to develop the expected long-term rate of return on assets. The expected return on asset assumption for the U.K. plan at December 31, 2019 is 5.2% and 5.5% at December 31, 2018. The remaining international defined benefit pension plans, with plan assets representing approximately 5% of the international defined benefit pension plan assets, are under the guidance of professional investment managers and have similar investment objectives.

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The fair values of the Company's U.S. defined benefit pension plans' assets at December 31, 2019 by asset class are as follows:

(In thousands)	Total	Level 1	Investments Valued at Net Asset Value (c)
Domestic equities:			
Common stocks	\$ 8,285	\$ 8,285	\$ —
Mutual funds—equities	61,346	61,346	—
International equities:			
Mutual funds—equities	57,188	57,188	—
Fixed income investments:			
Mutual funds—bonds	78,685	78,685	—
Other—mutual funds	8,764	8,764	—
Cash and money market accounts	1,816	1,816	—
Other—partnerships/joint ventures	10,184	—	10,184
Total	\$ 226,268	\$ 216,084	\$ 10,184

(c) Certain investments that are measured at fair value using the Net Asset Value per share (or its equivalent) as a practical expedient have not been classified in the fair value hierarchy.

The fair values of the Company's U.S. defined benefit pension plans' assets at December 31, 2018 by asset class are as follows:

(In thousands)	Total	Level 1	Investments Valued at Net Asset Value
Domestic equities:			
Common stocks	\$ 8,937	\$ 8,937	\$ —
Mutual funds—equities	54,002	54,002	—
International equities:			
Mutual funds—equities	45,195	45,195	—
Fixed income investments:			
Mutual funds—bonds	88,107	88,107	—
Other—mutual funds	7,703	7,703	—
Cash and money market accounts	1,444	1,444	—
Total	\$ 205,388	\$ 205,388	\$ —

The fair values of the Company's international defined benefit pension plans' assets at December 31, 2019 by asset class are as follows:

(In thousands)	Total	Level 1	Level 2
Equity securities:			
Mutual funds—equities	\$ 273,568	\$ —	\$ 273,568
Fixed income investments:			
Mutual funds—bonds	413,249	—	413,249
Insurance contracts	5,705	—	5,705
Other:			
Other mutual funds	169,886	—	169,886
Cash and money market accounts	2,228	2,228	—
Total	\$ 864,636	\$ 2,228	\$ 862,408

The fair values of the Company's international defined benefit pension plans' assets at December 31, 2018 by asset class are as follows:

(In thousands)	Total	Level 1	Level 2
Equity securities:			
Mutual funds—equities	\$ 217,321	\$ —	\$ 217,321

Fixed income investments:

Mutual funds—bonds	372,094	—	372,094
Insurance contracts	5,620	—	5,620
Other:			
Other mutual funds	147,313	—	147,313
Cash and money market accounts	2,190	2,190	—
Total	\$ 744,538	\$ 2,190	\$ 742,348

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Following is a description of the valuation methodologies used for the defined benefit pension plans' investments measured at fair value:

- Level 1 Fair Value Measurements—Investments in interest-bearing cash are stated at cost, which approximates fair value. The fair values of money market accounts and certain mutual funds are based on quoted net asset values of the shares held by the plan at year-end. The fair values of domestic and international stocks and corporate bonds, notes and convertible debentures are valued at the closing price reported in the active market on which the individual securities are traded.
- Level 2 Fair Value Measurements—The fair values of investments in mutual funds for which quoted net asset values in an active market are not available are valued by the investment advisor based on the current market values of the underlying assets of the mutual fund based on information reported by the investment consistent with audited financial statements of the mutual fund. Further information concerning these mutual funds may be obtained from their separate audited financial statements. Investments in U.S. Treasury notes and collateralized securities are valued based on yields currently available on comparable securities of issuers with similar credit ratings.

Multiemployer Pension Plans

The Company, through the Harsco Environmental Segment, contributes to several MEPPs under the terms of collective-bargaining agreements that cover union-represented employees, many of whom are temporary in nature. The Company's total contributions to MEPPs were \$1.9 million, \$2.0 million and \$2.0 million for the years ended December 31, 2019, 2018 and 2017, respectively.

10. Income Taxes

Current income tax expense represents the amounts expected to be reported on the Company's income tax returns, and deferred income tax expense or benefit represents the change in net deferred tax assets and liabilities. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities as measured by the enacted income tax rates that will be in effect when these differences reverse. Valuation allowances are recorded as appropriate to reduce deferred tax assets to the amount considered more likely than not to be realized.

On December 22, 2017, the Tax Act was signed into law. The Tax Act significantly changed U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system and imposing a repatriation tax on deemed repatriated earnings of foreign subsidiaries. The Tax Act permanently reduced the U.S. corporate income tax rate from a maximum of 35% to a 21% rate, effective January 1, 2018.

Included in the Tax Act were the global intangible low-taxed income ("GILTI") provisions. The Company elected to account for GILTI tax in the period in which it is incurred. The GILTI provisions require the Company to include in its U.S. income tax return foreign subsidiary earnings in excess of an allowable return on the foreign subsidiary's tangible assets.

Income (loss) from continuing operations before income taxes and equity income as reported on the Consolidated Statements of Operations consists of the following:

(In thousands)	2019	2018	2017
U.S.	\$ (13,934)	\$ 28,281	\$ (9,235)
International	70,405	85,368	84,637
Total income (loss) from continuing operations before income taxes and equity income	\$ 56,471	\$ 113,649	\$ 75,402

Income tax expense as reported on the Consolidated Statements of Operations consists of the following:

(In thousands)	2019	2018	2017
Income tax expense (benefit):			
Currently payable:			
U.S. federal	\$ 903	\$ (7)	\$ 654
U.S. state	233	177	54
International	23,775	17,127	19,763
Total income taxes currently payable	24,911	17,297	20,471
Deferred U.S. federal	(5,924)	1,854	46,372
Deferred U.S. state	(1,303)	(10,911)	1,121
Deferred international	2,530	(2,741)	10,226
Total income tax expense from continuing operations	\$ 20,214	\$ 5,499	\$ 78,190

Cash payments for income taxes were \$115.6 million, \$26.8 million and \$24.9 million for 2019, 2018 and 2017, respectively. The increase in cash payments for 2019 primarily relates to payments associated with the gain on the sale of AXC.

A reconciliation of the normal expected statutory U.S. federal income tax expense (benefit) to the actual Income tax expense from continuing operations as reported on the Consolidated Statements of Operations is as follows:

(In thousands)	2019	2018	2017
U.S. federal income tax expense	\$ 11,859	\$ 23,866	\$ 26,391
U.S. state income taxes, net of federal income tax benefit	(274)	566	642
U.S. other domestic deductions and credits	(1,322)	(2,407)	(364)
Difference in effective tax rates on international earnings and remittances	9,550	5,394	647
Uncertain tax position contingencies and settlements	310	(1,180)	(1,518)
Changes in realization on beginning of the year deferred tax assets	2,343	(6,937)	1,983
U.S. non-deductible expenses	2,554	1,128	609
Impact of U.S. tax reform	1,643	(11,686)	49,811
State deferred tax rate change	(3,353)	—	623
Foreign derived intangible income deduction	—	(2,366)	—
Employee share-based payments	(3,064)	(736)	(346)
Other, net	(32)	(143)	(288)
Total income tax expense from continuing operations	<u>\$ 20,214</u>	<u>\$ 5,499</u>	<u>\$ 78,190</u>

At December 31, 2019, 2018 and 2017, the Company's annual effective income tax rate on income from continuing operations was 35.8%, 4.8% and 103.7%, respectively.

The Company's international income from continuing operations before income taxes and equity income (loss) was \$70.4 million and \$85.4 million for 2019 and 2018, respectively. In 2018, the Company recorded an \$8.3 million income tax benefit in the second quarter of 2018 arising from the adjustment to certain existing deferred tax asset valuation allowances as the result of the Altek acquisition. The Company's total international income tax expense increased from \$14.4 million in 2018 to \$26.3 million in 2019 primarily due to the Altek adjustment in 2018 not recurring in 2019, the change in mix of income and withholding taxes on remitted earnings.

The Company's differences in effective income tax rates for 2019 and 2018 on international earnings and remittances was \$9.6 million and \$5.4 million, respectively, which included U.S. income tax expense on international deemed remittances of \$1.0 million and \$3.5 million respectively. This increase is primarily due to the change in mix of income and withholding taxes on remitted earnings.

The Company's U.S. income from continuing operations before income taxes and equity income was a \$13.9 million loss for 2019 and \$28.3 million of income for 2018. In 2018, the Company finalized the impact of the Tax Act and recognized a \$11.7 million income tax benefit because of the change in expected realization of foreign tax credit and state net operating loss carryforwards ("NOLs"). The Company's total U.S. income tax benefit decreased from \$8.9 million in 2018 to \$6.1 million in 2019 primarily due to the impact of the Tax Act in 2018 and the foreign derived intangible income deduction not recurring in 2019, partially offset by decreased U.S. income from continuing operations, and the increased income tax benefit recognized for the stock grants vested in 2019.

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The income tax effects of the temporary differences giving rise to the Company's deferred tax assets and liabilities at December 31, 2019 and 2018 are as follows:

(In thousands)	2019		2018	
	Asset	Liability	Asset	Liability
Depreciation and amortization (a)	\$ —	\$ 58,229	\$ —	\$ 8,714
Expense accruals	18,421	—	18,827	—
Inventories	4,568	—	3,071	—
Provision for receivables	1,109	—	689	—
Deferred revenue	—	3,222	—	3,122
Operating loss carryforwards	85,378	—	81,755	—
Foreign tax credit carryforwards	24,219	—	25,814	—
Capital loss carryforwards	—	—	9,759	—
Pensions	38,766	—	40,442	—
Currency adjustments	462	—	3,796	—
Deferred financing costs	—	566	—	2,226
Post-retirement benefits	411	—	471	—
Stock based compensation	6,572	—	5,832	—
Other	—	769	5,477	—
Subtotal	179,906	62,786	195,933	14,062
Valuation allowance	(127,074)	—	(137,450)	—
Total deferred income taxes	\$ 52,832	\$ 62,786	\$ 58,483	\$ 14,062

(a) The increase in 2019 is primarily related to the Clean Earth acquisition. See Note 3, Acquisitions and Dispositions, for additional information.

The deferred tax asset and liability balances recognized on the Consolidated Balance Sheets at December 31, 2019 and 2018 are as follows:

(In thousands)	2019	2018
Deferred income tax assets	\$ 14,288	\$ 48,551
Other liabilities	24,242	4,130

At December 31, 2019, the tax-effected amount of NOLs totaled \$85.4 million. Tax-effected NOLs from international operations are \$66.5 million. Of that amount, \$57.0 million can be carried forward indefinitely and \$9.5 million will expire at various times between 2020 and 2040. Tax-effected U.S. state NOLs are \$12.9 million. Of that amount, \$3.3 million expire at various times between 2020 and 2024, \$1.9 million expire at various times between 2025 and 2029, \$3.2 million expire at various times between 2030 and 2034 and \$4.5 million expire at various times between 2035 and 2039. At December 31, 2019, the tax-effected amount of U.S. Federal NOLs totaled \$6.0 million which can be carried forward indefinitely.

Valuation allowances of \$127.1 million and \$137.5 million at December 31, 2019 and 2018, respectively, related principally to deferred tax assets for pension liabilities, NOLs, foreign tax credit carryforwards, capital loss carryforwards and foreign currency translation that are uncertain as to realizability. In 2019, the Company recorded a valuation allowance reduction of \$12.5 million related to capital loss carryforwards, foreign tax credit carryforwards and state net operating loss carryforwards due to the losses and foreign tax credit carryforwards being utilized to reduce the tax liabilities on the capital gain realized as a result of the sale of AXC and PK. In addition, the Company recorded a valuation allowance reduction (and corresponding reduction to deferred tax assets) of \$5.6 million due to the merger and liquidation of certain foreign dormant entities resulting in the loss of certain tax attributes, offset by a net increase of \$7.9 million related to losses in certain jurisdictions where the Company determined that it is more likely than not that these assets will not be realized. In 2018, the Company finalized the impact of the Tax Act and reduced the provisional valuation allowance by \$15.2 million because of the expected realization of foreign tax credits and state NOLs. In addition, the U.K. valuation allowance was reduced by \$13.6 million as a result of the Altek acquisition and a change in estimate of interest deductions. The Company recorded a valuation allowance reduction of \$8.7 million from the effects of foreign currency translation adjustments, partially offset by the net increase related to losses in certain jurisdictions where the Company determined that it is more likely than not that these assets will not be realized.

The Tax Act introduced a transition tax and a territorial tax system, which was effective beginning in 2018. The territorial tax system impacts the Company's overall global capital and legal entity structure, working capital, and repatriation plan on a go-forward basis. The Company asserts that all foreign earnings will be indefinitely reinvested to the extent of local needs and earnings that would be distributed in a taxable manner. The Company therefore intends to limit distributions to earnings previously

taxed in the U.S., or earnings that would qualify for the 100 percent dividends received deduction provided for in the Tax Act, and earnings that would not result in any significant foreign taxes. Therefore, the Company has not recognized a deferred tax liability on its investment in foreign subsidiaries.

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The Company recognizes accrued interest and penalty expense related to unrecognized income tax benefits in income tax expense. The Company recognized an income tax expense of \$0.3 million during 2019 and an income tax benefit of \$0.2 million during 2018 for interest and penalties primarily due to the expiration of statutes of limitation and resolution of examinations. The Company did not recognize any income tax expense or benefit for interest and penalties during 2017. The Company has accrued \$1.2 million, \$0.9 million and \$1.1 million for the payment of interest and penalties at December 31, 2019, 2018 and 2017, respectively.

A reconciliation of the change in the unrecognized income tax benefits balance from January 1, 2017 to December 31, 2019 is as follows:

(In thousands)	Unrecognized Income Tax Benefits	Deferred Income Tax Benefits	Unrecognized Income Tax Benefits, Net of Deferred Income Tax Benefits
Balances, January 1, 2017	\$ 4,582	\$ (30)	\$ 4,552
Additions for tax positions related to the current year (includes currency translation adjustment)	658	(2)	656
Other reductions for tax positions related to prior years	(321)	—	(321)
Statutes of limitation expirations	<u>(1,296)</u>	<u>1</u>	<u>(1,295)</u>
Balance at December 31, 2017	<u>3,623</u>	<u>(31)</u>	<u>3,592</u>
Additions for tax positions related to the current year (includes currency translation adjustment)	196	(1)	195
Statutes of limitation expirations	<u>(1,397)</u>	<u>6</u>	<u>(1,391)</u>
Balance at December 31, 2018	<u>2,422</u>	<u>(26)</u>	<u>2,396</u>
Additions for tax positions related to the current year (includes currency translation adjustment)	414	(7)	407
Additions for tax positions related to prior years (includes currency translation adjustment)	681	—	681
Statutes of limitation expirations	<u>(326)</u>	<u>2</u>	<u>(324)</u>
Settlements	<u>(62)</u>	<u>9</u>	<u>(53)</u>
Total unrecognized income tax benefits that, if recognized, would impact the effective income tax rate at December 31, 2019	<u>\$ 3,129</u>	<u>\$ (22)</u>	<u>\$ 3,107</u>

Within the next twelve months, it is reasonably possible that up to \$0.3 million of unrecognized income tax benefits will be recognized upon settlement of income tax examinations and the expiration of various statutes of limitations.

The Company files income tax returns as prescribed by the tax laws of the jurisdictions in which it operates. With few exceptions, the Company is no longer subject to U.S and international income tax examinations by tax authorities through 2013.

11. Commitments and Contingencies

Environmental

The Company is involved in a number of environmental remediation investigations and cleanups and, along with other companies, has been identified as a "potentially responsible party" for certain byproduct disposal sites. While each of these matters is subject to various uncertainties, it is probable that the Company will agree to make payments toward funding certain of these activities and it is possible that some of these matters will be decided unfavorably to the Company. The Company has evaluated its potential liability, and its financial exposure is dependent upon such factors as the continuing evolution of environmental laws and regulatory requirements, the availability and application of technology, the allocation of cost among potentially responsible parties, the years of remedial activity required and the remediation methods selected. Other than set forth herein, the Company did not have any material accruals or record any material expenses related to environmental matters during the periods presented.

The Company evaluates its liability for future environmental remediation costs on a quarterly basis. Although actual costs to be incurred at identified sites in future periods may vary from the estimates (given inherent uncertainties in evaluating environmental exposures), the Company does not expect that any costs that are reasonably possible to be incurred by the Company in connection with environmental matters in excess of the amounts accrued would have a material adverse effect on the Company's financial condition, results of operations or cash flows.

As previously disclosed, the Company has had ongoing meetings with the Supreme Council for Environment in Bahrain (“SCE”) over processing a byproduct (“salt cakes”) stored at the Al Hafeerah site. The Company’s Bahrain operations that produced the salt cakes has ceased operations and are owned under a strategic venture for which its strategic venture partner owns a 35% minority interest. An Environmental Impact Assessment and Technical Feasibility Study were approved by the SCE during the first quarter of 2018. The Company is constructing facilities to process the salt cakes, and the Company currently expects those facilities to come online in 2020. The Company has previously established a reserve of \$7.0 million, which represents the Company’s best estimate of the ultimate costs to be incurred to resolve this matter. The Company continues to evaluate this reserve and any future change in estimated costs could be material to the Company’s results of operations in any one period.

On July 27, 2018, Brazil’s Federal and Rio de Janeiro State Public Prosecution Offices (MPF and MPE) filed a Civil Public Action against one of the Company’s customers (CSN), the Company’s Brazilian subsidiary, the Municipality of Volta Redonda, Brazil, and the Instituto Estadual do Ambiente (local environmental protection agency) seeking the implementation of various measures to limit and reduce the accumulation of customer-owned slag at the site in Brazil. On August 6, 2018, the 3rd Federal Court in Volta Redonda granted the MPF and MPE an injunction against the same parties requiring, among other things, CSN and the Company’s Brazilian subsidiary to limit the volume of slag sent to the site. Because the customer owns the site and the slag located on the site, the Company believes that complying with this injunction is the steel producer’s responsibility. On March 18, 2019, the Court issued an order fining the Company 5,000 Brazilian reais per day (or approximately \$1,300 per day) and CSN 20,000 Brazilian reais per day until the requirements of the injunction are met. On November 1, 2019, the Court issued an additional order increasing the fines assessed to the Company to 25,000 Brazilian reais per day (or approximately \$6,000 per day) and raising the fines assessed to CSN to 100,000 Brazilian reais per day (or approximately \$25,000 per day). The Court also assessed an additional fine of 10,000,000 Brazilian reais (or approximately \$2.5 million) against CSN and the Company jointly. The Company is appealing the fines and the underlying injunction. Both the Company and CSN continue to have discussions with the governmental authorities on the injunction and the possible resolution of the underlying case. The Company does not believe that a loss relating to this matter is probable or estimable at this point.

On October 19, 2018, local environmental authorities issued an enforcement action against the Company concerning the Company’s operations at a customer site in IJmuiden, Netherlands. The enforcement action alleges violations of the Company’s environmental permit at the site, which restricts the release of any visible dust emissions. The enforcement action ordered the Company to cease all violations of the permit by October 31, 2018. The authorities have issued fines of approximately \$0.5 million which the Company has recorded, with the possibility of additional fines for any future violations. The Company is vigorously contesting the enforcement action and fines and is also working with its customer to ensure the control of emissions. The Company has contractual indemnity rights from its customer, should it be required to pay the assessed fines.

On June 13, 2019, the Pennsylvania Department of Environmental Protection (“PA DEP”) indicated to the Company and a landowner who received processed slag from the Company that it plans to require action to bring the landowner’s site into compliance and to assess a civil penalty against the Company and the landowner. The Company is working with the landowner and PA DEP to determine the most effective way to address PA DEP’s concerns about the site and has established a \$0.4 million reserve, which represents the Company’s best estimate of the costs to bring the landowner’s site into compliance.

On March 24, 2017, the Allegheny County Health Department issued a notice of violation against the Company concerning the Company’s operations at a customer site in Natrona, Pennsylvania. On January 21, 2020, the Company paid \$107,020 to settle the civil penalties accrued up to that date. It is possible the Company could incur additional penalties for future violations. The Company and its customer continue to consider possible avenues for potential resolution of the matter.

Brazilian Tax Disputes

The Company is involved in a number of tax disputes with federal, state and municipal tax authorities in Brazil. These disputes are at various stages of the legal process, including the administrative review phase and the collection action phase, and include assessments of fixed amounts of principal and penalties, plus interest charges that increase at statutorily determined amounts per month and are assessed on the aggregate amount of the principal and penalties. In addition, the losing party, at the collection action or court of appeals phase could be subject to a charge to cover statutorily mandated legal fees, which are generally calculated as a percentage of the total assessed amounts due, inclusive of penalty and interest. Many of the claims relate to value-added (“ICMS”), services and social security tax disputes. The largest proportion of the assessed amounts relate to ICMS claims filed by the State Revenue Authorities from the State of São Paulo, Brazil (the “SPRA”), encompassing the period from January 2002 to May 2005.

In October 2009, the Company received notification of the SPRA's final administrative decision regarding the levying of ICMS in the State of São Paulo in relation to services provided to a customer in the State between January 2004 and May 2005. As of December 31, 2019, the principal amount of the tax assessment from the SPRA with regard to this case is approximately \$2 million, with penalty, interest and fees assessed to date increasing such amount by an additional \$21 million. On June 4, 2018, the Appellate Court of the State of São Paulo ruled in favor of the SPRA but ruled that the assessed penalty should be reduced to approximately \$2 million. After calculating the interest accrued on the penalty, the Company estimates that this ruling reduces the current overall potential liability for this case to approximately \$9 million. The Company has appealed the ruling in favor of the SPRA to the Superior Court of Justice. Due to multiple court precedents in the Company's favor, as well as the Company's ability to appeal, the Company does not believe a loss is probable.

Another ICMS tax case involving the SPRA refers to the tax period from January 2002 to December 2003. In December 2018, the administrative tribunal hearing the case upheld the Company's liability. The Company has appealed to the judicial phase. The aggregate amount assessed by the tax authorities in August 2005 was \$6.3 million (the amounts with regard to this claim are valued as of the date of the assessment since it has not yet reached the collection phase), composed of a principal amount of \$1.5 million, with penalty and interest assessed through that date increasing such amount by an additional \$4.8 million. On December 6, 2018, the administrative tribunal reduced the applicable penalties to \$1.2 million. After calculating the interest accrued on the current penalty, the Company estimates that the current overall liability for this case to be approximately \$12 million. All such amounts include the effect of foreign currency translation. Due to multiple court precedents in the Company's favor the Company does not believe a loss is probable.

The Company continues to believe that sufficient coverage for these claims exists as a result of the indemnification obligations of the Company's customer and such customer's pledge of assets in connection with the October 2009 notice, as required by Brazilian law.

The Company intends to continue its practice of vigorously defending itself against these tax claims under various alternatives, including judicial appeal. The Company will continue to evaluate its potential liability with regard to these claims on a quarterly basis; however, it is not possible to predict the ultimate outcome of these tax-related disputes in Brazil. No loss provision has been recorded in the Company's consolidated financial statements for the disputes described above because the loss contingency is not deemed probable, and the Company does not expect that any costs that are reasonably possible to be incurred by the Company in connection with Brazilian tax disputes would have a material adverse effect on the Company's financial condition, results of operations or cash flows.

Brazilian Labor Disputes

The Company is subject to ongoing collective bargaining and individual labor claims in Brazil through the Harsco Environmental Segment which allege, among other things, the Company's failure to pay required amounts for overtime and vacation at certain sites. The Company is vigorously defending itself against these claims; however, litigation is inherently unpredictable, particularly in foreign jurisdictions. While the Company does not currently expect that the ultimate resolution of these claims will have a material adverse effect on the Company's financial condition, results of operations or cash flows, it is not possible to predict the ultimate outcome of these labor-related disputes. As of December 31, 2019 and 2018, the Company has established reserves of \$6.5 million and \$7.1 million, respectively, on the Consolidated Balance Sheets for amounts considered to be probable and estimable.

Customer Disputes

The Company may, in the normal course of business, become involved in commercial disputes with subcontractors or customers. Although results of operations and cash flows for a given period could be adversely affected by a negative outcome in these or other lawsuits, claims or proceedings, management believes that the ultimate outcome of any ongoing matters will not have a material adverse effect on the Company's financial condition, results of operations or cash flows.

Lima Refinery Litigation

On April 8, 2016, Lima Refining Company filed a lawsuit against the Company in the District Court of Harris County, Texas related to a January 2015 explosion at an oil refinery operated by Lima Refining Company. In September 2019, the Company and Lima Refining Company agreed to settle the lawsuit for \$195 million. The settlement and defense costs were fully covered by insurance.

Other

The Company is named as one of many defendants (approximately 90 or more in most cases) in legal actions in the U.S. alleging personal injury from exposure to airborne asbestos over the past several decades. In their suits, the plaintiffs have named as defendants, among others, many manufacturers, distributors and installers of numerous types of equipment or products that allegedly contained asbestos.

The Company believes that the claims against it are without merit. The Company has never been a producer, manufacturer or processor of asbestos fibers. Any asbestos-containing part of a Company product used in the past was purchased from a supplier and the asbestos encapsulated in other materials such that airborne exposure, if it occurred, was not harmful and is not associated with the types of injuries alleged in the pending actions.

At December 31, 2019, there were approximately 17,142 pending asbestos personal injury actions filed against the Company. Of those actions, approximately 16,595 were filed in the New York Supreme Court (New York County), approximately 117 were filed in other New York State Supreme Court Counties and approximately 430 were filed in courts located in other states.

The complaints in most of those actions generally follow a form that contains a standard damages demand of \$20 million or \$25 million, regardless of the individual plaintiff's alleged medical condition, and without identifying any specific Company product.

At December 31, 2019, approximately 16,550 of the actions filed in New York Supreme Court (New York County) were on the Deferred/Inactive Docket created by the court in December 2002 for all pending and future asbestos actions filed by persons who cannot demonstrate that they have a malignant condition or discernible physical impairment. The remaining approximately 45 cases in New York County are pending on the Active or In Extremis Docket created for plaintiffs who can demonstrate a malignant condition or physical impairment.

The Company has liability insurance coverage under various primary and excess policies that the Company believes will be available, if necessary, to substantially cover any liability that might ultimately be incurred in the asbestos actions referred to above. The costs and expenses of the asbestos actions are being paid by the Company's insurers.

In view of the persistence of asbestos litigation in the U.S., the Company expects to continue to receive additional claims in the future. The Company intends to continue its practice of vigorously defending these claims and cases. At December 31, 2019, the Company has obtained dismissal in approximately 28,227 cases by stipulation or summary judgment prior to trial.

It is not possible to predict the ultimate outcome of asbestos-related actions in the U.S. due to the unpredictable nature of this litigation, and no loss provision has been recorded in the Company's consolidated financial statements because a loss contingency is not deemed probable or estimable. Despite this uncertainty, and although results of operations and cash flows for a given period could be adversely affected by asbestos-related actions, the Company does not expect that any costs that are reasonably possible to be incurred by the Company in connection with asbestos litigation would have a material adverse effect on the Company's financial condition, results of operations or cash flows.

The Company is subject to various other claims and legal proceedings covering a wide range of matters that arose in the ordinary course of business. In the opinion of management, all such matters are adequately covered by insurance or by established reserves, and, if not so covered, are without merit or are of such kind, or involve such amounts, as would not have a material adverse effect on the financial position, results of operations or cash flows of the Company.

Insurance liabilities are recorded when it is probable that a liability has been incurred for a particular event and the amount of loss associated with the event can be reasonably estimated. Insurance reserves have been estimated based primarily upon actuarial calculations and reflect the undiscounted estimated liabilities for ultimate losses, including claims incurred but not reported. Inherent in these estimates are assumptions that are based on the Company's history of claims and losses, a detailed analysis of existing claims with respect to potential value, and current legal and legislative trends. If actual claims differ from those projected by management, changes (either increases or decreases) to insurance reserves may be required and would be recorded through income in the period the change was determined. When a recognized liability is covered by third-party insurance, the Company records an insurance claim receivable to reflect the covered liability. Insurance claim receivables are included in Insurance claim receivable and Other receivables on the Consolidated Balance Sheets. See Note 1, Summary of Significant Accounting Policies, for additional information on Accrued insurance and loss reserves.

12. Capital Stock

The authorized capital stock of the Company consists of 150,000,000 shares of common stock and 4,000,000 shares of preferred stock, both having a par value of \$1.25 per share. The preferred stock is issuable in series with terms as fixed by the Board of Directors (the "Board"). No preferred stock has been issued. The following table summarizes the Company's common stock:

	Shares Issued	Treasury Shares (a)	Outstanding Shares
Outstanding, January 1, 2017	112,499,874	32,324,911	80,174,963
Shares issued for vested restricted stock units	375,355	105,431	269,924
Stock appreciation rights exercised	12,897	3,932	8,965
Outstanding, December 31, 2017	112,888,126	32,434,274	80,453,852
Shares issued for vested restricted stock units	545,908	161,774	384,134
Stock appreciation rights exercised	39,917	11,808	28,109
Treasury shares purchased	—	1,321,072	(1,321,072)
Outstanding, December 31, 2018	113,473,951	33,928,928	79,545,023
Shares issued for vested restricted stock units	321,965	125,863	196,102
Shares issued for vested performance stock units	908,566	379,353	529,213
Stock appreciation rights exercised	15,865	4,619	11,246
Treasury shares purchased	—	1,766,826	(1,766,826)
Outstanding, December 31, 2019	114,720,347	36,205,589	78,514,758

- (a) The Company repurchases shares in connection with the issuance of shares under stock-based compensation programs and in accordance with Board authorized share repurchase programs.

The following is a reconciliation of the average shares of common stock used to compute basic earnings per common share to the shares used to compute diluted earnings per common share as shown on the Consolidated Statements of Operations:

(In thousands, except per share data)	2019	2018	2017
Income (loss) from continuing operations attributable to Harsco Corporation common stockholders	\$ 28,231	\$ 100,578	\$ (6,810)
Weighted-average shares outstanding—basic	79,632	80,716	80,553
Dilutive effect of stock-based compensation	1,743	2,879	—
Weighted-average shares outstanding—diluted	81,375	83,595	80,553
Income (loss) from continuing operations per common share, attributable to Harsco Corporation common stockholders:			
Basic	\$ 0.35	\$ 1.25	\$ (0.08)
Diluted	\$ 0.35	\$ 1.20	\$ (0.08)

The following average outstanding stock-based compensation units were not included in the computation of diluted earnings per share because the effect was antidilutive:

(In thousands)	2019	2018	2017
Restricted stock units	—	—	934
Stock options	—	—	52
Stock appreciation rights	491	306	1,737
Performance share units	124	—	948

13. Stock-Based Compensation

The 2013 Equity and Incentive Plan as amended (the "2013 Plan") authorizes the issuance of up to 7.8 million shares of the Company's common stock for use in paying incentive compensation awards in the form of stock options or other equity awards such as restricted stock, restricted stock units ("RSUs"), stock appreciation rights ("SARs") or performance share units ("PSUs"). Of the 7.8 million shares authorized, a maximum of 4.6 million shares may be issued for awards other than option rights or SARs, as defined in the 2013 Plan. The 2016 Non-Employee Directors' Long-Term Equity Compensation Plan (the "2016 Plan") authorizes the issuance of up to 400 thousand shares of the Company's common stock for equity awards. Both plans have been

approved by the Company's stockholders. At December 31, 2019, there were 2.6 million shares available for granting equity awards under the 2013 Plan, of which 1.5 million shares were available for awards other than option rights or SARs. At December 31, 2019, there were 158 thousand shares available for granting equity awards under the 2016 Plan.

Restricted Stock Units

The Company's Board approves the granting of performance-based RSUs as the long-term equity component of director, officer and certain key employee compensation. The RSUs require no payment from the recipient and compensation cost is measured based on the market price of the Company's common stock on the grant date and is generally recorded over the vesting period. RSUs granted to officers and certain key employees in 2017, 2018 and 2019 either vest on a pro-rata basis over three years or upon obtainment of specified retirement or years of service criteria. The vesting period for RSUs granted to non-employee directors is one year and each RSU is exchanged for an equal number of shares of the Company's common stock upon vesting for awards issued under the 2016 Plan and following the termination of the participant's service as a director under prior plans. RSUs do not have an option for cash payment.

The following table summarizes RSUs issued and the compensation expense recorded for the years ended December 31, 2019, 2018, and 2017:

(Dollars in thousands, except per unit)	RSUs (a)	Weighted Average Fair Value	Expense		
			2019	2018	2017
Directors:					
2016	109,998	\$ 7.00	—	—	\$ 257
2017	56,203	13.70	—	179	641
2018	43,821	20.54	280	511	—
2019	14,211	25.33	240	—	—
Employees:					
2014	190,832	25.21	—	—	295
2015	239,679	16.53	—	193	498
2016	536,773	7.09	290	835	909
2017	286,251	13.70	832	910	1,325
2018	242,791	19.93	1,208	1,546	—
2019	270,864	22.25	1,620	—	—
Total			\$ 4,470	\$ 4,174	\$ 3,925

(a) Represents number of awards originally issued.

RSU activity for the year ended December 31, 2019 was as follows:

	Number of Shares	Weighted Average Grant-Date Fair Value
Non-vested at December 31, 2018	583,380	\$ 15.08
Granted	285,075	22.40
Vested	(348,572)	13.38
Forfeited	(53,274)	20.01
Non-vested at December 31, 2019	466,609	20.26

At December 31, 2019, the total unrecognized compensation expense related to non-vested RSUs was \$5.4 million, which will be recognized over a weighted-average period of 1.9 years.

Stock Appreciation Rights

The Company's Board approves the granting of SARs to officers and certain key employees under the 2013 Plan. The SARs generally vest on a pro-rata three-year basis from the grant date or upon specified retirement or years of service criteria and expire no later than ten years after the grant date. The exercise price of the SARs is equal to the fair value of Harsco common stock on the grant date. Upon exercise, shares of the Company's common stock are issued based on the increase in the fair value of the Company's common stock over the exercise price of the SAR. SARs do not have an option for cash payment.

During 2017, the Company issued SARS covering 266,540 shares in March under the 2013 Plan. During 2018, the Company issued SARS covering 221,818 shares in March and 7,622 in July under the 2013 Plan. During 2019, the Company issued SARS covering 216,100 shares in March and 13,244 shares in July under the 2013 Plan.

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The fair value of each SAR grant was estimated on the grant date using a Black-Scholes pricing model with the following assumptions:

	Risk-free Interest rate	Dividend Yield	Expected Life (Years)	Volatility	SAR Grant Price	Fair Value of SAR
March 2017 Grant	2.17%	—%	6.0	43.9%	\$ 13.70	\$ 6.13
March 2018 Grant	2.69%	—%	6.0	44.6%	19.80	9.16
July 2018 Grant	2.87%	—%	6.0	44.7%	24.65	11.48
March 2019 Grant	2.52%	—%	6.0	46.2%	22.51	10.62
July 2019 Grant	1.84%	—%	6.0	47.1%	27.39	12.80

SARs activity for the year ended December 31, 2019 was as follows:

	Number of Shares	Weighted Average Exercise Price	Aggregate Intrinsic Value (in millions) (b)
Outstanding, December 31, 2018	1,745,447	\$ 15.73	\$ 8.9
Granted	229,344	22.79	
Exercised	(43,594)	15.87	
Forfeited/Expired	(22,977)	26.94	
Outstanding, December 31, 2019	1,908,220	16.44	13.0

(b) Intrinsic value is defined as the difference between the current market value and the exercise price, for those SARs where the market price exceeds the exercise price.

The total intrinsic value of SARs exercised in 2019 and 2018 was \$0.3 million and \$0.5 million respectively.

The following table summarizes information concerning outstanding and exercisable SARs at December 31, 2019:

Range of exercisable prices	SARs Outstanding				SARs Exercisable	
	Vested	Non-vested	Weighted-Average Exercise Price per Share	Weighted-Average Remaining Contractual Life in Years	Number Exercisable	Weighted-Average Exercise Price per Share
\$7.00 - \$13.70	624,693	83,654	\$ 9.42	6.65	624,693	\$ 8.85
\$16.53 - \$22.70	584,950	361,000	19.45	6.60	584,950	18.23
\$23.03 - \$26.92	248,841	5,082	24.78	4.45	248,841	24.79
	1,458,484	449,736	16.44	6.33	1,458,484	15.33

Total compensation expense related to SARs was \$1.9 million, \$1.8 million and \$1.9 million for the years ended December 31, 2019, 2018 and 2017, respectively. At December 31, 2019, total unrecognized compensation expense related to non-vested SARs was \$2.4 million, which will be recognized over a weighted average period of 1.8 years.

Weighted-average grant date fair value of non-vested SARs for the year ended December 31, 2019 was as follows:

	Number of Shares	Weighted-Average Grant Date Fair Value
Non-vested shares, December 31, 2018	467,478	\$ 6.65
Granted	229,344	10.75
Vested	(233,842)	5.17
Forfeited	(13,244)	12.80
Non-vested shares, December 31, 2019	449,736	9.32

Performance Share Units

The Company's Board approves the granting of PSUs to officers and certain key employees that may be earned based on the Company's total shareholder return over the three-year performance period. PSUs are paid out at the end of each performance period based on the Company's performance, which is measured by determining the percentile rank of the total shareholder return of the Company's common stock in relation to the total shareholder return of a specific peer group of companies. The peer group of

companies utilized is the S&P 600 Industrial Index. The payment of PSUs following the performance period will be based in accordance with the scale set forth in the PSU agreements, and may range from 0% to 200% of the initial grant. PSUs do not have an option for cash payment.

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During the year ended December 31, 2017, the Company granted 286,251 shares in March under the 2013 Plan. During the year ended December 31, 2018, the Company granted 233,266 shares in March and 6,742 shares in July under the 2013 Plan. During the year ended December 31, 2019, the Company granted 233,112 shares in March, 6,189 shares in July and 38,006 shares in August under the 2013 Plan. The fair value of PSUs granted was estimated on the grant date using a Monte Carlo pricing model with the following assumptions:

	Risk-free Interest rate	Dividend Yield	Expected Life (Years)	Volatility	Fair Value of PSU
March 2017 Grant	1.54%	—%	2.83	34.2%	\$ 17.05
March 2018 Grant	2.36%	—%	2.83	34.7%	29.56
July 2018 Grant	2.69%	—%	2.42	33.1%	39.06
March 2019 Grant	2.48%	—%	2.82	33.8%	29.04
July 2019 Grant	1.75%	—%	2.50	34.3%	40.07
August 2019 Grant	1.57%	—%	2.41	34.9%	23.38

Total compensation expense related to PSUs was \$5.1 million, \$4.3 million and \$3.2 million for the years ended December 31, 2019, 2018 and 2017, respectively. At December 31, 2019, total unrecognized compensation expense related to non-vested PSUs was \$6.5 million, which will be recognized over a weighted average period of 1.7 years.

A summary of the Company's non-vested PSU activity during the year ending December 31, 2019 was as follows:

	Number of Shares	Weighted-Average Grant Date Fair Value
Non-vested shares, December 31, 2018	494,882	\$ 23.13
Granted	277,307	28.51
Forfeited	(70,391)	26.23
Vested, not issued (c)	(236,214)	17.05
Non-vested shares, December 31, 2019	<u>465,584</u>	<u>28.95</u>

(c) The measurement period for PSUs issued in 2017 ended on December 31, 2019 and these shares vested but will not be issued until the Board certifies the measurement period results in early 2020. A total of 472,428 shares are expected to be issued and have been included in the Company's calculation of diluted weighted average shares at the end of December 31, 2019.

14. Financial Instruments

Off-Balance Sheet Risk

As collateral for the Company's performance and to insurers, the Company is contingently liable under standby letters of credit, bonds and bank guarantees in the amounts of \$281.8 million, \$285.4 million and \$275.4 million at December 31, 2019, 2018 and 2017, respectively. These standby letters of credit, bonds and bank guarantees are generally in force for up to 2 years. Certain issues have no scheduled expiration date. The Company pays fees to various banks and insurance companies that range from 0.4% to 3.7% per annum of the instrument's face value. If the Company were required to obtain replacement standby letters of credit, bonds and bank guarantees at December 31, 2019 for those currently outstanding, it is the Company's opinion that the replacement costs would be within the present fee structure.

The Company has currency exposures in approximately 30 countries. The Company's primary foreign currency exposures during 2019 were in the European Union, the U.K., Brazil and China.

Off-Balance Sheet Risk—Third-Party Guarantees

During June 2014, the Company provided a guarantee to Brand as part of the net working capital settlement related to the Infrastructure Transaction, for certain matters occurring prior to closing. The remaining term of this guarantee is 1 year at December 31, 2019. The maximum potential amount of future payments related to this guarantee is approximately \$3 million at December 31, 2019. There is no recognition of this potential future payment in the consolidated financial statements as the Company believes the potential for making this payment is remote.

Any liabilities related to the Company's obligation to stand ready to act on third-party guarantees are included in Other current liabilities or Other liabilities (as appropriate) on the Consolidated Balance Sheets. Any recognition of these liabilities did not have a material impact on the Company's financial position or results of operations for 2019, 2018 or 2017.

In the normal course of business, legal indemnifications are provided related primarily to the performance of the Company's products and services and patent and trademark infringement of the products and services sold. These indemnifications generally relate to the performance (regarding function, not price) of the respective products or services and therefore no liability is recognized related to the fair value of such guarantees.

Derivative Instruments and Hedging Activities

The Company uses derivative instruments, including foreign currency exchange forward contracts, interest rate swaps and cross-currency interest rate swaps ("CCIRs"), to manage certain foreign currency and interest rate exposures. Derivative instruments are viewed as risk management tools by the Company and are not used for trading or speculative purposes. All derivative instruments are recorded on the Consolidated Balance Sheets at fair value. The accounting for changes in the fair value of derivatives depends on the intended use of the derivative, whether the Company has elected to designate a derivative in a hedging relationship and apply hedge accounting and whether the hedging relationship has satisfied the criteria necessary to apply hedge accounting. Derivatives designated and qualifying as a hedge of the exposure to variability in expected future cash flows, or other types of forecasted transactions, are considered cash flow hedges. Hedge accounting generally provides for the matching of the timing of gain or loss recognition on the hedging instrument with the recognition of the earnings effect of the hedged forecasted transactions in a cash flow hedge. The Company may enter into derivative contracts that are intended to economically hedge certain of its risk, even though hedge accounting does not apply, or the Company elects not to apply hedge accounting.

The Company primarily applies the market approach for recurring fair value measurements and endeavors to utilize the best available information. Accordingly, the Company utilizes valuation techniques that maximize the use of observable inputs, such as forward rates, interest rates, the Company's credit risk and counterparties' credit risks, and which minimize the use of unobservable inputs. The Company is able to classify fair value balances based on the ability to observe those inputs. Foreign currency exchange forward contracts, interest rate swaps and CCIRs are based upon pricing models using market-based inputs (Level 2). Model inputs can be verified and valuation techniques do not involve significant management judgment.

Fair value is 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 measurement date (an exit price). The Company utilizes market data or assumptions that the Company believes market participants would use in valuing the asset or liability, including assumptions about risk and the risks inherent in the inputs to the valuation technique.

The fair value hierarchy distinguishes between (1) market participant assumptions developed based on market data obtained from independent sources (observable inputs), and (2) an entity's own assumptions about market participant assumptions based on the best information available in the circumstances (unobservable inputs). The fair value hierarchy consists of three broad levels, which give the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3).

The three levels of the fair value hierarchy are described below:

- Level 1—Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities.
- Level 2—Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly, including quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in markets that are not active; inputs other than quoted prices that are observable for the asset or liability (e.g., interest rates); and inputs that are derived principally from or corroborated by observable market data by correlation or other means.
- Level 3—Inputs that are both significant to the fair value measurement and unobservable.

In instances in which multiple levels of inputs are used to measure fair value, hierarchy classification is based on the lowest level input that is significant to the fair value measurement in its entirety. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and considers factors specific to the asset or liability.

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The fair value of outstanding derivative contracts recorded as assets and liabilities on the Consolidated Balance Sheets was as follows:

(In thousands)	Balance Sheet Location	Fair Value of Derivatives Designated as Hedging Instruments	Fair Value of Derivatives Not Designated as Hedging Instruments	Total Fair Value
December 31, 2019				
Asset derivatives (Level 2):				
Foreign currency exchange forward contracts	Other current assets	\$ 2,039	\$ 946	\$ 2,985
Total		<u><u>\$ 2,039</u></u>	<u><u>\$ 946</u></u>	<u><u>\$ 2,985</u></u>
Liability derivatives (Level 2):				
Foreign currency exchange forward contracts	Other current liabilities	\$ 140	\$ 3,733	\$ 3,873
Interest rate swaps	Other current liabilities	<u><u>2,098</u></u>	—	<u><u>2,098</u></u>
Interest rate swaps	Other liabilities	<u><u>4,281</u></u>	—	<u><u>4,281</u></u>
Total		<u><u>\$ 6,519</u></u>	<u><u>\$ 3,733</u></u>	<u><u>\$ 10,252</u></u>
December 31, 2018				
Asset derivatives (Level 2):				
Foreign currency exchange forward contracts	Other current assets	\$ 2,970	\$ 589	\$ 3,559
Interest rate swaps	Other current assets	1,331	—	1,331
Interest rate swaps	Other assets	128	—	128
Total		<u><u>\$ 4,429</u></u>	<u><u>\$ 589</u></u>	<u><u>\$ 5,018</u></u>
Liability derivatives (Level 2):				
Foreign currency exchange forward contracts	Other current liabilities	\$ 24	\$ 2,910	\$ 2,934
Interest rate swaps	Other liabilities	1,849	—	1,849
Total		<u><u>\$ 1,873</u></u>	<u><u>\$ 2,910</u></u>	<u><u>\$ 4,783</u></u>

All of the Company's derivatives are recorded on the Consolidated Balance Sheets at gross amounts and not offset. All of the Company's interest rate swaps, CCIRs and certain foreign currency exchange forward contracts are transacted under International Swaps and Derivatives Association ("ISDA") documentation. Each ISDA master agreement permits the net settlement of amounts owed in the event of default. The Company's derivative assets and liabilities subject to enforceable master netting arrangements did not result in a net asset or liability at December 31, 2019 and resulted in a 0.1 million net liability at December 31, 2018.

The effect of derivative instruments on the Consolidated Statements of Operations and the Consolidated Statements of Comprehensive Income (Loss):

(In thousands)	Derivatives Designated as Hedging Instruments			Location of Amount Reclassified from Accumulated OCI into Income	Amount Reclassified from Accumulated OCI into Income - Effective Portion or Equity		
	2019	2018	2017		2019	2018	2017
Foreign currency exchange forward contracts	\$ (1,227)	\$ 1,935	\$ 3,547	Product revenues/Cost of services sold	\$ (506)	\$ (374)	\$ (954)
Foreign currency exchange forward contracts (a)	—	—	—	Retained earnings (b)	—	(1,520)	—
Interest rate swaps	—	—	—	Income from discontinued businesses	2,741	—	—
Interest rate swaps	(8,209)	1,451	(734)	Interest expense	(520)	(1,108)	—

Cross-currency interest rate

swaps (a)	(42)	63	(205)	Interest expense	1,219	1,264	1,002
	\$ (9,478)	\$ 3,449	\$ 2,608		\$ 2,934	\$ (1,738)	\$ 48

(a) Amounts represent changes in foreign currency translation related to balances in Accumulated other comprehensive loss.

(b) The Company adopted the new revenue recognition standard utilizing the modified retrospective transition method, including use of practical expedients in 2018.

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The location and amount of gain (loss) recognized on the Consolidated Statements of Operations:

(in thousands)	2019			
	Product Revenues	Cost of Services Sold	Interest Expense	Income From Discontinued Businesses
Total amounts of line items presented in the statement of operations in which the effects of cash flow hedges are recorded	\$ 422,269	\$ 839,156	\$ (36,586)	\$ 27,531
Interest rate swaps:				
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income	—	—	520	—
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income as a result that a forecasted transaction is no longer probable of occurring	—	—	—	(2,741)
Foreign exchange contracts:				
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income	550	(44)	—	—
Amount excluded from effectiveness testing recognized in earnings based on changes in fair value	509	—	—	—
Cross-currency interest rate swaps:				
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income	—	—	(1,219)	—
(in thousands)	2018			
	Product Revenues	Cost of Services Sold	Interest Expense	
Total amounts of line items presented in the statement of operations in which the effects of cash flow hedges are recorded	\$ 392,208	\$ 745,748	\$ (21,531)	
Interest rate swaps:				
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income	—	—	1,108	
Foreign exchange contracts:				
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income	374	—	—	—
Amount excluded from effectiveness testing recognized in earnings based on changes in fair value	(440)	1	—	—
Cross-currency interest rate swaps:				
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income	—	—	(1,264)	
(in thousands)	2017			
	Product Revenues	Cost of Services Sold	Interest Expense	
Total amounts of line items presented in the statement of operations in which the effects of cash flow hedges are recorded	\$ 373,188	\$ 737,499	\$ (26,862)	
Foreign exchange contracts:				
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income	936	18	—	—
Amount excluded from effectiveness testing recognized in earnings based on changes in fair value	(105)	—	—	—
Cross-currency interest rate swaps:				
Amount of gain (loss) reclassified from accumulated other comprehensive loss into income	—	—	(1,002)	
Amount excluded from the effectiveness testing recognized in earnings based an amortization approach	—	—	(420)	

Derivatives Not Designated as Hedging Instruments

(In thousands)	Location of Gain (Loss) Recognized in Income on Derivatives	Amount of Gain (Loss) Recognized in Income on Derivatives for the Twelve Months Ended December 31(c)		
		2019	2018	2017
Foreign currency exchange forward contracts	Cost of services and products sold	\$ 6,807	\$ 17,262	\$ (23,572)
(c) These gains (losses) offset amounts recognized in cost of service and products sold principally as a result of intercompany or third-party foreign currency exposures.				

Foreign Currency Exchange Forward Contracts

The Company conducts business in multiple currencies and, accordingly, is subject to the inherent risks associated with foreign exchange rate movements. Foreign currency-denominated assets and liabilities are translated into U.S. dollars at the exchange rates existing at the respective balance sheet dates, and income and expense items are translated at the average exchange rates during the respective periods.

The Company uses derivative instruments to hedge cash flows related to foreign currency fluctuations. Foreign currency exchange forward contracts outstanding are part of a worldwide program to minimize foreign currency exchange operating income and balance sheet exposure by offsetting foreign currency exposures of certain future payments between the Company and various subsidiaries, suppliers or customers. The unsecured contracts are with major financial institutions. The Company may be exposed to credit loss in the event of non-performance by the contract counterparties. The Company evaluates the creditworthiness of the counterparties and does not expect default by them. Foreign currency exchange forward contracts are used to hedge commitments, such as foreign currency debt, firm purchase commitments and foreign currency cash flows for certain export sales transactions.

Changes in the fair value of derivatives used to hedge foreign currency denominated balance sheet items are reported directly in earnings, along with offsetting transaction gains and losses on the items being hedged. Derivatives used to hedge forecasted cash flows associated with foreign currency commitments may be accounted for as cash flow hedges, as deemed appropriate, if the criteria for hedge accounting are met. Gains and losses on derivatives designated as cash flow hedges are deferred in Accumulated other comprehensive loss, a separate component of equity, and reclassified to earnings in a manner that matches the timing of the earnings impact of the hedged transactions. The ineffective portion of all hedges, if any, is recognized currently in earnings.

The recognized gains and losses offset amounts recognized in cost of services and products sold principally as a result of intercompany or third-party foreign currency exposures. At December 31, 2019 and December 31, 2018, the notional amounts of foreign currency exchange forward contracts were \$496.3 million and \$423.9 million, respectively. These contracts primarily hedge British pounds sterling and euros against other currencies and mature through October 2021.

In addition to foreign currency exchange forward contracts, the Company designates certain loans as hedges of net investments in international subsidiaries. The Company recorded pre-tax net gains of \$7.7 million, pre-tax net losses of \$9.9 million and pre-tax net gains of \$17.4 million related to hedges of net investments during 2019, 2018 and 2017, respectively, in Accumulated other comprehensive loss.

Interest Rate Swaps

The Company uses interest rate swaps in conjunction with certain variable rate debt issuances in order to secure a fixed interest rate. Changes in the fair value attributed to the effect of the swaps' interest spread and changes in the credit worthiness of the counter-parties are recorded in Accumulated other comprehensive loss.

In January 2017 and February 2018, the Company entered into a series of interest rate swaps that cover the period from 2018 through 2022 and had the effect of converting \$300.0 million of the Term Loan Facility from floating-rate to fixed-rate. The fixed rates provided by the swaps replace the adjusted LIBOR rate in the interest calculation, ranging from 2.12% for 2018 to 3.12% for 2022.

During June 2019, the Company effected the early termination of interest rate swaps that covered the period from 2019 through 2022 and had the effect of converting \$100.0 million of the Term Loan Facility from floating-rate to fixed-rate. This termination was conducted as a result of the Company's new Notes offering and required repayment of a portion of the Term Loan Facility with proceeds from the AXC disposal. The Company paid \$2.8 million and recognized a loss of \$2.7 million related to these terminations in Income from discontinued businesses on the Consolidated Statements of Operations. The total notional of the Company's interest rate swaps was \$200.0 million as of December 31, 2019.

Cross-Currency Interest Rate Swaps

The Company may use CCIRs in conjunction with certain debt issuances in order to secure a fixed local currency interest rate. Under these CCIRs, the Company receives interest based on a fixed or floating U.S. dollar rate and pays interest on a fixed local currency rate based on the contractual amounts in dollars and the local currency, respectively. At maturity, there is also the payment of principal amounts between currencies. Changes in the fair value attributed to the effect of the swaps' interest spread and changes in the credit worthiness of the counter-parties are recorded in Accumulated other comprehensive loss. Changes in value attributed to the effect of foreign currency fluctuations are recorded in the Consolidated Statements of Operations and offset currency fluctuation effects on the debt principal. The Company had no outstanding CCIRs at December 31, 2019 or December 31, 2018.

Fair Value of Other Financial Instruments

The carrying amounts of cash and cash equivalents, accounts receivable, accounts payable, accrued liabilities and short-term borrowings approximate fair value due to the short-term maturities of these assets and liabilities. At December 31, 2019 and 2018, the total fair value of long-term debt, including current maturities, was \$827.2 million and \$592.0 million, respectively, compared with a carrying value of \$795.0 million and \$605.4 million, respectively. Fair values for debt are based upon pricing models using market-based inputs (Level 2) for similar issues or on the current rates offered to the Company for debt of the same remaining maturities.

Concentrations of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist principally of cash and cash equivalents and accounts receivable. The Company places cash and cash equivalents with high-quality financial institutions and, by policy, limits the amount of credit exposure to any single institution.

Concentrations of credit risk with respect to accounts receivable exist in the Company's Harsco Environmental Segment and, to a lesser extent, the Harsco Rail Segment have several large customers throughout the world with significant accounts receivable balances. Consolidation in the global steel or rail industries could result in an increase in concentration of credit risk for the Company.

The Company generally does not require collateral or other security to support customer receivables. If a receivable from one or more of the Company's larger customers becomes uncollectible, it could have a material effect on the Company's results of operations or cash flows.

15. Information by Segment and Geographic Area

The Company reports information about operating segments using the "management approach," which is based on the way management organizes and reports the segments within the enterprise for making operating decisions and assessing performance. The Company's reportable segments are identified based upon differences in products, services and markets served. In 2019, the Company had three reportable segments. These segments and the types of products and services offered include the following:

Harsco Environmental

The Segment provides environmental services and material processing to the global steel and metals industries. The Segment partners with its global customer base to deliver production-critical on-site operational support and resource recovery services, through management of its customers' primary waste or byproduct streams. The Segment's services support the metal manufacturing process, generating significant operational and financial efficiencies for its customers and allowing them to focus on their core steelmaking businesses. In addition, this Segment creates value-added downstream products from industrial waste streams.

Harsco Clean Earth

The Segment is one of the largest specialty waste processing companies in the U.S. providing processing and beneficial reuse solutions for hazardous wastes, contaminated materials, and dredged volumes.

Harsco Rail Segment

The Segment is a supplier of equipment, after-market parts and services for the construction and maintenance of railway track. The Segment manufactures highly-engineered railway track maintenance equipment and supports a large installed-base of Harsco equipment with a full suite of aftermarket parts. The Segment is a leading supplier of collision avoidance and warning systems to enhance passenger, rail worker, and pedestrian safety, and pioneered a number of measurement and diagnostic technologies that further support railway maintenance programs.

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Other Information

The measurement basis of segment profit or loss is operating income. There are no significant inter-segment sales. Corporate assets, at December 31, 2019 and 2018, include principally cash, prepaid taxes, fair value of derivative instruments and U.S. deferred income taxes. Countries with revenues from unaffiliated customers or net property, plant and equipment of ten percent or more of the consolidated totals (in at least one period presented) are as follows:

Information by Geographic Area (a)

(In thousands)	Revenues from Unaffiliated Customers		
	Year Ended December 31		
	2019	2018	2017
U.S.	\$ 640,390	\$ 458,383	\$ 423,888
U.K.	144,689	143,346	146,624
All Other	718,663	745,943	736,958
Totals including Corporate	\$ 1,503,742	\$ 1,347,672	\$ 1,307,470

(a) Revenues are attributed to individual countries based on the location of the facility generating the revenue.

(In thousands)	Property, Plant and Equipment, Net		
	Balances at December 31		
	2019	2018	2017
U.S.	\$ 193,692	\$ 98,851	\$ 86,266
China	99,369	89,502	95,562
Brazil	37,047	36,960	54,704
All Other	231,678	207,480	208,151
Totals including Corporate	\$ 561,786	\$ 432,793	\$ 444,683

One customer provided in excess of 10% of the Company's consolidated revenues in 2019, 2018 and 2017.

In 2019, 2018 and 2017, the Harsco Environmental Segment had one customer that provided in excess of 10% of this Segment's revenues under multiple long-term contracts at several mill sites. Should additional consolidations occur involving some of the steel industry's larger companies which are customers of the Company, it would result in an increase in concentration of credit risk for the Company. The loss of any one of the contracts would not have a material adverse effect upon the Company's financial position or cash flows; however, it could have a significant effect on quarterly or annual results of operations.

In 2019, Harsco Clean Earth had no customers in excess of 10% of the Segment's revenues. In 2019, 2018 and 2017, the Harsco Rail Segment had one customer that provided in excess of 10% of the Segment's revenues. The loss of any of these customers would not have a material adverse impact on the Company's financial positions or cash flows; however, it could have a material effect on quarterly or annual results of operations.

Operating Information by Segment:

(In thousands)	Twelve Months Ended		
	December 31		
	2019	2018	2017
Revenues			
Harsco Environmental	\$ 1,034,847	\$ 1,068,304	\$ 1,011,328
Harsco Clean Earth	169,522	—	—
Harsco Rail	299,373	279,294	295,999
Corporate	—	74	143
Total Revenues	\$ 1,503,742	\$ 1,347,672	\$ 1,307,470
Operating Income (Loss)			
Harsco Environmental	\$ 112,298	\$ 121,195	\$ 102,362
Harsco Clean Earth	20,009	—	—
Harsco Rail	23,708	37,341	32,953
Corporate	(51,736)	(27,841)	(30,660)
Total Operating Income	\$ 104,279	\$ 130,695	\$ 104,655

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(In thousands)	Twelve Months Ended		
	December 31	2019	2018
Total Assets			
Harsco Environmental	\$ 1,296,061	\$ 1,230,152	\$ 1,184,280
Harsco Clean Earth	745,410	—	—
Harsco Rail	246,377	186,049	237,135
Corporate	26,037	53,342	43,860
Discontinued Operations	53,582	163,324	113,410
Total Assets	\$ 2,367,467	\$ 1,632,867	\$ 1,578,685
Depreciation and Amortization			
Harsco Environmental	\$ 112,126	\$ 115,059	\$ 112,329
Harsco Clean Earth	12,855	—	—
Harsco Rail	4,875	4,287	4,221
Corporate	5,238	5,710	6,027
Total Depreciation and Amortization	\$ 135,094	\$ 125,056	\$ 122,577
Capital Expenditures			
Harsco Environmental	\$ 153,694	\$ 114,142	\$ 87,526
Harsco Clean Earth	5,870	—	—
Harsco Rail	15,274	9,152	2,403
Corporate	1,762	1,313	1,490
Total Capital Expenditures	\$ 176,600	\$ 124,607	\$ 91,419

Reconciliation of Segment Operating Income to Consolidated Income From Continuing Operations Before Income Taxes and Equity Income:

(In thousands)	Twelve Months Ended		
	December 31	2019	2018
Segment operating income	\$ 156,015	\$ 158,536	\$ 135,315
General Corporate expense	(51,736)	(27,841)	(30,660)
Operating income from continuing operations	104,279	130,695	104,655
Interest income	1,975	2,155	2,469
Interest expense	(36,586)	(21,531)	(26,862)
Defined benefit pension income (expense)	(5,493)	3,457	(2,595)
Loss on early extinguishment of debt	(7,704)	(1,127)	(2,265)
Income from continuing operations before income taxes and equity income	\$ 56,471	\$ 113,649	\$ 75,402

16. Revenue Recognition

The Company recognizes revenues to depict the transfer of promised services and products to customers in an amount that reflects the consideration the Company expects to receive in exchange for those services or products. Service revenues include the Harsco Clean Earth Segment and the service components of the Harsco Environmental and Harsco Rail Segments. Product revenues include portions of the Harsco Environmental and Harsco Rail Segments. See Note 1, Summary of Significant Accounting Policies, Revenue Recognition, for additional information.

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A summary of the Company's revenues by primary geographical markets as well as by key product and service groups is as follows:

(In thousands)	Twelve Months Ended December 31, 2019					Consolidated Totals
	Harsco Environmental Segment	Harsco Clean Earth Segment	Harsco Rail Segment	Corporate		
Primary Geographical Markets (a):						
North America	\$ 294,367	\$ 169,522	\$ 221,724	\$ —	\$ 685,613	
Western Europe	386,593	—	44,569	—	431,162	
Latin America (b)	146,040	—	2,588	—	148,628	
Asia-Pacific	128,949	—	30,492	—	159,441	
Middle East and Africa	60,402	—	—	—	60,402	
Eastern Europe	18,496	—	—	—	18,496	
Total Revenues (c)	<u>\$ 1,034,847</u>	<u>\$ 169,522</u>	<u>\$ 299,373</u>	<u>\$ —</u>	<u>\$ 1,503,742</u>	

Key Product and Service Groups:

Environmental services related to resource recovery for metals manufacturing; and related logistical services	\$ 881,696	\$ —	\$ —	\$ —	\$ 881,696
Applied products	127,875	—	—	—	127,875
Environmental systems for aluminum dross and scrap processing	25,276	—	—	—	25,276
Railway track maintenance equipment	—	—	145,968	—	145,968
After-market parts and services; safety and diagnostic technology	—	—	132,249	—	132,249
Railway contracting services	—	—	21,156	—	21,156
Waste processing and reuse solutions	—	169,522	—	—	169,522
General Corporate	—	—	—	—	—
Total Revenues (c)	<u>\$ 1,034,847</u>	<u>\$ 169,522</u>	<u>\$ 299,373</u>	<u>\$ —</u>	<u>\$ 1,503,742</u>

(In thousands)	Twelve Months Ended December 31, 2018					Consolidated Totals
	Harsco Environmental Segment	Harsco Clean Earth Segment	Harsco Rail Segment	Corporate		
Primary Geographical Markets (a):						
North America	\$ 302,238	\$ —	\$ 205,212	\$ 74	\$ 507,524	
Western Europe	390,840	—	48,016	—	438,856	
Latin America (b)	151,886	—	3,977	—	155,863	
Asia-Pacific	145,761	—	22,089	—	167,850	
Middle East and Africa	50,003	—	—	—	50,003	
Eastern Europe	27,576	—	—	—	27,576	
Total Revenues (c)	<u>\$ 1,068,304</u>	<u>\$ —</u>	<u>\$ 279,294</u>	<u>\$ 74</u>	<u>\$ 1,347,672</u>	

Key Product and Service Groups:

Environmental services related to resource recovery for metals manufacturing; and related logistical services	\$ 924,766	\$ —	\$ —	\$ —	\$ 924,766
Applied products	128,488	—	—	—	128,488
Environmental systems for aluminum dross and scrap processing	15,050	—	—	—	15,050

Railway track maintenance equipment	—	—	112,547	—	112,547
After-market parts and services; safety and diagnostic technology	—	—	139,020	—	139,020
Railway contracting services	—	—	27,727	—	27,727
Waste processing and reuse solutions	—	—	—	—	—
General Corporate	—	—	—	74	74
Total Revenues (c)	\$ 1,068,304	\$ —	\$ 279,294	\$ 74	\$ 1,347,672

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Twelve Months Ended

December 31, 2017

(In thousands)	Harsco Environmental Segment	Harsco Clean Earth Segment	Harsco Rail Segment	Corporate	Consolidated Totals
Primary Geographical Markets (a):					
North America	\$ 274,476	\$ —	\$ 196,567	\$ 143	\$ 471,186
Western Europe	369,763	—	78,698	—	448,461
Latin America (b)	159,130	—	2,827	—	161,957
Asia-Pacific	138,311	—	17,907	—	156,218
Middle East and Africa	42,700	—	—	—	42,700
Eastern Europe	26,948	—	—	—	26,948
Total Revenues (c)	<u>\$ 1,011,328</u>	<u>\$ —</u>	<u>\$ 295,999</u>	<u>\$ 143</u>	<u>\$ 1,307,470</u>
Key Product and Service Groups:					
Environmental services related to resource recovery for metals manufacturing; and related logistical services	\$ 890,371	\$ —	\$ —	\$ —	\$ 890,371
Applied products	120,957	—	—	—	120,957
Environmental systems for aluminum dross and scrap processing	—	—	—	—	—
Railway track maintenance equipment	—	—	146,267	—	146,267
After-market parts and services; safety and diagnostic technology	—	—	110,195	—	110,195
Railway contracting services	—	—	39,537	—	39,537
Waste processing and reuse solutions	—	—	—	—	—
General Corporate	—	—	—	143	143
Total Revenues (c)	<u>\$ 1,011,328</u>	<u>\$ —</u>	<u>\$ 295,999</u>	<u>\$ 143</u>	<u>\$ 1,307,470</u>

(a) Revenues are attributed to individual countries based on the location of the facility generating the revenue.

(b) Includes Mexico.

(c) The Company has adopted the new revenue recognition standard utilizing the modified retrospective transition method, including use of practical expedients. Comparative information has not been restated and continues to be reported under U.S. GAAP in effect for those periods. See Note 2, Recently Adopted and Recently Issued Accounting Standards for additional information.

The Company may receive payments in advance of earning revenue, which are treated as Advances on contracts on the Consolidated Balance Sheets. The Company may recognize revenue in advance of being able to contractually invoice the customer, which is treated as Contract assets on the Consolidated Balance Sheets. Contract assets are transferred to Trade accounts receivable, net when right to payment becomes unconditional. Contract assets and Contract liabilities are reported as a net position, on a contract-by-contract basis, at the end of each reporting period. These instances are primarily related to the Harsco Rail Segment.

The Company had Contract assets totaling \$31.2 million at December 31, 2019 and \$12.1 million at December 31, 2018. The increase is due principally to additional contract assets recognized in excess of the transfer of contract assets to accounts receivable. The Company had Advances on contracts totaling \$60.3 million at December 31, 2019 and \$67.1 million at December 31, 2018. The decrease is due principally to the recognition of revenue on previously received advances on contracts in excess of receipts of new advances on contracts during the period, primarily in the Harsco Rail Segment. During the year ended December 31, 2019, the Company recognized approximately \$67 million of revenue related to amounts previously included in Advances on Contracts. Additionally, during the year ended December 31, 2019, the Company recognized decreased revenue of approximately \$1 million, in the Harsco Rail Segment, related to performance obligations partially satisfied in prior periods, resulting from the changes in estimated costs for certain projects where revenue is recognized on an over time basis.

At December 31, 2019, the Harsco Environmental Segment had remaining, fixed, unsatisfied performance obligations, where the expected contract duration exceeds one year totaling \$152.5 million. Of this amount, \$43.5 million is expected to be fulfilled by December 31, 2020, \$35.0 million by December 31, 2021, \$33.8 million by December 31, 2022, \$20.4 million by December 31, 2023 and the remainder thereafter. These amounts exclude any variable fees, fixed fees subject to indexation and any performance obligations expected to be satisfied within one year. The increase from September 30, 2019 is primarily related to a three-year contract extension related for one of the impacted locations.

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At December 31, 2019, the Harsco Rail Segment had remaining, fixed, unsatisfied performance obligations, where the expected contract duration exceeds one year totaling \$296.2 million. Of this amount, \$75.9 million is expected to be fulfilled by December 31, 2020, \$83.0 million by December 31, 2021, \$74.3 million by December 31, 2022, \$52.5 million by December 31, 2023 and the remainder thereafter. These amounts exclude any variable fees, fixed fees subject to indexation and any performance obligations expected to be satisfied within one year.

The Company provides assurance type warranties primarily for product sales in the Harsco Rail Segments. These warranties are typically not priced or negotiated separately (there is no option to separately purchase the warranty) or the warranty does not provide customers with a service in addition to the assurance that the product complies with agreed-upon specifications. Accordingly, such warranties do not represent separate performance obligations. See Note 1, Summary of Significant Accounting Policies for additional information on warranties.

17. Other (Income) Expenses, Net

The major components of this Consolidated Statements of Operations caption are as follows:

(In thousands)	2019	2018	2017
Net gains			
Harsco Environmental Segment	\$ (6,303)	\$ (2,650)	\$ (1,354)
Corporate	—	(1,218)	—
Total net gains	(6,303)	(3,868)	(1,354)
Employee termination benefit costs			
Harsco Environmental Segment	1,254	2,853	4,411
Clean Earth Segment	1,960	—	—
Harsco Rail Segment	2,393	704	1,133
Corporate	1,012	1,206	1,189
Total employee termination benefit costs	6,619	4,763	6,733
Other costs to exit activities			
Harsco Environmental Segment	970	352	706
Harsco Rail Segment	3,042	—	—
Corporate	196	(182)	556
Total other costs to exit activities	4,208	170	1,262
Impaired asset write-downs			
Harsco Environmental Segment	632	104	706
Harsco Rail Segment	141	—	—
Corporate	—	—	168
Total impaired asset write-downs	773	104	874
Contingent consideration adjustments			
Harsco Environmental Segment	(8,506)	(2,939)	—
Harsco Clean Earth Segment	825	—	—
Total contingent consideration adjustments	(7,681)	(2,939)	—
Other income			
	(237)	(431)	(188)
Total other (income) expenses, net	\$ (2,621)	\$ (2,201)	\$ 7,327

Net Gains

Net gains result from the sales of redundant properties (primarily land, buildings and related equipment) and non-core assets. In 2019, gains related to assets sold principally in Asia Pacific and North America; as well as a cumulative translation adjustment resulting from the substantial liquidation of a subsidiary in Western Europe. In 2018, gains related to assets sold principally in Eastern Europe, Western Europe and Asia Pacific. In 2017, gains related to assets sold principally in Latin America and Western Europe.

Employee Termination Benefit Costs

Costs and the related liabilities associated with involuntary termination benefit costs associated with one-time benefit arrangements provided as part of an exit or disposal activity are recognized by the Company when a formal plan for reorganization is approved at

the appropriate level of management and communicated to the affected employees. Additionally, costs associated with ongoing benefit arrangements, or in certain countries where statutory requirements dictate a minimum required benefit, are recognized when they are probable and estimable. The employee termination benefits costs in 2019 principally related to the Harsco Rail Segment's consolidation of facilities in North America; the Harsco Clean Earth Segment

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primarily in North America; and the Harsco Environmental Segment primarily in Asia Pacific and Western Europe. The employee termination benefits costs in 2018 related principally to the Harsco Environmental Segment, primarily in Asia Pacific and Western Europe and Corporate in North America. The employee termination benefits costs in 2017 related principally to the Harsco Environmental Segment, primarily in Latin America and Western Europe.

Other Costs to Exit Activities

Costs associated with exit or disposal activities include costs to terminate a contract and other costs associated with exit or disposal activities. Costs to terminate a contract that is not a capital lease are recognized when an entity terminates the contract or when an entity ceases using the right conveyed by the contract. This includes the costs to terminate the contract before the end of its term or the costs that will continue to be incurred under the contract for its remaining term without economic benefit to the entity (e.g., lease run-out costs). Other costs associated with exit or disposal activities (e.g., costs to consolidate or close facilities and relocate equipment or employees) are recognized and measured at their fair value in the period in which the liability is incurred. In 2019, \$4.2 million of exit costs were incurred in the Harsco Rail Segment, principally in North America due to the consolidation of facilities. In 2018, \$0.2 million of exit costs were incurred across several regions. In 2017, \$1.3 million of exit costs were incurred, principally in Western Europe and North America.

Impaired Asset Write-downs

Impaired asset write-downs are measured as the amount by which the carrying amount of assets exceeds their fair value. Fair value is estimated based upon the expected future realizable cash flows including anticipated selling prices. Non-cash impaired asset write-downs are included in, Other, net, on the Consolidated Statements of Cash Flows as adjustments to reconcile net income (loss) to net cash provided by operating activities. In 2019, \$0.8 million of impaired asset write-downs were incurred principally in the Harsco Environmental Segment, mostly in Western Europe. In 2017, \$0.9 million of impaired asset write-downs were incurred principally in the Harsco Environmental Segment, mostly in the Asia Pacific and North America regions.

Contingent Consideration Adjustments

The Company acquired Altek during 2018 and the purchase price included contingent consideration based on the performance of Altek through 2021. During 2019, the Company's assessment of these performance goals resulted in a \$8.5 million reduction to the previously recognized contingent consideration liability in the Harsco Environmental Segment. During 2018, the Company's assessment of these performance goals resulted in a \$2.9 million reduction to the previously recognized contingent consideration liability for Altek. In addition, during 2019, the Company acquired Clean Earth and included in the liabilities acquired was a contingent consideration liability resulting from a prior Clean Earth acquisition. During 2019, the Company recorded an increase to this liability of \$0.8 million. Each quarter until settlement of the contingency, the Company will assess the likelihood that the acquired businesses will achieve the performance goals and the resulting fair value of the contingent consideration and any future adjustments (increases or decreases) will be included in operating results.

18. Components of Accumulated Other Comprehensive Loss

Accumulated other comprehensive loss is included on the Consolidated Statements of Stockholders' Equity. The components of Accumulated other comprehensive loss, net of the effect of income taxes, and activity for the years ended December 31, 2019 and 2018 are as follows:

(In thousands)	Components of Accumulated Other Comprehensive Income (Loss) - Net of Tax				Total
	Cumulative Foreign Exchange Translation Adjustments	Effective Portion of Derivatives Designated as Hedging Instruments	Cumulative Unrecognized Actuarial Losses on Pension Obligations	Unrealized Loss on Marketable Securities	
Balance at December 31, 2017	\$ (111,567)	\$ 808	\$ (435,840)	\$ 17	\$ (546,582)
Adoption of new accounting standard	—	(1,520)	—	—	(1,520)
Balance at January 1, 2018	(111,567)	(712)	(435,840)	17	(548,102)
Other comprehensive income (loss) before reclassifications	(50,743) ^(a)	2,466 ^(b)	8,450 ^(c)	(48)	(39,875)
Amounts reclassified from accumulated other comprehensive loss, net of tax	—	(365)	18,735	—	18,370
Total other comprehensive income (loss)	(50,743)	2,101	27,185	(48)	(21,505)
Less: Other comprehensive loss attributable to noncontrolling interests	2,500	—	—	—	2,500
Other comprehensive income (loss) attributable to Harsco Corporation	(48,243)	2,101	27,185	(48)	(19,005)
Balance at December 31, 2018	<u>\$ (159,810)</u>	<u>\$ 1,389</u>	<u>\$ (408,655)</u>	<u>\$ (31)</u>	<u>\$ (567,107)</u>

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(In thousands)	Components of Accumulated Other Comprehensive Income (Loss) - Net of Tax				
	Cumulative Foreign Exchange Translation Adjustments	Effective Portion of Derivatives Designated as Hedging Instruments	Cumulative Unrecognized Actuarial Losses on Pension Obligations	Unrealized Loss on Marketable Securities	Total
Balance at December 31, 2018	\$ (159,810)	\$ 1,389	\$ (408,655)	\$ (31)	\$ (567,107)
Adoption of new accounting standard (c)	—	—	(21,429)	—	(21,429)
Balance at January 1, 2019	(159,810)	1,389	(430,084)	(31)	(588,536)
Other comprehensive income (loss) before reclassifications	17,261 ^(a)	(7,050) ^(b)	(32,274) ^(c)	28	(22,035)
Amounts reclassified from accumulated other comprehensive loss, net of tax	(1,763)	1,944	21,796	—	21,977
Total other comprehensive income (loss)	15,498	(5,106)	(10,478)	28	(58)
Less: Other comprehensive loss attributable to noncontrolling interests	972	—	—	—	972
Other comprehensive income (loss) attributable to Harsco Corporation	16,470	(5,106)	(10,478)	28	914
Balance at December 31, 2019	\$ (143,340)	\$ (3,717)	\$ (440,562)	\$ (3)	\$ (587,622)

(a) Principally foreign currency fluctuation.

(b) Principally net change from periodic revaluations.

(c) Principally changes due to annual actuarial remeasurements and foreign currency translation.

Amounts reclassified from accumulated other comprehensive loss for 2019 and 2018 are as follows:

(In thousands)	Year Ended December 31 2019	Year Ended December 31 2018	Affected Caption on the Consolidated Statements of Operations
Amortization of defined benefit pension items (d):			
Actuarial losses	\$ 19,806	\$ 20,014	Defined benefit pension income (expense)
Prior-service costs	326	(139)	Defined benefit pension income (expense)
Pension asset transfer - discontinued businesses	3,200	—	Gain on sale of discontinued businesses
Settlement/curtailment losses	19	249	Defined benefit pension income (expense)
Total before tax	23,351	20,124	
Tax benefit	(1,555)	(1,389)	
Total reclassification of defined benefit pension items, net of tax	\$ 21,796	\$ 18,735	
Recognition of cumulative foreign currency translation adjustments:			
Gain on substantial liquidation of subsidiaries (e)	\$ (2,425)	\$ —	Other (income) expenses, net
Loss on substantial liquidation of subsidiaries (e)	662	—	Gain on sale of discontinued business
Amortization of cash flow hedging instruments:			
Foreign currency exchange forward contracts	\$ (550)	\$ (374)	Product revenues
Foreign currency exchange forward contracts	44	—	Cost of services and products sold
Cross-currency interest rate swaps	1,219	1,264	Interest expense
Interest rate swaps	(520)	(1,108)	Interest expense
Interest rate swaps	2,741	—	Income from discontinued businesses
Total before tax	2,934	(218)	
Tax benefit	(990)	(147)	
Total reclassification of cash flow hedging instruments	\$ 1,944	\$ (365)	

- (d) These accumulated other comprehensive loss components are included in the computation of NPPC. See Note 9, Employee Benefit Plans, for additional information.
- (e) No tax impact.

19. Subsequent Events

On February 7, 2020, the Company announced it had entered into a definitive agreement to acquire the Stericycle Environmental Solutions Business ("ESOL"), an established hazardous waste transportation and processing solutions provider from Stericycle, Inc. Under the terms of the agreement, the Company will acquire ESOL for \$462.5 million in cash, subject to post-closing adjustments. The transaction has been approved by the Company's Board and is expected to close by March 31, 2020 subject to customary closing conditions, including regulatory approvals.

Two-Year Summary of Quarterly Results (Unaudited) (In millions, except per share amounts)

Quarterly	2019 (a)			
	First	Second	Third	Fourth
Revenues	\$ 329.9	\$ 350.9	\$ 423.2	\$ 399.8
Gross profit (b)	78.7	84.7	111.7	84.4
Net income attributable to Harsco Corporation	20.7	8.6	435.4	39.2
Basic income (loss) per share attributable to Harsco Corporation common stockholders:				
Continuing operations	\$ 0.13	\$ (0.04)	\$ 0.22	\$ 0.04
Discontinued operations (c)	0.13	0.14	5.24	0.46
Basic income per share attributable to Harsco Corporation common stockholders	\$ 0.26	\$ 0.11 ^(d)	\$ 5.46	\$ 0.50
Diluted income (loss) per share attributable to Harsco Corporation common stockholders:				
Continuing operations	\$ 0.13	\$ (0.04)	\$ 0.22	\$ 0.03
Discontinued operations (c)	0.13	0.14	5.15	0.45
Diluted income per share attributable to Harsco Corporation common stockholders	\$ 0.25 ^(d)	\$ 0.11 ^(d)	\$ 5.37	\$ 0.49 ^(d)

Quarterly	2018 (a)			
	First	Second	Third	Fourth
Revenues	\$ 324.4	\$ 339.9	\$ 351.6	\$ 331.8
Gross profit (b)	73.8	87.7	94.5	79.2
Net income attributable to Harsco Corporation	17.8	40.5	32.8	45.9
Basic income per share attributable to Harsco Corporation common stockholders:				
Continuing operations	\$ 0.13	\$ 0.38	\$ 0.30	\$ 0.43
Discontinued operations (c)	0.09	0.12	0.10	0.14
Basic income per share attributable to Harsco Corporation common stockholders	\$ 0.22	\$ 0.50	\$ 0.41 ^(d)	\$ 0.57
Diluted income per share attributable to Harsco Corporation common stockholders:				
Continuing operations	\$ 0.13	\$ 0.37	\$ 0.29	\$ 0.41
Discontinued operations (c)	0.09	0.11	0.10	0.14
Diluted income per share attributable to Harsco Corporation common stockholders	\$ 0.21 ^(d)	\$ 0.48	\$ 0.39	\$ 0.55

(a) Sum of the quarters may not equal the total year due to rounding.

(b) Gross profit is defined as Revenues less costs and expenses associated directly with or allocated to products sold or services rendered.

(c) Discontinued operations related principally to the Company's former Harsco Industrial Segment.

(d) Does not total due to rounding.

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

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

As of December 31, 2019, an evaluation was performed, under the supervision and with the participation of the Company's management, including the Company's Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of the Company's disclosure controls and procedures pursuant to Rule 13a-15 under the Securities and Exchange Act of 1934, as amended (the "Exchange Act"). Based upon that evaluation, such officers concluded that the Company's disclosure controls and procedures are effective to ensure that information required to be disclosed by the Company in the reports it files or submits under the Exchange Act (1) is recorded, processed, summarized, and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and (2) is accumulated and communicated to the Company's management, including the Chief Executive Officer and Chief Financial Officer, as appropriate to allow for timely decisions regarding required disclosure.

Changes in Internal Control Over Financial Reporting

The Company adopted changes issued by the Financial Accounting Standards Board related to accounting for leases, which required the implementation of new accounting processes, which changed the Company's internal controls over lease accounting. The Company has completed the design of these controls and they have been implemented as of March 31, 2019.

On June 28, 2019, the Company acquired CEHI Acquisition Corporation and Subsidiaries ("Clean Earth"). As a result, the Company is currently integrating Clean Earth's operations into its overall system of internal control over financial reporting. Under the guidelines established by the Securities and Exchange Commission, companies are permitted to exclude acquisitions from their assessment of internal control over financial reporting during the first year of acquisition. Accordingly, the Company excluded Clean Earth from the assessment of internal control over financial reporting for 2019.

Other than the foregoing, there were no changes in the Company's internal control over financial reporting during the Company's most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Management's Report on Internal Controls Over Financial Reporting is included in Part II, Item 8, "Financial Statements and Supplementary Data." The effectiveness of the Company's internal control over financial reporting at December 31, 2019 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in the Report of Independent Registered Public Accounting Firm appearing in Part II, Item 8, "Financial Statements and Supplementary Data."

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information regarding executive officers of the Company required by this Item is set forth as a Supplementary Item, titled "Executive Officers of the Registrant," at the end of Part I of this Annual Report on Form 10-K (pursuant to the general Instruction to Item 401 of Regulation S-K) and is incorporated herein by reference. The other information required by this Item is incorporated herein by reference from the disclosures that will be included under the sections entitled "Corporate Governance," "Proposal 1: Election of Directors - Nominees for Director," "Meetings and Committees of the Board," and "Report of the Audit Committee" of the Company's Definitive Proxy Statement for its 2020 Annual Meeting of Stockholders (the "2020 Proxy Statement"), which will be filed pursuant to SEC Regulation 14A not later than 120 days after the end of the Company's fiscal year ended December 31, 2019.

The Company's Code of Conduct (the "Code"), which applies to all officers, directors and employees of the Company, may be found on the Company's Internet website, www.harsco.com. The Company intends to disclose on its website any amendments to the Code or any waiver from a provision of the Code granted to an executive officer or director of the Company. The Code is available in print, without charge, to any person who requests it. To request a copy of the Code please contact the Company's Vice President—Corporate Communications at (717) 730-3683.

Item 11. Executive Compensation.

The information regarding compensation of executive officers and directors required by this Item is incorporated herein by reference from the disclosures that will be included under the sections entitled "Compensation Discussion and Analysis," "Discussion and Analysis of 2019 Compensation" and "Non-Employee Director Compensation" of the 2020 Proxy Statement. The other information required by this Item is incorporated herein by reference from the disclosures that will be included under the sections entitled "Compensation Committee Interlocks and Insider Participation" and "Compensation Committee Report" of the 2020 Proxy Statement.

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

The information regarding security ownership of certain beneficial owners and management required by this Item is incorporated herein by reference from the disclosures that will be included under the section entitled "Share Ownership of Directors, Management and Certain Beneficial Owners" of the 2020 Proxy Statement.

Equity compensation plan information is incorporated herein by reference from the disclosures that will be included under the section entitled "Equity Compensation Plan Information (As of December 31, 2019)" of the 2020 Proxy Statement.

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

The information regarding certain relationships and related transactions required by this Item is incorporated herein by reference from the disclosures that will be included under the section entitled "Transactions with Related Persons" of the 2020 Proxy Statement. The information regarding director independence required by this Item is incorporated herein by reference from the disclosures that will be included under the section entitled "Corporate Governance" of the 2020 Proxy Statement.

Item 14. Principal Accounting Fees and Services.

The information regarding principal accounting fees and services required by this Item is incorporated herein by reference from the disclosures that will be included under the sections entitled "Report of the Audit Committee" and "Fees Billed by the Independent Auditors for Audit and Non-Audit Services" of the 2020 Proxy Statement.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

- (a) 1. The Index to Consolidated Financial Statements and Supplementary Data is located under Part II, Item 8, "Financial Statements and Supplementary Data."

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Index to Consolidated Financial Statements and Supplementary Data	<u>42</u>

2. The following financial statement schedule should be read in conjunction with the Consolidated Financial Statements under Part II, Item 8, "Financial Statements and Supplementary Data":

	Page
Schedule II—Valuation and Qualifying Accounts for the years 2019, 2018 and 2017	<u>104</u>

Financial statement schedules other than that listed above are omitted because the required information is not applicable, or because the information required is included in the consolidated financial statements.

SCHEDULE II. VALUATION AND QUALIFYING ACCOUNTS
Continuing Operations
(In thousands)

COLUMN A Description	COLUMN B Balance at Beginning of Period	COLUMN C Additions (Deductions)	COLUMN D		COLUMN E Balance at End of Period
			Charged to Cost and Expenses	Due to Currency Translation Adjustments	
For the year 2019:					
Allowance for Doubtful Accounts	\$ 4,586	\$ 7,507	\$ 370	\$ 1,049 ^(a)	\$ 13,512
Deferred Tax Assets—Valuation Allowance	137,450	(7,395)	448	(3,429) ^(b)	127,074
For the year 2018:					
Allowance for Doubtful Accounts	\$ 4,470	\$ 380	\$ (149)	\$ (115) ^(a)	\$ 4,586
Deferred Tax Assets—Valuation Allowance	172,846	(20,104)	(8,612)	(6,680) ^(b)	137,450
For the year 2017:					
Allowance for Doubtful Accounts	\$ 11,558	\$ 5,211	\$ 524	\$ (12,823) ^(a)	\$ 4,470
Deferred Tax Assets—Valuation Allowance	145,216	32,785	9,853	(15,008) ^(b)	172,846

(a) Includes the write-off of previously reserved accounts receivable balances. Also, 2019 includes the acquisition of Clean Earth.

(b) Includes a decrease of \$5.6 million related to the loss of certain tax attributes in certain foreign dormant entities due to merger and liquidation, an increase of \$0.9 million related to pension adjustments recorded through Accumulate other comprehensive loss and an increase of \$0.8 million related to the investment tax credit which is unlikely to be used before expiration in certain foreign jurisdictions in 2019. Includes a decrease of \$5.4 million related to a change in estimate of interest deductions and a decrease of \$1.1 million due to capital loss carryforward expiring in the U.S. in 2018. Includes a decrease of \$11.6 million related to pension adjustments recorded through Accumulated other comprehensive loss and a \$4.6 million decrease related to a U.S. tax rate change in 2017.

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Listing of Exhibits Filed with Form 10-K

Description of Exhibit	
2(a)	<u>Stock Purchase Agreement, dated as of May 8, 2019, by and between Calrissian Holdings, LLC, CEHI Acquisition Corporation, the holders of stock and options in CEHI Acquisition Corporation, Compass Group Diversified Holdings LLC and, solely for the purposes of Section 9(r) thereof, the Company (incorporated by reference to the Company's Current Report on Form 8-K dated May 13, 2019, Commission File Number 001-03970).*</u>
2(b)	<u>Asset Purchase Agreement, dated as of May 8, 2019, by and among the Company, E&C FinFan, Inc. and, solely with respect to Section 11.19 thereof, Chart Industries, Inc (incorporated by reference to the Company's Current Report on Form 8-K dated May 13, 2019, Commission File Number 001-03970).*</u>
3(a)	<u>Restated Certificate of Incorporation (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2013, Commission File Number 001-03970).</u>
3(b)	<u>Certificate of Designation filed September 25, 1997 (incorporated by reference to Exhibit 3.A to the Company's Annual Report on Form 10-K for the period ended December 31, 1997, Commission File Number 001-03970).</u>
3(c)	<u>Certificate of Amendment to the Restated Certificate of Incorporation, dated April 29, 2015 (incorporated by reference to the Company's Current Report on Form 8-K/A dated May 22, 2015, Commission File Number 001-03970).</u>
3(d)	<u>By-laws, as amended October 28, 2014 (incorporated by reference to the Company's Current Report on Form 8-K dated October 28, 2014, Commission File Number 001-03970).</u>
4(a)	<u>Description of Company's Securities.</u>
4(b)	<u>Form of Specimen Common Stock Certificate (incorporated by reference to Exhibit 4(h) to the Company's Registration Statement on Form S-3 dated December 15, 1994, Registration No. 33-56885).</u>
4(c)	<u>Indenture, dated June 28, 2019, by and among Harsco Corporation, the subsidiary guarantors named therein and U.S. Bank National Association, as trustee (incorporated by reference to the Company's Current Report on Form 8-K dated July 5, 2019, Commission File Number 001-03970).</u>
4(d)	<u>Form of 5.75% Senior Notes due 2027 (included as part of Exhibit 4.1 above).</u>

* Schedules and similar attachments have been omitted pursuant to Item 601(b)(2) of Regulation S-K. The Company will furnish copies of any such schedules and attachments to the U.S. Securities and Exchange Commission upon request.

Material Contracts—Credit and Underwriting Agreements

10(a)(i)	<u>Amended and Restated Five-Year Credit Agreement, dated March 2, 2012, among Harsco Corporation, the lenders named therein, Citibank, N.A., as administrative agent, RBS Securities Inc., as syndication agent, and the Bank of Tokyo-Mitsubishi UFJ, Ltd., HSBC Bank USA, National Association, ING Bank N.V., Dublin Branch, JPMorgan Chase Bank, N.A. and Lloyds TSB Bank PLC, as documentation agents (incorporated by reference to the Company's Current Report on Form 8-K dated March 7, 2012, Commission File No. 001-03970).</u>
10(a)(ii)	<u>Amendment No. 1, dated September 12, 2013, to the Amended and Restated Five-Year Credit Agreement, dated March 2, 2012, among Harsco Corporation, the lenders named therein, Citibank, N.A., as administrative agent, RBS Securities Inc., as syndication agent, and the Bank of Tokyo-Mitsubishi UFJ, Ltd., HSBC Bank USA, National Association, ING Bank N.V., Dublin Branch, JPMorgan Chase Bank, N.A. and Lloyds TSB Bank PLC, as documentation agents (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended September 30, 2013, Commission File Number 001-03970).</u>
10(a)(iii)	<u>Amendment No. 2, dated December 20, 2013, to the Amended and Restated Five-Year Credit Agreement, dated March 2, 2012, among Harsco Corporation, the lenders named therein, Citibank, N.A., as administrative agent, RBS Securities Inc., as syndication agent, and the Bank of Tokyo-Mitsubishi UFJ, Ltd., HSBC Bank USA, National Association, ING Bank N.V., Dublin Branch, JPMorgan Chase Bank, N.A. and Lloyds TSB Bank PLC, as documentation agents (incorporated by reference to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014, Commission File Number 001-03970).</u>
10(a)(iv)	<u>Amendment No. 3, dated as of March 27, 2015, to the Amended and Restated Five-Year Credit Agreement among Harsco Corporation, a Delaware corporation, as Borrower, the Lenders party thereto and Citibank, N.A., as Administrative Agent (incorporated by reference to the Company's Current Report on Form 8-K filed April 1, 2015, Commission File Number 001-03970).</u>

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Description of Exhibit	
10(a)(v)	<u>Amendment and Restatement Agreement, dated as of December 2, 2015, among Harsco Corporation, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent, the other agents party thereto and the lenders party thereto including Second Amended and Restated Credit Agreement, dated as of December 2, 2015, among Harsco Corporation, the lenders named therein, Citibank, N.A. and Royal Bank of Canada, as issuing lenders, and Citibank N.A., as administrative agent and as collateral agent (incorporated by reference to the Company's Current Report on Form 8-K dated December 4, 2015, Commission File No. 001-03970).</u>
10(a)(vi)	<u>Amendment and Restatement Agreement and First Amendment to Guarantee and Collateral Agreement, dated as of November 2, 2016, among the Company, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K filed November 8, 2016, Commission file No. 001-03970).</u>
10(a)(vii)	<u>Amendment No. 1, dated December 8, 2017, among Harsco Corporation, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent, and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K dated December 13, 2017, Commission File No. 001-03970).</u>
10(a)(viii)	<u>Amendment No. 2, dated as of June 18, 2018, among the Company, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K dated June 21, 2018, Commission File No. 001-03970).</u>
10(a)(ix)	<u>Amendment No. 3, dated as of June 18, 2018, among the Company, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K Dated June 21, 2018, Commission File No. 001-03970).</u>
10(a)(x)	<u>Amendment No. 4, dated June 28, 2019, among Harsco Corporation, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent, and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K dated July 5, 2019, Commission File Number 001-03970).</u>

Material Contracts—Management Contracts and Compensatory Plans

10(b)	<u>Harsco Corporation Supplemental Retirement Benefit Plan as amended and restated January 1, 2009 (incorporated by reference to the Company's Annual Report on Form 10-K, for the period ended December 31, 2008, Commission File Number 001-03970).</u>
10(c)	<u>Trust Agreement between Harsco Corporation and Dauphin Deposit Bank and Trust Company dated July 1, 1987 relating to the Supplemental Retirement Benefit Plan (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 1987, Commission File Number 001-03970).</u>
10(d)	<u>Stock Option Contract (incorporated by reference to the Company's Current Report on Form 8-K dated January 31, 2011, Commission File Number 001-03970).</u>
10(e)	<u>Harsco Corporation 2013 Equity and Incentive Compensation Plan (incorporated by reference to the Company's Current Report on Form 8-K dated April 26, 2013, Commission File Number 001-03970).</u>
10(f)	<u>Amendment No. 1 to the Harsco Corporation 2013 Equity and Incentive Compensation Plan (incorporated by reference to the Company's Current Report on Form 8-K dated May 1, 2017, Commission File Number 001-03970).</u>
10(g)	<u>Harsco Corporation Form of Stock Appreciation Rights Agreement (effective for grants on and after May 10, 2013) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2013, Commission File Number 001-03970).</u>
10(h)(i)	<u>Harsco Corporation 1995 Non-Employee Directors' Stock Plan as Amended and Restated at January 27, 2004 (incorporated by reference to Proxy Statement dated March 23, 2004 on Exhibit A, pages A-1 through A-9, Commission File Number 001-03970).</u>
10(h)(ii)	<u>Amendment No. 1 to the Harsco Corporation 1995 Non-Employee Directors' Stock Plan (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2008, Commission File Number 001-03970).</u>
10(i)(i)	<u>Harsco Corporation Deferred Compensation Plan for Non-Employee Directors (as Amended and Restated as of December 31, 2008) (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2008, Commission File Number 001-03970).</u>
10(i)(ii)	<u>First Amendment to the Harsco Corporation Deferred Compensation Plan for Non Employee Directors (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31,</u>

Description of Exhibit	
10(j)	Harsco Non-Qualified Retirement Savings & Investment Plan Part B—Amendment and Restatement as of January 1, 2009 (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2008, Commission File Number 001-03970).
10(k)	Form of Change in Control Severance Agreement (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended September 30, 2014, Commission File Number 001-03970).
10(l)	Notification Letter to F. Nicholas Grasberger, III dated March 20, 2013 (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2013, Commission File Number 001-03970).
10(m)	Notification Letter to David Everitt dated March 14, 2014 (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2014, Commission File Number 001-03970).
10(n)	Notification Letter to F. N. Grasberger dated April 8, 2014 (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2014, Commission File Number 001-03970).
10(o)	Notification Letter to F. N. Grasberger dated August 1, 2014 (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended September 30, 2014, Commission File Number 001-03970).
10(p)	Form of Stock Appreciation Rights Agreement (effective for grants on or after April 28, 2014) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2014, Commission File Number 001-03970).
10(q)	Form of Performance Share Units Agreement (effective for grants on or after April 28, 2015) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2015, Commission File Number 001-03970).
10(r)	Form of Stock Appreciation Rights Agreement (effective for grants on or after April 28, 2015) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2015, Commission File Number 001-03970).
10(s)(i)	2016 Non-Employee Directors' Long-Term Equity Compensation Plan (incorporated by reference to the Company's Form S-8 dated May 6, 2016, Commission File Number 001-03970).
10(s)(ii)	First Amendment to 2016 Non-Employee Directors' Long-Term Equity Compensation Plan (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2016, Commission File Number 001-03970).
10(t)	Form of Restricted Stock Units Agreement (Non-Employee Director) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2016, Commission File Number 001-03970).
10(u)	Form of Performance Share Units Agreement (effective for grants on or after April 26, 2016) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2016, Commission File Number 001-03970).
10(v)	Form of Restricted Stock Units Agreement (effective for grants on or after April 26, 2016) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2016, Commission File Number 001-03970).
10(w)	Form of Stock Appreciation Rights Agreement (effective for grants on or after April 26, 2016) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2016, Commission File Number 001-03970).
10(x)	Form of Performance Share Units Agreement (effective for grants on or after February 16, 2017) (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2016, Commission File Number 001-03970).
10(y)	Form of Restricted Stock Units Agreement (effective for grants on or after February 16, 2017) (incorporated by reference to the Company's Annual Report on Form 10-K for the period Ended December 31, 2016, Commission File Number 001-03970).
10(z)	Form of Stock Appreciation Rights Agreement (effective for grants on or after February 16, 2017) (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2016, Commission File Number 001-03970).
10(aa)	Form of PSU Award Agreement (for awards granted on or after March 2, 2018) (incorporated by reference to the Company's current report on Form 8-K dated March 8, 2018, Commission File Number 001-03970).
10(ab)	Form of RSU Award Agreement (for awards granted on or after March 6, 2019) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period Ended March 31, 2019, Commission File Number 001-03970).



Description of Exhibit	
10(ac)	Form of PSU Award Agreement (for awards granted on or after March 6, 2019) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period Ended March 31, 2019, Commission File Number 001-03970).
10(ad)	Form of SAR Award Agreement (for awards granted on or after March 6, 2019) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period Ended March 31, 2019, Commission File Number 001-03970).
Director Indemnity Agreements	
10(bb)	Form of Director Indemnification Agreement (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2017, Commission File Number 001-03970).
21	Subsidiaries of the Registrant.
23	Consent of Independent Registered Public Accounting Firm.
31.1	Certification Pursuant to Rule 13a-14(a) and 15d-14(a) as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (Chief Executive Officer).
31.2	Certification Pursuant to Rule 13a-14(a) and 15d-14(a) as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (Chief Financial Officer).
32	Certifications Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (Chief Executive Officer and Chief Financial Officer).
101.Def	Definition Linkbase Document
101.Pre	Presentation Linkbase Document
101.Lab	Labels Linkbase Document
101.Cal	Calculation Linkbase Document
101.Sch	Schema Document
101.Ins	Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.

Exhibits other than those listed above are omitted for the reason that they are either not applicable or not material.

Item 16. Form 10-K Summary.

None.

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.

HARSCO CORPORATION
(Registrant)

DATE February 21, 2020

/s/ PETER F. MINAN

Peter F. Minan

*Senior Vice President and Chief Financial Officer
(Principal Financial Officer)*

DATE February 21, 2020

/s/ SAMUEL C. FENICE

Samuel C. Fenice

*Vice President and Corporate Controller
(Principal Accounting 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.

<u>Signature</u>	<u>Capacity</u>	<u>Date</u>
/s/ F. NICHOLAS GRASBERGER III F. Nicholas Grasberger III	Chairman, President, Chief Executive Officer and Director (Principal Executive Officer)	February 21, 2020
/s/ PETER F. MINAN Peter F. Minan	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	February 21, 2020
/s/ DAVID C. EVERITT David C. Everitt	Lead Director	February 21, 2020
/s/ JAMES F. EARL James F. Earl	Director	February 21, 2020
/s/ KATHY G. EDDY Kathy G. Eddy	Director	February 21, 2020
/s/ CAROLANN I. HAZNEDAR Carolann I. Haznedar	Director	February 21, 2020
/s/ MARIO LONGHI Mario Longhi	Director	February 21, 2020
/s/ EDGAR M. PURVIS, JR. Edgar M. Purvis, Jr.	Director	February 21, 2020
/s/ PHILLIP C. WIDMAN Phillip C. Widman	Director	February 21, 2020